

**REPUBLIC OF KENYA**



**MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES AND COOPERATIVES  
STATE DEPARTMENT FOR CROP DEVELOPMENT AND AGRICULTURE**

**SMALL SCALE IRRIGATION AND VALUE ADDITION PROJECT**

**Tender No. MOALF/SIVAP/T001/2022-2023**

**COMPLETION OF CONSTRUCTION OF KIRUMI KIAMUNJARI  
IRRIGATION SCHEME IN THARAKA NITHI COUNTY**

National Competitive Bidding  
Instruction to bids, conditions of contract, Specifications &  
Bills of Quantities

**Launched: 11-10-2022**

**Closing: 8-11-2022**

**Name of Bidder: .....**

## SPECIFIC PROCUREMENT NOTICE



REPUBLIC OF KENYA

MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES AND  
COOPERATIVES

STATE DEPARTMENT FOR CROP DEVELOPMENT AND AGRICULTURAL  
RESEARCH

SMALL SCALE IRRIGATION AND VALUE ADDITION PROJECT (SIVAP)

ADVERTISEMENT

Date: **11-10-2022**

Loan No: **2000130014530**  
Project ID No.: **P-KE-AAZ-009**

### CONSTRUCTION OF THE REMAINING WORKS FOR KIRUMI KIA MUNJIARI IRRIGATION SCHEME IN THARAKA NITHI COUNTY

1. This Invitation for Bids follows the General Procurement Notice (GPN) for this project that appeared in UNDB online **AfDB811-11/15 of 19<sup>th</sup> November, 2015** and on the African Development Bank Group's Internet Website.
2. The Government of Kenya has received loan from the African Development Bank towards the cost of the **Small Scale Irrigation and Value Addition Project (SIVAP)**. It is intended that part of the Proceeds of this loan will be applied to eligible payments under the contract for Construction the remaining works for Kirumi Kia Munjiari Irrigation Scheme in Tharaka Nithi County.
3. The Ministry of Agriculture, Livestock, Fisheries and Cooperatives now invites sealed bids from eligible bidders for the above works as below;

S/N	Tender No	Tender description	Bid Security Amount(Kshs)
1.	MOALF/SIVAP/T001/ 2022-2023	Construction of the remaining works for Kirumi Kia Munjiari Irrigation Scheme in Tharaka Nithi County	2,000,000.00

4. Interested eligible bidders may obtain further information from the Office of the **Project Coordinator, Small-scale Irrigation and Value Addition Project (SIVAP), Hill Plaza 9<sup>th</sup> Floor, Ngong Road P.O. Box 30028 00100 Nairobi.**

5. A complete set of bidding documents may be **down loaded** from the Ministry's web site [www.kilimo.go.ke](http://www.kilimo.go.ke)
6. The provisions in the Instructions to Bidders and in the General Conditions of Contract are the provisions of the **African Development Bank Standard Bidding Document: Procurement of Works.**
7. Bids should be clearly marked '**Construction of Kirumi Kia Munjiari Irrigation Scheme in Tharaka Nithi County, Tender No. MOALF/SIVAP/T080/2021-2022**' and deposited at **State Department for Crop Development and Agricultural Research Tender Box, situated at the Ground Floor, Kilimo House, Cathedral Road** or posted to

**Principal Secretary  
State Department for Crop Development and Agricultural Research  
Ministry of Agriculture, Livestock, Fisheries and Cooperatives  
Kilimo House, Cathedral Road  
P. O. Box 30028-00100  
NAIROBI**

and should be received on or before **8<sup>th</sup> November, 2022 at 11.00 am local time and *MUST* be accompanied by a bid guarantee as indicated in the table above.**

Bulky bid documents that cannot fit in the tender box should be dropped at the Head: Supply Chain Management Office at Kilimo House, 4<sup>th</sup> Floor Room 4-2B.

8. Bids will be opened in the presence of bidders' representatives who choose to attend at **11.00am on 8<sup>th</sup> November, 2022 at the Conference Room Kilimo House 7<sup>th</sup> Floor.**

**Head, Supply Chain Management Unit  
State Department for Crop Development and Agricultural Research  
FOR: PRINCIPAL SECRETARY**

## **PART 1 – BIDDING PROCEDURES**

### **Section I. Instructions to Bidders (ITB)**

This Section provides relevant information to help Bidders prepare their bids. Information is also provided on the submission, opening, and evaluation of bids and on the award of Contracts.

### **Section II. Bid Data Sheet (BDS)**

This Section consists of provisions that are specific to each procurement and that supplement the information or requirements included in Section I, **Instructions to Bidders**.

### **Section III. Evaluation and Qualification Criteria**

This Section contains the criteria to determine the lowest evaluated bid and the qualifications of the Bidder to perform the contract.

### **Section IV. Bidding Forms**

This Section contains the forms which are to be completed by the Bidder and submitted as part of his Bid

### **Section V. Eligible Countries**

This Section contains information regarding eligible countries.

## **PART 2 – EMPLOYER’S REQUIREMENTS**

### **Section VI. Requirements**

This Section contains the Specification, the Drawings, and supplementary information that describe the Works to be procured.

## **PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS**

### **Section VII. General Conditions (GC)**

This Section contains the general clauses to be applied in all contracts.

### **Section VIII. Particular Conditions (PC)**

This Section consists of Contract Data and Specific Provisions which contains clauses specific to each contract. The contents of this Section supplement the General Conditions and shall be prepared by the Employer.

## **Section IX. Contract Forms**

This Section contains forms which, once completed, will form part of the Contract. The forms for **Performance Security** and **Advance Payment Security**, when required, shall only be completed by the successful Bidder after contract award.

# Table of Contents

<b>PART 1 – Bidding Procedures .....</b>	<b>7</b>
Section I. Instructions to Bidders .....	9
Section II. Bid Data Sheet .....	36
Section III. Evaluation and Qualification Criteria.....	40
Section IV. Bidding Forms.....	55
Section V. Eligible Countries .....	315
<b>PART 2 – Employer’s Requirements.....</b>	<b>316</b>
Section VI. Requirements .....	317
<b>PART 3 – Conditions of Contract and Contract Forms .....</b>	<b>411</b>
Section VII. General Conditions (GC) .....	413
Section VIII. Particular Conditions .....	455
Section IX. Contract Forms .....	459

# **PART 1 – Bidding Procedures**





## Section I. Instructions to Bidders

### Table of Contents

<b>A.</b>	<b>General</b> .....	<b>11</b>
1.	Scope of Bid.....	11
2.	Source of Funds.....	11
3.	Fraud and Corruption.....	11
4.	Eligible Bidders.....	14
5.	Eligible Goods and Related Services .....	16
<b>B.</b>	<b>Contents of Bidding Document</b> .....	<b>17</b>
15.	Sections of Bidding Document .....	17
7.	Clarification of Bidding Document, Site Visit, Pre-Bid Meeting.....	18
8.	Amendment of Bidding Document.....	19
<b>C.</b>	<b>Preparation of Bids</b> .....	<b>19</b>
9.	Cost of Bidding .....	19
17.	Language of Bid .....	19
11.	Documents Comprising the Bid.....	20
12.	Letter of Bid and Price Schedules .....	20
13.	Alternative Bids .....	21
14.	Bid Prices and Discounts .....	21
15.	Currencies of Bid and Payment .....	22
115.	Documents Establishing the Qualifications of the Bidder .....	22
17.	Documents Establishing the Eligibility of the Goods and Related Services .....	22
18.	Period of Validity of Bids .....	23
19.	Bid Security .....	23
20.	Format and Signing of Bid .....	25
<b>D.</b>	<b>Submission and Opening of Bids</b> .....	<b>26</b>
21.	Submission, Sealing and Marking of Bids.....	26
22.	Deadline for Submission of Bids.....	26
23.	Late Bids .....	27
24.	Withdrawal, Substitution, and Modification of Bids.....	27

---

25.	Bid Opening.....	27
<b>E.</b>	<b>Examination of Bids.....</b>	<b>29</b>
215.	Confidentiality .....	29
27.	Clarification of Bids .....	29
28.	Determination of Responsiveness .....	29
<b>F.</b>	<b>Bid Evaluation and Comparison .....</b>	<b>31</b>
29.	Correction of Arithmetical Errors .....	31
30.	Conversion to Single Currency .....	31
31.	Bid Adjustments .....	31
32.	Qualification of the Bidder .....	32
33.	Comparison of Bid .....	33
34.	Employer’s Right to Accept Any Bid, and to Reject Any or All Bids... ..	33
<b>G.</b>	<b>Award of Contract.....</b>	<b>33</b>
35.	Award Criteria .....	33
315.	Notification of Award.....	33
37.	Signing of Contract .....	34
38.	Performance Security .....	35

# Section I. Instructions to Bidders

## A. General

1. **Scope of Bid**
  - 1.1 The Employer indicated in Section II, **Bid Data Sheet (BDS)** issues this Bidding Document for the procurement of Works, as specified in Section VI, Requirements. The name, identification, and number of lots are provided in the **BDS**.
  - 1.2 Unless otherwise stated, throughout this Bidding Document definitions and interpretations shall be as prescribed in Section VII, **General Conditions**.
2. **Source of Funds**
  - 2.1 The Borrower or Recipient (hereinafter called “Borrower”) indicated in the **BDS** has applied for or received financing (hereinafter called “funds”) from the African Development Bank<sup>1</sup> (hereinafter called “the Bank”) toward the cost of the project named in the **BDS**. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.
  - 2.2 Payments by the Bank will be made only at the request of the Borrower and upon approval by the Bank in accordance with the terms and conditions of the financing agreement between the Borrower and the Bank (hereinafter called the Loan Agreement), and will be subject in all respects to the terms and conditions of that Loan Agreement. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the funds.
3. **Fraud and Corruption**
  - 3.1 It is the Bank’s policy to require that Borrowers (including beneficiaries of Bank Financing), as well as bidders, suppliers, and contractors, and their agents (whether declared or not), subcontractors, sub-consultants, service providers or suppliers, and any personnel thereof, under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts<sup>2</sup>. In pursuance of this policy, the Bank:

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<sup>1</sup> The specific financing institution shall be as stipulated in the **BDS**.

<sup>2</sup> *In this context, any action to influence the procurement process or contract execution for undue advantage is improper.*

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
- (i) “Corrupt Practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party<sup>3</sup>;
  - (ii) “Fraudulent Practice” any act or omission, including a 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<sup>4</sup>, designed to achieve an improper purpose, including to influence improperly the actions of another party; and
  - (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<sup>5</sup>;
  - (v) “Obstructive practice” is
    - (v.1) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or

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<sup>3</sup> For the purpose of this sub-paragraph, “another party” refers to a public official acting in relation to the procurement process or contract execution. In this context, “public official” includes Bank staff and employees of other organizations taking or reviewing procurement decisions.

<sup>4</sup> For the purpose of this sub-paragraph, “parties” refers to participants in the procurement process (including public officials) attempting either themselves, or through another person or entity not participating in the procurement or selection process, to simulate competition or to establish bid prices at artificial, non-competitive levels, or are privy to each other’s bid prices or other conditions.

<sup>5</sup> For the purpose of this sub-paragraph, “party” refers to a participant in the procurement process or contract execution.

(v.2) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 3.1(e) below.

- (b) will reject a proposal for award if it determines that the bidder recommended for award, or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees has, directly or indirectly, engaged in Corrupt, Fraudulent, Collusive, Coercive, or Obstructive Practices in competing for the contract in question;
- (c) will declare mis procurement and cancel the portion of the Financing allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of such Financing engaged in Corrupt, Fraudulent, Collusive, Coercive or Obstructive Practices during the procurement or the implementation of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;
- (d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank's sanctions procedures<sup>6</sup> including by publicly declaring such firm or individual ineligible to bid for, or to be awarded Bank-financed contracts either indefinitely or for a stated period of time, (i) to be awarded a Bank-financed contract; (ii) to be a nominated<sup>7</sup> sub-contractor, consultant, supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract; and
- (e) will require that a clause be included in bidding documents and in contracts financed by the Bank,

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<sup>6</sup> A firm or an individual may be declared ineligible to be awarded a Bank financed contract: (i) upon completion of the Bank's sanctions proceedings as per its sanctions procedures, including, inter alia, cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks, or otherwise decided by the Bank; and through the application of the Proposal for the Implementation of a Sanctions Process within the African Development Bank Group; and (ii) as a result of temporary suspension or early temporary suspension in connection with an on-going sanction proceeding. See footnote 18 and paragraph 9 of Appendix 1 of the Rules and Procedures for Procurement of Goods and Works.

<sup>7</sup> A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding documents) is one which has either been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirement for the particular bid; or (ii) appointed by the Borrower."

requiring bidders, suppliers and contractors and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts and records and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by the Bank.

3.2 Furthermore, Bidders shall be aware of the provisions stated in Section VII, **General Conditions**.

#### 4. **Eligible Bidders**

4.1 A Bidder may be a natural person, private entity, government-owned entity—subject to **ITB** 4.5—or any combination of such entities supported by a letter of intent to enter into an agreement or under an existing agreement in the form of a joint venture, consortium, or association (JVCA). In the case of a joint venture, consortium, or association:

(a) unless otherwise specified in the **BDS**, all partners shall be jointly and severally liable, and

(b) the JVCA shall nominate a Representative who shall have the authority to conduct all businesses for and on behalf of any and all the partners of the JVCA during the bidding process and, in the event the JVCA is awarded the Contract, during contract execution.

4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with the Bank's **Rules and Procedures for Procurement of Goods and Works**, and as listed in Section V, Eligible Countries.<sup>8</sup> A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including Related Services.

4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

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<sup>8</sup> Including eligibility criteria for participation in the supply of goods, works and related services.

- (a) they have controlling partners in common; or
  - (b) they receive or have received any direct or indirect subsidy from any of them; or
  - (c) they have the same legal representative for purposes of this bid; or
  - (d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
  - (e) a Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which it is involved. However, this does not limit the inclusion of the same subcontractor, not otherwise participating as a Bidder, in more than one bid; or
  - (f) a Bidder participated as a consultant in the preparation of Section VI, Requirements that are the subject of the bid.
  - (g) a Bidder or any of its affiliates has been hired, or is proposed to be hired, by the Employer or the Borrower for the supervision of the contract.
- 4.4 A Bidder that is under a declaration of ineligibility by the Bank in accordance with **ITB** Clause 3, at the date of the deadline for bid submission or thereafter, shall be disqualified.
- 4.5 Government-owned entities in the Borrower's country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under the principles of commercial law, and (iii) are not dependent agencies of the Employer or the Borrower.
- 4.6 Bidders shall not be under execution of a Bid-Securing Declaration in the Employer's Country.
- 4.7 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

- 4.8 Firms from an eligible country shall be excluded if:
- (a) as a matter of law or official regulation, the Borrower's country 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, the Borrower's country prohibits any import of Goods from that country or any payments to persons or entities in that country.
- 4.9 In case a prequalification process has been conducted prior to the bidding process, this bidding is open only to prequalified Bidders.
- 4.10 A firm sanctioned by the Bank in accordance with the above ITB Clause 3.1 (d), or in accordance with the Bank's policies on anti-corruption and fraud and Bank's sanctions procedures<sup>9</sup>, shall be ineligible to be awarded a Bank-financed contract, or to benefit from a Bank-financed contract, financially or in any other manner, during the period of time determined by the Bank

**5. Eligible Goods and Related Services**

- 5.1 All Goods and Related Services to be supplied under the Contract and financed by the Bank, shall have as their country of origin an eligible country of the Bank in accordance with the Bank's **Rules and Procedures for Procurement of Goods and Works**, as listed in Section V, Eligible Countries.
- 5.2 For purposes of this Clause, the term "Goods" includes commodities, raw material, machinery, equipment, and industrial plants; and "Related Services" includes services such as insurance, transportation, installation, and commissioning, training, and initial maintenance.
- 5.3 The term "country of origin" means the country where the Goods have been mined, grown, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially

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<sup>9</sup> See the Proposal for the Implementation of a Sanctions Process within the African Development Bank Group and the Bank's Whistleblowing and Complaints Handling Policy. The Bank's sanctions procedures are publicly disclosed on the Bank's external website."



recognized article results that differs substantially in its basic characteristics from its imported components.

- 5.4 The nationality of the firm that produces, assembles, distributes, or sells the Goods shall not determine their origin.

## **B. Contents of Bidding Document**

### **6. Sections of Bidding Document**

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

#### **PART 1 Bidding Procedures**

- Section I. Instructions to Bidders (**ITB**)
- Section II. Bid Data Sheet (**BDS**)
- Section III. Evaluation and Qualification Criteria
- Section IV. Bidding Forms
- Section V. Eligible Countries

#### **PART 2 Employer's Requirements**

- Section VI. Requirements

#### **PART 3 Conditions of Contract and Contract Forms**

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

- 6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Document.
- 6.3 The Bidder shall obtain the Bidding Document from the source stated by the Employer in the Invitation for Bids; otherwise the Employer is not responsible for the completeness of the Bidding Document.
- 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.

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

- 7.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address indicated in the **BDS** or raise his enquiries during the pre-bid meeting if provided for in accordance with **ITB** 7.4. The Employer will respond to any request for clarification, provided that such request is received prior to the deadline for submission of bids, within the number of days specified in the **BDS**. The Employer response shall be in writing with copies to all Bidders who have acquired the Bidding Document in accordance with **ITB** 15.3, including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under **ITB** 8 and **ITB** 22.2.
- 7.2 Where applicable, the Bidder is advised to visit and examine the project site and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract for the provision of the Requirements. The costs of visiting the site shall be at the Bidder's own expense.
- 7.3 Pursuant to **ITB** 7.2, where the Bidder and any of its personnel or agents have been granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the visit.
- 7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if provided for in the **BDS**. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. If so provided for in the **BDS**, the Employer will organize a site visit.
- 7.5 The Bidder is requested, as far as possible, to submit any questions in writing, to reach the Employer not later than one week before the meeting.

- 7.6 Minutes of the pre-bid meeting, including the text of the questions raised without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with **ITB** 15.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an Addendum pursuant to **ITB** 8 and not through the minutes of the pre-bid meeting.
- 7.7 Non-attendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
- 8. Amendment of Bidding Document**
- 8.1 At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addenda.
- 8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with **ITB** 15.3.
- 8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bids, pursuant to **ITB** 22.2

### **C. Preparation of Bids**

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

**11. Documents  
Comprising  
the Bid**

11.1 The Bid shall comprise the following:

- (a) Letter of Bid
- (b) Completed Schedules as provided in Section IV, Bidding Forms;
- (c) Bid Security or Bid-Securing Declaration, in accordance with **ITB** 19;
- (d) at the Bidder's option, alternative proposals, if permissible, in accordance with **ITB** 13;
- (e) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with **ITB** 20.2;
- (f) documentary evidence establishing the eligibility of the Goods and Related Services offered by the Bidder, in accordance with **ITB** 17.1;
- (g) documentary evidence establishing the Bidder's qualifications in accordance with the requirements of Section III, Evaluation and Qualification Criteria, using the relevant forms furnished in Section IV, Bidding Forms;
- (h) documentary evidence as specified in the **BDS**, establishing the conformity of the Technical Proposal offered by the Bidder with the Bidding Document, using the relevant forms furnished in Section IV, Bidding Forms;
- (i) in the case of a bid submitted by a JVCA, JVCA agreement, or letter of intent to enter into a JVCA including a draft agreement, indicating at least the parts of the Requirements to be executed by the respective partners;
- (j) any other document required in the **BDS**.

**12. Letter of Bid  
and Price  
Schedules**

12.1 The Bidder shall submit the Letter of Bid using the form furnished in Section IV, Bidding Forms. This form must be completed without any alterations to its format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

**13. Alternative Bids**

13.1 Unless otherwise indicated in the **BDS**, alternative proposals shall not be considered. If alternative proposals are permitted, their method of evaluation shall be as stipulated in Section III, Evaluation and Qualification Criteria.

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

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

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

**14. Bid Prices and Discounts**

14.1 The prices and discounts quoted by the Bidder in the Letter of Bid and in the Price Schedules shall conform to the requirements specified in **ITB** 14.2.

14.2 Unless otherwise provided in the **BDS** and the **General Conditions (GC)**, the prices quoted by the Bidder shall be fixed.

14.3 The Bidder shall submit a bid for the whole of the works described in **ITB** 1.1 by filling in prices for all items of the Works, as identified in Section IV, Bidding Forms. In case of admeasurement contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities.

- 14.4 The price to be quoted in the Letter of Bid shall be the total price of the Bid, excluding any discounts offered.
- 14.5 Unconditional discounts, if any, and the methodology for their application shall be quoted in the Letter of Bid, in accordance with **ITB** 12.1.
- 14.6 If, pursuant to **ITB** 14.2, prices are adjustable, the Bidder shall furnish the indices and weightings for the price adjustment formula in the Schedule of Adjustment Data in Section IV (Bidding Forms) and the Employer may require the Bidder to justify its proposed indices and weightings.
- 14.7 If so indicated in **ITB** 1.1, bids are invited for individual contracts or for any combination of contracts (packages). Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with **ITB** 14.5, provided the bids for all contracts are submitted and opened at the same time.
- 14.8 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total bid price submitted by the Bidder.
- 15. Currencies of Bid and Payment**
- 15.1 The currency(ies) of the bid and the currency(ies) for payment shall be as specified in the **BDS**.
- 16. Documents Establishing the Qualifications of the Bidder**
- 16.1 To establish its qualifications to perform the Contract in accordance with Section III, Evaluation and Qualification Criteria, the Bidder shall provide the information requested in Section IV, Bidding Forms.
- 16.2 Bidders, individually or in joint ventures, applying for eligibility for margin of preference, if such margin applies pursuant to **ITB** 31.2, shall supply all information required to satisfy the criteria for eligibility as described in **ITB** 31.2.
- 17. Documents Establishing**
- 17.1 To establish the eligibility of the Goods and Related Services in accordance with **ITB** Clause 5, Bidders shall

**the Eligibility  
of the Goods  
and Related  
Services**

complete the forms, included in Section IV, Bidding Forms.

**18. Period of  
Validity of  
Bids**

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

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

18.3 In the case of fixed price contracts, if the award is delayed by a period exceeding fifty-six (515) days beyond the expiry of the initial bid validity, the Contract price shall be adjusted as specified in the request for extension. Bid evaluation shall be based on the Bid Price without taking into consideration the above correction.

**19. Bid Security**

19.1 The Bidder shall furnish as part of its bid, at the option of the Employer, and as stipulated in the **BDS**, the original of either a Bid-Securing Declaration or a bid security using the relevant form included in Section IV, Bidding Forms. In the case of a bid security, the bid security amount and currency shall be as specified in the **BDS**.

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

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

- (a) an unconditional guarantee issued by a bank or surety;
- (b) an irrevocable letter of credit; or

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

19.4 Pursuant to the option stipulated at **ITB 19.1**, any bid not accompanied by a substantially responsive bid security or Bid-Securing Declaration shall be rejected by the Employer as non-responsive.

19.5 If a bid security is specified pursuant to **ITB 19.1**, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the performance security pursuant to **ITB 38**.

19.6 The bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.

19.7 The bid security may be forfeited or the Bid-Securing Declaration executed:

(a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder in the Letter of Bid or

(b) if the successful Bidder fails to:

(i) sign the Contract in accordance with **ITB 37**; or

(ii) furnish a performance security in accordance with **ITB 38**.



19.8 The Bid Security or the Bid Securing Declaration of a JVCA shall be in the name of the JVCA that submits the bid. If the JVCA has not been legally constituted into a legally enforceable JVCA at the time of bidding, the Bid Security or the Bid Securing Declaration shall be in the names of all future partners as named in the letter of intent referred to in **ITB** 4.1.

19.9 If a Bid-Securing Declaration is executed in accordance with **ITB** 19.7, the Employer will declare the Bidder ineligible to be awarded a contract by the Employer for the period of time stated in the Form of Bid-Securing Declaration.

**20. Format and  
Signing of  
Bid**

20.1 The Bidder shall prepare one original of the documents comprising the bid as described in **ITB** 11 and clearly mark it "ORIGINAL." In addition, the Bidder shall submit copies of the bid, in the number specified in the **BDS** and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

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

20.3 A bid submitted by a JVCA shall comply with the following requirements:

- (a) Unless not required in accordance with **ITB** 4.1 (a), be signed so as to be legally binding on all partners and
- (b) Include the Representative's authorization referred to in **ITB** 4.1 (b), consisting of a power of attorney signed by those legally authorized to sign on behalf of the JVCA.

20.4 Any amendments, interlineations, erasures, or overwriting shall be valid only if they are signed or initialled by the person signing the bid.

#### **D. Submission and Opening of Bids**

##### **21. Submission, Sealing and Marking of Bids**

21.1 Bidders may always submit their bids by mail or by hand. If so specified in the **BDS**, bidders shall have the option of submitting their bids electronically. Procedures for submission, sealing and marking are as follows:

- (a) Bidders submitting bids by mail or by hand shall enclose the original and copies of the Bid in separate sealed envelopes. If so permitted in accordance with **ITB** 13, alternative proposals, and copies thereof, shall also be placed in separate envelopes. The envelopes shall be duly marked as "ORIGINAL," "ALTERNATIVE," "ORIGINAL COPY," and "ALTERNATIVE COPY" These envelopes shall then be enclosed in one single package. The rest of the procedure shall be in accordance with **ITB** 21.2 and 21.3.
- (b) Bidders submitting bids electronically shall follow the electronic bid submission procedures specified in the **BDS**.

21.2 The inner and outer envelopes shall:

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

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

##### **22. Deadline for Submission of Bids**

22.1 Bids must be received by the Employer at the address and no later than the date and time indicated in the **BDS**.

22.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding

Document in accordance with **ITB 8**, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

**23. Late Bids**

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

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

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

- (a) prepared and submitted in accordance with **ITB 20** and **ITB 21** (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and
- (b) received by the Employer prior to the deadline prescribed for submission of bids, in accordance with **ITB 22**.

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

24.3 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

**25. Bid Opening**

25.1 The Employer shall conduct the bid opening in public, in the presence of Bidders` designated representatives and anyone who choose to attend, and at the address, date and time specified in the **BDS**. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with **ITB 21.1**, shall be as specified in the **BDS**.

25.2 First, envelopes marked "Withdrawal" shall be opened and read out and the envelope with the corresponding bid

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

- 25.3 The Employer shall open all other envelopes one at a time and read out: the name of the Bidder, the Bid Price(s), any discounts and their application methodology, alternative bids, the presence or absence of a bid security or Bid-Securing Declaration; and any other details as the Employer may consider appropriate. Only discounts and alternative bids read out at bid opening shall be considered for evaluation. No bid shall be rejected at bid opening except for late bids, in accordance with **ITB 23.1**.
- 25.4 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot if applicable, including any discounts and alternative proposals; and the presence or absence of a bid security or a Bid-Securing Declaration. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted bids in time, and posted online when electronic bidding is permitted.

## E. Examination of Bids

- 26. Confidentiality**
- 26.1 Information relating to the evaluation of bids shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.
- 26.2 Any attempt by a Bidder to influence improperly the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid.
- 26.3 Notwithstanding **ITB** 215.1, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it should do so in writing.
- 27. Clarification of Bids**
- 27.1 To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its bid, allowing a reasonable time for response. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids, in accordance with **ITB** 29.
- 27.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Employer's request for clarification, its bid may be rejected.
- 28. Determination of Responsiveness**
- 28.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself, as defined in **ITB** 11.
- 28.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission.
- (a) "Deviation" is a departure from the requirements specified in the Bidding Document;
- (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the

requirements specified in the Bidding Document;  
and

- (c) “Omission” is the failure to submit part or all of the information or documentation required in the Bidding Document.

28.3 A material deviation, reservation, or omission is one that,

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

28.4 The Employer shall examine the technical aspects of the bid in particular, to confirm that all requirements of Section VI have been met without any material deviation, reservation, or omission.

28.5 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

28.6 Provided that a bid is substantially responsive, the Employer may waive any quantifiable nonconformity in the bid that does not constitute a material deviation, reservation or omission.

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

comply with the request may result in the rejection of its bid.

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

## F. Bid Evaluation and Comparison

### 29. Correction of Arithmetical Errors

29.1 The Employer shall use the criteria and methodologies indicated in Section III, Evaluation and Qualification Criteria. No other evaluation criteria or methodologies shall be permitted

29.2 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors as indicated in Section III, Evaluation and Qualification Criteria

29.3 If a Bidder does not accept the correction of errors, its bid shall be declared non-responsive and its Bid Security shall be forfeited or the Bid-Securing Declaration executed.

### 30. Conversion to Single Currency

30.1 For evaluation and comparison purposes, the currency(ies) of the bid shall be converted into a single currency as specified in Section III, Evaluation and Qualification Criteria.

### 31. Bid Adjustments

31.1 For evaluation and comparison purposes the Employer shall adjust the bid prices using the criteria and methodology specified in Section III, Evaluation and Qualification Criteria.

31.2 Unless otherwise specified in the **BDS**, no margin of domestic or regional preference shall apply. If a margin of preference applies, the application methodology shall be as specified in Section III, Evaluation and Qualification Criteria, and in accordance with the provisions stipulated in the Bank's **Rules and Procedures for Procurement of Goods and Works**.

31.3 If in the opinion of the Employer the bid which results in the lowest Evaluated Bid, is seriously unbalanced or

front loaded or substantially below the Employer's estimates, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

**32. Qualification of the Bidder**

32.1 The Employer shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

32.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to **ITB 115**.

32.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the Employer shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder's qualifications to perform satisfactorily.

32.4 The capabilities of the manufacturers and subcontractors proposed in its Bid to be used by the lowest evaluated Bidder for identified major items of the Requirements will also be evaluated for acceptability in accordance with the criteria and methodologies defined in Section III, Evaluation and Qualification Criteria. Their participation should be confirmed with a letter of intent between the parties, as needed. Should a manufacturer or subcontractor be determined to be unacceptable, the Bid will not be rejected, but the Bidder will be required to substitute an acceptable manufacturer or subcontractor without any change to the bid price.



- 33. Comparison of Bid** 33.1 Subject to **ITB** 29, 30 and 31, the Employer shall compare all substantially responsive bids to determine the lowest evaluated bid.
- 34. Employer's Right to Accept Any Bid, and to Reject Any or All Bids** 34.1 The Employer reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

### **G. Award of Contract**

- 35. Award Criteria** 35.1 Subject to **ITB** 34.1, the Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
- 36. Notification of Award** 315.1 Prior to the expiration of the period of bid validity, the Employer shall notify the successful Bidder, in writing, that its bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Works (hereinafter and in the Contract Forms called "the Contract Price").
- 315.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.

315.3 At the same time, the Employer shall also notify all other Bidders of the results of the bidding process, and shall publish in **UNDB online** and at the **Bank's website** ([www.afdb.org](http://www.afdb.org)), the results identifying the bid and lot numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. After publication of the award, unsuccessful bidders may request in writing to the Employer for a debriefing seeking explanations on the grounds on which their bids were not selected. The Employer shall promptly respond in writing to any unsuccessful Bidder who, after Publication of contract award, requests a debriefing.

### **37. Signing of Contract**

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

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

37.3 Upon the successful Bidder's furnishing of the signed Contract Agreement and Performance Security pursuant to **ITB 38**, the Employer will discharge its Bid Security, pursuant to **ITB 19**.

37.4 Notwithstanding **ITB 37.2** above, in case signing of the Contract Agreement is prevented by any export restrictions attributable to the Employer, to the country of the Employer, or to the use of the products/goods, systems or services to be supplied, where such export restrictions arise from trade regulations from a country supplying those products/goods, systems or services, the Bidder shall not be bound by its bid, always provided, however, that the Bidder can demonstrate to the satisfaction of the Employer and of the Bank that signing of the Contract Agreement has not been prevented by any lack of diligence on the part of the Bidder in completing any formalities, including applying for permits, authorizations and licenses necessary for the export of the products/goods, systems or services under the terms of the Contract Agreement.

**38. Performance  
Security**

38.1 Within twenty-eight (28) days of the receipt of notification of award from the Employer, the successful Bidder shall furnish the performance security in accordance with the conditions of contract, subject to **ITB 31.3**, using for that purpose the Performance Security Form included in Section IX, Contract Forms, or another form acceptable to the Employer. If the performance security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.

38.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security, or execution of the Bid-Securing Declaration. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

<b>Section II. Bid Data Sheet</b>
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<b>A. General</b>	
<b>ITB 1.1</b>	The number of the Invitation for Bids is: MOALF/SIVAP/T001/2022-2023
<b>ITB 1.1</b>	The Employer is: <b>Principal Secretary, State Department for Crop Development and Agricultural Research - Ministry of Agriculture, Livestock, Fisheries and Cooperatives</b>
<b>ITB 1.1</b>	The name of the bidding process is: <b>National Competitive Bidding</b>  The identification number of the bidding process is: <b>MOALF/SIVAP/T001/2022-2023</b>  The number and identification of lots comprising this bidding process are: <b>N/A</b>
<b>ITB 2.1</b>	The Borrower is: <b>Republic of Kenya</b>
<b>ITB 2.1</b>	The specific Bank financing institution is: <b>African Development Bank</b>
<b>ITB 2.1</b>	The name of the Project is: <b>Small Scale Irrigation and Value Addition Project (SIVAP)</b>
<b>ITB 4.1(a)</b>	The individuals or firms in a joint venture, consortium or association <b>“shall be”</b> jointly and severally liable.
<b>ITB 4.4</b>	A list of debarred firms is available at <a href="http://www.afdb.org/debarred">http://www.afdb.org/debarred</a>
<b>B. Contents of Bidding Document</b>	
<b>ITB 7.1</b>	Attention: <b>Project Coordinator</b> Street Address: <b>Hill Plaza, Ngong Road P.O. Box 30028-00170 Nairobi, Kenya</b> Floor/Room number: <b>9<sup>th</sup> Floor</b> City: <b>Nairobi</b> ZIP Code: <b>N/A</b> Country: <b>KENYA</b>

	Electronic mail address: <b><u>npchoa@kilimo.go.ke</u></b> Requests for clarifications should be received by the Employer no later than <b>ten (10) days</b> , prior to the deadline for submission of Bids.
<b>ITB 7.4</b>	A Pre-Bid meeting “ <b>shall not</b> ” take place.
<b>C. Preparation of Bids</b>	
<b>ITB 17.1</b>	The language of the bid is: <b>English</b>
<b>ITB 11.1 (h)</b>	The Bidder must provide the following Documentary Evidence to establish the conformity of the Technical Proposal with the Bidding Document: <ul style="list-style-type: none"> <li>• <b>Certificate of registration/incorporation</b></li> <li>• <b>Evidence of similar works undertaken in the past two years</b></li> <li>• <b>List of equipment proposed for the works (provide proof of ownership, lease or hire)</b></li> <li>• <b>List of proposed personnel, signed CV’s and clear proposed positions/tasks for each</b></li> <li>• <b>Clear work program/plan</b></li> </ul>
<b>ITB 11.1 (j)</b>	The Bidder shall submit with its bid the following additional documents: <ul style="list-style-type: none"> <li>• <b>Copy of the Bidder’s VAT registration certificate or equivalent</b></li> <li>• <b>A valid tax compliance certificate</b></li> <li>• <b>Written authorization for the person signing the documents from the company/Power of Attorney</b></li> <li>• <b>Joint venture agreement, in the required format, for those submitting bids as joint ventures</b></li> <li>• <b>A bid guarantee from a Reputable Bank in the format given/attached and shall be valid for twenty-eight days (28) beyond the original validity period of the bid</b></li> <li>• <b>Duly filled and signed letter of bid in the company letterhead and in the format attached.</b></li> </ul>
<b>ITB 13.1</b>	Alternative bids are not permitted.
<b>ITB 13.2</b>	Alternatives to the Times for Completion “ <b>shall not be</b> ” permitted.  If alternatives to the Times for Completion are permitted, the evaluation method will be as specified in Section III, Evaluation and Qualification Criteria.

<b>ITB 13.4</b>	Alternative technical solutions shall be permitted for the following parts of the Works, as further detailed in the Specification: <b>“none”</b> .
<b>ITB 14.2</b>	Prices <b>“shall be”</b> fixed.
<b>ITB 14.15</b>	The prices quoted by the Bidder <b>“shall not be”</b> subject to adjustment during the performance of the Contract.
<b>ITB 15.1</b>	The currency of the bid and payment shall be: <b>Kenya Shilling (KES)</b>
<b>ITB 18.1</b>	The bid validity period shall be: <b>120</b> days.
<b>ITB 19.1</b>	The Bidder shall furnish a bid security, in the amount of <b>KSH 2,000,000.00</b>
<b>ITB 20.1</b>	In addition to the original of the Bid, the number of copies is: <b>1 copy</b>
<b>ITB 20.2</b>	The written confirmation of authorization to sign on behalf of the Bidder shall indicate:  (a) The name and description of the documentation required to demonstrate the authority of the signatory to sign the Bid such as a Power of Attorney, authorization letter in company stationery; and  (b) In the case of Bids submitted by an existing or intended JVCA an undertaking signed by all parties (i) stating that all parties shall be jointly and severally liable, if so required in accordance with <b>ITB 4.1(a)</b> , and (ii) nominating a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JVCA during the bidding process and, in the event the JV is awarded the Contract, during contract execution.”]
<b>D. Submission and Opening of Bids</b>	
<b>ITB 21.1</b>	Bidders <b>“shall not”</b> have the option of submitting their bids electronically.
<b>ITB 21.1 (b)</b>	The electronic bidding submission procedures shall be: <b>None</b>
<b>ITB 22.1</b>	For <b>bid submission purposes</b> only, the Employer’s address is :

	<p>Attention: <b>Principal Secretary, State Department for Crop Development and Agricultural Research</b>  Street Address: <b>Cathedral Road</b>  Floor/Room number: <b>Ground Floor, State Department for Crop Development and Agricultural Research Tender Box</b>  City: <b>Nairobi</b>  ZIP Code: <b>P.O. Box 30028-00170 Nairobi, Kenya</b>  Country: <b>KENYA</b></p> <p><b>The deadline for bid submission is:</b>  Date: <b>8-11-2022</b>  Time: <b>11.00am</b></p>
<b>ITB 25.1</b>	<p><b>The bid opening shall take place at:</b>  Street Address: <b>Cathedral Road, State Department for Crop Development and Agricultural Research,</b>  Floor/Room number: <b>7<sup>th</sup> Floor Conference Room, Kilimo House</b>  City: <b>Nairobi</b>  Country: <b>Kenya</b>  Date: <b>8-11-2022</b>  Time: <b>11.00am</b></p>
<b>ITB 25.1</b>	The electronic bid opening procedures shall be: <b>None</b>
<b>F. Bid Evaluation and Comparison</b>	
<b>ITB 31.2</b>	A margin of domestic or regional preference <b>“shall not”</b> apply.

## **Section III. Evaluation and Qualification Criteria**

### **1. Evaluation Criteria and Methodology**

#### **1.1 Alternative Proposal (If permitted in accordance with ITB 13.1)**

Technical Alternative **None**

Alternative Time for Completion **None**

#### **1.2 Correction of Arithmetical Errors (In accordance with ITB 29.1)**

- (a) Where there are errors between the total of the amounts given under the column for the price breakdown and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly
- (b) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
- (c) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
- (d) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

#### **1.3 Conversion to a Single Currency (In accordance with ITB 30)**

Not applicable.

#### **1.4 Discounts (In accordance with ITB 14.5)**

The Employer will adjust the Bid Price, using the methodology prescribed by the Bidder in its Letter of Bid, to take account of the



Discounts offered by the Bidder in its Letter of Bid, as read out at the Bid Opening.

**1.5 Quantifiable Nonmaterial Nonconformities (In accordance with ITB 28.8)**

The adjustment shall be made using the following methodology:  
**[insert methodology]**

**1.6 Margin of Domestic or Regional Preference (If permitted in accordance with ITB 31.2)**

None

**1.7 Any other Criteria or Methodology**

See Section II & Section VIII

## 2. Qualification Criteria

<b>2</b>	<b>Qualification (Without Prequalification)</b>
<b>2.1</b>	Eligibility (TABLE)
<b>2.2</b>	Historical Contract Non-Performance (TABLE)
<b>2.3</b>	Financial Situation (TABLE)
<b>2.4</b>	Experience (TABLE)
<b>2.5</b>	Personnel (TABLE)
<b>2.15</b>	Equipment (TABLE)

## 2. Qualification Tables (Without Prequalification)

Factor	2.1 Eligibility					
	Criteria					
		Bidder				
			Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.1.1 Nationality	Nationality in accordance with <b>ITB</b> 4.2.	Must meet requirement	Existing or intended JVCA must meet requirement	Must meet requirement	N / A	Form ELI –1.1 and 1.2, with attachments
2.1.2 Conflict of Interest	No- conflicts of interests as described in <b>ITB</b> 4.3.	Must meet requirement	Existing or intended JVCA must meet requirement	Must meet requirement	N / A	Letter of Bid
2.1.3 Bank Ineligibility	Not having been declared ineligible by the Bank as described in <b>ITB</b> 4.4.	Must meet requirement	Existing JVCA must meet requirement	Must meet requirement	N / A	Letter of Bid
2.1.4 Government Owned Entity	Compliance with conditions of <b>ITB</b> 4.5	Must meet requirement	Must meet requirement	Must meet requirement	N / A	Form ELI –1.1 and 1.2, with attachments

<b>Factor</b>	<b>2.1 Eligibility</b>					
	Criteria					
		<b>Bidder</b>				
			<b>Joint Venture, Consortium or Association</b>			
			<b>All partners combined</b>	<b>Each partner</b>	<b>At least one partner</b>	
2.1.5 Ineligibility based on a United Nations resolution or Borrower's country law	Not having been excluded as a result of the Borrower's country laws or official regulations, or by an act of compliance with UN Security Council resolution, in accordance with <b>ITB</b> 4.8	Must meet requirement	Existing JVCA must meet requirement	Must meet requirement	N / A	Letter of Bid

<b>Factor</b>	<b>2.2 Historical Contract Non-Performance</b>					
	Criteria					
		Bidder				
			Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.2.1 History of non-performing contracts	Non-performance of a contract did not occur <b>within the last two (2)</b> years prior to the deadline for application submission, based on all information on fully settled disputes or litigation. A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract, and where all appeal instances available to the bidder have been exhausted.	Must meet requirement by itself or as partner to past or existing JVCA	N / A	Must meet requirement by itself or as partner to past or existing JVCA	N / A	Form CON - 2
2.2.2 Failure to Sign Contract	Not being under execution of Bid-Securing Declaration pursuant to <b>ITB 4.15 for two (2No) years</b>	Must meet requirement	N / A	Must meet requirement by itself or as partner to a JVCA	N / A	Letter of Bid

<b>Factor</b>	<b>2.2 Historical Contract Non-Performance</b>					
	Criteria					
		Bidder				
			Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.2.3 Pending Litigation	All pending litigation shall in total not represent <b>more than five percent (5%) of the Bidder's net worth</b> and shall be treated as resolved against the Bidder.	Must meet requirement by itself or as partner to past or existing JVCA	N / A	Must meet requirement by itself or as partner to past or existing JVCA	N / A	Form CON – 2

Factor	2.3 Financial Situation					
	Criteria					
		Bidder				
			Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.3.1 Historical Financial Performance	Submission of audited balance sheets or if not required by the law of the bidder's country, other financial statements acceptable to the Employer, <b>for the last three[3No] years</b> to demonstrate the current soundness of the bidders financial position and its prospective long term profitability. <i>(a) Audited accounts in comparative form</i> <i>(b) Valid Tax Compliance</i> <i>(c) Cash flow statements (Supported by Bank statements)</i>	Must meet requirement	N / A	Must meet requirement	N / A	Form FIN – 3.1 with attachments
2.3.2. Average Annual Turnover	<b>Minimum average annual turnover of KES 100million</b> , calculated as total certified payments received for contracts in progress or completed,	Must meet requirement	Must meet requirement	Must meet _____ percent (____%) of	Must meet _____ percent (____%) of	Form FIN –3.2

<b>Factor</b>	<b>2.3 Financial Situation</b>					
	Criteria					
		<b>Bidder</b>				
			<b>Joint Venture, Consortium or Association</b>			
			<b>All partners combined</b>	<b>Each partner</b>	<b>At least one partner</b>	
	<b>within the last three (3No ) years</b>			the requirement	the requirement	
2.3.3. Financial Resources	The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of credit, and other financial means, other than any contractual advance payments to meet: (i) the following cash-flow requirement: $\text{Current ratio} = \frac{\text{Liquid Assets}}{\text{Liquid liabilities}}$ Greater than 1 and $\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$ Less than 1 and	Must meet requirement	Must meet requirement	Must meet fifty percent (50%) of the requirement	Must meet seventy five percent (75%) of the requirement	Form FIN -3.3 + Form CCC



<b>Factor</b>	<b>2.3 Financial Situation</b>					
	Criteria					
		<b>Bidder</b>				
			<b>Joint Venture, Consortium or Association</b>			
			<b>All partners combined</b>	<b>Each partner</b>	<b>At least one partner</b>	
	(ii) the overall cash flow requirements for this contract and its current commitments.					

Factor	2.4 Experience						
	Criteria						
		Bidder					
			Joint Venture, Consortium or Association				
			All partners combined	Each partner			
2.4.1 General Experience	Experience under contracts in the role of contractor, subcontractor, or management contractor for <b>at least the last two [2No] years</b> prior to the applications submission deadline, and with an activity in for at least nine (9) months in each year.	Must meet requirement	N / A	Must meet requirement	N / A	Form EXP-4.1	
2.4.2 Specific Experience	(a)Participation as contractor or subcontractor in <b>at least three (3No) pressurized irrigation infrastructure construction contracts within the last three (3No) years</b> , each with a value of at least fifty (50) million, that have been successfully and substantially completed and that are similar to the proposed Works. The similarity shall be based on the <b>physical size, complexity, methods/technology or other characteristics as described in Section VI, Requirements.</b>	Must meet requirement	Must meet requirements for all characteristics	N / A	Must meet requirement for one characteristic	Form EXP 2.4.2(a)	

<b>Factor</b>	<b>2.4 Experience</b>					
	Criteria					
		Bidder				
			Joint Venture, Consortium or Association			
			All partners combined	Each partner	At least one partner	
2.4.2 Specific Experience	b) For the above or other contracts executed during the period stipulated in 2.4.2(a) above, a minimum experience in the following key activities: <ol style="list-style-type: none"> <li>1. Construction of piped irrigation system</li> <li>2. Pressure testing</li> <li>3. installation of sprinklers</li> <li>4. Operation and maintenance</li> </ol>	Must meet requirements	Must meet requirements	N / A	Must meet requirements	Form EXP-2.4.2(b)

## 2.5 Personnel

The Bidder must demonstrate that it will have the personnel for the key positions that meet the following requirements:

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Forms included in Section IV, Bidding Forms.

<b>Staff Position</b>	<b>Minimum Qualifications</b>	<b>Total Specific experience (years)</b>	<b>In similar works Experience (years)</b>
Site Agent	BSc.(Civil /Agricultural Engineering) and registered with EBK with current practicing license	6 years supervising Irrigation Infrastructural construction works	8years construction of irrigation infrastructural works or other civil works
Surveyor*	Bsc. in Survey and Photogrammetry or its equivalent and registered with their professional body (conversant in AUTOCAD/CIVIL 3D)	5 in surveying for irrigation infrastructure projects	5 years in surveying for construction projects
Concrete Foreman	Diploma (civil/Agricultural Engineering) or building construction	5 years constructions in works for irrigation schemes	5 years in general constructions of civil works
Formwork Foreman	Diploma (civil/Agricultural Engineering) or building construction	5 years constructions in works for irrigation schemes	5 years in general constructions of civil works
Environmental/Safety Expert	Bsc. In environmental science/ natural science or its equivalent and be registered by NEMA as a lead expert	5years in carrying out ESIA/EA for irrigation projects	5years in carryings ESIAs/EAs

## 2.15 Equipment

The Bidder must demonstrate that it will have access to the key Contractor's equipment listed hereafter:

<b>S/no.</b>	<b>Description</b>	<b>Minimum (Rating/capacity)</b>	<b>Quantity (No.)</b>
1	Grader	150-160HP	1
2	Van or Utility vehicle	1 tonne	1
3	Dump truck/tipping lorry	7 tonne	1
4	Water tanker/Bowser	7,000 litres	1
5	Excavator	1.0 m <sup>3</sup>	2
6	Front end loaders/Shovel	4 m <sup>3</sup>	1
7	Compactor Roller, Steel Drum	1 tonne	1
8	Concrete mixer	1 m <sup>3</sup>	2
9	Dewatering Pumps	100 mm dia. delivery	1
10	Concrete Vibrators (poker)	3 KVA (Output)	2
11	Generator	500KVA	1
12	Survey Equipment	Total Station with all the accessories (or a superior survey equipment)	1



## Section IV. Bidding Forms

### Table of Forms

<b>Letter of Bid.....</b>	<b>56</b>
<b>Bill of Quantities/Schedules of Prices .....</b>	<b>59</b>
<b>Schedule of Adjustment Data .....</b>	
<b>Summary of Payment Currencies .....</b>	<b>281</b>
<b>Form of Bid Security (Bank Guarantee) .....</b>	<b>284</b>
<b>Form of Bid Security (Bid Bond) .....</b>	<b>286</b>
<b>Form of Bid-Securing Declaration.....</b>	<b>288</b>
<b>Technical Proposal.....</b>	<b>289</b>
Site Organization .....	290
Method Statement.....	291
Mobilization Schedule .....	292
Construction Schedule.....	293
Contractor's Equipment .....	294
Proposed Personnel.....	295
Resume of Proposed Personnel.....	296
Others .....	297
.....	297
<b>Bidder's Qualification.....</b>	<b>298</b>
Bidder Information Sheet .....	299
Party to JVCA Information Sheet.....	300
Historical Contract Non-Performance .....	301
Current Contract Commitments / Works in Progress .....	303
Financial Situation.....	304
Average Annual Turnover .....	306
Financial Resources .....	307
General Experience .....	308
Specific Experience .....	310
Specific Experience in Key Activities .....	312

## Letter of Bid

The Bidder **MUST** prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and address.

Date: \_\_\_\_\_  
 Bidding No.: \_\_\_\_\_  
 Invitation for Bid No.: \_\_\_\_\_

To:

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (**ITB**) Clause 8;
- (b) We offer to execute in conformity with the Bidding Documents the following \_\_\_\_\_ Works: \_\_\_\_\_;
- (c) The total price of our Bid, excluding any discounts offered in item (d) below is: \_\_\_\_\_;
- (d) The discounts offered and the methodology for their application are: \_\_\_\_\_;
- (e) Our bid shall be valid for a period of \_\_\_\_\_ [insert validity period as specified in **ITB** 18.1.] days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) If price adjustment provisions apply, the Table(s) of Adjustment Data shall be considered part of this Bid;<sup>10</sup>

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<sup>10</sup> Include if price adjustment provisions apply in the Contract in accordance with **PC** Clause **5.17 Price Adjustment**.



- (g) If our bid is accepted, we commit to obtain a performance security in accordance in accordance with **ITB** 38 and **GC** 5.15, for the due performance of the Contract;
- (h) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries;
- (i) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with **ITB** 4.3;
- (j) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with **ITB** 4.3, other than alternative offers submitted in accordance with **ITB** 13;
- (k) Our firm, its affiliates or subsidiaries (including any Subcontractors or Suppliers for any part of the contract), has not been declared ineligible by the Bank, or under execution of a Bid-Securing Declaration in the Employer's country, or under the Employer's country laws or official regulations, or by an act of compliance with a decision of the United Nations Security Council, in accordance with **ITB** 4.4, 4.15 and 4.8, respectively;
- (l) We are not a government owned entity / We are a government owned entity but meet the requirements of **ITB** 4.5;<sup>11</sup>
- (m) We are / are not under sanction by the World Bank, the IADB, EBRD or the AsDB for any action of corruption and fraud in accordance with ITB 3. [If under sanction, please provide details including date of start of sanction and duration].
- (n) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: <sup>12</sup>

Name of Recipient	Address	Reason	Amount
.....	.....	.....	.....
.....	.....	.....	.....

- (o) We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in the country of the Employer, as such laws

<sup>11</sup> Use one of the two options as appropriate.

<sup>12</sup> If none has been paid or is to be paid, indicate "none".

have been listed by the Employer in the bidding documents for this contract.<sup>13</sup>

- (p) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed;
- (q) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and
- (r) If awarded the contract, the person named below shall act as Contractor's Representative: \_\_\_\_\_
- (s) We accept the appointment of **[Employer to insert full name and address of suggested appointee]** as the Adjudicator. / We do not accept the appointment of **[Bidder to insert name suggested by Employer]** as the Adjudicator, and propose instead that **[Bidder to insert alternative name]** be appointed as the Adjudicator, whose daily fees and biographical data are attached.<sup>14</sup>

Name: \_\_\_\_\_

In the capacity of: \_\_\_\_\_

Signed: \_\_\_\_\_

Duly authorized to  
sign the Bid for  
and on behalf of: \_\_\_\_\_

Date: \_\_\_\_\_

<sup>13</sup> The Bank will accept the introduction of such undertaking at the request of the Borrowing country, provided the arrangements governing such undertaking are satisfactory to the Bank.

<sup>14</sup> Use one of the two options as appropriate.

## Bill of Quantities/Schedules of Prices

**BILLS OF QUANTITIES FOR THE CONSTRUCTION OF KIRUMI KIAMUNJARI IRRIGATION SCHEME**

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>OFFICIAL USE</b>		<b>TENDERER'S USE</b>	
				<b>AMOUNT</b>	
	<b><u>GRAND SUMMARY</u></b>	<b>KSHS</b>	<b>CTS</b>	<b>KSHS</b>	<b>CTS</b>
A.	CONSTRUCTION OF KIRUMI KIAMUNJARI IRRIGATION SCHEME IN THARAKA NITHI COUNTY				
B.	Contingency Sum (10%)				
	<b>CONTRACT SUM CARRIED TO FORM OF TENDER</b>				
<p>AMOUNT IN WORDS:                      .....</p> <p>NAME OF TENDERER:                      .....</p> <p>ADDRESS:                      .....</p> <p>SIGN:                      .....                      ...</p> <p>DATE:                      .....</p> <p>WITNESS NAME:                      .....</p>					

ADDRESS: .....
SIGN: .....
DATE: .....

**NB: The bidder must fill the schedule of prices of basic materials at the end of the bill of quantities**

<b>GRAND SUMMARY</b>		
		<b>BoQ</b>
<b>Bill No.</b>	<b>Description</b>	<b>Amount (KSHss)</b>
1	Preliminaries and General	
2	Diversion Weir & Intake Chamber Construction Works	
3	Sedimentation Basin Construction Works	
4	Conveyance Pipeline	
5	Main pipeline	
6	Branch pipelines	
7	Distribution/Feeder Pipelines	
8	In-field Irrigation System	
9	Day Works (Provisional)	
	<b>GRAND TOTAL</b>	

<b>Bill No .1- PRELIMINARY AND GENERALS</b>			BoQ		
<b>1.1</b>	Contractor's Camp				
1.2. 1	Provide for establishment, mobilization and demobilization of the Contractor's camp together with all the required equipment	LS	1	1,000,000	1,000,000
<b>1.2</b>	Resident Engineer's Office/Supervision of Construction Works				
1.2. 1	Provide a provisional sum for renting of the office in accordance with the Specifications for the use of the Resident Engineer and his staff	P.C Su m	8	30,000	240,000
1.2. 2	Provide a provisional sum for Furniture and Equipment for the Engineer's Office and in accordance with Specifications and as directed by the PM	P.C Su m	1	500,000	500,000
1.2. 3	Provide a provisional sum for operation and maintenance including of purchase of stationery of the office in accordance with the Specifications and as shall be instructed by the PM	P.C Su m	8	15,000	120,000

1.2. 4	Provide a provisional sum for supervision of construction works for completion of the scheme	P.C Su m	8	650,000	5,200,000
					-
1.2. 5	Provide a provisional sum for surveying and documenting the scheme irrigation system before commencement of construction works	P.C Su m	1	3,000,00 0	3,000,000
1.2. 5	Allow for Attendance	%			
<b>1.3</b>	<b>Concrete Strength Tests</b>				
1.3. 1	Concrete Strength tests (six cubes / test) in accordance with the Specifications. See clause 3.11 of Specifications.	ITE M	30		
<b>1.4</b>	<b>Signboards</b>				
1.4. 1	Provision, erection and maintenance of project signboards in accordance with the Specifications. See Clause 1.31 of Specifications.	No.	4		
<b>1.5</b>	<b>Resident Engineer's Vehicles</b>				
1.5. 1	Provide provisional sum of khs.500,000 for repairing of project vehicle	P.C Su m	1	500,000	500,000
1.5. 2	Fuel, maintenance, tyre replacement and insurance for Resident Engineer's Vehicles inclusive of 5000km per month	P.C Su m	8	180,000	1,440,000

1.5.3	1 No. Drivers for Resident Engineer's vehicles	P.C Su m	8	30,000	240,000
1.5.4	Allow for Attendance	%			
<b>1.6</b>	<b>Marker Posts</b>				
1.6.1	Provide for transport(From coffee factory yard),excavation and fixing of indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers.	Nr	339		
1.6.1	supply, excavate and fix additional indicator posts for water main route, road crossings, change of direction, air valves, washouts, and valve chambers as directed by Resident Engineer	Nr	500		
<b>1.7</b>	<b>Testing and commissioning of the works</b>				
1.7.1	Operate completed project for 14 days prior to handing over including all costs.	Day s	14		
1.8.	<b>Management Meetings</b>				
1.8.1	Provide a provisional sum management meetings of KSHss 400,000 per month to facilitate management	P.C Su m	8	400,000	3,200,000



	meetings and to spend as directed by PM				
1.8. 2	Allow for Attendance	%			
<b>1.9</b>	<b>Other Works, Obligations</b>				
1.9. 1	The Contractor shall describe in detail hereunder other works, obligations and things which may be referred to in the Specifications or which he may consider have been omitted from the Bills of Quantities and for which he desires to enter a separate charge (the charge to be carried direct to the amount column). FULL DESCRIPTION OF ITEM(S) OF WORK OR ANY OTHER ISSUE SHOULD BE MADE. If no separate charge is made hereunder, the rates in the Bills of Quantities will be held as covering all expenses for all such works				
	TOTAL CARRIED OVER TO GRAND SUMMARY				

<b>Bill No. 2 - DIVERSION WEIR AND INTAKE CHAMBER CONSTRUCTION WORKS</b>						
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>	
<b>2.1</b>	<b>SITE CLEARANCE</b>					
2.1.1	Re-Clear site of all bushes and dispose as specified with respect to weir body and intake chamber locations.	m <sup>2</sup>	100			
<b>2.2</b>	<b>RIVER DIVERSION WORKS</b>					
2.2.1	Provide for reinstatement of river diversion works and ensuring water course follow	Lump Sum	1			

	natural river to approval of PM				
	<b>2.3 PROTECTION WORKS</b>				
2.3.1	Provide for protection works as directed by PM	P.C	1		
	<b>2.4 METALWORKS</b>				
2.4.1	Transport galvanized steel trash rack from coffee factory yard and Install complete with all fixing iron mongery to intake as specified.	No.	1		
2.4.2	Transport from coffee factory yard and install galvanized metal slide gate to intake pipe as specified/shown in the drawings.	No.	1		
2.4.3	Transport from coffee yard and install debris screens for intake chamber as specified/shown in the drawings.	No	2		
2.4.4	Transport from coffee factory yard and install lockable metal spindle gates to sluice ways as specified/shown in the drawings.	No	2		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				

	<b>2.5</b>	<b>INTAKE CHAMBER PIPE WORK AND FITTINGS</b>				
		Provide, handle, install and test the following steel pipes, fittings and gate valve. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	2.5.1	700/718 mm GI/GRP stepped coupling or equally approved coupling as directed by PM	No	1		
		Transport, handle, install and test the following steel pipes, fittings and gate valve. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	2.5.2	65 mm dia gate valve	No.	1		
	2.5.3	65 mm dia nipple	No	1		
	2.5.4	65 mm dia union	No	1		
	2.5.5	65/75 mm GI/uPVC adaptor	No	1		
	2.5.6	75 mm dia uPVC class B (PN 6) pipes	m	9		
	2.5.7	75 mm dia 90 deg. uPVC elbow	No	1		

2.6	<b>ACCESS ROAD TO INTAKE AND SEDIMENTATION TANK</b>				
2.6.1	Provide provisional cost of KSHs 300,000 for rehabilitation of existing access road	P.C Sum	1		
2.7	Fencing of Intake and SB Sites				
2.7.1	Excavate ,including maintaining and supporting side and keeping bottoms free of water and mud or other fallen material				
2.7.2	Excavate for fencing posts bases from existing ground level and not exceeding 1.50m deep. (300 x 300x800mm deep holes)	m <sup>3</sup>	7		
2.7.3	Excavate for gate columns bases from existing ground level and not exceeding 1.50m deep.	m <sup>3</sup>	5		
2.7.4	50 mm blinding bed under holes for fencing posts and gate columns	m <sup>3</sup>	1		
	Reinforced concrete posts and gates				
2.7.5	Install 100x125x2400 cranked concrete post fixed every 2m span (length 2600mm)	No	100		
2.7.6	Install 100x125 x2600 concrete post (corner posts) for bracing at corners and at every 20m span (Length 2600mm)	No	16		

2.7. 7	Mortise all the posts in mass Reinforced Concrete 1:2:4 - 20mm gauge surround	m <sup>3</sup>	6			
	Gates					
2.7. 8	Supply and install mild steel gate 1No. as per the drawing	No	1			
	High Tensile wire					
2.7. 9	Supply and fix 6 strands of high tensile (4.5mm) galvanized iron wire on the concrete posts	m	1080			
	Chain Link					
2.7. 10	Supply and install chain link for the fence of the intake/sedimentation tank 2.4m high, 11G (mesh spacing of 50x50mm) chain link (3.00mm dia link wire) as per the provided drawing	m <sup>2</sup>	432			
	Columns Gate					
2.7. 11	provide Reinforced Concrete 1:2:4 - 25/20 to columns bases and columns to include formwork	m <sup>3</sup>	2			
	Reinforcement					
2.7. 12	T8	KG	35			
2.7. 13	T12	KG	100			
2.7. 14	Plaster columns surface to fair finish	m <sup>2</sup>	12			
	Gates					

2.7. 15	Make and install purposed made steel grilled double gate overall size 5000x1800mm high with external frame of 50x50x2mm vertical and horizontal framing bracing with 40x40x2mm spaced @300mm internal and vertical bracing, with slotted pedestrian passage of 1200mmx1500mm including hinged supported by RC Columns complete with locking devices	No	1		
2.8	BRIDGE ACROSS THE INTAKE				
	<b>Concrete bases</b>				
	<b><u>Reinforced Concrete</u></b> <b><u>1:1.5:3- 20mm gauge mix</u></b> <b><u>in/class 25/20.</u></b>				
2.8. 1	300x300x250mm RC base,C20,including formwork	m3	0.1		
	<b>Metal works</b>				
	<b><u>mild Steel to B.S. 449</u></b>				
	<b><u>To include fabrication, transport to site, fixing at site and application of protective measures i.e.. painting to RE approval</u></b>				
2.8. 2	300x150x8mm Base plates	No.	4		
2.8. 3	200x200x8mm Base plates	No.	16		
2.8. 4	12mm diameter Rawl Bolts	No.	64		
2.8. 5	4mm chequered plate to access steps fabricated to shape	m2	2		
2.8. 6	4mm chequered plate to bridge walking platform	m2	8.2		
2.8. 7	50x50x3mm SHS columns support tubes	m	6		

2.8.8	75x50x3mm RHS primary support	m	22		
2.8.9	40x40x2mm SHS secondary support spaced @ 500mm c/c	m	17.5		
2.8.10	30x30x2mm SHS Horizontal hand rail support	m	44		
2.8.11	30x30x2mm SHS Vertical hand rail support	m	18.5		
	<b>TOTAL CARRIED OVER TO GRAND SUMMARY</b>				

<b>Bill No. 3 - SEDIMENTATION BASIN CONSTRUCTION WORKS</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHss)</b>
<b>3.1</b>	<b>SITE CLEARANCE AND SETTING OUT</b>				
3.1.1	Re-Clear site of all bushes, shrubs, etc and dispose in accordance with specifications.	m <sup>2</sup>	350		
<b>3.5</b>	<b>INLET AND OUTLET CHAMBERS PIPEWORKS</b>				
	The rates inserted should cover supplying of new materials or Transport of existing material from yard fittings including all jointing accessories, handling, fixing, jointing and testing.				



<b>3.5.1</b>	<b>Inlet Chamber</b>				
3.5.1.1	700/718 mm GI/GRP stepped coupling or equally approved coupling as directed by PM	No.	1		
3.5.1.2	Transport from coffee factory yard of Dia 700 mm GI/Steel 90 deg. double flanged bend and install	No.	2		
3.5.1.4	Transport from coffee factory and install Dia 700 mm x 1.0 m long double flanged spigot steel pipe	No.	1		
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<b>3.5.2</b>	<b>Outlet Chamber and Sluice Valve Chamber</b>				
	The rates inserted should cover supplying of new materials or Transport of existing material from yard fittings including all jointing accessories, handling, fixing, jointing and testing.				

3.5.2.1	Transport from coffee factory yard and install 200 mm dia x 0.5 m long double flanged steel spigot with puddle flange welded.	No.	4		
3.5.2.2	Supply and install Dia 700 mm double flanged GI/Steel 90 deg. bends	No.	1		
3.5.2.3	Transport from coffee factory yard and install 700/200 mm double flanged stepped GI reducer	No	3		
3.5.2.4	Transport from coffee factory yard and install 700 mm dia flanged equal GI tee	No	4		
3.5.2.5	Transport from coffee factory yard and install 700 mm dia x 0.5 m long double flanged steel spigot with puddle flange welded.	No	2		
3.5.2.6	Transport from coffee factory yard and install Dia 700 mm double flanged spigot steel pipe x 1.5 m long	No	2		
3.5.2.7	Transport from coffee factory yard and install Dia 700 mm double flanged spigot steel pipe x 0.5m long	No	2		
3.5.2.8	Transport from coffee factory yard and install Dia 700 mm double	No	1		

	flanged spigot steel pipe x 3.0 m long				
3.5.2.9	Transport from coffee factory yard and install Dia 700 mm double flanged Sluice valve	No	1		
3.5.2.1 0	Supply and install Dia 700/718 mm steel/GRP stepped coupling	No.	1		
3.5.2.1 1	Provide Provision for an air vent on the outlet steel pipe after sluice valve	No.	1		
<b>3.6</b>	<b>SLUICE VALVE CHAMBER</b>				
	Provide all materials and construct complete sluice valve chamber as specified/shown in the drawings. Rates to include for all thrust blocks and pipe supports (exavation, concrete and steel works provided for under Bill Item 3.2, 3.3 and 3.4).				
3.6.1	Provide all materials and construct chamber as per the drawings with Lockable manhole cover for sluice valve chamber	No.	1		
3.6.2	Supply and install cast in step irons (100 x 375 mm) as shown in the drawings	No	8		

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<b>Bill No.4-Conveyance Pipeline</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>4.1</b>	<b>Excavation and Backfilling</b>				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications defined in the drawings.				
4.1.1	General clearance of shrubs, bushes to include uprooting of stamps of girth upto 1.0m along pipeline route of 3m wide	m <sup>2</sup>	6000		
4.1.2	Excavate to levels the ground to allow movement of excavation machine due to stiff slope terrain along pipe line of 3m wide by 1m deep	m <sup>3</sup>	6000		
4.1.3	Excavation and backfilling in normal material for Dia 718 mm GRP pipe for depth not exceeding 1.5 m	m <sup>3</sup>	4500		
4.1.4	Excavation and backfilling in normal material for Dia 718 mm GRP pipe for depth 1.5 - 3.0m	m <sup>3</sup>	4500		
4.1.5	Excavation and backfilling in soft rock material for Dia 718 mm GRP pipe for depth not exceeding 1.5 m	m <sup>3</sup>	2250		
<b>4.2</b>	<b>GRP Pipe work</b>				

	Transport, lay, joint and pressure test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting and wastage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000				
	<b>Pipe Class</b> <b>Working Pressure (m)</b>				
	B (PN 6) 60				
	C (PN 8) 80				
	C (PN 10) 100				
	D (PN 12.5) 125				
	E (PN 16) 160				
<b>4.2</b>	<b>GRP Straights</b>				
<b>.1</b>					
4.2. 1.1	Transport from coffee factory yard/Katharaka primary school yard, 718mm dia GRP Pipes , install and pressure test with all necessary joining fittings as directed by P.M	m	2000		
4.2. 1.2	pressure test all the pipeline sections already installed	m	1940		
<b>4.2</b>	<b>GRP PIPE FITTINGS</b>				
<b>.2</b>					
	<b>Vertical Bends</b>				
	<b>718 mm dia</b>				

4.2. 2.1	Transport from coffee factory yard and install 45 deg. bends along the pipeline as directed by the PM	No.	26		
4.2. 2.2	Transport from coffee factory yard and install 22.5 deg. bends along the pipeline as directed by the PM	No.	19		
4.2. 2.3	supply and install 11.25 deg. bends along the pipeline as directed by the PM	No.	18		
	<b>Horizontal Bends</b>				
	<b>718 mm dia</b>				
4.2. 2.4	Transport from coffee factory yard and install 90 deg. bends along the pipeline as directed by the PM	No.	7		
4.2. 2.5	Transport from coffee factory yard and install 45 deg. bends along the pipeline as directed by the PM	No.	5		
4.2. 2.6	Transport from coffee factory yard and install 22.5 deg. bends along the pipeline as directed by the PM	No.	3		
4.2. 2.7	supply and install 11.25 deg. bends along the pipeline as directed by the PM	No.	6		
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<b>4.3</b>	<b>WASHOUTS (W/O)</b>				
4.3.1	Excavate for, provide all materials and construct complete w/o chambers/spill chamber of internal dimensions 2500 x 1500 x 1200 mm. Rates to include thrust blocks, pipe supports as shown in the drawings.	No.	7		
<b>4.3.2</b>	<b>7 No. Washout Fittings at Chainage shown in the drawings (CH. 360, 420, 520, 880, 1020, 1160, 2040 m)</b>				
4.3.2.1	718/700 dia GRP/steel stepped coupling	No.	7		
4.3.2.2	700 mm dia x 0.5m single flanged GI pipe	No.	7		
4.3.2.3	700 mm x 200mm dia level invert scour GI tee with flanged branch	No.	7		
4.3.2.4	200mm x 80mm dia flanged reducer	No.	7		
4.3.2.5	80 mm dia flanged gate valve	No.	7		
4.3.2.6	80 mm dia x 0.5m single flanged GI pipe	No.	14		
4.3.2.7	80/90mm dia PVC-U/ GI adaptor	No.	14		
4.3.2.8	90 mm dia long uPVC pipe	m	84		
<b>4.4</b>	<b>AIR VALVES</b>				



4.4.1	Excavate for, provide all materials and construct complete air valve chambers. Internal dimensions 1200 x 1200 x 1200 mm. Rates to include for all thrust blocks , pipe supports, inspection covers, excavation and backfilling, etc as detailed in the drawings.	No.	8		
<b>4.4.2</b>	<b>7 No. Double Air Valves (DAVs) at Chainage 160, 480, 620, 980, 1080, 1440, 2360 m</b>				
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completing all pipe joints as specified in the specification.				
4.4.2.1	718/700mm dia GRP / Steel stepped coupling	No.	14		
4.4.2.2	700 mm dia x 0.5m single flanged GI pipe	No.	14		
4.4.2.3	700 mm x 50 mm double flanged GI tee	No.	7		
4.4.2.4	50mm dia x 0.4 m long double flanged GI pipe	No.	7		
4.4.2.5	50mm flanged gate valve	No.	7		
4.4.2.6	50mm double orifice air valve	No.	7		

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<b>4.4</b>	<b>For 1 No. Single Air Valve .3 (SAV) at Chainage 380 m</b>				
4.4. 3.1	718/700mm dia GRP / Steel stepped coupling	No.	2		
4.4. 3.2	700 mm dia x 0.5m single flanged GI pipe	No.	2		
4.4. 3.3	700 mm x 50 mm double flanged GI tee	No.	1		
4.4. 3.4	50mm dia x 0.4 m long double flanged GI pipe	No.	1		
4.4. 3.5	50mm flanged gate valve	No.	1		
4.4. 3.6	50mm single orifice air valve	No.	1		
<b>4.5</b>	<b>ROAD CROSSINGS FOR PIPES</b>				
4.5. 1	Provide for major road crossings at Chainage 3+730 m along the conveyance pipeline as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, supply and installation of ring culverts and concrete surround and all jointing materials and	No.	4		

	other fittings as per specifications.				
4.5. 2	Provide for major road crossings at tarmac KERRA roads along the conveyance pipeline as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, supply and installation of ring culverts and concrete surround and all jointing materials and other fittings as per specifications.	No.	2		
	<b>TOTAL CARRIED OVER TO GRAND SUMMARY</b>				

<b>Bill No. 5 - Main Pipeline</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>5.1</b>	<b>Excavation and Backfilling</b>				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.				
5.1.1	Excavation and backfilling in normal material for Dia 463 mm GRP pipe for depth not exceeding 1.5 m	m <sup>3</sup>	1,222		
5.1.2	Excavation and backfilling in trench loose hard rock material for Dia 463 mm GRP pipe for depth not exceeding 1.5 m	m <sup>3</sup>	1,222		
<b>5.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working				

	pressures shall conform to KS-06-149 Part 2:2000.				
	<b>Pipe Class Working Pressure (m)</b>				
	B (PN 6) 60				
	C (PN 8) 80				
	C (PN 10) 100				
	D (PN 12.5) 125				
	E (PN 16) 160				
	<b>STRAIGHTS</b>				
	<b>GRP Straights</b>				
5.2.1. 1	Transport from coffee factory yard/Katharaka primary school yard, 463mm dia GRP Pipes and install with all necessary joining fittings as directed by PM)	m	543		
5.2.1. 2	pressure test all the pipeline sections already installed and make good any defects	m	4597		
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<b>5.2.2</b>	<b>PIPE FITTINGS</b>				
	<b>GRP Bends</b>				

	<b>Vertical Bends</b>				
	<b>463 mm dia</b>				
5.2.2. 1	Transport from coffee factory yard and install 45 deg. bends along the pipeline as directed by the PM	No.	9		
5.2.2. 2	Supply and install 22.5 deg. bends along the pipeline as directed by the PM	No.	24		
5.2.2. 3	Transport from coffee factory yard and install 11.25 deg. bends along the pipeline as directed by the PM	No.	14		
	<b>Horizontal Bends</b>				
	<b>463 mm dia</b>				
5.2.2. 4	Transport from coffee factory yard and install 90 deg. bends along the pipeline as directed by the PM	No.	6		
5.2.2. 5	supply and install 45 deg. as directed by PM	No.	4		
5.2.2. 6	supply and install 22.5 deg. as directed by PM	No.	3		
5.2.2. 7	supply and install 11.25 deg. as directed by PM	No.	17		
	<b>uPVC Bends</b>				
	<b>Vertical Bends</b>				
	<b>355 mm dia</b>				
5.2.2. 8	45 deg.	No.	1		

5.2.2. 9	22.5 deg.	No.	1		
5.2.2. 10	11.25 deg.	No.	1		
	<b>280 mm dia</b>				
5.2.2. 11	22.5 deg.	No.	1		
5.2.2. 12	11.25 deg.	No.	1		
	<b>Horizontal Bends</b>				
	<b>355 mm dia</b>				
5.2.2. 13	45 deg.	No.	1		
5.2.2. 14	22.5 deg.	No.	1		
5.2.2. 15	11.25 deg.	No.	1		
	<b>280 mm dia</b>				
5.2.2. 16	22.5 deg.	No.	1		
5.2.2. 17	11.25 deg.	No.	1		
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	<b>Couplers</b>				
5.2.2. 18	463/450 mm dia GRP/Steel stepped coupling	No.	1		
5.2.2. 19	350/355 dia Steel/GRP stepped coupling	No.	1		
	<b>GI Pipes</b>				
5.2.2. 20	450 mm dia x 0.5 m single flanged GI pipe	No.	1		
5.2.2. 21	350 mm dia x 0.5 m single flanged GI pipe	No.	1		
	<b>Reducers</b>				
5.2.2. 22	450 mm x 350 mm dia flanged reducer	No.	1		
5.2.2. 23	355 x 280 uPVC reducer	No.	1		
<b>5.3</b>	<b>AIR VALVES</b>				
5.3.1	Provide all materials and finish constructing (i.e.. plastering and installing covers) complete inspection valve chambers of internal dimensions 1200 x 1200 x 1200 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	6		
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe jointing as per the specifications.				





<b>5.3.3</b>	<b>3 No. Double Air Valves (DAVs) at Chainage 5320, 5900, 7720 m (350 mm Dia)</b>				
5.3.3.1	355/350 mm dia PVC U/GI stepped coupling	No.	2		
5.3.3.2	350 mm dia x 0.5 m single flanged GI pipe	No.	2		
5.3.3.3	350 mm x 50 mm double flanged GI tee	No.	1		
5.3.3.4	50 mm dia x 0.4 m long double flanged GI pipe	No.	1		
5.3.3.5	50 mm flanged gate valve	No.	1		
5.3.3.6	50 mm double orifice air valve	No.	1		
<b>5.4</b>	<b>WASHOUTS</b>				
5.4.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete w/o chambers of internal dimensions 2500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	6		
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				

<b>5.4.2</b>	<b>3 No. Washout Fittings at Chainage shown in the drawings (CH. 1540, 2260, 4720 m) (450 mm Dia)</b>				
5.4.2.1	463/450 dia GRP/steel stepped coupling	No.	3		
5.4.2.2	450 mm dia x 0.5m single flanged GI pipe	No.	3		
5.4.2.3	450 mm x 80mm dia level invert scour GI tee with flanged branch	No.	3		
5.4.2.4	80 mm dia flanged gate valve	No.	3		
5.4.2.5	80 mm dia x 0.5m single flanged GI pipe	No.	6		
5.4.2.6	80/90mm dia PVC-U/ GI adaptor	No.	6		
5.4.2.7	90 mm dia long uPVC pipe	m	36		
5.4.2.8	80mm GI threaded pipe 500 mm long with a flap valve	No.	3		
<b>5.4.3</b>	<b>3 No. Washout Fittings at Chainage shown in the drawings (CH. 5280, 5780, 7640 m) (350 mm Dia)</b>				
5.4.3.1	355/350 dia PVC-u/steel stepped coupling	No.	3		
5.4.3.2	350 mm dia x 0.5m single flanged GI pipe	No.	3		

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5.4.3.3	350 mm x 80 mm dia level invert scour GI tee with flanged branch	No.	3		
5.4.3.4	80 mm dia flanged gate valve	No.	3		
5.4.3.5	80 mm dia x 0.5m single flanged GI pipe	No.	6		
5.4.3.6	80/90mm dia PVC-U/ GI adaptor	No.	6		
5.4.3.7	90 mm dia long uPVC pipe	m	36		
5.4.3.8	80 mm GI threaded pipe 500 mm long with a flap valve	No.	3		
<b>5.5</b>	<b>PRESSURE REGULATING VALVE</b>				
5.5.1	Provide all materials and finish constructing (i.e. Plastering and installation of covers) complete PRV chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	6		

	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
<b>5.5.2</b>	<b>For 3 No. PRV at ch.880, 1860, 3540, 4060 m (463 mm Dia)</b>				
5.5.2.1	463/450 mm dia GRP/GI stepped coupling	No.	9		
5.5.2.2	450 mm dia x 0.5 m single flanged GI pipe	No.	9		
5.5.2.3	450 mm dia double flanged sluice valve	No.	6		
5.5.2.4	450 mm dia double flanged pressure regulator valve	No.	6		
<b>5.5.3</b>	<b>For 3 No. PRV at ch.5180, 7040, 8680 m (355 mm Dia)</b>				
5.5.3.1	355/350 mm dia PVC-U/GI stepped coupling	No.	6		
5.5.3.2	350 mm dia x 0.5m single flanged GI pipe	No.	6		
5.5.3.3	350 mm dia double flanged sluice valve	No.	3		
5.5.3.4	350 mm dia double flanged pressure regulator valve	No.	3		
<b>5.5.4</b>	<b>For 2 No. PRV at ch.9340, 11200, m (280 mm Dia)</b>				

5.5.4.1	280/250 mm dia PVC-U/GI stepped coupling	No.	4		
5.5.4.2	250 mm dia x 0.5m single flanged GI pipe	No.	4		
5.5.4.3	250 mm dia double flanged sluice valve	No.	2		
5.5.4.4	450 mm dia double flanged pressure regulator valve	No.	2		
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<b>5.6</b>	<b>SECTION VALVE CHAMBERS</b>				
5.6.1	Provide all materials and finish constructing (i.e. plastering and installing covers) complete inspection valve chambers of internal dimensions 2500 x 1500 x 1200 mm at the pipe junctions. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	6		
5.6.2	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete inspection	No.	2		

	valve chambers of internal dimensions 1200 x 1200 x 1200 mm at the pipe junctions. Rates to including thrust blocks, pipe supports as shown in the drawings.				
	Provide, handle, install and test the following steel, uPVC pipes and fittings, valves and water meter in the pipeline junction chambers to the satisfaction of the Engineer. Rates shall include for completing all pipe joints and testing as specified.				
	<b>5.6.3 Block Chamber for F1 Offtake at Ch.020 m (2.5m x 1.5m)</b>				
5.6.3.1	463/450 mm dia GRP/GI stepped coupling	No	2		
5.6.3.2	450 mm dia single flanged steel spigot (500mm long)	No	2		
5.6.3.3	450 x 80 mm dia all flanged tee	No	1		
5.6.3.4	80mm dia double flanged gate valve	No	1		
5.6.3.5	80 mm dia single flanged GI piece (0.5 m long)	No	1		
5.6.3.6	80/90 mm dia GI/PVC-u adaptor	No	1		
5.6.3.7	80 mm dia water meter	No	1		

5.6.3. 8	80 mm dia double flanged GI piece (0.5 m long)	No	1		
<b>5.6.4</b>	<b>Block Chamber for F2 Offtake at Chainage 040 m (2.5mx1.5m)</b>				
5.6.4. 1	463/450 mm dia GRP/GI stepped coupling	No	1		
5.6.4. 2	450 mm dia single flanged steel spigot (500mm long)	No	1		
5.6.4. 3	450 x 125 mm dia all flanged tee	No	1		
5.6.4. 4	450 mm dia double flanged sluice valve	No	1		
5.6.4. 5	125 mm dia double flanged sluice valve	No	1		
5.6.4. 6	125 mm dia single flanged GI piece (0.5 m long)	No	1		
5.6.4. 7	125/140 mm dia GI/PVC-u stepped coupling	No	1		
5.6.4. 8	450 mm dia water meter	No	1		
5.6.4. 9	450 mm dia double flanged GI piece (0.5 m long)	No	1		
5.6.4. 10	125 mm dia water meter	No	1		
5.6.4. 11	125 mm dia double flanged GI piece (0.5 m long)	No	1		
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<b>5.6.5</b>	<b>Block Chamber After F2 Offtake at Ch.0+040 m (1.2m x 1.2 m x 1.2 m)</b>				
5.6.5.1	450 mm dia double flanged sluice valve	No	1		
5.6.5.2	450 mm dia single flanged steel spigot (500mm long)	No	1		
5.6.5.3	463/450 mm dia GI/GRP stepped coupling	No	1		
<b>5.6.6</b>	<b>Block Chamber for B2 Offtake at Chainage 2420 m (2.5x1.5)</b>				
5.6.6.1	463/450 mm dia GRP/GI stepped coupling	No	2		
5.6.6.2	450 mm dia single flanged steel spigot (500mm long)	No	2		
5.6.6.3	450 x 450 mm dia all flanged tee	No	1		
5.6.6.4	450 x 200 mm dia all flanged tee	No	1		
5.6.6.5	450 mm dia double flanged GI piece (1 m long)	No	1		
5.6.6.6	200 mm dia double flanged sluice valve	No	1		
5.6.6.7	200 mm dia single flanged GI piece (0.5 m long)	No	1		

5.6.6. 8	200/200 mm dia GI/PVC-u stepped coupling	No	1		
<b>5.6.2</b>	<b>Block Chamber for B1 Offtake at Chainage 2420 m (1.2x1.2)</b>				
5.6.2. 1	463/450 mm dia GRP/GI stepped coupling	No	2		
5.6.2. 2	450 mm dia single flanged steel spigot (500mm long)	No	2		
5.6.2. 3	450 mm dia double flanged sluice valve	No	1		
<b>5.6.2</b>	<b>Block Chamber After B2 Offtake at Chainage 2420 m (1.2x1.2)</b>				
5.6.2. 1	450 mm dia double flanged sluice valve	No	1		
5.6.2. 2	450 mm dia single flanged steel spigot (500mm long)	No	1		
5.6.2. 3	163/450 mm dia GI/GRP stepped coupling	No	1		
<b>5.6.3</b>	<b>Block Chamber for B3 Offtake Chainage 5140 m (2.5x1.5)</b>				
5.6.3. 1	463/450 mm dia GRP/GI stepped coupling	No	2		
5.6.3. 2	450 mm dia single flanged steel spigot (500mm long)	No	2		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				

	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
5.6.3.3	450 x 300 mm dia all flanged tee	No	1		
5.6.3.4	450 mm dia double flanged sluice valve	No	1		
5.6.3.5	300 mm dia double flanged sluice valve	No	1		
5.6.3.6	300 mm dia single flanged GI piece (0.5 m long)	No	1		
5.6.3.7	300/315 mm dia GI/PVC-U stepped coupling	No	1		
<b>5.6.4</b>	<b>Block Chamber for B4 Offtakes at Chainage 9080 m (2.5x1.5)</b>				
5.6.4.1	355 / 350 mm dia PVC-U / GI stepped coupling	No.	2		
5.6.4.2	350 mm dia single flanged GI pipe ( 0.5 m long)	No.	2		
5.6.4.3	350 mm x 250 mm dia all flanged tee	No.	1		
5.6.4.4	350 mm dia double flanged sluice valve	No.	1		
5.6.4.5	250 mm dia double flanged sluice valve	No.	1		
5.6.4.6	250 mm dia single flanged GI pipe ( 0.5 m long)	No.	1		

5.6.4. 7	250/250 mm GI / PVC-U stepped coupling	No.	1		
<b>5.6.4</b>	<b>Block Chamber for B5 &amp; B6 Offtakes at Chainage 12180 m (2.5x1.5)</b>				
5.6.4. 1	280/250 mm dia PVC-U / GI stepped coupling	No.	1		
5.6.4. 2	250 mm dia single flanged GI pipe ( 0.5 m long)	No.	3		
5.6.4. 3	250 mm x 250 mm dia all flanged tee	No.	1		
5.6.4. 4	250 mm dia double flanged sluice valve	No.	2		
5.6.4. 5	250/250 mm GI / PVC-U stepped coupling	No.	2		
<b>5.7</b>	<b>ROAD CROSSINGS FOR PIPES</b>				
5.7.1	Provide for major road crossings at Chainage 1340 m as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, culvert, concrete surround and all jointing materials and other fittings as per the specifications.	No.	1		
5.7.2	Provide for major road crossings and undertake/fix i.e. Micro tunneling across Meru Nairobi highway, KeNHA Road in accordance with specifications and to the satisfaction of KeNHA.	No.	1		

	Rates to include for excavation and backfilling, culvert, concrete surround and all jointing materials and other fittings as per the specifications to the satisfaction of KeNHA and PM				
	<b>TOTAL CARRIED OVER TO GRAND SUMMARY</b>				

	<b>BILL NO. 6 - BRANCH PIPELINES</b>	

	<b>COLLECTION</b>	
1	Bill No.6.1 Branch 1 Pipeline	
2	Bill No.6.2 Branch 2 Pipeline	
3	Bill No.6.4 Branch 4 Pipeline	
4	Bill No.6.5 Branch 5 Pipeline	
5	Bill No.6.6 Branch 6 Pipeline	
	<b>TOTAL CARRIED OVER TO GRAND SUMMARY</b>	

<b>Bill No. 6.1 - Branch 1 PIPELINE</b>

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSHs)	AMOUNT (KSHs)
<b>6.1.1</b>	<b>Excavation and backfilling</b>				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations as per the specifications. Depth of excavation not exceeding 1.5 m.				
6.1.1.1	Excavation in normal soil	m <sup>3</sup>	68		
6.1.1.2	Ditto for excavation in loose hard rock	m <sup>3</sup>	21		
<b>6.1.2</b>	<b>Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				

	C 100				
	D 125				
	E 160				
<b>6.1.2.2</b>	<b>uPVC Straights</b>				
<b>2</b>					
	<b>Class B</b>				
6.1.2.2 .2	Dia 250 mm	m	32		
6.1.2.2 .3	Dia 200 mm	m	36		
<b>6.1.3</b>	<b>Washouts</b>				
6.1.3.1	Provide all materials and finish constructing (i.e. Plastering and installing cover)complete w/o chambers of internal dimensions 1200 x 1200 x 1200 mm. Rates to including thrust blocks, pipe supports as shown in the drawings.	No	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				



	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and detailed drawings.				
	Provide, lay, joint and test the following fittings for Wash Outs				
	<b>For Wash Out at branch 1 Chainage 2680m</b>				
6.1.3.2	200 / 200 mm dia V/J stepped coupling	No.	2		
6.1.3.3	200 mm dia single flanged steel spigot (0.5 m long)	No.	2		
6.1.3.4	200 x 80 mm dia Level invert scour tee with flanged branch	No.	1		
6.1.3.5	80 mm dia flanged gate valve	No.	1		
6.1.3.6	80mm , 0.5m long single flanged GI piece	No.	1		
6.1.3.7	90 / 80 mm dia uPVC/GI adaptor	No.	2		
6.1.3.8	90 mm dia uPVC pipe	m	6		
6.1.3.9	80mm dia 0.5 m long with flap valve	No	1		
<b>6.1.4</b>	<b>AIR VALVES</b>				

6.1.4.1	Provide all materials and finish constructing (i.e. plastering and installing covers) complete air valve chambers. Internal dimensions 1200 x 1200 x 1200 mm. Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the detailed drawings.	No	2		
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completing all pipe joints as specified in the specifications.				
	<b>1 No. Double Air Valve (DAVs) at branch 1 Ch.1780 m</b>				
6.1.4.2	250 / 250 mm dia V/J stepped coupling	No.	2		
6.1.4.3	250 mm dia single flanged GI pipe (500mm)	No.	2		
6.1.4.4	250 x 80 mm dia all flanged tee	No.	1		
6.1.4.5	80x50mm dia flanged reducer	No.	1		
6.1.4.6	50 mm flanged gate valve	No.	1		
6.1.4.7	50 mm x 400 mm long double flanged spigot	No.	1		
6.1.4.8	50 mm dia Double orifice air valve	No.	1		

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>1 No. Double Air Valve (DAV) at branch 1 Ch.2900 m</b>				
6.1.4.9	140 / 125 mm dia VJ stepped coupling	No.	2		
6.1.4.1 0	125 mm dia single flanged GI pipe (500mm)	No.	2		
6.1.4.1 1	125 x 50 mm all flanged tee	No.	1		
6.1.4.1 2	50 mm flanged gate valve	No.	1		
6.1.4.1 3	50 mm x 400 mm long double flanged spigot	No.	1		
6.1.4.1 4	50 mm dia Double orifice air valve	No.	1		
<b>6.1.5</b>	<b>PRESSURE REGULATOR VALVES</b>				
6.1.5.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete pressure regulator chambers. Internal dimensions 1000 x 750 x 1200 mm. Rates to include for all thrust blocks , pipe supports, inspection	No	3		

	covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Special rates shall include for completing all pipe joints as specified in the specification				
	<b>1 No. Pressure Regulator Valve (PRV) at branch 1 Ch.20 m</b>				
6.1.5.2	463 / 450 mm dia VJ stepped coupling	No.	2		
6.1.5.3	450 mm dia single flanged GI pipe (500mm)	No.	2		
6.1.5.4	450 mm dia PRV	No.	1		
	<b>1 No. Pressure Regulator Valve (PRV) at branch 1 Chainage 500 m</b>				
6.1.5.5	315 / 300 mm dia VJ stepped coupling	No.	2		
6.1.5.6	300 mm dia single flanged GI pipe (500mm)	No.	2		
6.1.5.7	300 mm dia PRV	No.	1		
	<b>1 No. Pressure Regulator Valve (PRV) at branch 1 Chainage 2040 m</b>				
6.1.5.8	250 / 250 mm dia VJ stepped coupling	No.	2		

6.1.5.9	250 mm dia single flanged GI pipe (500mm)	No.	2		
6.1.5.10	250 mm dia PRV	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>6.1.6</b>	<b>SECTION VALVE CHAMBERS</b>				
6.1.6.1	Provide all materials and finish constructing (i.e. Plastering and installing of covers) complete inspection valve chambers at the pipe junctions. Internal dimensions 1200 x1200x 1200 mm. Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No	5		
6.1.6.2	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete inspection valve chambers at the pipe junctions. Internal dimensions 1000 x750x 1200 mm. Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No	6		

	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions (inspection valve chambers). Rates shall include for completing all pipe joints as specified in the specifications				
	<b>Branch 1 Block Chamber for B1-1 Offtake at Chainage 40 m</b>				
6.1.6.3	500 x 32 mm dia saddle clamp (mild steel)	No.	1		
6.1.6.4	40 /32 mm dia GI / uPVC adaptor	No	3		
6.1.6.5	40 mm dia uPVC pipe	m	1		
6.1.6.6	32 mm, 0.5m long, threaded steel pipe	No	2		
6.1.6.7	32 mm dia gate valve	No	1		
6.1.6.8	32 mm dia GI Nipple	No	1		
6.1.6.9	32 mm dia GI union	No	1		
	<b>Branch 1 Block Chamber for B1-2 Offtake at Chainage 40 m</b>				
6.1.6.10	500 x 80 mm dia saddle clamp (mild steel)	No.	1		
6.1.6.11	90 / 80 mm dia V/J stepped couplings	No	3		

6.1.6.1 2	90 mm dia uPVC pipe	m	1		
6.1.6.1 3	80 mm dia single flanged steel spigot (500mm Long)	No	2		
6.1.6.1 4	80 mm dia double flanged sluice valve	No	1		
6.1.6.1 5	450 / 450 mm dia V/J stepped couplings	No	1		
6.1.6.1 6	450 mm dia single flanged steel spigot (500mm Long)	No	1		
6.1.6.1 7	450 x 300 mm dia double flanged reducer	No	1		
6.1.6.1 8	300 mm dia single flanged steel spigot (500mm Long)	No	1		
6.1.6.1 9	315 / 300 mm dia V/J stepped couplings	No	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Branch 1 Block Chamber for B1-3 Offtake at Chainage 340 m</b>				
6.1.6.2 0	300 x 50 mm dia saddle clamp (mild steel)	No.	1		
6.1.6.2 1	50 / 63 mm dia GI / uPVC adaptor	No	3		

6.1.6.2 2	63 mm dia uPVC pipe	m	1		
6.1.6.2 3	50 mm, 0.5m long, threaded steel pipe	No	2		
6.1.6.2 4	50 mm dia gate valve	No	1		
6.1.6.2 5	50 mm dia GI Nipple	No	1		
6.1.6.2 6	50 mm dia GI union	No	1		
	<b>Section Valve Chamber at Chainage 1000m</b>				
6.1.6.2 7	315 / 300 mm dia V/J stepped couplings	No.	2		
6.1.6.2 8	300 mm dia single flanged steel straight ( 0.5 m long)	No.	2		
6.1.6.2 9	300 mm dia double flanged sluice valve	No.	1		
	<b>Branch 1 Block Chamber for B1-4 Offtake at Chainage 1720 m</b>				
6.1.6.3 0	300 x 50 mm dia saddle clamp (mild steel)	No.	1		
6.1.6.3 1	50 /63 mm dia GI / uPVC adaptor	No	3		
6.1.6.3 2	63 mm dia uPVC pipe	m	1		
6.1.6.3 3	50 mm, 0.5m long, threaded steel pipe	No	2		



6.1.6.3 4	50 mm dia gate valve	No	1		
6.1.6.3 5	50 mm dia GI Nipple	No	1		
6.1.6.3 6	50 mm dia GI union	No	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Branch 1 Block Chamber for B1-5 Offtake at Chainage 1720 m</b>				
6.1.6.3 7	300 x 50 mm dia saddle clamp (mild steel)	No.	1		
6.1.6.3 8	50 /63 mm dia GI / uPVC adaptor	No	3		
6.1.6.3 9	63 mm dia uPVC pipe	m	1		
6.1.6.4 0	50 mm, 0.5m long, threaded steel pipe	No	2		
6.1.6.4 1	50 mm dia gate valve	No	1		
6.1.6.4 2	50 mm dia GI Nipple	No	1		

6.1.6.4 3	50 mm dia GI union	No	1		
6.1.6.4 4	315 / 300 mm dia V/J stepped couplings	No	1		
6.1.6.4 5	300 mm dia single flanged steel spigot (500mm Long)	No	1		
6.1.6.4 6	300 x 250 mm dia flanged reducer	No	1		
6.1.6.4 7	250 mm dia single flanged steel piece (500 mm)	No	1		
6.1.6.4 8	250 / 250 mm dia V/J couplings	No	1		
	<b>Branch 1 Block Chamber for B1-6 Offtake at Chainage 2020 m</b>				
6.1.6.4 9	250 / 250 mm dia V/J stepped coupling	No	2		
6.1.6.5 0	250 mm dia single flanged steel spigot (0.5 m long)	No	2		
6.1.6.5 1	250 x 150 mm dia all flanged tee	No	1		
6.1.6.5 2	150 x125 mm dia flanged reducer	No	1		
6.1.6.5 3	125 mm dia double flanged sluice valve	No	1		
6.1.6.5 4	125 mm dia single flanged GI piece (0.5 m long)	No	1		
6.1.6.5 5	140 / 125 mm dia VJ stepped coupling	No	1		

	<b>Branch 1 Block Chamber for B1-7 Offtake at Chainage 2460 m</b>				
6.1.6.5 6	250 x 32 mm dia saddle clamp (mild steel)	No.	1		
6.1.6.5 7	40 /32 mm dia GI / uPVC adaptor	No	3		
6.1.6.5 8	40 mm dia uPVC pipe	m	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.1.6.5 9	32 mm, 0.5m long, threaded steel pipe	No	2		
6.1.6.6 0	32 mm dia gate valve	No	1		
6.1.6.6 1	32 mm dia GI Nipple	No	1		
6.1.6.6 2	32 mm dia GI union	No	1		
6.1.6.6 3	250 / 250 mm dia V/J couplings	No	1		
6.1.6.6 4	250mm 0.5m long single flanged	No	1		
6.1.6.6 5	250 x 200 mm dia double flanged reducer	No	1		

6.1.6.6 6	200 mm dia single flanged steel spigot (0.5 m long)	No	1		
6.1.6.6 7	200 / 200 mm dia V/J stepped coupling	No	1		
	<b>Branch 1 Block Chamber for B1-8 Offtake at Chainage 2780 m</b>				
6.1.6.6 8	200 / 200 mm dia V/J stepped coupling	No	1		
6.1.6.6 9	200 mm dia single flanged steel spigot (0.5 m long)	No	1		
6.1.6.7 0	200 x 150 mm dia all flanged tee	No	1		
6.1.6.7 1	150 mm dia double flanged GI pipe(500 mm)	No	1		
6.1.6.7 2	150 mm dia double flanged sluice valve	No	1		
6.1.6.7 3	150 mm dia single flanged GI piece (0.5 m long)	No	2		
6.1.6.7 4	160 / 150 mm dia VJ stepped coupling	No	2		
6.1.6.7 5	200 x 150 flanged reducer	No	1		
	<b>Branch 1 Block Chamber for B1-9 Offtake at Chainage 2900 m</b>				
6.1.6.7 6	160 / 150 mm dia V/J stepped coupling	No	2		
6.1.6.7 7	150 mm dia single flanged steel spigot (0.5 m long)	No	2		

6.1.6.7 8	150 mm flanged sluice valve	No	1		
	<b>Branch 1 Block Chamber for B1-10 Offtake at Chainage 2020 m</b>				
6.1.6.7 9	250 / 250 mm dia V/J stepped coupling	No	2		
6.1.6.8 0	250 mm dia single flanged steel spigot (0.5 m long)	No	2		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.1.6.8 1	250 x 80 mm dia all flanged tee	No	1		
6.1.6.8 2	250 mm flanged sluice valve	No	1		
6.1.6.8 3	80 x 50 flanged reducer	No	1		
6.1.6.8 4	50 mm , 0.5m long double flanged GI piece	No	1		
6.1.6.8 5	50 mm flanged sluice valve	No	1		
6.1.6.8 6	50mm , 0.5m long single flanged GI piece	No	1		

6.1.6.8 7	63 /50 mm dia GI / uPVC adaptor	No	1		
<b>6.1.7</b>	<b>Bends</b>				
	<b>Bends (Horizontal)</b>				
	<b>463 mm dia (GRP)</b>				
6.1.7.1	22.5° bends	No.	1		
6.1.7.1 0	45° bends	No.	2		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>250 mm dia</b>				
6.1.7.1 1	22.5° bends	No.	2		
6.1.7.1 2	11.25 deg.	No.	7		
6.1.7.1 3	45° bends	No.	2		
	<b>200 mm dia</b>				
6.1.7.1 4	22.5° bends	No.	2		
6.1.7.1 5	11.25 deg.	No.	4		

	<b>160 mm dia</b>				
6.1.7.1 6	11.25° bends	No.	2		
<b>6.1.8</b>	<b>Road Crossings</b>				
6.1.8.1	Provide for minor road crossing structures at Chainage 10m taking reference to drawings. Rates to include for excavation and backfilling, culvert, concrete surround and all jointing materials and other fittings defined in specifications.	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 6.2 - Branch 2 Pipeline</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>6.2.1</b>	<b>Excavation and Backfilling</b>				
	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from				

	the excavations as per the specifications. Depth of excavation not exceeding 1.0 m unless otherwise specified				
6.2.1.1	Excavation in normal soil	m <sup>3</sup>	524		
6.2.1.2	Ditto for excavation in loose hard rock	m <sup>3</sup>	160		
<b>6.2.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchorage.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes . Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				
6.2.2.1	<b>uPVC Straights</b>				



	<b>Class B</b>				
6.2.2.1 .1	Dia 200 mm	m	24		
6.2.2.1 .4	Dia 90 mm	m	500		
<b>6.2.3</b>	<b>PRESSURE REGULATOR VALVES</b>				
6. 2.3.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete pressure regulator chambers. Internal dimensions 1000 x 750 x 1200 mm. Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No	3		
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completing all pipe joints as specified in the specifications.				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>1 No. Pressure Regulator Valve (PRV)</b>				

	<b>at branch 2 Chainage 140 m</b>				
6. 2.3.2	200 / 200 mm dia VJ stepped coupling	No.	2		
6. 2.3.3	200 mm dia single flanged GI pipe (500mm)	No.	2		
6. 2.3.4	200 mm dia PRV	No.	1		
	<b>1 No. Pressure Regulator Valve (PRV) at branch 2 Chainage 820 m</b>				
6. 2.3.5	160 / 150 mm dia VJ stepped coupling	No.	2		
6. 2.3.6	150 mm dia single flanged GI pipe (500mm)	No.	2		
6. 2.3.7	150 mm dia PRV	No.	1		
	<b>1 No. Pressure Regulator Valve (PRV) at branch 2 Chainage 1520 m</b>				
6.2.3.8	110 / 100 mm dia VJ stepped coupling	No.	2		
6.2.3.9	100 mm dia single flanged GI pipe (500mm)	No.	2		
6.2.3.1 0	100 mm dia PRV	No.	1		
<b>6.2.4</b>	<b>SECTION VALVE CHAMBERS</b>				

6.2.4.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete inspection valve chambers of internal dimensions 1200 x1200x 1200 mm at the pipe junctions. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	4		
6.2.4.2	provide all materials and finish constructing (i.e. Plastering and installing covers) complete inspection valve chambers of internal dimensions 1000 x750x 1200 mm at the pipe junctions. Rates to including thrust blocks, pipe supports as shown in the drawings.	No.	2		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>Branch 2 Block Chamber for B2-1 Offtake at Ch.20 m</b>				
6.2.4.3	200 x 32 mm dia saddle clamp (mild steel)	No.	1		

6.2.4.4	40 /32 mm dia GI / uPVC adaptor	No	3		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.2.4.5	40 mm dia uPVC pipe	m	1		
6.2.4.6	32 mm, 0.5m long, threaded steel pipe	No	2		
6.2.4.7	32 mm dia gate valve	No	1		
6.2.4.8	32 mm dia GI Nipple	No	1		
6.2.4.9	32 mm dia GI union	No	1		
	<b>Branch 2 Block Chamber for B2-2 Offtake at Chainage 40 m</b>				
6.2.4.1 0	200 x 40 mm dia saddle clamp (mild steel)	No.	1		
6.2.4.1 1	50 /40 mm dia GI / uPVC adaptor	No	3		
6.2.4.1 2	50 mm dia uPVC pipe	m	1		
6.2.4.1 3	40 mm, 0.5m long, threaded steel pipe	No	2		

6.2.4.1 4	40 mm dia gate valve	No	1		
6.2.4.1 5	40 mm dia GI Nipple	No	1		
6.2.4.1 6	40 mm dia GI union	No	1		
	<b>Branch 2 Block Chamber for B2-3 Offtake at Chainage 240 m</b>				
6.2.4.1 7	200 / 200 mm dia V/J stepped coupling	No	1		
6.2.4.1 8	200 mm dia single flanged steel spigot (0.5 m long)	No	1		
6.2.4.1 9	200 x 80 mm dia all flanged tee	No	1		
6.2.4.2 0	80 mm , 0.5m long double flanged GI piece	No	1		
6.2.4.2 1	80 mm flanged sluice valve	No	1		
6.2.4.2 2	80mm , 0.5m long single flanged GI piece	No	1		
6.2.4.2 3	90 / 80 mm dia uPVC/GI adaptor	No	1		
6.2.4.2 4	200 x 150 flanged reducer	No	1		
6.2.4.2 5	150 mm dia single flanged steel spigot (0.5 m long)	No	1		
6.2.4.2 6	160 / 150 mm dia V/J stepped coupling	No	1		

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Branch 2 Block Chamber for B2-4 Offtake at Ch.840 m</b>				
6.2.4.2 7	160 / 150 mm dia V/J stepped coupling	No	1		
6.2.4.2 8	150 mm dia single flanged steel spigot (0.5 m long)	No	1		
6.2.4.2 9	150 x 100 mm dia all flanged tee	No	1		
6.2.4.3 0	100 mm , 0.5m long double flanged GI piece	No	1		
6.2.4.3 1	100 mm flanged sluice valve	No	2		
6.2.4.3 2	100mm , 0.5m long single flanged GI piece	No	2		
6.2.4.3 3	100 / 110 mm dia V/J stepped coupling	No	2		
6.2.4.3 4	150 x 100 flanged reducer	No	1		
	<b>Branch 2 Block Chamber for B2-5 Offtake at Ch.1800 m</b>				

6.2.4.3 5	110 / 100 mm dia V/J stepped coupling	No	1		
6.2.4.3 6	100 mm dia single flanged steel spigot (0.5 m long)	No	1		
6.2.4.3 7	100 x 32 mm double flanged steel tee	No	1		
6.2.4.3 8	32 mm dia GI Nipple	No	2		
6.2.4.3 9	32 mm dia gate valve	No	1		
6.2.4.4 0	32 mm dia GI union	No	1		
6.2.4.4 1	32 mm, 0.5m long threaded steel pipe	No	1		
6.2.4.4 2	40 / 32 mm dia uPVC/GI adaptor	No	1		
6.2.4.4 3	100 x 80 flanged reducer	No	1		
6.2.4.4 4	80 mm dia single flanged steel spigot (0.5 m long)	No	1		
6.2.4.4 5	80 mm flanged sluice valve	No	1		
6.2.4.4 6	80 / 90 mm dia V/J stepped coupling	No	1		
	<b>Branch 2 Block Chamber for B2-6 and B2-7 Offtakes at Chainage 2300 m</b>				

6.2.4.4 7	80 / 90 mm dia V/J stepped coupling	No	1		
6.2.4.4 8	80mm , 0.5m long single flanged GI piece	No	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.2.4.4 9	80 x 80 mm dia all flanged tee	No	1		
6.2.4.5 0	80 x 65mm dia flanged reducer	No	1		
6.2.4.5 1	65 mm dia double flanged sluice valve	No	1		
6.2.4.5 2	65 mm dia single flanged GI piece (500mm long)	No	1		
6.2.4.5 3	75 / 65 mm dia V/J stepped coupling	No	1		
6.2.4.5 4	80 x 40 mm dia flanged reducer	No	1		
6.2.4.5 5	40 mm flanged sluice valve	No	1		
6.2.4.5 6	40 mm dia 0.5m long single flanged	No	1		
6.2.4.5 7	50 / 40 mm dia uPVC / GI adaptor	No	1		



<b>6.2.5</b>	<b>Bends</b>				
	<b>Horizontal Bends</b>				
	<b>11.25 degrees</b>				
6.2.5.1	160 mm dia	No.	1		
6.2.5.2	110 mm dia	No.	1		
6.2.5.3	90 mm dia	No.	1		
	<b>22.5 degrees</b>				
6.2.5.4	160 mm dia	No.	2		
6.2.5.5	90 mm dia	No.	1		
	<b>45 degrees</b>				
6.2.5.6	90 mm dia	No.	1		
	<b>90 degrees</b>				
6.2.5.7	200 mm dia	No.	1		
	<b>Bends (Vertical)</b>				
	<b>11.25 degrees</b>				
6.2.5.8	200 mm dia	No.	3		
6.2.5.9	110 mm dia	No.	5		
6.2.5.10	90 mm dia	No.	6		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				

	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>22.5 degrees</b>				
6.2.5.1 1	160 mm dia	No.	5		
6.2.5.1 2	110 mm dia	No.	2		
	<b>45 degrees</b>				
6.2.5.1 3	200 mm dia	No.	2		
6.2.5.1 4	110 mm dia	No.	1		
6.2.5.1 5	90 mm dia	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No.6.4 - Branch 4 Pipeline</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNI T</b>	<b>QUAN TITY</b>	<b>RATE (KSHs )</b>	<b>AMOUNT (KSHs)</b>
<b>6.4.3</b>	<b>AIR VALVES</b>				
6.4.3.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete air valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves . Rates shall include for completing all pipe joints as detailed in the drawings.				
	<b>Double Air Valve (DAV) at Chainage 560m</b>				
6.4.3.2	140 / 125 mm dia PVC U/GI stepped coupling	No.	2		
6.4.3.3	125 mm x 500 mm long Double flanged steel spigot	No.	2		

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.4.3.4	125 x 50 mm double flanged steel tee	No.	1		
6.4.3.5	50 mm x 400mm long double flanged steel piece	No.	1		
6.4.3.6	50 mm flanged gate valve	No.	1		
6.4.3.7	50 mm dia Double orifice air valve	No.	1		
<b>6.4.4</b>	<b>WASHOUTS</b>				
6.4.4.1	provide all materials and finish constructing (i.e. Plastering and installing covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				

	<b>For W/O at Chainage 920m</b>				
6.4.4.2	140 / 125 mm dia VJ stepped coupling	No.	2		
6.4.4.3	125 mm dia double flanged steel spigot (500mm long)	No.	2		
6.4.4.4	125 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
6.4.4.5	50 mm flanged gate valve	No.	1		
6.4.4.6	50 mm dia 0.5m long single flanged	No.	1		
6.4.4.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
6.4.4.8	63 mm UPVC pipe Class B	m	6		
6.4.4.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
<b>6.4.5</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>6.4.5.1</b>	<b>PRV Chambers</b>				
6.4.5.1.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	2		

	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions (Section valve chambers).				
	Rates shall include for completing all pipe joints and fittings as specified in the detailed drawings.				
	<b>PRV Chamber at Chainage 640m</b>				
6.4.5.1.2	140 / 125 mm dia VJ stepped coupling	No.	2		
6.4.5.1.3	125 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.4.5.1.4	125 mm dia double flanged PRV	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>PRV Chamber at Chainage 1600m</b>				
6.4.5.1.5	100 / 110 mm dia V/J stepped couplings	No.	2		
6.4.5.1.6	100 mm dia single flanged steel spigot (0.5m long)	No.	2		

6.4.5.1.7	100 mm dia double flanged PRV	No.	1		
<b>6.4.5.2</b>	<b>Block Chambers</b>				
6.4.5.2.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	7		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions (Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the detailed drawings				
	<b>Block Chamber at Chainage 20m offtake to B4-1</b>				
6.4.5.2.2	250 / 250 mm dia V/J couplings	No.	2		
6.4.5.2.3	250mm single flanged steel piece (0.5m long)	No.	1		
6.4.5.2.4	250 x 125 mm dia all flanged tee	No.	1		

6.4.5.2.5	125 mm dia double flanged steel spigot (500mm long)	No.	1		
6.4.5.2.6	125 mm dia double flanged sluice valve	No.	1		
6.4.5.2.7	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.4.5.2.8	125 / 125 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 20m offtake to B4-2</b>				
6.4.5.2.9	250 / 250 mm dia V/J couplings	No.	1		
6.4.5.2.10	250mm single flanged steel piece (0.5m long)	No.	1		
6.4.5.2.11	250 x 200 mm dia all flanged tee	No.	1		
6.4.5.2.12	200 mm dia double flanged steel spigot (0.5m long)	No.	1		
6.4.5.2.13	200 mm dia double flanged sluice valve	No.	1		
6.4.5.2.14	200 mm dia single flanged steel spigot (0.5 m long)	No.	2		
6.4.5.2.15	200 / 200 mm dia V/J stepped coupling	No.	2		
6.4.5.2.16	250 x 200 mm dia double flanged reducer	No.	1		



	<b>Block Chamber at Chainage 320m Offtake to B4-3</b>				
6.4.5.2.1 7	200 / 200 mm dia V/J stepped coupling	No.	2		
6.4.5.2.1 8	200 mm dia single flanged steel spigot (0.5 m long)	No.	2		
6.4.5.2.1 9	200 x 100 mm dia all flanged tee	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.4.5.2.2 0	100 mm dia double flanged GI piece (0.5 m long)	No.	1		
6.4.5.2.2 1	100 mm dia double flanged sluice valve	No.	1		
6.4.5.2.2 2	100 mm dia single flanged steel spigot (0.5m long)	No.	1		
6.4.5.2.2 3	100 / 110 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 320m Offtake to B4-4</b>				
6.4.5.2.2 4	200 / 200 mm dia V/J stepped coupling	No.	1		

6.4.5.2.2 5	200 mm dia single flanged steel spigot (0.5 m long)	No.	1		
6.4.5.2.2 6	200 x 50 mm dia all flanged tee	No.	1		
6.4.5.2.2 7	50 mm dia double flanged steel piece (0.5m long)	No.	1		
6.4.5.2.2 8	50 mm double flanged sluice valve	No.	1		
6.4.5.2.2 9	50 mm dia 0.5m long single flanged	No.	1		
6.4.5.2.3 0	63 / 50 mm dia VJ stepped coupling	No.	1		
6.4.5.2.3 1	200 x 125 mm dia double flanged reducer	No.	1		
6.4.5.2.3 2	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.4.5.2.3 3	140 / 125 mm dia VJ stepped coupling	No.	1		
	<b>Block Chamber at Chainage 1080m Offtake to B4-5</b>				
6.4.5.2.3 4	140 / 125 mm dia VJ stepped coupling	No.	1		
6.4.5.2.3 5	125 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.4.5.2.3 6	125 x 40 mm all flanged steel Tee	No.	1		

6.4.5.2.3 7	40 mm, 0.5m long Double flanged steel pipe	No.	1		
6.4.5.2.3 8	40 mm flanged sluice valve	No.	1		
6.4.5.2.3 9	40 mm, 0.5m long single flanged steel pipe	No.	1		
6.4.5.2.4 0	50 / 40 mm dia VJ stepped coupling	No.	1		
6.4.5.2.4 1	125 mm dia double flanged steel spigot (500mm long)	No.	1		
6.4.5.2.4 2	125 mm dia double flanged sluice valve	No.	1		
6.4.5.2.4 3	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.4.5.2.4 4	125 / 125 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 1560m Offtake to B4-6</b>				
6.4.5.2.4 5	125 / 125 mm dia V/J stepped couplings	No.	1		
6.4.5.2.4 6	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.4.5.2.4 7	125 x 50 mm all flanged steel tee	No.	1		
6.4.5.2.4 8	50 mm dia double flanged steel pipe (0.5m long)	No.	1		

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.4.5.2.4 9	50 mm flanged sluice valve	No.	1		
6.4.5.2.5 0	50 mm dia single flanged steel pipe (0.5m long)	No.	1		
6.4.5.2.5 1	63 / 50 mm dia VJ stepped coupling	No.	1		
6.4.5.2.5 2	125 x 100 mm dia flanged reducer	No.	1		
6.4.5.2.5 3	100 mm dia single flanged steel spigot (0.5m long)	No.	1		
6.4.5.2.5 4	100 / 110 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 2240m Offtake to B4-7</b>				
6.4.5.2.5 5	110 / 100 mm dia V/J stepped couplings	No.	2		
6.4.5.2.5 6	100 mm , 0.5m long double flanged GI piece	No.	2		
6.4.5.2.5 7	100 mm flanged sluice valve	No.	1		
<b>6.4.6</b>	<b>BENDS</b>				

	<b>Vertical Bends</b>				
	<b>11.25 degrees</b>				
6.4.6.1	200 mm dia	No.	2		
6.4.6.2	140 mm dia	No.	6		
6.4.6.3	125 mm dia	No.	1		
6.4.6.4	110 mm dia	No.	8		
	<b>22.5 degrees</b>				
6.4.6.5	250 mm dia	No.	1		
6.4.6.6	200 mm dia	No.	1		
6.4.6.7	140 mm dia	No.	5		
6.4.6.8	125 mm dia	No.	1		
6.4.6.9	110 mm dia	No.	1		
	<b>45 degrees</b>				
6.4.6.10	200 mm dia	No.	1		
6.4.6.11	140 mm dia	No.	8		
	<b>90 degrees</b>				
6.4.6.12	140 mm dia	No.	2		
	<b>Horizontal Bends</b>				
	<b>11.25 degrees</b>				
6.4.6.13	200 mm dia	No.	2		
6.4.6.14	140 mm dia	No.	3		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				

	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.4.6.15	125 mm dia	No.	1		
6.4.6.16	110 mm dia	No.	4		
	<b>22.5 degrees</b>				
6.4.6.17	140 mm dia	No.	2		
	<b>45 degrees</b>				
6.4.6.18	140 mm dia	No.	1		
	<b>90 degrees</b>				
6.4.6.19	200 mm dia	No.	1		
6.4.6.20	140 mm dia	No.	1		
<b>6.4.7</b>	<b>Road Crossings</b>				
6.4.7.1	Provide for minor road crossing structures at Chainage 10m taking reference to drawings. Rates to include for excavation and backfilling, culvert, concrete surround and all jointing materials and other fittings defined in specifications.	No.	3		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 6.5 - Branch 5 Pipeline</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUAN TITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>6.5.3</b>	<b>AIR VALVES</b>				
6.5.3.1	Provide all materials and finish constructing (i.e. plastering and installing covers) complete air valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for	No.	2		

	all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe joints as specified in the detailed drawings.				
	<b>Double Air Valve (DAV) at Chainage 2740m</b>				
6.5.3.2	160 / 150 mm dia V/J stepped coupling	No.	2		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.5.3.3	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.5.3.4	150 x 50 mm dia all flanged tee	No.	1		



6.5.3.5	50 mm x 400mm long double flanged steel piece	No.	1		
6.5.3.6	50 mm flanged gate valve	No.	1		
6.5.3.7	50 mm dia Double orifice air valve	No.	1		
	<b>Double Air Valve (DAV) at Chainage 3480m</b>				
6.5.3.8	100 / 110 mm dia V/J stepped couplings	No.	2		
6.5.3.9	100 mm dia single flanged steel spigot (0.5m long)	No.	2		
6.5.3.10	100 x 50 mm double flanged steel tee	No.	1		
6.5.3.11	50 mm x 400mm long double flanged steel piece	No.	1		
6.5.3.12	50 mm flanged gate valve	No.	1		
6.5.3.13	50 mm dia Double orifice air valve	No.	1		
<b>6.5.4</b>	<b>WASHOUTS</b>				
6.5.4.1	Provide all materials and finish constructing (i.e. plastering and installing covers) complete washout chambers. Internal dimensions <b>1000 x</b>	No.	1		

	<b>750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	<b>For W/O at Chainage 2340m</b>				
6.5.4.2	160 / 150 mm dia V/J stepped coupling	No.	2		
6.5.4.3	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.5.4.4	150 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
6.5.4.5	50 mm flanged gate valve	No.	1		
6.5.4.6	50 mm dia 0.5m long single flanged steel pipe	No.	1		
6.5.4.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		

6.5.4.8	63 mm UPVC pipe Class B	m	6		
6.5.4.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>6.5.5</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>6.5.5.1</b>	<b>PRV Chambers</b>				
6.5.5.1.1	Provide all materials and finish constructing (i.e. plastering and installing covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	5		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions				

	( Section valve chambers).				
	Rates shall include for completing all pipe joints and fittings as specified in the detailed drawings.				
	<b>PRV Chamber at Chainage 120m</b>				
6.5.5.1.2	250 / 250 mm dia V/J couplings	No.	2		
6.5.5.1.3	250mm 0.5m long single flanged steel piece	No.	2		
6.5.5.1.4	250 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 1100m</b>				
6.5.5.1.5	200 / 200 mm dia V/J stepped coupling	No.	2		
6.5.5.1.6	200 mm dia single flanged steel spigot (0.5 m long)	No.	2		
6.5.5.1.7	200 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 2060m</b>				
6.5.5.1.8	160 / 150 mm dia V/J stepped coupling	No.	2		

6.5.5.1.9	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.5.5.1.10	150 mm dia double flanged sluice valve	No.	1		
6.5.5.1.11	150 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 3060m</b>				
6.5.5.1.12	160 / 150 mm dia V/J stepped coupling	No.	2		
6.5.5.1.13	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.5.5.1.14	150 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 4140m</b>				
6.5.5.1.15	100 / 110 mm dia V/J stepped couplings	No.	2		
6.5.5.1.16	100 mm dia single flanged steel spigot (0.5m long)	No.	2		
6.5.5.1.17	100 mm dia double flanged PRV	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD</b>				

	<b>FROM PREVIOUS PAGE</b>				
<b>6.5.5.2</b>	<b>Block chambers</b>				
6.5.5.2.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	6		
6.5.5.2.2	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	3		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions				

	( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the detailed drawings.				
	<b>Block Chamber at Chainage 20m Offtake to B5-1 and B5-2</b>				
6.5.5.2.3	250 x 40 mm dia saddle clamp (mild steel)	No.	2		
6.5.5.2.4	50 / 40 mm dia uPVC / GI adaptor	No.	6		
6.5.5.2.5	50 mm dia, 1m long, uPVC pipe	No.	2		
6.5.5.2.6	40 mm, 0.5m long threaded steel pipe	No.	4		
6.5.5.2.7	40 mm dia GI union	No.	2		
6.5.5.2.8	40 mm dia GI Nipple	No.	2		
6.5.5.2.9	40 mm dia gate valve	No.	2		
	<b>Block Chamber at Chainage 340m Offtake to B5-3</b>				
6.5.5.2.10	250 x 32 mm dia saddle clamp (mild steel)	No.	1		
6.5.5.2.11	32 / 40 mm dia GI / uPVC adaptor	No.	3		

6.5.5.2.1 2	40 mm dia, 1m long, uPVC pipe	No.	1		
6.5.5.2.1 3	32 mm, 0.5m long threaded steel pipe	No.	2		
6.5.5.2.1 4	32 mm dia GI union	No.	1		
6.5.5.2.1 5	32 mm dia GI Nipple	No.	1		
6.5.5.2.1 6	32 mm dia gate valve	No.	1		
	<b>Block Chamber at Chainage 340m Offtake to B5-4</b>				
6.5.5.2.1 7	250 / 250 mm dia V/J couplings	No.	1		
6.5.5.2.1 8	250mm 0.5m long single flanged steel piece	No.	2		
6.5.5.2.1 9	250 x 80 mm dia all flanged tee	No.	1		
6.5.5.2.2 0	80 mm , 0.5m long double flanged GI piece	No.	1		
6.5.5.2.2 1	80 mm flanged sluice valve	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD</b>				



	<b>FROM PREVIOUS PAGE</b>				
6.5.5.2.2 2	80mm , 0.5m long single flanged GI piece	No.	1		
6.5.5.2.2 3	80 / 90 mm dia V/J stepped coupling	No.	1		
6.5.5.2.2 4	250 x 200 mm dia double flanged reducer	No.	1		
6.5.5.2.2 5	200 mm dia single flanged steel spigot (0.5 m long)	No.	1		
6.5.5.2.2 6	225 / 200 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 980m Offtake to B5-5</b>				
6.5.5.2.2 7	225 / 200 mm dia V/J stepped couplings	No.	1		
6.5.5.2.2 8	200 mm dia single flanged steel spigot (0.5 m long)	No.	2		
6.5.5.2.2 9	200 x 65 mm dia all flanged tee	No.	1		
6.5.5.2.3 0	65 mm dia double flanged GI pipe(500mm long)	No.	1		
6.5.5.2.3 1	65 mm dia double flanged sluice valve	No.	1		

6.5.5.2.3 2	65 mm dia single flanged GI piece (500mm long)	No.	1		
6.5.5.2.3 3	65 / 75 mm dia VJ stepped coupling	No.	1		
6.5.5.2.3 4	200 / 200 mm dia V/J stepped coupling	No.	1		
	<b>Block Chamber at Chainage 1740m Offtake to B5-6</b>				
6.5.5.2.3 5	200 / 200 mm dia V/J stepped coupling	No.	1		
6.5.5.2.3 6	200 mm dia single flanged steel spigot (0.5 m long)	No.	1		
6.5.5.2.3 7	200 x 80 mm all flanged steel tee	No.	1		
6.5.5.2.3 8	80 mm , 0.5m long double flanged GI piece	No.	1		
6.5.5.2.3 9	80 mm flanged sluice valve	No.	1		
6.5.5.2.4 0	80mm , 0.5m long single flanged GI piece	No.	1		
6.5.5.2.4 1	80 / 90 mm dia V/J stepped coupling	No.	1		
6.5.5.2.4 2	200 x 150 mm dia flanged reducer	No.	1		
6.5.5.2.4 3	150 mm dia double flanged steel spigot (500mm long)	No.	1		

6.5.5.2.4 4	150 mm dia double flanged sluice valve	No.	1		
6.5.5.2.4 5	150 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.5.5.2.4 6	160 / 150 mm dia V/J stepped coupling	No.	1		
	<b>Block Chamber at Chainage 3220m Offtake to B5-7</b>				
6.5.5.2.4 7	160 / 150 mm dia V/J stepped coupling	No.	1		
6.5.5.2.4 8	150 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.5.5.2.4 9	150 x 125 mm dia all flanged tee	No.	1		
6.5.5.2.5 0	125 mm dia double flanged steel spigot (500mm long)	No.	2		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.5.5.2.5 1	125 mm dia double flanged sluice valve	No.	2		

6.5.5.2.5 2	125 / 125 mm dia V/J stepped couplings	No.	1		
6.5.5.2.5 3	150 x125 mm dia flanged reducer	No.	1		
6.5.5.2.5 4	125 mm dia double flanged steel spigot (500mm long)	No.	1		
6.5.5.2.5 5	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.5.5.2.5 6	140 / 125 mm dia VJ stepped coupling	No.	1		
	<b>Block Chamber at Chainage 3240m Offtake to B5-8</b>				
6.5.5.2.5 7	140 / 125 mm dia VJ stepped coupling	No.	1		
6.5.5.2.5 8	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.5.5.2.5 9	125 x 125 mm all flanged steel tee	No.	1		
6.5.5.2.6 0	125 mm dia double flanged steel spigot (500mm long)	No.	1		
6.5.5.2.6 1	125 mm dia double flanged sluice valve	No.	1		
6.5.5.2.6 2	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.5.5.2.6 3	125 / 125 mm dia V/J stepped couplings	No.	1		

6.5.5.2.6 4	125 x 100 mm dia flanged reducer	No.	1		
6.5.5.2.6 5	100 mm dia single flanged steel spigot (0.5m long)	No.	1		
6.5.5.2.6 6	100 / 110 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 4640m Offtake to B5-9</b>				
6.5.5.2.6 7	100 / 110 mm dia V/J stepped couplings	No.	2		
6.5.5.2.6 8	100 mm dia double flanged GI piece (0.5 m long)	No.	1		
6.5.5.2.6 9	100 mm dia double flanged sluice valve	No.	1		
<b>6.5.6</b>	<b>BENDS</b>				
	<b>Vertical Bends</b>				
	<b>11.25 degrees</b>				
6.5.6.1	250 mm dia	No.	2		
6.5.6.2	225 mm dia	No.	4		
6.5.6.3	200 mm dia	No.	5		
6.5.6.4	160 mm dia	No.	12		
6.5.6.5	110 mm dia	No.	12		
	<b>22.5 degrees</b>				

6.5.6.6	225 mm dia	No.	2		
6.5.6.7	160 mm dia	No.	7		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.5.6.8	110 mm dia	No.	7		
	<b>45 degrees</b>				
6.5.6.9	160 mm dia	No.	1		
6.5.6.10	140 mm dia	No.	1		
6.5.6.11	110 mm dia	No.	1		
	<b>Horizontal Bends</b>				
	<b>11.25 degrees</b>				
6.5.6.12	250 mm dia	No.	1		
6.5.6.13	225 mm dia	No.	1		
6.5.6.14	200 mm dia	No.	5		
6.5.6.15	160 mm dia	No.	12		
6.5.6.16	110 mm dia	No.	3		

	<b>22.5 degrees</b>				
6.5.6.17	250 mm dia	No.	2		
6.5.6.18	225 mm dia	No.	3		
6.5.6.19	200 mm dia	No.	2		
6.5.6.20	160 mm dia	No.	5		
6.5.6.21	110 mm dia	No.	1		
	<b>45 degrees</b>				
6.5.6.22	160 mm dia	No.	4		
6.5.6.23	110 mm dia	No.	1		
	<b>90 degrees</b>				
6.5.6.24	160 mm dia	No.	2		
6.5.6.25	110 mm dia	No.	3		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 6.6 - B6 Pipeline</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QU AN</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>



			<b>TIT Y</b>		
<b>6.6.3</b>	<b>Fittings</b>				
	<b>Provide, lay, joint and test Fittings</b>				
<b>6.6.3.1</b>	<b>uPVC Reducers</b>				
<b>6.6.3.2</b>	200 x 160mm dia	No.	1		
<b>6.6.4</b>	<b>AIR VALVES</b>				
6.6.4.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete air valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe joints as specified in the detailed drawings.				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				

	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Double Air Valve (DAV) at Chainage 2720m</b>				
6.6.4.2	160 / 150 mm dia V/J stepped coupling	No.	2		
6.6.4.3	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.6.4.4	150 x 50 mm dia all flanged tee	No.	1		
6.6.4.5	50 mm x 400mm dia double flanged steel piece	No.	1		
6.6.4.6	50 mm flanged gate valve	No.	1		
6.6.4.7	50 mm dia Double orifice air valve	No.	1		
<b>6.6.5</b>	<b>WASHOUTS</b>				
6.6.5.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		

	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings				
	<b>For W/O at Chainage 2440m</b>				
6.6.5.2	160 / 150 mm dia V/J stepped coupling	No.	2		
6.6.5.3	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.6.5.4	150 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
6.6.5.5	50 mm flanged gate valve	No.	1		
6.6.5.6	50 mm dia 0.5m long single flanged steel pipe	No.	1		
6.6.5.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
6.6.5.8	63 mm UPVC pipe Class B	m	6		
6.6.5.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
<b>6.6.6</b>	<b>SECTION VALVE CHAMBERS</b>				

<b>6.6.6.1</b>	<b>PRV Chambers</b>				
6.6.6.1.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	3		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the detailed drawings.				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>PRV Chamber at Chainage 480m</b>				
6.6.6.1.2	200 / 200 mm dia V/J stepped coupling	No.	2		

6.6.6.1.3	200 mm dia single flanged steel spigot (0.5 m long)	No.	2		
6.6.6.1.4	200 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 1900m</b>				
6.6.6.1.5	160 / 150 mm dia V/J stepped coupling	No.	2		
6.6.6.1.6	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.6.6.1.7	150 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 3220m</b>				
6.6.6.1.8	100 / 110 mm dia V/J stepped couplings	No.	2		
6.6.6.1.9	100 mm dia single flanged steel spigot (0.5m long)	No.	2		
6.6.6.1.10	100 mm dia double flanged PRV	No.	1		
<b>6.6.6.2</b>	<b>Block Chambers</b>				
6.6.6.2.1	Provide all materials and finish constructing (i.e. Plastering and installing covers) complete valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all	No.	6		

	thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the detailed drawings.				
	<b>Block Chamber at Chainage 20m Offtake to B6-1</b>				
6.6.6.2. 2	250 / 250 mm dia V/J couplings	No.	2		
6.6.6.2. 3	250mm 0.5m long single flanged steel piece	No.	2		
6.6.6.2. 4	250 x 150 mm dia all flanged tee	No.	1		
6.6.6.2. 5	150 x125 mm dia flanged reducer	No.	1		
6.6.6.2. 6	125 mm dia double flanged steel spigot (500mm long)	No.	1		
6.6.6.2. 7	125 mm dia double flanged sluice valve	No.	1		
6.6.6.2. 8	125 mm dia single flanged GI piece (0.5 m long)	No.	1		

6.6.6.2. 9	125 / 125 mm dia V/J stepped couplings	No.	1		
6.6.6.2. 10	250 mm dia double flanged steel piece (500 mm)	No.	1		
6.6.6.2. 11	250 mm dia double flanged PRV	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Block Chamber at Chainage 460m Offtake to B6-2</b>				
6.6.6.2. 12	250 / 250 mm dia V/J couplings	No.	1		
6.6.6.2. 13	250mm 0.5m long single flanged steel piece	No.	1		
6.6.6.2. 14	250 x 150 mm dia all flanged tee	No.	1		
6.6.6.2. 15	150 x125 mm dia flanged reducer	No.	1		
6.6.6.2. 16	125 mm dia double flanged steel spigot (500mm long)	No.	1		
6.6.6.2. 17	125 mm dia double flanged sluice valve	No.	1		

6.6.6.2. 18	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.6.6.2. 19	140 / 125 mm dia VJ stepped coupling	No.	1		
6.6.6.2. 20	250 x 200 mm dia double flanged reducer	No.	1		
6.6.6.2. 21	200 mm dia double flanged steel spigot (0.5m long)	No.	1		
6.6.6.2. 22	200 mm dia double flanged sluice valve	No.	1		
6.6.6.2. 23	200 mm dia single flanged steel spigot (0.5 m long)	No.	1		
6.6.6.2. 24	200 / 200 mm dia V/J stepped coupling	No.	1		
	<b>Block Chamber at Chainage 1880m Offtake to B6-3</b>				
6.6.6.2. 25	160 / 150 mm dia V/J stepped coupling	No.	2		
6.6.6.2. 26	150 mm dia single flanged GI piece (0.5 m long)	No.	2		
6.6.6.2. 27	150 x 80 mm dia all flanged tee	No.	1		
6.6.6.2. 28	80 mm , 0.5m long double flanged GI piece	No.	1		
6.6.6.2. 29	80 mm flanged sluice valve	No.	1		



6.6.6.2. 30	80mm , 0.5m long single flanged GI piece	No.	1		
6.6.6.2. 31	80 / 90 mm dia V/J stepped coupling	No.	1		
6.6.6.2. 32	150 mm dia double flanged steel spigot (500mm long)	No.	1		
6.6.6.2. 33	150 mm dia double flanged sluice valve	No.	1		
6.6.6.2. 34	150 mm dia single flanged GI piece (0.5 m long)	No.	1		
	<b>Block Chamber at Chainage 3040m Offtake to B6-4</b>				
6.6.6.2. 35	160 / 150 mm dia V/J stepped coupling	No.	1		
6.6.6.2. 36	150 mm dia single flanged GI piece (0.5 m long)	No.	1		
6.6.6.2. 37	150 x 125 mm dia all flanged tee	No.	1		
6.6.6.2. 38	125 mm dia double flanged steel spigot (500mm long)	No.	1		
6.6.6.2. 39	125 mm dia double flanged sluice valve	No.	1		
6.6.6.2. 40	125 mm dia single flanged GI piece (0.5 m long)	No.	1		

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
6.6.6.2.41	140 / 125 mm dia VJ stepped coupling	No.	1		
6.6.6.2.42	150 x 100 mm dia flanged reducer	No.	1		
6.6.6.2.43	100 mm dia double flanged GI piece (0.5 m long)	No.	1		
6.6.6.2.44	100 mm dia double flanged sluice valve	No.	1		
6.6.6.2.45	100 mm dia single flanged steel spigot (0.5m long)	No.	1		
6.6.6.2.46	100 / 110 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 3800m Offtake to B6-5</b>				
6.6.6.2.47	110 x 50 mm dia saddle clamp	No.	1		
6.6.6.2.48	63 / 50 mm dia GI / uPVC adaptor	No.	3		
6.6.6.2.49	63 mm dia, 1m long, uPVC pipe	No.	1		

6.6.6.2. 50	50 mm dia GI piece 500 mm long with threads	No.	2		
6.6.6.2. 51	50 mm dia GI union	No.	1		
6.6.6.2. 52	50 mm dia GI nipple	No.	1		
6.6.6.2. 53	50 mm gate valve	No.	1		
	<b>Block Chamber at Chainage 3800m Offtake to B6-6</b>				
6.6.6.2. 54	100 / 110 mm dia V/J stepped couplings	No.	1		
6.6.6.2. 55	100 mm dia double flanged GI piece (0.5 m long)	No.	1		
6.6.6.2. 56	100 x 50 mm dia flanged reducer	No.	1		
6.6.6.2. 57	50 mm flanged gate valve	No.	1		
6.6.6.2. 58	50 mm dia 0.5m long single flanged GI piece	No.	1		
6.6.6.2. 59	63 / 50 mm dia VJ stepped coupling	No.	1		
<b>6.6.7</b>	<b>BENDS</b>				
	<b>Vertical Bends</b>				
	<b>11.25 degrees</b>				
6.6.7.1	250 mm dia	No.	3		

6.6.7.2	160 mm dia	No.	6		
6.6.7.3	110 mm dia	No.	4		
	<b>22.5 degrees</b>				
6.6.7.4	160 mm dia	No.	1		
	<b>45 degrees</b>				
6.6.7.5	110 mm dia	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Horizontal Bends</b>				
	<b>11.25 degrees</b>				
6.6.7.6	160 mm dia	No.	5		
6.6.7.7	110 mm dia	No.	2		
	<b>22.5 degrees</b>				
6.6.7.8	160 mm dia	No.	2		
6.6.7.9	110 mm dia	No.	2		
	<b>45 degrees</b>				
6.6.7.10	160 mm dia	No.	1		
<b>6.6.8</b>	<b>Road Crossings</b>				

6.6.8.1	Provide for Main road crossing at Chainage 0+000m as per Drawing and in accordance with specifications. Rates to include for excavation and backfilling, culvert rings, concrete surround and all jointing materials and other fittings as per specifications.	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No.7 - DISTRIBUTION PIPELINES</b>		
	<b>DESCRIPTION</b>	<b>AMOUNT (KSHs)</b>
	<b>COLLECTION</b>	
1	Bill No.7.1: Distribution B6-1	
2	Bill No.7.2: Distribution B6-1-1	
3	Bill No.7.3: Distribution B6-2	
4	Bill No.7.4: Distribution B6-2-1	
5	Bill No.7.5: Distribution B6-2-1-1	
6	Bill No.7.6: Distribution B6-2-1-2	
7	Bill No.7.7: Distribution B6-2-3	
8	Bill No.7.8: Distribution B6-4	
9	Bill No.7.9: Distribution B6-4-1	
10	Bill No.7.10: Distribution B6-4-3	
11	Bill No.7.11: Distribution B6-5	
12	Bill No.7.12: Distribution B6-6	
	<b>TOTAL CARRIED OVER TO GRAND SUMMARY</b>	

<b>Bill No. 7.1- B6-1 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUAN TITY</b>	<b>RATE (KSHs )</b>	<b>AMOUNT (KSHs)</b>
<b>7.1.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				

	<b>Provide, lay, joint and test Fittings</b>				
<b>7.1.3.1</b>	<b>Reducers</b>				
7.1.3.1.3	75 x 63 mm	No.	1		
7.1.3.1.4	63 x 50 mm	No.	1		
7.1.3.1.5	50 x 25 mm	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.1.4</b>	<b>AIR VALVES</b>				
7.1.4.1	Provide all materials and Finish constructing complete air valve chambers(Plastering and installations of covers). Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe joints as specified in the specifications				



	<b>Double Air Valve (DAV) at Chainage 800m</b>				
7.1.4.2	110 / 100 mm dia PVC U/GI stepped coupling	No.	2		
7.1.4.3	100 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.1.4.4	100 x 50 mm dia all flanged tee	No.	1		
7.1.4.5	50 mm x 400mm long double flanged steel piece	No.	1		
7.1.4.6	50 mm flanged gate valve	No.	1		
7.1.4.7	50 mm dia Double orifice air valve	No.	1		
<b>7.1.5</b>	<b>WASHOUTS</b>				
7.1.5.1	Provide all materials and finish constructing complete washout chambers (Internal Plastering and installations of covers) . Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings.				

	<b>For W/O at Chainage 660m</b>				
7.1.5.2	110 / 100 mm dia VJ stepped coupling	No.	2		
7.1.5.3	100 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.1.5.4	100 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
7.1.5.5	50 mm flanged gate valve	No.	1		
7.1.5.6	50 mm dia 0.5m long single flanged GI piece	No.	1		
7.1.5.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
7.1.5.8	63 mm UPVC pipe Class B	m	6		
7.1.5.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.1.6</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.1.6.1</b>	<b>PRV Chamber</b>				

7.1.6.1.1	Provide all materials and finish constructing complete valve chambers( Internal plastering and installations of covers). Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	2		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes and fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 460m</b>				
7.1.6.1.2	110 / 100 mm dia V/J stepped coupling	No.	2		
7.1.6.1.3	100 mm dia single flanged steel spigot (0.5m long)	No.	2		
7.1.6.1.4	100 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 1460m</b>				
7.1.6.1.5	75 / 65 mm dia V/J stepped coupling	No.	2		
7.1.6.1.6	65 mm dia single flanged GI piece (500mm long)	No.	2		

7.1.6.1.7	65 mm dia double flanged sluice valve	No.	1		
7.1.6.1.8	65 mm dia double flanged PRV	No.	1		
<b>7.1.6.2</b>	<b>Block Chambers</b>				
7.1.6.2.1	Provide all materials and finish constructing (i.e. Internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	3		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>Block Chamber at Chainage 400m Offtake to B6-1-1</b>				
7.1.6.2.2	125 / 125 mm dia V/J stepped couplings	No.	1		
7.1.6.2.3	125 mm dia single flanged GI piece (0.5 m long)	No.	1		

7.1.6.2.4	125 x 50 mm double flanged and socketed steel tee	No.	1		
7.1.6.2.5	50 mm dia GI piece 500 mm long with threads	No.	2		
7.1.6.2.6	50 mm dia GI union	No.	1		
7.1.6.2.7	50 mm dia GI Nipple	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
7.1.6.2.8	50 mm dia gate valve	No.	1		
7.1.6.2.9	63 / 50 mm dia GI / uPVC adaptor	No.	1		
7.1.6.2.10	125 x 100 mm dia flanged reducer	No.	1		
7.1.6.2.11	100 mm dia single flanged steel spigot (0.5m long)	No.	1		
7.1.6.2.12	100 / 110 mm dia V/J stepped couplings	No.	1		
	<b>Block Chamber at Chainage 580m Offtake to B6-1-2</b>				
7.1.6.2.13	100 / 110 mm dia V/J stepped couplings	No.	2		
7.1.6.2.14	100 mm dia single flanged steel spigot (0.5m long)	No.	2		

7.1.6.2.1 5	100 x 40 mm double flanged steel tee	No.	1		
7.1.6.2.1 6	40 mm, 0.5m long threaded steel pipe	No.	2		
7.1.6.2.1 7	40 mm dia GI union	No.	1		
7.1.6.2.1 8	40 mm dia GI Nipple	No.	1		
7.1.6.2.1 9	40 mm dia gate valve	No.	1		
7.1.6.2.2 0	50 / 40 mm dia uPVC / GI adaptor	No.	1		
	<b>Block Chamber at Chainage 1740m Offtake to B6-1-3</b>				
7.1.6.2.2 1	63 / 50 mm dia GI / uPVC adaptor	No.	2		
7.1.6.2.2 2	50 mm dia GI piece 500 mm long with threads	No.	2		
7.1.6.2.2 3	50 mm x 25mm dia socketed GI tee	No.	1		
7.1.6.2.2 4	25 mm, 0.5m long threaded steel pipe	No.	2		
7.1.6.2.2 5	25 mm dia GI union	No.	1		
7.1.6.2.2 6	25 mm dia GI nipple	No.	1		
7.1.6.2.2 7	25 mm dia gate valve	No.	1		
7.1.6.2.2 8	32 / 25 mm dia GI / uPVC adaptor	No.	1		

<b>7.1.7</b>	<b>Saddle clamps</b>				
7.1.7.1	125 x 15 mm dia saddle clamp	No.	5		
7.1.7.2	100 x 15 mm dia saddle clamp	No.	6		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.1.11.8	125 mm dia	No.	1		
7.1.11.9	110 mm dia	No.	5		
7.1.11.1 0	75 mm dia	No.	1		
7.1.11.1 1	63 mm dia		1		
	<b>22.5 degrees</b>				
7.1.11.1 2	110 mm dia	No.	4		
7.1.11.1 3	63 mm dia	No.	2		
7.1.11.1 4	50 mm dia	No.	1		

	<b>45 degrees</b>				
7.1.11.1 5	125 mm dia	No.	1		
7.1.11.1 6	110 mm dia	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				



<b>Bill No. 7.2- B6-1-1 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.2.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes . Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				

	D 125				
	E 160				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.2.4</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.2.4.1</b>	<b>PRV Chamber</b>				
7.2.4.1.1	Provide all materials and Finish constructing (i.e. Internal plastering and installations of covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes and fittings and valves in the pipeline junctions ( Section valve chambers).				

	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 80m</b>				
7.2.4.1. 2	63 / 50 mm dia VJ stepped coupling	No.	2		
7.2.4.1. 3	50 mm dia 0.5m long single flanged	No.	2		
7.2.4.1. 4	50 mm dia PRV	No.	1		
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.2.7.2	63 mm dia	No.	1		
7.2.7.3	50 mm dia	No.	2		
	<b>22.5 degrees</b>				
7.2.7.4	50 mm dia	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.3- B6-2 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.3.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classe				



	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.3.4</b>	<b>WASHOUTS</b>				
7.3.4.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install & test the following steel and uPVC pipes, fittings & valves. Rates shall include for completion & pipe protection at all pipe joints as specified in specifications & drawings				
	<b>For W/O at Chainage 2000m</b>				
7.3.4.2	110 / 100 mm dia VJ stepped coupling	No.	2		
7.3.4.3	100 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.3.4.4	100 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
7.3.4.5	50 mm flanged gate valve	No.	1		

7.3.4.6	50 mm dia 0.5m long single flanged GI piece	No.	1		
7.3.4.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
7.3.4.8	63 mm UPVC pipe Class B	m	6		
7.3.4.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
<b>7.3.5</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.3.5.1</b>	<b>PRV Chamber</b>				
7.3.5.1.1	Provide all materials and Finish constructing *i.e. Internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	3		
	Provide, handle, install & test the following steel (or GI)/uPVC pipes and fittings & valves in the pipeline junctions (Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				

	<b>PRV Chamber at Chainage 20m</b>				
7.3.5.1.2	140 / 125 mm dia VJ stepped coupling	No.	2		
7.3.5.1.3	125 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.3.5.1.4	125 mm dia PRV	No.	1		
	<b>PRV Chamber at Chainage 1040m</b>				
7.3.5.1.5	125 / 125 mm dia V/J stepped couplings	No.	2		
7.3.5.1.6	125 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.3.5.1.7	125 mm dia double flanged sluice valve	No.	1		
7.3.5.1.8	125 mm dia double flanged PRV	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>PRV Chamber at Chainage 2640m</b>				
7.3.5.1.9	63 / 50 mm dia VJ stepped coupling	No.	2		



7.3.5.1.1 0	50 mm dia 0.5m long single flanged	No.	2		
7.3.5.1.1 1	50 mm double flanged sluice valve	No.	1		
7.3.5.1.1 2	50 mm dia double flanged steel spigot (500mm long)	No.	1		
7.3.5.1.1 3	50 mm dia double flanged PRV	No.	1		
<b>7.3.5.2</b>	<b>Block Chambers</b>				
7.3.5.2.1	Provide all materials and Finish constructing (i.e. Internal Plastering and installations of covers) complete valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	2		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				

	<b>Block Chamber at Chainage 1020m Offtake to B6-2-1</b>				
7.3.5.2.2	140 / 125 mm dia VJ stepped coupling	No.	1		
7.3.5.2.3	125 mm dia single flanged GI piece (0.5 m long)	No.	3		
7.3.5.2.4	125 x 125 mm all flanged steel tee	No.	1		
7.3.5.2.5	125 mm dia double flanged steel spigot (500mm long)	No.	1		
7.3.5.2.6	125 mm dia double flanged sluice valve	No.	1		
7.3.5.2.7	125 / 125 mm dia V/J stepped couplings	No.	2		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Block Chamber at Chainage 2380m Offtake to B6-2-2</b>				
7.3.5.2.8	80 / 90 mm dia V/J stepped coupling	No.	2		
7.3.5.2.9	80mm , 0.5m long single flanged GI piece	No.	2		

7.3.5.2.1 0	80 x 32mm double flanged steel tee	No.	1		
7.3.5.2.1 1	32 mm, 0.5m long threaded steel pipe	No.	2		
7.3.5.2.1 2	32 mm dia GI union	No.	1		
7.3.5.2.1 3	32 mm dia GI Nipple	No.	1		
7.3.5.2.1 4	32 mm dia gate valve	No.	1		
7.3.5.2.1 5	32 / 40 mm dia uPVC / GI adaptor	No.	1		
<b>7.3.6</b>	<b>Saddle clamps</b>				
7.3.6.1	125 x 15 mm dia saddle clamp	No.	42		
7.3.6.2	100 x 15 mm dia saddle clamp	No.	14		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.3.10.0</b>	<b>BENDS</b>				
	<b>Vertical bends</b>				

	<b>11.25 degrees</b>				
7.3.10.1 1	140 mm dia	No.	2		
7.3.10.1 2	110 mm dia	No.	3		
7.3.10.1 3	90 mm dia	No.	2		
7.3.10.1 4	63 mm dia	No.	3		
7.3.10.1 5	50 mm dia	No.	3		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>22.5 degrees</b>				
7.3.10.1 6	140 mm dia	No.	1		
7.3.10.1 7	90 mm dia	No.	2		
7.3.10.1 8	63 mm dia	No.	2		

7.3.10.1 9	50 mm dia	No.	1		
<b>7.3.11</b>	<b>Road Crossings</b>				
7.3.11.1	Provide for Main road crossing at Chainage 0+000 m as per Drawing and in accordance with specifications. Rates to include for excavation and backfilling, culvert rings, concrete surround and all jointing materials and other fittings as per specifications and detailed drawings.	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.4 B6-2-1 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.4.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				

	C 100				
	D 125				
	E 160				
<b>7.4.3</b>	<b>Fittings</b>				
	<b>Provide, lay, joint and test Fittings</b>				
<b>7.4.3.1</b>	<b>Reducers</b>				
7.4.3.1.1	75 x 63 mm	No.	1		
7.4.3.1.2	63 x 40 mm	No.	1		
<b>7.4.4</b>	<b>AIR VALVES</b>				
7.4.4.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete air valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				

	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>Double Air Valve (DAV) at Chainage 1200m</b>				
7.4.4.2	40 / 32 mm dia uPVC adaptor	No.	2		
7.4.4.3	32 mm, 0.5m long threaded steel pipe	No.	2		
7.4.4.4	32 x 32 mm dia GI tee threaded	No.	1		
7.4.4.5	32 mm dia x 400mm long threaded GI pipe	No.	1		
7.4.4.6	32 mm gate valve	No.	1		
7.4.4.7	32 mm dia Double orifice air valve	No.	1		
<b>7.4.5</b>	<b>WASHOUTS</b>				
7.4.5.1	Provide all materials and Finish constructing (i.e. Internal plastering and installations of	No.	2		



	covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings.				
	<b>For W/O at Chainage 180m</b>				
7.4.5.2	125 / 125 mm dia V/J stepped couplings	No.	2		
7.4.5.3	125 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.4.5.4	125 x 50 mm dia Level invert scour tee with flanges	No.	1		
7.4.5.5	50 mm flanged gate valve	No.	1		
7.4.5.6	50 mm dia 0.5m long single flanged GI piece	No.	1		

7.4.5.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
7.4.5.8	63 mm UPVC pipe Class B	m	6		
7.4.5.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>For W/O at Chainage 1140m</b>				
7.4.5.10	40 / 32 mm dia uPVC adaptor	No.	2		
7.4.5.11	32 mm, 0.5m long threaded steel pipe	No.	2		
7.4.5.12	32mm x 25 mm dia level invert scour GI tee with flanged branch	No.	1		
7.4.5.13	25 mm dia flanged gate valve	No.	1		

7.4.5.14	25 mm dia 0.5m long single flanged GI piece	No.	1		
7.4.5.15	25 / 32 mm dia uPVC / GI adaptor	No.	2		
7.4.5.16	32 mm UPVC pipe Class B	m	6		
7.4.5.17	32 mm dia GI pipe 0.5 m long with flap valve	No.	1		
<b>7.4.6</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.4.6.1</b>	<b>PRV Chamber</b>				
7.4.6.1.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes and fittings and valves in the pipeline junctions (Section valve chambers).				

	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 20m</b>				
7.4.6.1.2	125 / 125 mm dia V/J stepped couplings	No.	2		
7.4.6.1.3	125 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.4.6.1.4	125 mm dia double flanged PRV	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.4.6.2</b>	<b>Block Chambers</b>				
7.4.6.2.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete valve chambers. Internal dimensions	No.	1		

	<b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>Block Chamber at Chainage 260m Offtake to B6-2-1-1</b>				
7.4.6.2.2	125 / 125 mm dia V/J stepped couplings	No.	1		
7.4.6.2.3	125 mm dia single flanged GI piece (0.5 m long)	No.	1		
7.4.6.2.4	125 x 80 mm all flanged steel tee	No.	1		
7.4.6.2.5	80 mm , 0.5m long double flanged GI piece	No.	1		

7.4.6.2.6	80 mm flanged sluice valve	No.	1		
7.4.6.2.7	80mm , 0.5m long single flanged GI piece	No.	1		
7.4.6.2.8	80 / 90 mm dia V/J stepped coupling	No.	1		
7.4.6.2.9	125 x 65 mm dia flanged reducer	No.	1		
7.4.6.2.1 0	65 mm dia single flanged GI piece (500mm long)	No.	1		
7.4.6.2.1 1	65 / 75 mm dia VJ stepped coupling	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.4.9</b>	<b>BENDS</b>				
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.4.9.8	125 mm dia	No.	5		
7.4.9.9	75 mm dia	No.	2		

7.4.9.10	63 mm dia	No.	1		
7.4.9.11	40 mm dia	No.	6		
	<b>22.5 degrees</b>				
7.4.9.12	125 mm dia	No.	1		
7.4.9.13	75 mm dia	No.	1		
7.4.9.14	63 mm dia	No.	2		
7.2.9.15	40 mm dia	No.	1		
	<b>45 degrees</b>				
7.2.9.16	125 mm dia	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.5 B6-2-1-1 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.5.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe				



	dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				
<b>7.5.2.1</b>	<b>uPVC Straights</b>				
<b>7.5.3</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.5.3.1</b>	<b>Block Chambers</b>				
7.5.3.1.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete air valve chambers. Internal dimensions <b>1200 x 1200 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				

	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Block Chamber at Chainage 20m Offtake to B6-2-1-2</b>				
7.5.3.1. 2	80 / 90 mm dia V/J stepped coupling	No.	2		
7.5.3.1. 3	80mm , 0.5m long single flanged GI piece	No.	2		
7.5.3.1. 4	80 x 80 mm all flanged steel tee	No.	1		
7.5.3.1. 5	80 mm , 0.5m long double flanged GI piece	No.	1		
7.5.3.1. 6	80 mm flanged sluice valve	No.	1		
7.5.3.1. 7	80 x 25 mm dia flanged reducer	No.	1		
7.5.3.1. 8	25 mm, 0.5m long single flanged steel pipe	No.	1		

7.5.3.1. 9	32 / 25 mm dia uPVC adaptor	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.6 B6-2-1-2 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNI T</b>	<b>QUANT ITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.6.2</b>	<b>uPVC Pipe work</b>				

	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD</b>				

	<b>FROM PREVIOUS PAGE</b>				
<b>7.6.4</b>	<b>AIR VALVES</b>				
7.6.4.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete air valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	2		
	Provide, handle, install and test the following steel and uPVC pipes and fittings and valves. Rates shall include for completing all pipe joints as specified in the specifications				
	<b>Double Air Valve (DAV) at Chainage 140m</b>				
7.6.4.2	80 / 90 mm dia V/J stepped coupling	No.	2		
7.6.4.3	80mm , 0.5m long single flanged GI piece	No.	2		
7.6.4.4	80 x 50 mm double flanged steel tee	No.	1		

7.6.4.5	50 mm x 400mm long double flanged steel piece	No.	1		
7.6.4.6	50 mm flanged gate valve	No.	1		
7.6.4.7	50 mm dia Double orifice air valve	No.	1		
	<b>Double Air Valve (DAV) at Chainage 720m</b>				
7.6.4.8	65 / 75 mm dia VJ stepped coupling	No.	2		
7.6.4.9	65 mm dia single flanged GI piece (500mm long)	No.	2		
7.6.4.10	65 x 50 mm double flanged steel tee	No.	1		
7.6.4.11	50 mm x 400mm long double flanged steel piece	No.	1		
7.6.4.12	50 mm flanged gate valve	No.	1		
7.6.4.13	50 mm dia Double orifice air valve	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				

	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.6.5</b>	<b>WASHOUTS</b>				
7.6.5.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings.				
	<b>For W/O at Chainage 620m</b>				
7.6.5.2	65 / 75 mm dia VJ stepped coupling	No.	2		
7.6.5.3	65 mm dia single flanged GI piece (500mm long)	No.	2		

7.6.5.4	65 mm x 50mm level invert scour GI tee with flanged branch	No.	1		
7.6.5.5	50 mm flanged gate valve	No.	1		
7.6.5.6	50 mm dia 0.5m long single flanged GI piece	No.	1		
7.6.5.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
7.6.5.8	63 mm UPVC pipe Class B	m	6		
7.6.5.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
<b>7.6.6</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.6.6.1</b>	<b>PRV Chamber</b>				
7.6.6.1.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes,				



	fittings and valves in the pipeline junctions (Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>PRV Chamber at Chainage 520m</b>				
7.6.6.1.2	65 / 75 mm dia VJ stepped coupling	No.	2		
7.6.6.1.3	65 mm dia single flanged GI piece (500mm long)	No.	2		
7.6.6.1.4	65 mm dia double flanged PRV	No.	1		
<b>7.6.6.2</b>	<b>Block Chambers</b>				

7.6.6.2. 1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>Block Chamber at Chainage 1060m Offtake to B6-2-1-2-1</b>				
7.6.6.2. 2	65 / 75 mm dia VJ stepped coupling	No.	2		
7.6.6.2. 3	65 mm dia single flanged GI piece (500mm long)	No.	2		

7.6.6.2. 4	65 x 32 mm double flanged steel tee	No.	1		
7.6.6.2. 5	32 mm, 0.5m long threaded steel pipe	No.	2		
7.6.6.2. 6	32 mm dia GI union	No.	1		
7.6.6.2. 7	32 mm dia GI Nipple	No.	1		
7.6.6.2. 8	32 mm dia gate valve	No.	1		
7.6.6.2. 9	40 / 32 mm dia GI / uPVC adaptor	No.	1		
<b>7.6.7</b>	<b>PVC-U Tees</b>				
7.6.7.1	90 mm x 20 mm dia	No.	8		
7.6.7.2	75 mm x 20 mm dia	No.	18		
7.6.7.3	50 mm x 20 mm dia	No.	6		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.6.9</b>	<b>BENDS</b>				
	<b>Vertical bends</b>				



	<p>Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.</p>				
	<p>Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.</p>				
	<p>Class Working Pressure (m)</p>				
	<p>B 60</p>				
	<p>C 100</p>				
	<p>D 125</p>				
	<p>E 160</p>				
	<p><b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b></p>				
	<p><b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b></p>				

<b>7.7.4</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.7.4.1</b>	<b>PRV Chamber</b>				
7.7.4.1.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 120m</b>				
7.7.4.1.2	65 / 75 mm dia VJ stepped coupling	No.	1		
7.7.4.1.3	65 mm dia single flanged GI piece (500mm long)	No.	1		
7.7.4.1.4	65 mm dia double flanged PRV	No.	1		

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	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.7.6</b>	<b>BENDS</b>				
<b>6</b>					
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.7.6 .2	75 mm dia	No.	2		
7.7.6 .3	63 mm dia	No.	3		
7.7.6 .4	32 mm dia	No.	1		
	<b>22.5 degrees</b>				
7.7.6 .5	63 mm dia	No.	2		
	<b>45 degrees</b>				
7.7.6 .6	75 mm dia	No.	1		
7.7.6 .7	63 mm dia	No.	2		

	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.8 B6-4 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.8.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/ working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				



	E 160				
<b>7.8.2.1</b>	<b>uPVC Straights</b>				
	<i>Class B</i>				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.8.4</b>	<b>AIR VALVES</b>				
7.8.4.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete air valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completing all pipe joints as specified in the specifications.				

	<b>Double Air Valve (DAV) at Chainage 740m</b>				
7.8.4.2	110 / 100 mm dia PVC U/GI stepped coupling	No.	2		
7.8.4.3	100 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.8.4.4	100 x 50 mm dia all flanged tee	No.	1		
7.8.4.5	50 mm x 400mm long double flanged steel piece	No.	1		
7.8.4.6	50 mm flanged gate valve	No.	1		
7.8.4.7	50 mm dia Double orifice air valve	No.	1		
<b>7.8.5</b>	<b>WASHOUTS</b>				
7.8.5.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		

	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and detailed drawings.				
	<b>For W/O at Chainage 560m</b>				
7.8.5.2	110 / 100 mm dia VJ stepped coupling	No.	2		
7.8.5.3	100 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.8.5.4	100 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
7.8.5.5	50 mm flanged gate valve	No.	1		
7.8.5.6	50 mm dia 0.5m long single flanged GI piece	No.	1		
7.8.5.7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
7.8.5.8	63 mm UPVC pipe Class B	m	6		
7.8.5.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		

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	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.8.6</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.8.6.1</b>	<b>PRV Chamber</b>				
7.8.6.1.1	Provide all materials and Finish constructing (i.e. Internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	2		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions (Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the				

	specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 300m</b>				
7.8.6.1.2	110 / 100 mm dia V/J stepped coupling	No.	2		
7.8.6.1.3	100 mm dia single flanged steel spigot (0.5m long)	No.	2		
7.8.6.1.4	100 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 1060m</b>				
7.8.6.1.5	63 / 50 mm dia V/J stepped coupling	No.	2		
7.8.6.1.6	50 mm dia single flanged GI piece (500mm long)	No.	2		
7.8.6.1.7	50 mm flanged sluice valve	No.	1		
7.8.6.1.8	50 mm dia double flanged steel spigot (500mm long)	No.	1		
7.8.6.1.9	50 mm dia double flanged PRV	No.	1		
<b>7.8.6.2</b>	<b>Block Chambers</b>				
7.8.6.2.1	Provide all materials and Finish constructing (i.e. Internal plastering and installations of covers) complete valve chambers. Internal	No.	5		

	dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>Block Chamber at Chainage 20m Offtake to B6-4-1</b>				
7.8.6.2.2	140 / 125 mm dia VJ stepped coupling	No.	2		

7.8.6.2.3	125 mm dia single flanged GI piece (0.5 m long)	No.	2		
7.8.6.2.4	125 x 65 mm all flanged steel tee	No.	1		
7.8.6.2.5	65 mm dia double flanged GI pipe (500mm long)	No.	2		
7.8.6.2.6	65 mm dia double flanged sluice valve	No.	1		
7.8.6.2.7	65 mm dia single flanged GI piece (500mm long)	No.	1		
7.8.6.2.8	65 / 75 mm dia VJ stepped coupling	No.	1		
	<b>Block Chamber at Chainage 340m Offtake to B6-4-2</b>				
7.8.6.2.9	110 x 20 mm dia saddle clamp	No.	1		
7.8.6.2.10	20 / 25 mm dia uPVC / GI adaptor	No.	3		
7.8.6.2.11	25 mm dia, 1m long, uPVC pipe	No.	1		
7.8.6.2.12	20 mm, 0.5m long threaded steel pipe	No.	2		
7.8.6.2.13	20 mm dia GI union	No.	1		
7.8.6.2.14	20 mm dia GI nipple	No.	1		
7.8.6.2.15	20 mm dia gate valve	No.	1		

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Block Chamber at Chainage 580m Offtake to B6-4-3</b>				
7.8.6.2.1 6	100 / 110 mm dia V/J stepped couplings	No.	1		
7.8.6.2.1 7	100 mm dia single flanged steel spigot (0.5m long)	No.	1		
7.8.6.2.1 8	100 x 50 mm double flanged steel tee	No.	1		
7.8.6.2.1 9	50 mm dia GI piece 500 mm long with threads	No.	2		
7.8.6.2.2 0	50 mm dia GI union	No.	1		
7.8.6.2.2 1	50 mm dia GI Nipple	No.	1		
7.8.6.2.2 2	50 mm dia gate valve	No.	1		
7.8.6.2.2 3	63 / 50 mm dia GI / uPVC adaptor	No.	1		



7.8.6.2.2 4	100 x 65 mm dia double flanged reducer	No.	1		
7.8.6.2.2 5	65 mm dia single flanged GI piece (500mm long)	No.	1		
7.8.6.2.2 6	65 / 75 mm dia VJ stepped coupling	No.	1		
	<b>Block Chamber at Chainage 1080m Offtake to B6-4-4</b>				
7.8.6.2.2 7	50 x 20 mm dia saddle clamp	No.	1		
7.8.6.2.2 8	20 / 25 mm dia uPVC / GI adaptor	No.	3		
7.8.6.2.2 9	25 mm dia, 1m long, uPVC pipe	No.	1		
7.8.6.2.3 0	20 mm, 0.5m long threaded steel pipe	No.	2		
7.8.6.2.3 1	20 mm dia GI union	No.	1		
7.8.6.2.3 2	20 mm dia GI nipple	No.	1		
7.8.6.2.3 3	20 mm dia gate valve	No.	1		
	<b>Block Chamber at Chainage 1240m Offtake to B6-4-5</b>				
7.8.6.2.3 4	50 x 20 mm dia saddle clamp	No.	1		
7.8.6.2.3 5	20 / 25 mm dia uPVC / GI adaptor	No.	3		

7.8.6.2.3 6	25 mm dia, 1m long, uPVC pipe	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
7.8.6.2.3 7	20 mm, 0.5m long threaded steel pipe	No.	2		
7.8.6.2.3 8	20 mm dia GI union	No.	1		
7.8.6.2.3 9	20 mm dia GI nipple	No.	1		
7.8.6.2.4 0	20 mm dia gate valve	No.	1		
<b>7.8.7</b>	<b>Saddle clamps</b>				
7.8.7.1	125 x 15 mm dia saddle clamp	No.	1		
7.8.7.2	100 x 15 mm dia saddle clamp	No.	6		
<b>7.8.8</b>	<b>Adaptors</b>				
7.8.8.1	15 / 20 mm dia GI / uPVC adaptor	No.	7		
<b>7.8.11</b>	<b>BENDS</b>				

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.8.11.1 1	110 mm dia	No.	8		
7.8.11.1 2	75 mm dia	No.	3		
7.8.11.1 3	63 mm dia	No.	2		
7.8.11.1 4	50 mm dia	No.	3		
	<b>22.5 degrees</b>				
7.8.11.1 5	140 mm dia	No.	2		
7.8.11.1 6	110 mm dia	No.	4		
7.8.11.1 7	63 mm dia	No.	1		
7.8.11.1 8	40 mm dia	No.	1		
7.8.11.1 9	25 mm dia	No.	1		

	<b>45 degrees</b>				
7.8.11.2 0	50 mm dia	No.	1		
7.8.11.2 1	40 mm dia	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.9 B6-4-1 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.9.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				

	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				
<b>7.9. 2.1</b>	<b>uPVC Straights</b>				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.9. 4</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.9. 4.1</b>	<b>PRV Chamber</b>				

7.9.4 .1.1	Provide all materials and Finish constructing (i.e. internals plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions (Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 200m</b>				
7.9.4 .1.2	63 / 50 mm dia VJ stepped coupling	No.	2		
7.9.4 .1.3	50 mm dia 0.5m long single flanged	No.	2		
7.9.4 .1.4	50 mm dia PRV	No.	1		
<b>7.9.7</b>	<b>BENDS</b>				
	<b>Vertical bends</b>				

	<b>11.25 degrees</b>				
7.9.7 .4	63 mm dia	No.	1		
7.9.7 .5	40 mm dia	No.	3		
7.9.7 .6	20 mm dia	No.	1		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.10 B6-4-3 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNI T</b>	<b>QUAN TITY</b>	<b>RATE (KSHs )</b>	<b>AMOUNT (KSHs)</b>

<b>7.10.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				
<b>7.10.2.1</b>	<b>uPVC Straights</b>				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				



	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.10.4</b>	<b>AIR VALVES</b>				
7.10.4.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete air valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completing all pipe joints as specified in the specifications				
	<b>Double Air Valve (DAV) at Chainage 580m</b>				
7.10.4.2	50 / 50 mm dia VJ stepped coupling	No.	2		
7.10.4.3	50 mm dia 0.5m long single flanged	No.	2		
7.10.4.4	50 mm x 50 mm dia all flanged tee	No.	1		

7.10.4. 5	50 mm x 400mm long double flanged steel piece	No.	1		
7.10.4. 6	50 mm flanged gate valve	No.	1		
7.10.4. 7	50 mm dia Double orifice air valve	No.	1		
<b>7.10.5</b>	<b>WASHOUTS</b>				
7.10.5. 1	Provide all materials and Finish constructing (i.e. Internal plastering and installations of covers) complete washout chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		
	Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings.				
	<b>For W/O at Chainage 300m</b>				
7.10.5. 2	63 / 50 mm dia VJ stepped coupling	No.	2		
7.10.5. 3	50 mm dia 0.5m long single flanged	No.	2		

7.10.5. 4	100 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
7.10.5. 5	50 mm flanged gate valve	No.	1		
7.10.5. 6	50 mm dia 0.5m long single flanged GI piece	No.	1		
7.10.5. 7	50 / 63 mm dia uPVC / GI adaptor	No.	2		
7.10.5. 8	63 mm UPVC pipe Class B	m	6		
7.10.5. 9	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.10.6</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.10.6. 1</b>	<b>PRV Chamber</b>				
7.10.6. 1.1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete valve	No.	1		

	chambers. Internal dimensions <b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 200m</b>				
7.10.6.1.1	63 / 50 mm dia V/J stepped coupling	No.	2		
7.10.6.1.2	50 mm dia single flanged GI piece (500mm long)	No.	2		
7.10.6.1.3	50 mm dia double flanged PRV	No.	1		
<b>7.10.6.2</b>	<b>Block Chambers</b>				
7.10.6.2.1	Provide all materials and Finish constructing (i.e. Internals plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x</b>	No.	1		

	<b>750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>Block Chamber at Chainage 140m Offtake to B6-4-3-1</b>				
7.10.6.2.2	50 x 20 mm dia saddle clamp	No.	1		
7.10.6.2.3	20 / 25 mm dia uPVC / GI adaptor	No.	3		
7.10.6.2.4	25 mm dia, 1m long, uPVC pipe	No.	1		
7.10.6.2.5	20 mm, 0.5m long threaded steel pipe	No.	2		
7.10.6.2.6	20 mm dia GI union	No.	1		
7.10.6.2.7	20 mm dia GI nipple	No.	1		
7.10.6.2.8	20 mm dia gate valve	No.	1		

	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
7.10.9	<b>BENDS</b>				
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.10.9.4	63 mm dia	No.	8		
7.10.9.5	50 mm dia	No.	2		
7.10.9.6	40 mm dia	No.	1		
	<b>22.5 degrees</b>				
7.10.9.7	63 mm dia	No.	1		
	<b>45 degrees</b>				
7.10.9.8	63 mm dia	No.	1		
7.10.9.9	40 mm dia	No.	1		

	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.11 B6-5 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNI T</b>	<b>QUAN TITY</b>	<b>RATE (KSHs )</b>	<b>AMOUNT (KSHs)</b>

<b>7.11.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/ working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				
<b>7.11.2.1</b>	<b>uPVC Straights</b>				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				



	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.11.4</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.11.4.1</b>	<b>PRV Chamber</b>				
7.11.4.1. 1	Provide all materials and Finish constructing (i.e. internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	2		
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions (Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				

	<b>PRV Chamber at Chainage 100m</b>				
7.11.4.1.1	63 / 50 mm dia V/J stepped coupling	No.	2		
7.11.4.1.2	50 mm dia single flanged GI piece (500mm long)	No.	2		
7.11.4.1.3	50 mm dia double flanged PRV	No.	1		
	<b>PRV Chamber at Chainage 720m</b>				
7.11.4.1.4	50 / 50 mm dia V/J stepped coupling	No.	2		
7.11.4.1.5	50 mm dia single flanged GI piece (500mm long)	No.	2		
7.11.4.1.6	50 mm dia double flanged PRV	No.	1		
<b>7.11.4.2</b>	<b>Block Chambers</b>				
7.11.4.2.1	Provide all materials and Finish constructing (i.e. Internal plastering and installations of covers) complete valve chambers. Internal dimensions <b>1000 x 750 x 1200 mm</b> . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	1		

	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Block Chamber at Chainage 260m Offtake to B6-5-1</b>				
7.11.4.2. 2	50 x 15 mm dia saddle clamp	No.	1		
7.11.4.2. 3	15 / 20 mm dia uPVC / GI adaptor	No.	3		
7.11.4.2. 4	20 mm dia, 1m long, uPVC pipe	No.	1		
7.11.4.2. 5	15 mm, 0.5m long threaded steel pipe	No.	2		

7.11.4.2. 6	15 mm dia GI union	No.	1		
7.11.4.2. 7	15 mm dia GI nipple	No.	1		
7.11.4.2. 8	15 mm dia gate valve	No.	1		
<b>7.11.7</b>	<b>BENDS</b>				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.11.7.7	63 mm dia	No.	1		
7.11.7.8	50 mm dia	No.	1		
	<b>22.5 degrees</b>				
7.11.7.9	63 mm dia	No.	3		
<b>7.11.8</b>	<b>Road Crossings</b>				
7.11.8.1	Provide for Main road crossing at Chainage 0+000m as per Drawing and in accordance with specifications. Rates to include for	No.	1		

	excavation and backfilling, culvert rings, concrete surround and all jointing materials and other fittings as per specifications				
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No. 7.12 B6-6 DISTRIBUTION PIPELINE</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUAN TITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>7.12.2</b>	<b>uPVC Pipe work</b>				
	Provide, lay, joint and test the following flexible spigot and socket pipe and fittings with rubber ring joints. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/ working				

	pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
	C 100				
	D 125				
	E 160				
<b>7.12.2.1</b>	<b>uPVC Straights</b>				
	<i>Class B</i>				
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.12.4</b>	<b>SECTION VALVE CHAMBERS</b>				
<b>7.12.4.1</b>	<b>PRV Chamber</b>				
7.12.4.1.1	Provide all materials and Finish constructing (i.e. Internal plastering and installations of covers) complete valve chambers. Internal dimensions	No.	1		

	<b>1000 x 750 x 1200 mm.</b> Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.				
	Provide, handle, install and test the following steel (or GI)/uPVC pipes, fittings and valves in the pipeline junctions ( Section valve chambers).				
	Rates shall include for completing all pipe joints as specified in the specifications and detailed drawings.				
	<b>PRV Chamber at Chainage 220m</b>				
7.12.4.1. 2	63 / 50 mm dia V/J stepped coupling	No.	2		
7.12.4.1. 3	50 mm dia single flanged GI piece (500mm long)	No.	2		
7.12.4.1. 4	50 mm dia double flanged PRV	No.	1		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				

	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>7.12.7</b>	<b>BENDS</b>				
	<b>Vertical bends</b>				
	<b>11.25 degrees</b>				
7.12.7.4	50 mm dia	No.	1		
7.12.7.5	25 mm dia	No.	1		
	<b>22.5 degrees</b>				
7.12.7.6	63 mm dia	No.	2		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No.8 - IN-FIELD IRRIGATION SYSTEM</b>		
<b>BILL ITEM</b>	<b>DESCRIPTION</b>	<b>AMOUNT (KSHs)</b>
	<b>COLLECTION</b>	





	Rates for excavation and backfilling in trench shall include for trimming trench bottom and for providing selected bedding and surround materials from the excavations with the specifications defined in the drawings.				
8.18.1.2	Provide provisional sum of KShs 1,000,000 for excavation for laying in field pipes in section and areas where excavation were not yet done	P.C Sum	1		
<b>8.18</b>	<b>Category 1 Plots (21 Nos.)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
8.18.1.3	25 mm dia GI straight threaded on both sides 1000 mm long	No.	42		
8.18.1.4	25 mm dia GI nipple	No.	105		
8.18.1.5	25 mm dia gate valve	No.	21		

8.18.1. 6	25mm dia flow limiter	No	21		
8.18.1. 7	25x 20 mm dia GI tee	No.	21		
8.18.1. 8	20 mm dia plug	No.	21		
8.18.1. 9	25mm dia GI union	No.	21		
<b>8.18.2</b>	<b>Field Hydrants (3 x 21)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
8.18.2. 2	25x19mm dia GI tee	No.	63		
8.18.2. 3	19mm dia GI riser (1m long)	No.	63		
8.18.3. 2	25/20mm dia HDPE/GI Adapter	No.	21		
8.18.3. 3	20mm dia GI equal tee	No.	21		
8.18.3. 4	1m high, 12/16mm dia GI riser with support	No.	21		
8.18.3. 5	Sprinklers as specified complete with valve sockets	No.	21		

8.18.3. 6	20/25mm dia HDPE line coupler	No.	42		
8.18.3. 7	12mm dia GI plug	No.	21		
8.18.3. 8	25/20mm dia HDPE Tee	No.	42		
<b>8.18.4</b>	<b>In-field Supply Pipeline (Buried)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
8.18.4. 2	Dia 20/25 mm dia uPVC end cap	No.	21		
8.18.4. 3	20 mm dia plot inlet connecting uPVC pipe	m	1638		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>9.19</b>	<b>Category 2 Plots (110 Nos.)</b>				

<b>8.19.1</b>	<b>Plot Hydrants (1 x110)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
8.19.1.3	25 mm dia GI straight threaded on both sides 1000 mm long	No.	220		
8.19.1.4	25 mm dia GI nipple	No.	550		
8.19.1.5	25 mm dia gate valve	No.	110		
8.19.1.6	25mm dia flow limiter	No	110		
8.19.1.7	25x 20 mm dia GI tee	No.	110		
8.19.1.8	20 mm dia plug	No.	110		
8.19.1.9	25mm dia GI union	No.	110		
<b>8.19.2</b>	<b>Field Hydrants (2 x 110)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage				

	and anchor/thrust blocks.				
8.19.2.2	25x19mm dia GI tee	No.	220		
8.19.2.3	19mm dia GI riser (1m long)	No.	220		
8.19.3.2	25/20mm dia HDPE/GI Adapter	No.	330		
8.19.3.3	20mm dia GI equal tee	No.	110		
8.19.3.4	1m high, 12/16mm dia GI riser with support	No.	110		
8.19.3.5	Sprinklers as specified complete with valve sockets	No.	110		
8.19.3.6	20/25mm dia HDPE line coupler	No.	330		
8.19.3.7	12mm dia GI plug	No.	110		
8.19.3.8	25/20mm dia HDPE Tee	No.	110		
<b>8.19.4</b>	<b>In-field Supply Pipeline (Buried)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				

8.19.4. 3	Dia 20/25 mm dia uPVC end cap	No.	110		
	<b>SUB-TOTAL CARRIED FORWARD TO NEXT PAGE</b>				
	<b>SUB-TOTAL CARRIED FORWARD FROM PREVIOUS PAGE</b>				
<b>8.20</b>	<b>Category 3 Plots (288 Nos.)</b>				
<b>8.20.1</b>	<b>Plot Hydrants (1 x288)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
8.20.1. 3	25 mm dia GI straight threaded on both sides 1000 mm long	No.	576		
8.20.1. 4	25 mm dia GI nipple	No.	1440		
8.20.1. 5	25 mm dia gate valve	No.	288		
8.20.1. 6	25mm dia flow limiter	No	288		

8.20.1.7	25x 20 mm dia GI tee	No.	288		
8.20.1.8	20 mm dia plug	No.	288		
8.20.1.9	25mm dia GI union	No.	288		
<b>8.20.2</b>	<b>Field Hydrants (2 x 288)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
8.20.2.2	25x19mm dia GI tee	No.	576		
8.20.2.3	19mm dia GI riser (1m long)	No.	576		
<b>8.20.3</b>	<b>Sprinkler System Arrangement (1 x 288)</b>				
8.20.3.2	25/20mm dia HDPE/GI Adapter	No.	288		
8.20.3.3	20mm dia GI equal tee	No.	288		
8.20.3.4	1m high, 12/16mm dia GI/HDPE riser with support/tripod	No.	288		
8.20.3.5	Sprinklers as specified complete with valve sockets	No.	288		



8.20.3.6	20/25mm dia HDPE line coupler	No.	864		
8.20.3.7	12 mm dia GI end plug	No.	288		
8.20.3.8	20/25mm dia HDPE Tee	No.	288		
<b>8.20.4</b>	<b>In-field Supply Pipeline (Buried)</b>				
	Transport from store the following fittings, lay, joint and test. Rates to include for all jointing materials, cutting, wastage and anchor/thrust blocks.				
8.20.4.3	Dia 20/25 mm dia uPVC end cap	No.	288		
	<b>TOTAL CARRIED OVER TO COLLECTION SHEET</b>				

<b>Bill No 9 - Day works</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
9.1	<b>THE WHOLE OF THIS BILL IS PROVISIONAL</b>				
	<b>LABOUR</b>				

	The rates should include for all costs, such as insurance, traveling time, overtime, accommodation, use of small tools of trade, supervision, overheads and profit. Only time engaged upon work will be paid for:				
9.2	Unskilled labour	Hr	1		
9.3	Semi-skilled labour	Hr	1		
9.4	Skilled Labour	Hr	1		
	<b>PLANT</b>				
	The rates should be included for all operational and maintenance costs, fuel, oil, operators, turn boys, Supervision, overhead and profits. Only the time employed on work will be paid for and the rates should include the idle, traveling and overtime.				
9.5	Compressor CP with 2 jacks	Hr	1		
9.6	Concrete vibrator (petrol or diesel)	Hr	1		
9.7	Concrete mixer , 1m <sup>3</sup>	Hr	1		
9.8	Tipper 7 tones	Hr	1		
9.9	Portable water pump 5hp 50mm inclusive of	Hr	1		

	hoses, couplings, valves and strainer)				
	<b>MATERIALS</b>				
9.10	Ordinary Portland cement	ton	1		
9.11	Mild steel/High yield steel	ton	1		
9.12	Fine aggregate for concrete	m <sup>3</sup>	1		
9.13	Coarse Aggregate for concrete max. size 19mm	m <sup>3</sup>	1		
9.14	Use of Shuttering timber	m <sup>2</sup>	1		

**SCHEDULE OF BASIC PRICES- KIRUMI KIAMUNJARI IRRIGATION SCHEME PROJECT**

ITEM	DESCRIPTION	UNIT	RATE
	<b>Schedule of Basic Prices</b>		
	The tenderer should insert in the following schedule of the basic prices in Kenya shillings and per unit for supply to the scheme for which clause 70 of the conditions of contract shall be deemed applicable. The tenderer may extend to include such additional materials, forming part of the permanent works, as he/she consider will be the subject of price fluctuation. The material shall be fully described and the price shall be for supply at the scheme.		
	No variation in price will be applicable in respect of fuel, oils or any other consumable items other than those directly from changes in Kenya Government duties and taxes incurred subsequent to the submission of the Tender. Tenderers supporting documents must be submitted for all prices. Fluctuation in prices of materials, other than those listed will be at the Contractors risk.		
	<b>Materials</b>		

<b>Material Schedule No.1-Pipes</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
	<b>PIPE LINE FITTINGS ACCESSORIES</b>				
	<b>uPVC Pipe work</b>				
	Note: The following have been used on the drawings to specify pipe diameters/types/classes. Pipe dimensions/ working pressures shall conform to KS-06-149 Part 2:2000.				
	Class Working Pressure (m)				
	B 60				
9.15	355 mm dia	m	1		
9.16	315 mm dia	m	1		
9.17	280 mm dia	m	1		
9.18	250 mm dia	m	1		
9.19	225 mm dia	m	1		
9.2	200 mm dia	m	1		
9.21	160 mm dia	m	1		
9.22	140 mm dia	m	1		
9.23	110 mm dia	m	1		

9.24	90 mm dia	m	1		
9.25	75 mm dia	m	1		
9.26	63 mm dia	m	1		
9.27	50 mm dia	m	1		
9.28	40 mm dia	m	1		
9.29	25 mm dia	m	1		
9.3	20 mm dia	m	1		
	<b>Bends</b>				
	<b>11.25 degrees</b>				
9.31	355mm dia	No.	1		
9.32	315 mm dia	No.	1		
9.33	280mm dia	No.	1		
9.34	250mm dia	No.	1		
9.35	225mm dia	No.	1		
9.36	200mm dia	No.	1		
9.37	160mm dia	No.	1		
9.38	140mm dia	No.	1		
9.39	125mm dia	No.	1		
9.4	110mm dia	No.	1		
9.41	90mm dia	No.	1		
9.42	75mm dia	No.	1		
9.43	63mm dia	No.	1		

9.44	50mm dia	No.	1		
	<b>22.5 degrees</b>				
9.45	355mm dia	No.	1		
9.46	315 mm dia	No.	1		
9.47	280mm dia	No.	1		
9..48	250mm dia	No.	1		
9.49	225mm dia	No.	1		
9.5	200mm dia	No.	1		
9.51	160mm dia	No.	1		
9.52	140mm dia	No.	1		
9.53	125mm dia	No.	1		
9.54	110mm dia	No.	1		
9.55	90mm dia	No.	1		
9.56	75mm dia	No.	1		
9.57	63mm dia	No.	1		
9.58	50mm dia	No.	1		
	<b>45 degrees</b>				
9.59	355mm dia	No.	1		
9.6	315 mm dia	No.	1		
9.61	280mm dia	No.	1		
9.62	250mm dia	No.	1		
9.63	225mm dia	No.	1		

9.64	200mm dia	No.	1		
9.65	160mm dia	No.	1		
9.66	140mm dia	No.	1		
9.67	125mm dia	No.	1		
9.68	110mm dia	No.	1		
9.69	90mm dia	No.	1		
9.7	75mm dia	No.	1		
9.71	63mm dia	No.	1		
9.72	50mm dia	No.	1		
	<b>90 degrees</b>				
9.73	355mm dia	No.	1		
9.74	315 mm dia	No.	1		
9.75	280mm dia	No.	1		
9.76	250mm dia	No.	1		
9.77	225mm dia	No.	1		
9.78	200mm dia	No.	1		
9.79	160mm dia	No.	1		
9.8	140mm dia	No.	1		
9.81	125mm dia	No.	1		
9.82	110mm dia	No.	1		
9.83	90mm dia	No.	1		
9.84	75mm dia	No.	1		

9.85	63mm dia	No.	1		
9.86	50mm dia	No.	1		
	<b>G.I Reducers</b>				
9.87	450 x 300 mm dia double flanged reducer	No.	1		
9.88	300 x 250 mm dia flanged reducer	No.	1		
9.89	250 x 200 mm dia double flanged reducer	No.	1		
9.9	200 x 150 flanged reducer	No.	1		
9.91	200 x 125 mm dia double flanged reducer	No.	1		
9.92	150 x 100 flanged reducer	No.	1		
9.93	150 x125 mm dia flanged reducer	No.	1		
9.94	125 x 100 mm dia flanged reducer	No.	1		
9.95	125 x 65 mm dia flanged reducer	No.	1		
9.96	100 x 80 flanged reducer	No.	1		
9.97	100 x 65 mm dia double flanged reducer	No.	1		
9.98	100 x 50 mm dia flanged reducer	No.	1		
9.99	80 x 65mm dia flanged reducer	No.	1		
10.1	80 x 50 flanged reducer	No.	1		



10.2	80 x 40 mm dia flanged reducer	No.	1		
10.3	80 x 25 mm dia flanged reducer	No.	1		
	<b>uPVC Reducers</b>				
10.4	355 x 280 uPVC reducer	No.	1		
	<b>Saddle Clamps (Mild steel)</b>				
10.5	500x80mm dia	No.	1		
10.6	500x32mm dia	No.	1		
10.7	250x40mm dia	No.	1		
10.8	200x32mm dia	No.	1		
10.9	125x15mm dia	No.	1		
10.1	110x50mm dia	No.	1		
10.1 1	110x20mm dia	No.	1		
10.1 2	100x15m dia	No.	1		
10.1 3	50x20mm dia	No.	1		
10.1 4	50x15mm dia	No.	1		
	<b>Sprinklers</b>				
10.1 5	Sprinklers as specified complete with valve sockets	No.	1		

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<b>Material Schedule No.2-Airvalves</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>10</b>	<b>AIR VALVES</b>				
10.1	463/450 mm dia GRP/Steel stepped coupling	No.	1		
10.2	450 mm dia x 0.5 m single flanged GI pipe	No.	1		
10.3	450 mm dia x 500 mm double flanged GI tee	No.	1		
10.4	355/350 mm dia PVC U/GI stepped coupling	No.	1		
10.4 a	315 / 300 mm dia VJ stepped coupling	No.	1		
10.5	350 mm dia x 0.5 m single flanged GI pipe	No.	1		
10.6	350 mm x 50 mm double flanged GI tee	No.	1		
10.6 a	300 mm dia single flanged GI pipe (500mm)	No.	1		
10.6 b	280/250 mm dia PVC-U/GI stepped coupling	No.	1		
10.7	250 / 250 mm dia V/J stepped coupling	No.	1		
10.8	250 mm dia single flanged GI pipe (500mm)	No.	1		

10.8 a	200 / 200 mm dia VJ stepped coupling	No.	1		
10.8 b	200 mm dia single flanged GI pipe (500mm)	No.	1		
10.9	250 x 80 mm dia all flanged tee	No.	1		
10.1	160 / 150 mm dia V/J stepped coupling	No.	1		
10.1 1	150 mm dia single flanged GI piece (0.5 m long)	No.	1		
10.1 2	150 x 50 mm dia all flanged tee	No.	1		
10.1 3	140 / 125 mm dia PVC U/GI stepped coupling	No.	1		
10.1 4	140 / 125 mm dia VJ stepped coupling	No.	1		
10.1 5	125 mm dia single flanged GI pipe (500mm)	No.	1		
10.1 6	125 x 50 mm all flanged tee	No.	1		
10.1 7	125 mm dia x 500 mm long Double flanged steel spigot	No.	1		
10.1 8	125 x 50 mm double flanged steel tee	No.	1		
10.1 9	110 / 100 mm dia PVC U/GI stepped coupling	No.	1		
10.1 9a	110 / 100 mm dia VJ stepped coupling	No.	1		

10.2	100 mm dia single flanged GI piece (0.5 m long)	No.	1		
10.2 1	100 x 50 mm dia all flanged tee	No.	1		
10.2 2	80 / 90 mm dia V/J stepped coupling	No.	1		
10.2 3	80mm , 0.5m long single flanged GI piece	No.	1		
10.2 4	80 x 50 mm double flanged steel tee	No.	1		
10.2 6	65 / 75 mm dia VJ stepped coupling	No.	1		
10.2 7	65 mm dia single flanged GI piece (500mm long)	No.	1		
10.2 8	65 x 50 mm double flanged steel tee	No.	1		
10.2 8a	63 / 50 mm dia VJ stepped coupling	No.	1		
10.2 9	50 / 50 mm dia VJ stepped coupling	No.	1		
10.3	50 mm dia 0.5m long single flanged	No.	1		
10.3 1	50 mm x 50 mm dia all flanged tee	No.	1		
10.3 2	50 mm flanged gate valve	No.	1		
10.3 3	50 mm x 400 mm long double flanged spigot	No.	1		
10.3 4	50 mm dia Double orifice air valve	No.	1		

10.3 5	50 mm dia x 0.4 m long double flanged GI pipe	No.	1		
10.3 6	40 / 32 mm dia uPVC adaptor	No.	1		
10.3 7	32 mm, 0.5m long threaded steel pipe	No.	1		
10.3 8	32 x 32 mm dia GI tee threaded	No.	1		
10.3 9	32 mm dia x 400mm long threaded GI pipe	No.	1		
10.4	32 mm gate valve	No.	1		
10.4 1	32 mm dia Double orifice air valve	No.	1		

**Material Schedule No.3-PRV'S**

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>11</b>	<b>PRV'S</b>				
11.1	450 mm dia double flanged sluice valve	No.	1		
11.2	450 mm dia double flanged pressure regulator valve	No.	1		
11.3	350 mm dia double flanged sluice valve	No.	1		

11.4	350 mm dia double flanged pressure regulator valve	No.	1		
11.4 b	300 mm dia double flanged sluice valve	No	1		
11.5	300 mm dia PRV	No.	1		
11.6	250 mm dia double flanged sluice valve	No.	1		
11.7	250 mm dia PRV	No.	1		
11.8	200 mm dia PRV	No.	1		
11.9	150 mm dia PRV	No.	1		
11.1	150 mm dia double flanged sluice valve	No.	1		
11.1 2	125 mm dia PRV	No.	1		
11.1 3	100 mm dia PRV	No.	1		
11.1 4	250 mm dia double flanged PRV	No.	1		
11.1 5	200 mm dia double flanged PRV	No.	1		
11.1 6	150 mm dia double flanged PRV	No.	1		
11.1 7	125 mm dia double flanged PRV	No.	1		
11.1 8	100 mm dia double flanged PRV	No.	1		
11.1 9	65 mm dia double flanged sluice valve	No.	1		

11.2	65 mm dia double flanged PRV	No.	1		
11.2 1	50 mm dia PRV	No.	1		
11.2 2	125 mm dia double flanged sluice valve	No.	1		
11.2 3	50 mm double flanged sluice valve	No.	1		
11.2 4	50 mm dia double flanged PRV	No.	1		

<b>Material Schedule No.4- Washouts</b>					
<b>ITEM</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>RATE (KSHs)</b>	<b>AMOUNT (KSHs)</b>
<b>12</b>	<b>Washouts</b>				
12.1	450 mm x 80mm dia level invert scour GI tee with flanged branch	No.	1		
12.2	350 mm x 80 mm dia level invert scour GI tee with flanged branch	No.	1		
12.3	200 x 80 mm dia Level invert scour tee with flanged branch	No.	1		
12.4	150 x 50 mm dia Level invert scour tee with flanged branch	No.	1		

12.5	125 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
12.6	100 x 50 mm dia Level invert scour tee with flanged branch	No.	1		
12.7	80 mm dia flanged gate valve	No.	1		
12.8	80 mm dia x 0.5m single flanged GI pipe	No.	1		
12.9	80/90mm dia PVC-U/ GI adaptor	No.	1		
12.1	80mm dia GI threaded pipe 500 mm long with a flap valve	No.	1		
12.1 1	50 / 63 mm dia uPVC / GI adaptor	No.	1		
12.1 2	50mm dia GI pipe 0.5 m long with flap valve	No.	1		
12.1 3	32mm x 25 mm dia level invert scour GI tee with flanged branch	No.	1		
12.4	25 mm dia flanged gate valve	No.	1		
12.1 5	25 mm dia 0.5m long single flanged GI piece	No.	1		
12.1 6	25 / 32 mm dia uPVC / GI adaptor	No.	1		
12.1 7	32 mm dia GI pipe 0.5 m long with flap valve	No.	1		



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<b>Summary of Payment Currencies</b>
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**Table: Alternative A**

**For** .....insert name of Section of the Works

Separate tables may be required if the various sections of the Works (or of the Bill of Quantities) will have substantially different foreign and local currency requirements. The Employer should insert the names of each Section of the Works.

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>Name of Payment Currency</b>	<b>Amount of Currency</b>	<b>Rate of Exchange to Local Currency</b>	<b>Local Currency Equivalent</b> <b>C = A x B</b>	<b>Percentage of Net Bid Price (NBP)</b> <b><u>170xC</u></b>

				<b>NBP</b>
<b>Local currency</b> _____		<b>1.00</b>		
<b>Foreign Currency #1</b> _____				
<b>Foreign Currency #2</b> _____				
<b>Foreign Currency #3</b> _____				
<b>Net Bid Price</b>				<b>170.00</b>
<b>Provisional Sums Expressed in Local Currency</b>		<b>1.00</b>		
<b>BID PRICE</b>				

### Table: Alternative B

**To be used only with Alternative B Prices directly quoted in the currencies of payment.** (Clause **ITB** 15.1)

Summary of currencies of the bid for \_\_\_\_\_ [insert name of Section of the Works]

Name of currency	Amounts payable
Local currency: _____	
Foreign currency #1: _____	
Foreign currency #2: _____	
Foreign currency #3: _____	

## Form of Bid Security (Bank Guarantee)

\_\_\_\_\_ [Bank's Name, and Address of Issuing Branch or Office]

**Beneficiary:** \_\_\_\_\_ [Name and Address of Employer]

**Date:** \_\_\_\_\_

**BID GUARANTEE No.:** \_\_\_\_\_

We have been informed that \_\_\_\_\_ [name of the Bidder] (hereinafter called "the Bidder") has submitted to you its bid dated \_\_\_\_\_ (hereinafter called "the Bid") for the execution of \_\_\_\_\_ [name of contract] under Invitation for Bids No. \_\_\_\_\_ ("the IFB")

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Employer, we \_\_\_\_\_ [name of Bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of \_\_\_\_\_ [amount in figures] (\_\_\_\_\_) [amount in words] upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or
- (b) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Form, if required, or (ii) fails or refuses to furnish the performance security, in accordance with **ITB 38**.

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy your notification to the Bidder of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of the Bidder's bid.

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

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

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[signature(s)]

## Form of Bid Security (Bid Bond)

BOND NO. \_\_\_\_\_

BY THIS BOND [name of Bidder] as Principal (hereinafter called “the Principal”), and [name, legal title, and address of surety], **authorized to transact business in** [name of country of Employer], as Surety (hereinafter called “the Surety”), are held and firmly bound unto [name of Employer] as Obligee (hereinafter called “the Employer”) in the sum of [amount of Bond]<sup>15</sup> [amount in words], for the payment of which sum, well and truly to be made, we, the said Principal and Surety, bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has submitted a written Bid to the Employer dated the \_\_\_ day of \_\_\_\_\_, 20\_\_\_, for the construction of [name of Contract] (hereinafter called the “Bid”).

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal:

- (a) withdraws its Bid during the period of bid validity specified in the Form of Bid; or
- (b) having been notified of the acceptance of its Bid by the Employer during the period of Bid validity; (i) fails or refuses to execute the Contract Form, if required; or (ii) fails or refuses to furnish the Performance Security in accordance with the Instructions to Bidders;

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

The Surety hereby agrees that its obligation will remain in full force and effect up to and including the date 28 days after the date of expiration of the Bid validity as stated in the Invitation to Bid or extended by the Employer at any time prior to this date, notice of which extension(s) to the Surety being hereby waived.

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<sup>15</sup> The amount of the Bond shall be denominated in the currency of the Employer’s country or the equivalent amount in a freely convertible currency.

IN TESTIMONY WHEREOF, the Principal and the Surety have caused these presents to be executed in their respective names this \_\_\_\_ day of \_\_\_\_\_ 20\_\_.

Principal: \_\_\_\_\_

Surety: \_\_\_\_\_

Corporate Seal (where appropriate)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Signature)

(Printed name and title)

(Printed name and title)

## Form of Bid-Securing Declaration

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

Bid No.: [insert number of bidding process]

Alternative No.: [insert identification No if this is a Bid for an alternative]

To: [insert complete name of Employer]

We, the undersigned, declare that:

We understand that, according to your conditions, bids must be supported by a Bid-Securing Declaration.

We accept that we will automatically be suspended from being eligible for bidding in any contract with the Borrower for the period of time of **[Employer to 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 Bid during the period of bid validity specified in the Letter of Bid; or
- (b) having been notified of the acceptance of our Bid by the Employer 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 **ITB 38**.

We understand this Bid-Securing Declaration shall expire if we are not the successful Bidder, upon the earlier of (i) our receipt of your notification to us of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of our Bid.

Signed: [insert signature of person whose name and capacity are shown] In the capacity of [insert legal capacity of person signing the Bid-Securing Declaration]

Name: [insert complete name of person signing the Bid-Securing Declaration]

Duly authorized to sign the bid for and on behalf of: [insert complete name of Bidder]

Dated on \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ [insert date of signing]



Corporate Seal (where appropriate)

[Note: In case of a Joint Venture, the Bid-Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid.]

## **Technical Proposal**

### Technical Proposal Forms

**Site Organization**

**Method Statement**

**Mobilization Schedule**

**Construction Schedule**

**Contractor's Equipment**

**Personnel**

**Others**

<p><b>Site Organization</b></p>
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<p><b>Method Statement</b></p>
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<p><b>Mobilization Schedule</b></p>
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**Construction Schedule**

## Contractor's Equipment

### Form EQU

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III, Evaluation and Qualification Criteria. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder. The Bidder shall provide all the information requested below, to the extent possible. Fields with asterisk (\*) shall be used for evaluation.

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

The following information shall be provided only for equipment not owned by the Bidder.

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

**Proposed Personnel**

Form PER – 1

Bidders should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions listed in Section III, Evaluation and Qualification Criteria. The data on their experience should be supplied using the Form below for each candidate.

<b>1.</b>	<b>Title of position</b>
	<b>Name</b>
<b>2.</b>	<b>Title of position</b>
	<b>Name</b>
<b>3.</b>	<b>Title of position</b>
	<b>Name</b>
<b>4.</b>	<b>Title of position</b>
	<b>Name</b>
<b>5.</b>	<b>Title of position</b>
	<b>Name</b>
<b>15.</b>	<b>Title of position</b>
	<b>Name</b>
<b>etc.</b>	<b>Title of position</b>
	<b>Name</b>





<p><b>Others</b></p>
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## **Bidder's Qualification**

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

<b>Bidder Information Sheet</b>
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Form ELI - 1.1

Date: \_\_\_\_\_  
 Bidding No.: \_\_\_\_\_  
 Invitation for Bid No.: \_\_\_\_\_  
 Page \_\_\_\_\_ of \_\_\_\_\_ pages

1. Bidder's Legal Name
2. In case of Joint Venture, Consortium or Association (JVCA), legal name of each party:
3. Bidder's actual or intended Country of Registration:
4. Bidder's Year of Registration:
5. Bidder's Legal Address in Country of Registration:
15. Bidder's Authorized Representative Information Name: Address: Telephone/Fax numbers: Email Address:
7. Attached are copies of original documents of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Articles of Incorporation or Registration of firm named in 1, above, in accordance with <b>ITB</b> Clauses 4.1 and 4.2.</li> <li><input type="checkbox"/> In case of JVCA, letter of intent to form JVCA including a draft agreement, or JVCA agreement, in accordance with <b>ITB</b> Clause 4.1</li> <li><input type="checkbox"/> In case of government owned entity from the Employer's country, documents establishing legal and financial autonomy and compliance with the principles of commercial law, in accordance with <b>ITB</b> Clause 4.5.</li> </ul>

<h2 style="margin: 0;">Party to JVCA Information Sheet</h2>
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Form ELI - 1.2

Date: \_\_\_\_\_  
 Bidding No.: \_\_\_\_\_  
 Invitation for Bid No.: \_\_\_\_\_  
 Page \_\_\_\_\_ of \_\_\_\_\_ pages

1. Bidder's Legal Name:
2. JVCA's Party legal name:
3. JVCA's Party Country of Registration:
4. JVCA's Party Year of Registration:
5. JVCA's Party Legal Address in Country of Registration:
15. JVCA's Party Authorized Representative Information Name: Address: Telephone/Fax numbers: Email Address:
7. Attached are copies of original documents of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Articles of Incorporation or Registration of firm named in 1, above, in accordance with <b>ITB</b> Clauses 4.1 and 4.2.</li> <li><input type="checkbox"/> In case of government owned entity from the Purchaser's country, documents establishing legal and financial autonomy and compliance with the principles of commercial law, in accordance with <b>ITB</b> Clause 4.5.</li> </ul>

## Historical Contract Non-Performance

Form CON – 2

Bidder’s Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_

JVCA Partner Legal Name: \_\_\_\_\_

Bidding No.: \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ pages

Non-Performing Contracts in accordance with (Evaluation and Qualification Criteria)

Contract non-performance did not occur during the stipulated period, in accordance with Sub-Factor 2.2.1 of Section III, Evaluation and Qualification Criteria.

Contract non-performance during the stipulated period, in accordance with Sub-Factor 2.2.1 of Section III, Evaluation and Qualification Criteria.

Year	Outcome as Percent of Total Assets	Contract Identification	Total Contract Amount (current value, US\$ equivalent)
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____

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

No pending litigation in accordance with Sub-Factor 2.2.3 of Section III, Evaluation and Qualification Criteria.

Pending litigation in accordance with Sub-Factor 2.2.3 of Section III, Evaluation and Qualification Criteria, as indicated below

Year	Outcome as Percent of Total Assets	Contract Identification	Total Contract Amount (current value, US\$ equivalent)
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____

_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____
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## Current Contract Commitments / Works in Progress

### Form CCC

Bidders and each partner to a JVCA 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.

Name of contract	Employer, contact address/tel/fax	Value of outstanding work (current US\$ equivalent)	Estimated completion date	Average monthly invoicing over last six months (US\$/month)
1.				
2.				
3.				
4.				
5.				
etc.				

## Financial Situation

Form FIN – 3.1

### Historical Financial Performance

Bidder’s Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_

JVCA Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_

\_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ pages

To be completed by the Bidder and, if JVCA, by each partner

Financial information in US\$ equivalent	Historic information for previous _____ ( ) years (US\$ equivalent in 000s)						
	Year 1	Year 2	Year 3	Year ...	Year n	Avg.	Avg. Ratio
<b>Information from Balance Sheet</b>							
Total Assets (TA)							
Total Liabilities (TL)							
Net Worth (NW)							
Current Assets (CA)							
Current Liabilities (CL)							
<b>Information from Income Statement</b>							
Total Revenue (TR)							
Profits Before Taxes (PBT)							




- Attached are copies of financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following conditions:
  - Must reflect the financial situation of the Bidder or partner to a JVCA, and not sister or parent companies
  - Historic financial statements must be audited by a certified accountant
  - Historic financial statements must be complete, including all notes to the financial statements
  - Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted)

## Average Annual Turnover

Form FIN – 3.2

Bidder’s Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 JVCA Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ pages

Annual turnover data (construction only)		
Year	Amount and Currency	US\$ equivalent
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
*Average Annual Construction Turnover	_____	_____

\*Average annual turnover calculated as total certified payments received for work in progress or completed over the number of years specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.2, divided by that same number of years.

**Financial Resources**

## Form FIN – 3.3

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 indicated in Section III, Evaluation and Qualification Criteria.

Source of financing	Amount (US\$ equivalent)
1.	
2.	
3.	
4.	

## General Experience

Form EXP – 2.4.1

Bidder’s Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_

JVCA Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_

\_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ pages

Starting Month / Year	Ending Month / Year	Years *	Contract Identification	Role of Bidder
_____	_____	_____	Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____	_____	Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____	_____	Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____	_____	Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____	_____	Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____
_____	_____	_____	Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	_____

\*List calendar year for years with contracts with at least nine (9) months activity per year starting with the earliest year



## Specific Experience

Form EXP – 2.4.2(a)

Bidder’s Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_

JVCA Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_

\_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ pages

<b>Similar Contract Number: _____</b> <b>[insert specific number] of</b> <b>_____ [insert total number of</b> <b>contracts required.</b>	<b>Information</b>		
Contract Identification	_____		
Award date	_____		
Completion date	_____		
Role in Contract	<input type="checkbox"/> Contractor	<input type="checkbox"/> Management Contractor	<input type="checkbox"/> Subcontractor
Total contract amount	_____		US\$ _____
	_____		_____
If partner in a JVCA or subcontractor, specify participation of total contract amount	_____ %	_____	US\$ _____
Employer’s Name:	_____		
Address:	_____		
	_____		
Telephone/fax number:	_____		
E-mail:	_____		

**Specific Experience (cont.)**

Form EXP – 2.4.2(a) (cont.)

Bidder’s Legal Name: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages  
 JVCA Partner Legal Name: \_\_\_\_\_

<b>Similar Contract No. __[insert specific number] of __[insert total number of contracts] required</b>	<b>Information</b>
Description of the similarity in accordance with Sub-Factor 2.4.2(a) of Section III, Evaluation and Qualification Criteria:	
Amount	_____ _____
Physical size	_____ _____
Complexity	_____ _____
Methods/Technology	_____ _____
Physical Production Rate	_____ _____

## Specific Experience in Key Activities

Form EXP – 2.4.2(b)

Bidder’s Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_

JVCA Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_

Subcontractor’s Legal Name: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages

	Information		
Contract Identification	_____		
Award date	_____		
Completion date	_____		
Role in Contract	<input type="checkbox"/> Contractor	<input type="checkbox"/> Management Contractor	<input type="checkbox"/> Subcontract or
Total contract amount	_____		US\$_____
If partner in a JVCA or subcontractor, specify participation of total contract amount	_____ %	_____	US\$_____
Employer’s Name:	_____		
Address:	_____		
Telephone/fax number:	_____		
E-mail:	_____		



### Specific Experience in Key Activities (cont.)

Form EXP – 2.4.2(b) (cont.)

Bidder's Legal Name: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages

JVCA Partner Legal Name: \_\_\_\_\_

Subcontractor's Legal Name: \_\_\_\_\_

	Information
Description of the key activities in accordance with Sub-Factor 2.4.2(b) of Section III, Evaluation and Qualification Criteria:	
Amount	
Physical size	
Complexity	
Methods/Technology	
Physical Production Rate	



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## **Section V. Eligible Countries**

### **Eligibility for the Provision of Goods, Works and Related Services in Bank-financed Procurement**

#### **A. Provision at Paragraph 1.15 of the Bank's Rules and Procedures for Procurement of Goods and Works**

1.15 The African Development Fund permits firms and individuals from all countries to offer goods, works and services for ADF funded projects.

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# **PART 2 – Employer’s Requirements**

**Section VI. Requirements**

**Table of Contents**

**Drawings..... 409**  
**Supplementary Information ..... 410**

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**TECHNICAL SPECIFICATION****Specifications**

Wherever reference is made in the Contract to specific standards and codes to be met by the goods and materials to be furnished, and work performed or tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect shall apply, unless otherwise expressly stated in the Contract. Where such standards and codes are national, or relate to a particular country or region, other authoritative standards that ensure a substantially equal or higher quality than the standards and codes specified will be accepted subject to the Project Manager's prior review and written consent. Differences between the standards specified and the proposed alternative standards shall be fully described in writing by the Contractor and submitted to the Project Manager at least 28 days prior to the date when the Contractor desires the Project Manager's consent. In the event the Project Manager determines that such proposed deviations do not ensure substantially equal or higher quality, the Contractor shall comply with the standards specified in the documents.

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**TECHNICAL SPECIFICATION****GENERAL**

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**FOR Construction of KIRUMI KIAMUNJARI IRRIGATION SCHEME in THARAKA NITHI County)****Description of the works**

The contract works include construction and Completion of:

1. intake works
2. sedimentation basin
3. conveyance pipeline
4. Main pipeline
5. Sub-main pipelines
6. Distribution pipelines
7. In field system

**Provision of equipment's material and labour**

The contractor shall provide all equipment's, transport consumable materials and labour necessary for the satisfactory completion of the works in compliance with the specifications herein. The Project Manager reserves the right to inspect plant and materials prior to contractor selection, and may reject plant or material that in his/her opinion is substandard or inappropriate. The contractor shall provide full descriptions of all plants to be deployed for these works. The contractor shall present method statements describing in detail the proposed approach to work.

The contractor shall provide summary detail of the experience of key personnel to be deployed for these works.

**Occupation of site**

The employer will provide land on which the works shall be constructed. The contractor shall be given possession of such parts of the site that he requires for activities related to construction works including storage of raw materials, equipment and setting up of camp during the period of contract provided his operation does not interfere with the daily activities of the employer.

The Contractor shall not enter upon or occupy with men, tools, equipment and materials any land other than the land or right of way provided by the employer

**Diligent performance**

The contractor shall at all times perform the Works diligently and in accordance with sound professional practice. He/she shall not proceed from one stage of works to another without the express permission of the Project Manager

Decisions regarding Temporary halt, discontinuing of any element or part of any element of these works, or abandonment of these works, shall be discussed jointly between the contractor and the Project Manager before any further actions are authorized by the Engineer. The Project Manager's decision shall be final.

The Engineer will require a written submission justifying any steps taken by the successful bidder taken without the Project Manager's approval. An unsatisfactory explanation shall lead to non-payment for works undertaken without prior agreement, and may be included for consideration as liquidated Damages.

**Drawings**

The project drawings shall comprise

- (a) The drawings attached to tender documents
- (b) Such other drawings and/or sketches as are issued from time to time by the Project Manager to deal with design modifications in response to on-site conditions.

**Record drawing**

As the work proceeds the Contractor shall markup 'As Built' details on a set of prints of the contract Drawings modified to portray the works as actually constructed and issue to the Project Manager for approval within 7 days of completion of the works covered by each drawing.

**Level datum**

The Project Manager will establish on site temporary benchmark and will assign a value to it. The Contractor shall establish and maintain such additional benchmarks as are necessary; the form of such benchmarks shall be approved by the Project Manager.

**Contractor's staff, communication, offices etc****General**

The contractor shall advise the Project Manager at which of his offices any notices may be served in accordance with the conditions of contract.



**Language of correspondence and records**

All communication from contractor to the Project Manager and the Project Manager shall be in English language.

All site books, time sheets, records, notes drawings, documents, specifications etc. shall be in English language

**Contractor's duty staff & offices**

At least one responsible senior representative of the contractor shall be immediately available at all times and he shall be on site during normal working hours.

To such representative shall be delegated full authority to confer with Project Manager 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 Project Manager 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.

The contractor shall provide and maintain at the site, offices for the use of representative and to which written instructions by the Project Manager can be delivered. Any instructions delivered to such offices shall be deemed to have been delivered to the contractor.

**Public Relations**

The contractor shall designate within his site organization competent staff whose responsibility shall be to ensure good relations.

The location of all yards, stores, workshops, offices, etc. shall be agreed beforehand with the Project Manager and shall be such as to avoid obstruction and nuisance to public and/or the client.

The contractor shall provide and maintain at or near the site suitable and sufficient shelters, mess rooms, washrooms, latrines etc. as are necessary and customary, to the satisfaction of the Project Manager Project Manager and in accordance with the law and regulations of the relevant authorities.

**Accommodation for workmen**

Where the contractor wishes to construct camp to accommodate his labour, the following requirements shall be adhered to and shall also be subject to the requirement made by the District or Provincial Administration or any local Authority.

**Demolition of contractor's temporary structures**

The Project Manager may at any time before the end of the period of maintenance give the contractor notice in writing to demolish and remove those buildings and works which are no longer required, whereupon the title to such buildings and works and materials connected therewith shall revert to the contractor. After the demolition and removal of building and works as required by the Project Manager and contractor shall level, clear, restore and make good the sites and surrounding ground and fill in and compact all latrines, drains, pits and similar works leaving the satisfaction of the Project Manager.

**First aid outfits**

The contractors shall provide and maintain in an easily accessible place at the site of the works adequate first aid outfits for the whole duration of the contract, to the satisfaction of the Project Manager. The contractor shall have available at all times a suitable vehicle for conveyance of the sick or injured people to hospital.

**Protective clothing**

The contractor shall provide all protective or any other special clothing or equipment for his employees that may be necessary.

**Inspection by Project Manager during period of defects liability**

The Project Manager will give the contractor due notice of his intention to carry out any inspection during the period of Defects Liability and the contractor shall hereupon arrange for a responsible representative to be present at the times and dates named by the Project Manager. This representative shall render all necessary assistance and take note all matters and things to which his attention is directed by the Project Manager.

**Advertisement**

No advertisements shall be placed on any boarding or scaffolding erected for any purpose connected with the contract without the written permission of the Project Manager.

**Site investigations**

- (a) Ground levels shown on the drawings are believed to be correct. Should the contractor consider the levels shown to be inaccurate he must draw the attention of the Project Manager to the discrepancy before interfering with the existing ground.
- (b) The Contractor must make such site investigations as he thinks fit and satisfy him/her as to the nature of the ground and availability of materials.

**Work Programme**

The contractor shall submit a work programme showing the sequence and timing of the various stages in the execution of the works as per the conditions of contract.

**Facilities for the Project Manager**

The Contractor shall provide for the Project Manager or his representative:

- (a) Such instruments as are necessary to enable the Project Manager to check the setting out and make such inspections as he may deem necessary.
- (b) Such labour and assistance as may be required.
- (c) Any facilities necessary to enable the Engineer to take samples
- (d) Provide a temporary site office during the contract period.

**Testing facilities**

(a) The Contractor shall provide laboratory facilities on site suitable for carrying out tests as shown:-

- (ii) Concrete
  - Slump
  - Crushing strength
- (iii) Aggregates
  - Particle Size
  - Impurities

- (b) Should the contractor so wish he may make arrangements for the necessary tests to be carried out by a Laboratory to be approved by the Project Manager.

**Water supply**

The contractor will arrange to provide water for use in the camps and on the works. The Contractor must provide any treatment necessary to ensure it is suitable for use as in accordance to health regulations.

**Electrical supply**

The Contractor must provide his own source of electricity if he so requires.

**Security**

The Contractor will be responsible for the security of the Works and of site installations during the Contract period. He must provide such fencing, watching & lighting as he deems necessary.

**Description of the materials and workmanship**

The following apply to all sections hereafter.

(a) Materials

Materials, commodities, components and equipment are to be new and unused unless otherwise specified. Handle, store, fix and protect all commodities with care to ensure that they are in perfect condition when incorporated into the work and handed over on completion.

(b) Manufacturer's recommendation

Handle, store and fix every commodity strictly in accordance with the printed or written recommendations of the manufacturer and/or supplier. Supply the Project Manager with copies of the manufacturer's recommendations. Inform the Project Manager if the manufacturer's recommendations conflict with any other specified requirements, and obtain his instructions before proceeding.

(c) Standards

Where commodities or workmanship are specified by reference to Kenya Bureau of Standards (K.S.), or British Standards (B.S.) or Codes of Practice (C.P.) or International (I.S.O.), or other standards, such standards are deemed to be the latest published at the time of tendering. The Contractor will be deemed to have read and understood the

standards specified, and no claim for want of knowledge will be allowed. The substitution of commodities or standards of workmanship complying with other standards may be allowed at the discretion of the Project Manager, but application for permission for such substitution must be made in writing in sufficient time to allow adequate investigation. Obtain Certificates of Compliance with standards and supply to the Project Manager on request.

(d) Local conditions

All materials, commodities, components and equipment must be suitable for use in tropical climates.

**Samples**

The Contractor shall submit to the Project Manager samples of materials to be used in the works, the samples must be fairly representative of the bulk to be supplied. Samples should be subject to relevant tests before submission and Test Certificates should accompany the samples.

**Clearing site on completion**

The site, including borrow pits and spoil dumps shall be carefully tidied up on completion, and shaped to avoid ponding, holes, and dangerous slopes. The borrow pits and spoil dumps must be covered with topsoil neatly trimmed and the whole site left in a tidy and satisfactory condition.

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**EARTHWORKS**

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**Clearing in general**

Clear the area of the permanent works, and borrow pits of all vegetation and destroy by burning or otherwise.

**Stripping top soil**

N/A

**Excavation and classification**

Excavation shall be carried out to the lines and levels shown on the drawings or to such other lines and levels as the Engineer may direct.

Excavation in excess of the lines and levels shown on the drawings or without the approval of the Engineer will be rectified by the Contractor at his expense in a manner approved by the Engineer.

Any patches of unsuitable ground in the bottom of the excavations shall be excavated to such additional depth as the Engineer may direct.

Excavated material shall be taken to embankment fill or to spoil tip as the Engineer may direct.

Excavation must be kept dry and the sides supported as necessary. Excavation classification shall be as in the Ministry of Works Standard Specification (MOWSS) Section 5.

Class 1 "Rock" or "Hard Material" shall include all materials which in the opinion of the Project Manager requires blasting or the use of metal wedges or the use of compressed air drilling for its removal or cannot be extracted by ripping with a tractor of less than 180 hp. and rear mounted heavy ripper. Individual boulders greater than 0.2 m<sup>3</sup> in volume shall be included in this class when their nature and size are such that they cannot be removed without recourse to one of these methods.

When a portion of excavation contains 75% or more by volume of boulders of this order such portion shall be considered as class 1 material throughout.

Class 2 "Normal" or "Soft Material" shall include all material, which, in the opinion of the Engineer, does not require blasting and metal wedges and sledge hammers, or compressed air drilling or rooting or ripping.

It shall include wearing course gravel stones and boulders less than 0.2 m<sup>3</sup> in volume that can be removed without recourse to these methods.

Class 3 "Compacted Gravel" or "Decomposed Rock" shall include all material such as consolidated murrum and decomposed stratified rock, stones or boulders less than 0.2 m<sup>3</sup> in volume which are harder than "soft" or "normal" material in that they may be extracted by ripping as defined in Class 1, or in confined spaces by hand excavation using compressor tools, provided all other reasonable steps to the satisfaction of the Project Manager have been taken to facilitate the removal by other methods.

"Waterlogged Material" material (Class 2 and Class 3) that is excavated in a waterlogged condition and necessitates de-watering and pumping operations, provided all reasonable precautions have been taken by the contractor to dewater the material to the satisfaction of the Project Manager.

**Blasting**

The prior approval of the Project Manager must be obtained and the methods approved if the Contractor wishes to remove rock by Blasting. The handling and use of explosives must comply with the explosives act or the department of mines and geology regulations. All necessary precautions to prevent injury or Damage to person or property must be taken. Generally blasting on the Weir site is to be avoided.

**Borrow areas**

N/A

**Spoil tips**

Surplus or unsuitable materials are to be disposed of in spoil tips to be approved by the Project Manager. Spoil tips must be neatly graded, properly drained, and have stable slopes and a tidy appearance.

**Earth fill**

The embankment is to be built of selected soil as specified and shown on the drawings. The earthfill shall be of cohesive material of low permeability, with negligible organic matter.

Specially selected material free from stones shall be used in the cut off and central zone; the upstream zone shall also be free of stones, the downstream zone may have small quantities of stone not exceeding 25 mm.

**Compaction of earth fill**

Earth fill shall be placed and mechanically compacted in layers, approximately horizontal, to give a finished thickness of not more than 150 mm after compaction to 95% of Proctor Maximum Dry Density. Each layer shall be scarified to ensure a satisfactory bond with the next overlying layer, and water shall be added if necessary to ensure uniform moisture content. Subsequent layers will be placed only after the previous layer has been ratified by the Project Manager.

Heavy rollers of a type and weight to be approved by the Project Manager shall be used for compaction. In the cut off trench and other confined spaces compaction in area which the rollers cannot serve shall be by means of approved pneumatic tampers.

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**CONCRETE WORKS**

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**General**

## (a) Code of practice

All workmanship, materials, tests and performances in connection with the reinforced concrete work are to be in conformity with the latest edition of British Standard Code of Practice (B.S. 8117 for “Structural Use of Concrete”) where not inconsistent with these specifications.

## (b) Contractor’s plant

Not less than 30 days prior to the installation of the Contractor’s plant and equipment for processing, handling, transporting, storing and proportioning ingredients, and for mixing, transporting and placing concrete, the Contractor shall submit drawings for approval by the Project Manager, showing proposed general plant arrangements, together with a general description of the equipment he proposes to use.

After completion of installation, the operation of the plant and equipment shall be subject to the approval of the Project Manager.

**Materials****Cement**

Cement, unless otherwise specified, shall be Portland cement of the Blue Triangle brand, or Bamburi Portland Cement brand, Mombasa cement brand or any other brand which comply with the requirements of B.S.12 and is approved by the Project Manager. The cement shall not contain reactive volcanic ash (of not more than 17% of total weight) and the quantity of insoluble residue permitted in B.S. 12 may be exceeded. A manufacturer’s Certificate of Test in accordance with B.S. shall be supplied for each consignment delivered to site.

Should the Contractor require using cement of the rapid hardening variety, he shall obtain the approval of the Project Manager and also obtain any instructions regarding the modifications to the preambles caused thereby. Any additional cost that may be caused by the use of the rapid hardening cement shall be at the Contractor’s expense.

Cement may be delivered to site either in bags or in bulk. If delivered in bags, each bag shall be properly sealed and marked with the manufacturer’s name and on the site is to be stored in a weather-proof shed of adequate dimensions with a raised floor. Each consignment shall



be kept separate and marked so that it may be used in the sequence in which it was received. Any bag found to contain cement which has set or partly set shall be completely discarded and not used in the Works. Bags shall not be stored more than 1500 mm in height.

If delivered in bulk the cement shall be stored in a weather-proof silo either provided by the cement supplier or by the Contractor, but in either case the silo shall be to the approval of the Engineer.

### **Aggregates**

The aggregates shall conform to the requirements of B.S. 882 and the sources and all types of all aggregates are to be approved in all respects by the Project Manager before work commences.

The grading of aggregates shall be one within the limits set out in B.S. 882 and as later specified and the grading, once approved, shall be adhered to throughout the Works and not varied without the approval of the Project Manager. Fine aggregate shall be clean, coarse, siliceous sand of good, sharp, hard quality and shall be free from lumps of stone, earth, loam, dust, salt, organic matter and any other deleterious substances. It shall be graded within the limits set out in zone 1 or 2 of B.S. 882.

Coarse aggregate shall be good, hard, clean approved black trap or similar stone, free from dust, decomposed stone, clay, earthy matter, foreign substances or friable thin elongated or laminated pieces. It shall be graded within the limits of Table 1 of B.S. 882 for its respective nominal size.

If in the opinion of the Project Manager the aggregate meets the above requirements, but is dirty or adulterated in any manner it shall be screened and/or washed with clean water if he so directs at the Contractor's expense.

Aggregates shall be delivered to the site in their prescribed sizes or grading and shall be stockpiled on paved areas or boarded platforms in separate units to avoid intermixing.

### **Fine aggregate**

Fine aggregate shall be sand free from impurities and complying with British Standard No. 882. Grading zone 2 of Table 2.

**Coarse aggregate**

Coarse aggregate shall be hard crushed rock free from impurities and complying with British Standard No. 882 "graded aggregate" 20 mm to 5 mm nominal size as Table 1.

**Water**

Water for concrete shall be free from impurities, complying with BS 3148

**Hardcore**

Hardcore for filling under floors shall be good, hard stone ballast or quarry waste, to the approval of the the Project Manager, broken to pass through not greater than a 150 mm ring or to be 75% of the finished thickness of the layers being compacted, whichever is the lesser. Hardcore shall be free from all weeds, roots, vegetable soil, clay, black cotton soil or other unstable materials.

It shall be graded with smaller stones and fine materials to give a dense compact mass after consolidation. Sufficient fine material shall be added to each layer to give gradation of material as necessary to obtain a solid compact mass after rolling. Hardcore filling is to be laid in layers each of a consolidated thickness not exceeding 250 mm. Each layer shall be compacted by at least 8 passes of a 17-tonne smooth-wheeled roller or a 2-tonne vibrating roller until all movement ceases. Sufficient water is to be added to obtain maximum compaction to the Project Manager's approval. To each layer a 25 mm thick layer of sand complying with the specification of fine aggregate for concrete shall be spread over the surface and forced into the hardcore by the use of a vibrating roller weighing not less than 2 tones. This operation should be carried out when the materials are dry and repeated whilst the sand is well watered. Should all the sand be absorbed the Project Manager may require a further layer to be applied and the process repeated.

The top surface of the hardcore shall be leveled or graded to fall as required, and shall then be blinded with a layer of similar material broken to 25 mm gauge and finished with a 17-tonne smooth-wheeled roller. The surface so obtained shall be to the Engineer's approval.

**Compacted hard-core**

The sub-grade shall be compacted by a smooth-wheeled roller of 8 to 17 tones weight or the vibrating roller of minimum 1300 Kg., or other approved plant. The number of coverage shall be at least 17 and there shall be a 50% overlap of successive coverage. If so instructed by the Engineer, water shall be added during compaction to obtain optimum

water content. Filling shall be compacted as above but in maximum 200 mm deep layers.

### **Sand**

The sand shall be as described for fine aggregate but that for plastering shall be light in colour and well graded to a suitable fineness in accordance with the nature of work in order to obtain the finish directed.

### **Finishes**

#### **General**

The Contractor will be required from an early stage in the contract to prepare samples, for the approval of the Project Manager, of the various concrete finishes specified hereafter. Samples are to be prepared using the same materials and the same methods of construction, compaction, curing, etc. as the Contractor proposes to use for executing the full quantity of the work. A record of the mix, water content, method of compaction, any additives used, etc., is to be kept for each sample prepared. When the Project Manager has approved a sample it will be kept on site in an approved location. The finishes in construction will be expected to be up to a standard equal to the approved sample. Consistency in cement colour, and the colour, grading and quality of aggregates must be maintained in all finished concrete work.

#### **Mortars**

Cement mortar shall consist of one part of Portland cement to three parts sand by volume. The cement/lime mortar shall consist of one part of Portland cement, one part of lime and six parts of sand by volume.

The ingredients of mortar shall be measured in proper gauge boxes on a boarded platform, the ingredients being thoroughly mixed dry, and again whilst adding water. In the case of cement/lime mortar, sand and lime shall be mixed first and then the cement added.

All mortar is to be thoroughly mixed to a uniform consistency with only sufficient water to obtain a plastic condition suitable for troweling. No mortar that has commenced to set is to be used or re-mixed for use.

#### **Tamped finish**

Areas so specified shall be finished at the time of casting with a tamped finish to the Engineer's approval produced by an edge board. Board marks are to be made to a true pattern and will generally be at right angles to the traffic flow. Haphazard or diagonal tamping will not be accepted.

**Fair face**

Fair face surfaces shall be clean, smooth, even, true to form, line and level, and free from all board marks, joint marks, honeycombing, pitting, and other blemishes. Forms are to be provided with a smooth lining of plywood, steel, or other approved material which will achieve the required finish without any general rubbing down. Rubbing down will only be permitted to remove any projecting fins at corners or joints.

**Fine face**

Fine face surfaces shall be for Fair face above, but to a higher standard obtained from forms provided with an impervious sheet lining of metal or plastics faced plywood in large panels arranged in an approved pattern. Rubbing down shall only be permitted after an inspection by the Project Manager. The finished surfaces shall be capable of receiving a painted finish.

**Chisel-dressed finish**

Chisel-dressed finish is to be carried out on any grade of concrete but not until it is at least 30 days old. The surfaces are to be fully chisel-dressed to remove a maximum of 12 mm (average 9 mm) of the surface by shearing and exposing the aggregate without excessive cracking of the surrounding matrix. Arises of columns, beams, etc., are pre-formed fair face with timber fillets set in the formwork and care must be taken in working up to these to preserve a clean line.

For vertical surfaces of walls and columns particular care must be taken to remove all sharp projections. For beam soffits this requirement is not necessary. All surfaces requiring this treatment are to have margins chisel-dressed by hand for a minimum width of 75 mm commencing from the fillet edge. Thereafter, mechanical chisel-dressing may be used, but the Contractor must ensure that a uniform texture and even plane surface is achieved. The use of sharply pointed steel tools for both hand and mechanical chisel-dressing is essential. Upon completion the surfaces are to be thoroughly wire brushed and washed down.

**Protection of finishes**

Wherever possible, in-situ exposed concrete finishes should be commenced at the highest level and worked progressively down the building. Precaution shall be taken to avoid staining or discoloration of previously finished concrete faces by leakage of grout from newly placed

concrete. The Contractor shall, during all stages of construction, adequately protect all concrete finishes from Damage by leaking grout, knocking, paint stains, falling plaster, etc. In cases of balustrade walls to staircases and members where Damage is otherwise likely, concrete finishes shall be protected by cladding with timber, Celotex, or other approved sheeting. All Sub-contractors shall be informed accordingly on the precautions to be taken.

**Blinding**

All blinding concrete to be 1:3:15, or as otherwise instructed by the Project Manager in writing.

**Formwork**

The method and system of formwork which the Contractor proposes to use shall be approved of by the Project Manager before construction commences. Formwork shall be substantially and rigidly constructed of timber or steel or pre-cast concrete or other approved material.

All timber for formwork shall be good, sound, clean, sawn, well-seasoned timber, free from warps and loose knots and of scantings sufficiently strong for their purpose.

**Construction of formwork**

All formwork shall be of sufficient thickness and with joints close enough to prevent undue leakage of liquid from the concrete and fixed to proper alignment, level and plumb and supported on sufficiently strong bearers, shores, braces, plates etc. properly held together by bolts or other fastenings to prevent displacement, vibration or movement by the weight of materials, men and plant on same and so wedged and clamped as to permit easing and removal of the formwork without jarring the concrete. Where formwork is supported on previously constructed portions of the reinforced concrete structural frame, the Contractor shall by consultation with the Project Manager ensure that the supporting concrete is capable of carrying the load and/or sufficiently propped from lower floors or portions of the frame to permit the load to be temporarily carried during construction.

Soffits shall be erected with an upward camber of 5 mm for each 5 meters of horizontal span or as directed by the Project Manager.

Great care shall be taken to make and maintain all joints in the formwork as tight as possible, to prevent the leakage of grout during vibration. All faulty joints shall be caulked to the Project Manager's approval before

concreting. The formwork shall be sufficiently rigid to ensure that no distortion or bulging occurs under the effects of vibration. If at any time the formwork is insufficiently rigid or in any way defective the Contractor shall strengthen or improve such formwork as the Project Manager may direct.

The Contractor's attention is drawn to the various surface textures and applied finishes required and the faces of formwork next to the concrete must be of such material and construction and be sufficiently true to provide a concrete surface which will in each particular case permit the specified surface treatment or applied finish.

All surfaces which will be in contact with concrete shall be oiled or greased to prevent adhesion of mortar. Oil or grease shall be of a non-staining mineral type applied as a thin film before the reinforcement is placed. Surplus moisture shall be removed from the forms prior to placing of the concrete.

Temporary openings shall be provided at the base of columns, wall and beam forms and at any other points where necessary to facilitate cleaning and inspection immediately before the pouring of concrete. Before the concrete is placed the shuttering shall be trued-up and any water accumulated therein shall be removed. All sawdust, nails, chips and other debris shall be washed out or otherwise removed from within the formwork. The reinforcement shall then be inspected for accuracy of fixing. Immediately before placing the concrete the formwork shall be well wetted and inspection openings shall be closed. The erection, easing, striking and removing of all formwork must be done under the personal supervision of a competent foreman, and any Damage occurring through faulty formwork or its incorrect removal shall be made good by the Contractor at his own expense.

After removal of formwork, all projections, fins etc., on the concrete surface shall be chipped off, and made good to the requirements of the Project Manager. Any voids or honeycombing shall be treated as described in "Faulty Concrete".

### **Stripping formwork**

All formwork shall be removed without undue vibration or shock and without Damage to the concrete. No formwork shall be removed without the prior consent of the Engineer and the minimum periods that shall elapse between the placing of the concrete and the striking of the formwork will be as follows:

Beam sides, wall and columns	2 days
Slab Soffits (props left under)	3 days
Beam Soffits	7 days
Removal of props (partly subject to 7 days Concrete cube strength being satisfactory) to:	
Slabs	17 days
Beams	14 days
Cantilevered Beams and Slabs	28 days

If the Contractor wishes to take advantage of the shorter stripping times permitted for beams and slab soffits when props are left in place, he must so design his formwork that sufficient props are agreed with the Project Manager can remain in their original positions without being moved in any way until the expiry of the minimum time for removal of props. Stripping and re-propping will not be permitted.

The above times may be reduced in certain circumstances, at the discretion of the Engineer provided an approved method is adopted at the Contractor's expense to ensure that the required concrete strength is attained before the forms are stripped.

Solid strips in composite slabs shall be considered as beams. The tops of retaining walls shall be adequately supported with stout raking props at intervals required by the Engineer. These props are not to be removed until 7 days after casting of the floor slab is over.

### **Supporting props to wall and beam soffits**

When directed by the Project Manager, supporting props to wall and beam soffits are to be left in position until the completion of the whole of the reinforced concrete structure. The props are to be to the approval of the Engineer and the Contractor must submit the suggested method of propping to the Engineer prior to removal of formwork to the relevant surfaces.

### **Concrete mixes**

Concrete to be used shall be of the classes specified in "Ministry of Works standard Specification" Section 17.

Class	Nominal mix	Trial Strength in		Where used in this Contract
		7 day	28 day	

15	1:3:1 5	13	19.5	Surround to pipes
25	1:2:4	25	32.5	Spillway lining, walls

### Concrete mixing and placing

The concrete shall be mixed only in approved power-driven mixers of a type and capacity suitable for the work, and in any event not smaller than 0.04/0.28 c.u.m. capacity. The mixer shall be equipped with an accurate water measuring device. All materials shall be thoroughly mixed dry before water is added and the mixing of each batch shall continue for a period of not less than two minutes after the water has been added and until there is a uniform distribution of the materials and the mass is uniform in colour.

The entire contents of the mixed drum shall be discharged before recharging. The volume of mixed material shall not exceed the rated capacity of the mixer. Whenever the mixer is started, 17% extra cement shall be added to the first batch and no extra payment will be made on this account.

As a check on concrete consistency slump tests may be carried out and shall be in accordance with B.S. 1881. The Contractor shall provide the necessary apparatus and carry out such tests as are required. The slump of the concrete made with the specified water content, using dry materials, shall be determined and the water to be added under wet conditions shall be so reduced as to give approximately the same slump.

The concrete shall be mixed as near to the place where it is required as is practicable, and only as much as is required for a specified section of the work shall be mixed at one time, such sections being commenced and finished in one operation without delay. All concrete must be efficiently handled and used in the Works within twenty (20) minutes of mixing. It shall be discarded from the mixer direct either into receptacles or barrows and shall be distributed by approved means which do not cause separation or otherwise impair the quality of the concrete. Approved mechanical means of handling will be encouraged, but the use of chutes for placing concrete is subject to prior approval of the Project Manager.

Concrete shall be placed from a height not exceeding 1,500 mm directly into its permanent position and shall not be worked along the shutters to that position. Unless otherwise approved, concrete shall be placed in a single operation to the full thickness of slabs, beams, and similar



members, and shall be placed in horizontal layers not exceeding 1,500 mm deep in the walls and similar members.

Concrete in columns may be placed to a height of 4 meters with careful placing and vibration and satisfactory results. Where the height of the column exceeds 4 meters suitable openings must be left in the shutters so that this maximum lift is not exceeded.

Concrete shall be placed continuously until completion of the part of the work between construction joints as specified hereinafter or of a part of the approved extent. At the completion of a specified or approved part a construction joint of the form and in the positions hereinafter specified shall be made. If stopping of concrete be unavoidable elsewhere, a construction joint shall be made where the work is stopped. A record of all such joints shall be made by the Contractor and a copy supplied to the Project Manager.

Any accumulation of set concrete on the reinforcement shall be removed by wire brushing before further concrete is placed. The Contractor shall provide runways for concreting to the satisfaction of the Project Manager. Under no circumstances will the runways be allowed to rest on the reinforcement. Care shall be taken that the concrete is not disturbed or subjected to vibrations and shocks during the setting period. Mixing machines, platforms and barrows shall be clean before commencing mixing and be cleaned on every cessation of work. Where concrete is laid on hardcore or other absorbent materials, the base shall be suitable and sufficiently wetted before the concrete is deposited.

### **Works cube tests**

Work cubes are to be made at intervals as required by the Project Manager in accordance with C.P. 114, and the Contractor shall provide a continuous record of the concrete work. The cubes shall be made in approved 150 mm moulds in strict accordance with the Code of Practice. Three cubes shall be made on each occasion. Each cube shall be marked with a distinguishing number (numbers) to run consecutively and the date, and a record shall be kept on site giving the following particulars:-

- a) Cube No.
- b) Date made
- c) Location in work
- d) 7-Day Test, Date, Strength
- e) 28-Day Test, Date, Strength

Cubes shall be forwarded, carriage paid, to an approved Testing Authority, in time to be tested two at 7 days and the remaining one at the discretion of the Project Manager. No cube shall be dispatched within

three days of casting. Copies of all Works Cube Tests shall be forwarded to the Project Manager and one shall be retained on site. If the strengths required above are not attained and maintained during the carrying out of the contract, the Contractor will be required to increase the proportion of cement and/or substitute better aggregates so as to give concrete which does comply with the requirements of the contract. The Contractor may be required to remove and replace at his own cost any concrete which fails to attain the required strength as ascertained by Works Cube Tests.

### **Compaction**

At all times during which the concrete is being placed, the Contractor shall provide adequate trained and experienced labour to ensure that the concrete is compacted in the forms to the satisfaction of the Project Manager. Concrete shall not be placed at a rate greater than will permit satisfactory compaction or to a depth greater than 400 mm before it is compacted.

During and immediately after placing, the concrete shall be thoroughly compacted by means of continuous tamping, spading, slicing and vibration. Vibration is required for all concrete of classes 40, 35, 25, and 20. Care shall be taken to fill every part of the forms, to work the concrete under and around the reinforcement without displacing it to avoid disturbing recently placed concrete which has begun to set. Any water accumulating on the surface of newly placed concrete shall be removed and no further concrete shall be placed thereon until such water is removed.

Internal vibrators shall be of a frequency not less than 7000 cycles per minute and shall have a rotating eccentric weight of at least 0.05 Kg. with an eccentricity of not more than 12 mm. Such vibrators shall visibly affect the concrete within a radius of 250 mm from the vibrator. Internal vibrators shall not be inserted between layers of reinforcement less than one and one half times the diameter of the vibrators apart. Contact between the vibrators and reinforcement, and vibrators and formwork shall be avoided. Internal vibrators shall be inserted vertically into the concrete at not more than 500 mm centers and shall be moved constantly from place to place. No internal vibrator shall be permitted to remain in any one position for more than ten seconds and it shall be withdrawn very slowly from the concrete.

In consolidating each layer of concrete the vibrating head shall be allowed to penetrate and re-vibrate the concrete in the upper portion of the underlying layer. In the area where newly placed concrete in each layer joins previously placed concrete more than usual vibration shall be performed, the vibrator penetrating deeply at close intervals along these

contacts. Layers of concrete shall not be placed until layers previously placed have been vibrated thoroughly as specified. Vibrators shall not be used to move concrete from place to place in the formwork.

At least one internal vibrator shall be of the high frequency, low amplitude type applied with the principal direction of vibration in the horizontal plane. They shall be attached directly to the forms at no more than 1200 mm centers. In addition to internal and external vibration the upper surface of suspended floor slabs shall be leveled by tamping or vibrating to receive finishes. Vibrating elements shall be of the low frequency high amplitude type operating at a speed of not less than 3000 r.p.m.

### **Curing and protection**

Care must be taken that no concrete is allowed to become prematurely dry and the fresh concrete must be carefully protected, within two hours of placing, from rain, sun and wind by means of Hessian sacking, polythene sheeting, or other approved means. This protective layer and the concrete itself must be kept continuously wet for at least 7 days after the concrete has been placed. The contractor will be required to provide complete coverage of all fresh concrete for a period of 7 days. Hessian or polythene sheeting shall be in the maximum widths obtainable and shall be secured against wind. The Contractor will not be permitted to use old cement bags, Hessian or other materials in small pieces.

Concrete in foundations and other underground work shall be protected from admixture with falling earth during and after placing. Traffic or loading must not be allowed on the concrete until the concrete is sufficiently matured, and in no case shall traffic or loading be of such magnitude as to cause deflection or other movement in the formwork or Damage to the concrete members. Where directed by the Project Manager props may be required to be left in position under slabs and other members for greater periods than those specified hereafter.

### **Faulty concrete**

Any concrete which fails to comply with these specifications, or which shows signs of setting before it is placed shall be taken out and removed from site. Where concrete is found to be defective after it has set, the concrete shall be cut out and replaced in accordance with the Project Manager's instructions. On no account shall any faulty, honeycombed, or otherwise defective concrete be repaired or patched until the Project Manager has made an inspection and issued instructions for the repair. The whole cost whatsoever, which might be occasioned by the need to remove faulty concrete, shall be borne by the Contractor.

**Pre-cast units**

Pre-cast reinforced concrete slabs to be made to sizes as shown in the Drawings. Slabs to be cast with Grade 25 concrete in approved formwork, suitably vibrated and cured for 28 days before use.

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**REINFORCEMENT**

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**Material**

Reinforcement shall be as specified by the Project Manager.

**Bending and placing reinforcement**

Reinforcement shall be cleaned before placing and secured with space blocks in the correct position. It shall be bound with suitable wire and have such cover as shown on the drawings.

**Strength of reinforcement**

Characteristic strengths of reinforcement are as given in B.S. 4449, 44151, and 4483. Refer to 503.

**Rod reinforcement**

The steel reinforcement shall comply with the latest requirements of the following British Standards:-

Hot Rolled bars for the Reinforcement of concrete to B.S. 4449 (metric units)

Cold worked steel for the reinforcement of concrete to B.S. 44151 (metric units)

The Contractor will be required to submit a test certificate of the rollings. Reinforcement shall be stored on racks above ground level. All reinforcement shall be free from loose mill scale or rust, grease, paint or other substances likely to reduce the bond between the steel and the concrete.

**BRC**

The BRC should be electrically cross-welded steel wire mesh reinforcement to B.S. 4483: 19159, or as directed by the Project Manager, and of the size and weight specified in the Drawings.

The fabric shall be free from scale, dust, rust, grease or other substance likely to reduce the bond between the steel and the concrete and shall be

laid with a minimum 300 mm laps and bound with No. 18 S.W.G. annealed iron wire.

### **Fixing reinforcement**

Reinforcement shall be accurately bent to the shapes and dimensions shown on the Drawings and in accordance with B.S. 441515 (19159). Reinforcement must be cut and bent cold and no welded joints will be permitted, unless so detailed. Reinforcement shall be accurately placed as shown on the Drawings, and before and during concreting, shall be secured against displacement by using No. 18 S.W.G. annealed binding wire or suitable clips at intersections, and shall be supported by concrete or metal supports, spacers or metal hangers to ensure the correct position. No concreting shall be commenced until the Project Manager has inspected the reinforcement in position and until his approval has been obtained and Contractor has given two clear days' notice of intention to concrete.

The Contractor is responsible for maintaining the reinforcement in its correct position, according to the drawings, before and during concreting. During concreting, a competent steel fixer must be in attendance to adjust and correct the position of any reinforcement which may be displaced. The vibrators are not to come into contact with the reinforcement.

### **Position and correctness of reinforcement**

Irrespective of whether any inspection and/or approval of the fixing of the reinforcement has been carried out as in C above, it shall be the Contractor's sole responsibility to ensure that the reinforcement complies with the details on the Drawings and is fixed exactly in the positions shown therein and in the positions to give the prescribed cover. The Contractor will be held entirely responsible for any failure or defect in any portion of the reinforced concrete structure and including any consequent delay, claims, third party claims. etc., where it is shown that the reinforcement has been incorrectly positioned or is incorrect in size or quantity with respect to the detailed Drawings.

### **Concrete cover to reinforcement**

Unless otherwise directed, the concrete cover to rod reinforcement over main bars in any face shall be:-

Foundations against blinding	50 mm
Strip foundations	40 mm
Columns/Floor slab	40 mm
Beams	25 mm

**Projecting reinforcement**

Where reinforcement projects from a concreted section of the structure and this reinforcement is expected to remain exposed for some time, it is to be coated with a cement grout to prevent rust staining on the finished concrete. This grout is to be brushed off the reinforcement prior to the continuation of concreting.

**Fixtures**

No openings, chases, holes or other voids shall be formed in the concrete without the prior approval of the Project Manager. Details of any fixtures to be permanently built into the concrete including the proposed position of all electrical conduits 25 mm and over in diameter shall be submitted to the Project Manager for his approval before being placed.

**Chases, holes, etc., in concrete**

The Contractor shall be responsible for the co-ordination with the Electrical and other Sub-Contractors for incorporating electrical conduits, pipes, fixing blocks, chases and holes in concrete members as required and must ensure that adequate notice is given to such Sub-Contractors informing them when concrete members incorporating the above are to be poured. The Contractor shall submit full details of these items to the Engineer for approval before the work is put in hand. All fixing blocks, chases, holes, etc., to be left in the concrete shall be accurately set out and cast with the concrete. Unless otherwise instructed by the Project Manager, all electrical conduit to be positioned within the reinforced concrete shall be fixed inside the steel cages of beams and columns and between the top and bottom steel layers in the slabs and similar members.

The proposed position of all electrical conduits 25 mm and over in diameter which are to be enclose in the concrete shall be shown accurately on a plan to be submitted to the Engineer, whose approval shall be obtained before any such conduit is placed.

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**PIPEWORK**

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**General**

The Contractor shall construct pipelines to the lines and levels using grades, classes, or designs of pipe, bedding, haunching and surrounding as shown on the Drawings or directed by the Project Manager.

Unless otherwise described in the Contract or agreed by the Project Manager only one type of pipe shall be used within any individual length.

All materials shall be subject to the approval of the Project Manager prior to procurement and delivery. Upon delivery, the Project Manager shall inspect the delivered material for compliance with the specifications. In case of non-conformity, the Contractor shall replace the material at his own cost.

The pipes and fittings shall comply in all respects with British Standards and jointing of pipes and fittings shall be carried out in accordance with the manufacturers' instructions and to the approval of the Project Manager.

### **Storage and Protection of Materials**

Pipes shall be stacked on a firm base using two timber packers only under the barrel of rigid pipes such as concrete.

Flexible pipes such as PVC-U shall be stacked closely side by side on a firm plane base so that the whole length of the barrel is uniformly supported and sockets are clear of the ground. Each succeeding layer shall be placed at right angles to the previous layers. The height of any stack shall be not more than six layers of pipes and in the case of steel, not more than two layers.

Each class and size of pipe shall be stored separately in its own stockpile.

Fittings and specials of any type shall be stored in a single layer only.

Pipes and fittings shall at all times be adequately protected from damage during transport, storage and handling. Cracked or chipped pipes shall not be used in the permanent works. Steel and large diameter plastic pipes shall be fitted in the factory with end caps or reinforcement adequate to prevent distortion during transport, storage and handling.

Plastic pipes and fittings shall be protected from direct sunlight and excessive heat. Deformed pipes and fittings shall not be used in the permanent works.

All rubber rings or other materials that may deteriorate under the action of sunlight, ozone or inclement weather shall be stored in permanent shade in lockable weatherproof sheds. Care shall be taken at all times to prevent contamination of rubber or plastic products or other petroleum-derived solvents.

Granular bedding shall be stored on a firm impermeable base so that it does not become contaminated with deleterious matter.

## **Handling Pipes and Fittings**

Before any pipes are delivered to site the Contractor shall submit details to the Project Manager of his proposals for handling pipes during transport, in store and during lying.

Pipes and specials shall only be transported on properly constructed or adapted vehicles containing correctly shaped and padded cradles or with strong, sawdust-filled bags separating pipes and vehicle body. During transport and in store, pipes shall not rest on narrow traverse supports likely to cause damage to the pipe or its coating. Pipes shall not be unloaded from a vehicle by tipping or dropping.

Pipes, specials and fittings shall not be subjected to rough handling at any time. Under no circumstances shall they be dropped during loading or off-loading or be allowed to collide with one another. Any materials that have been dropped from a vehicle shall immediately be rejected for use on the Works. The same shall apply for any pipes found defective before laying.

The handling of any pipes exceeding 200kg mass other than by means of a crane is specifically forbidden. The Contractor shall maintain a suitable mobile crane on the Site and shall use it for all loading, unloading, transferring between vehicles and lowering into the trench of such pipes. The crane shall be fitted with a sling of ample width. Wire rope slings or hooks in the ends of pipes shall not be used for pipes or fittings of any diameter or mass.

In making arrangements for handling pipes, the Contractor shall take into account any recommendations made by the pipe manufacturer.

Where appropriate the requirements of this Clause shall apply to fittings and other components.

## **Cutting Pipes**

The cutting of pipes for making up lengths shall be carried out by a method, which leaves a clean square end.

Concrete pipes shall be cut with a concrete saw or by hand. If cut by hand the end of the pipes shall be trimmed even and square and if reinforced, the steel shall be cut flush with the face of the concrete. If instructed by the Project Manager the exposed ends of the steel shall be protected with bitumen or a cement grout.

Steel pipes to be cut shall have the line to be cut clearly marked round the pipe. Cutting shall be carried out by cutting disc or by oxy-acetylene and the



cut end shall subsequently be ground to the correct profile for the method of jointing in use.

## 1.1 Pipes and Fittings

### Concrete Pipes

Concrete pipes shall comply with BS 5911 “Specification for concrete cylindrical pipes, bends, junctions and manholes, unreinforced or reinforced with steel cages or hoops” save that the crushing test loads for the various diameters of pipe shall be as follows:

Table 5.9: Pipes and Fittings

Nominal size of pipe (mm)	Works proof load kN/m effective length
300	23 (Class M equivalent)
450	35 (Class M equivalent)
600	46 (Class M equivalent)
800	54 (Class M equivalent)
900	85 (Class M equivalent)
1000	73 (Class M equivalent)
1200	110 (Class M equivalent)
1500	132 (Class M equivalent)

Works proof loads shall be 80% of the maximum loads for each size of pipe.

Damaged pipes showing signs of visible cracking either on the inside or outside surface shall not be used.

### Steel Pipes

Steel pipes and fittings shall comply with BS EN 10224:2003 Non-alloy steel tubes and fittings for the conveyance of aqueous liquids including water for human consumption – technical delivery conditions.

Pipe shall be either seamless, electric welded or submerged arc welded. However the manufacturing process shall not be beyond their allocated diameter ranges:

Table 5.10: Steel Pipes

Manufacturing process	Outside diameter range, mm	Thickness range, mm

Seamless (S)	26.9 – 711	2.0 – 100
Electric Welded (EW)	26.9 – 610	1.4 – 16
Submerged Arc Welded (SAW)	168.3 - 2743	2.9 - 50

Seamless (S) pipe is formed by a method of hot working steel to form a tubular product without a welded seam. If necessary, the hot worked tubular product may be subsequently cold finished to produce the desired shape, dimension and properties.

Electric Welded (EW) pipe formed continuously from a steel strip with a longitudinal seam. This seam is joined by electric resistance or electric induction welding wherein the edges to be welded are mechanically pressed together and the heat for welding is generated by the resistance to flow of the electric current.

Submerged Welded pipe (SAW) formed from a steel strip with a longitudinal or helical (spiral) seam. The seams are then welded together by a coalescence of metals caused by heating them with an arc or arcs between a bare consumable electrode or electrodes. The arc and molten metal are shielded by a blanket of granular, fusible material on the work. Welding shall include at least one pass on the inside and one pass on the outside of the pipe.

Pipes shall not include welds used for joining lengths of steel strip together prior to forming except for helical welded pipe provided that such weld is made using the same method of welding as the helical seam.

Pipes shall not contain circumferential welds. Pipes shall not be manufactured on site.

Pipes formed from, plate, strip or coil shall have edges mechanically sheared before forming. In the case of pipes thicker than 10mm to be manufactured by the Submerged Arc Process (SAW), the edges of plate, strip or coil shall be chamfered by mechanical milling.

Pipe shall be delivered in 12m exact lengths for DN 250 and above and 6m exact lengths for DN 200 and below. The tolerances on pipe length shall be in accordance to Table 9 of BS EN 10224.

Unless otherwise specified, pipe shall be supplied with spigot and socket push-fit joints with elastomeric seals. The joints shall be flexible joints as defined in BS EN 805:2000 and the allowable angular deflection of the joints shall comply with the Class B limits given in Table 5 of EN 805.

Steel pipes and fittings larger or equal to DN 200 shall be internally lined throughout their entire length internally with either:

- (a) Fusion bonded epoxy to AWWA C213 (400  $\mu\text{m}$  dry film thickness);
- (b) Solvent free liquid epoxy to AWWA C210 (400  $\mu\text{m}$  dry film thickness);
- (c) Polyurethane to AWWA C222 (500  $\mu\text{m}$  dry film thickness).

The materials and application process shall be subject to the Project Manager's approval.

Steel pipes and fittings smaller or equal to DN 150 may be lined in cement mortar to AWWA C205.

For steel pipes DN 500 and below, the external protection shall be fusion-bonded epoxy to AWWA C213.

Dimensions for fittings shall comply with BS EN 10224. In the case of fittings such as reducers, laterals and washout tees not covered in BS EN 10224, the dimensions shall comply with AWWA C208.

Calculation of thickness of bends and reinforcement of tees and laterals shall comply with AWWA C208 and AWWA M11. The Contractor shall submit details of such calculations.

Flange jointed pipes shall have flanges complying with BS EN 1092: 2002.

All steel flanged pipes and fittings shall be supplied complete with hot dipped galvanized bolts, nuts to BS EN ISO 1461 (minimum 305g/m<sup>2</sup>) and appropriate gaskets. Gaskets shall be EPDM rubber and conform to BS EN 681. They shall be suitable for potable water.

The Contractor shall make available to the Project Manager the manufacturer's certificates covering the chemical analysis and physical properties of each cast of steel used in the manufacture of pipes. In addition, a product analysis shall be conducted on the steel coils, plates, billet or blanks prior to pipe manufacture.

All pipes shall be hydraulically tested before leaving the factory to induce a hoop stress equal to 70% of the minimum yield stress pressure as specified in BS EN 10224.

All pipes shall be tested according to Table 14 of BS EN 10224 and at the frequency stipulated in Table 15.

All tests shall be carried at the expense of the Contractor at the place of manufacture and the Contractor shall supply a signed certificate on delivery of the goods concerned giving results of the tests and certify that the goods concerned have been manufactured in accordance with this Specification.

### **Galvanized Steel Tubes**

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Galvanized mild steel tubes and fittings shall comply with BS 1387 Class B or "Medium Grade". Threading for screwed and socketed joints shall be in accordance with the requirements of BS 21.

Joints shall be made with an approved pipe-jointing compound in accordance with the manufacturer's instructions. Red lead compounds shall not be used. Joints in underground piping shall be coated with bitumen or other approved composition.

All underground sections of pipe work to be protected against corrosion by treating with K1-60 bitumen emulsion primer, and wrapped with fibreglass and coated with two coats of bituminous tap coats all to manufacturer's specification.

The bituminous paint is to be manufactured to ASTM D1187-82.

All fittings for galvanized steel water pipe work shall be galvanized heavy weight fittings in accordance with BS EN 10241. All fittings shall be subject to the approval of the Project Manager.

Brass or gunmetal fittings shall be subject to the approval of the Project Manager.

### **PVC-U Pipes**

Unplasticized Polyvinyl Chloride (PVC-U) pressure pipes shall have outside diameters, laying lengths and wall thickness complying with KS-06-149 Part 2: 2000. Joints shall be of the spigot and integral socket type. Solvent weld joints are not permitted in buried PVC-U pipelines.

Table 5.11: uPVC Pipes and Fittings

<b>Name/Size of Pipe</b>	<b>Wash proof load N/m length</b>
630mm	Class B
560mm	Class B
500mm	Class B
500mm	Class C
400mm	Class B
400mm	Class C
355mm	Class B
355mm	Class C
315mm	Class B
315mm	Class C
280mm	Class B
280mm	Class C
250mm	Class B
250mm	Class C
200mm	Class B
200mm	Class C
225mm	Class B

225mm	Class C
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Fittings for use with PVC-U pressure pipe shall be manufactured from either PVC-U or cast iron with socketed joints and shall comply with ISO 727. Cast iron fittings shall be bitumen coated. Aluminium alloy fittings are not permitted.

The metal adaptor fittings shall comply with ISO 4132.

### **PE Pipes**

Polyethylene (PE) pipes and fittings shall comply with ISO 4427:1996.

### **Valves**

#### **Gate Valves**

Gate valves shall conform to BS 5153-1:2004. The valves shall be tested in accordance with BS EN 1074-2:2000.

Non-return valves	BS EN 1074-3:2000
Air valves	BS EN 1074-4 :2000
Hydrants	BS EN 1074-6 :2004

All gate valves shall close in a clockwise direction and the direction of opening and closing shall be cast on the hand wheels or valve casing with the words 'OPEN' and 'CLOSE' respectively. All gate valves shall be capable of being operated manually with a maximum applied torque of 100 Nm for valves with a nominal diameter less than 450mm. The Contractor shall ensure that the gate valves supplied are fitted with appropriate thrust bearing guides and gearing to fulfill these requirements, ensuring that when reduction gearing is employed, the gear ratio shall not exceed 4:1.

Isolating gate valves shall permit manual closing off the raw water supply.

#### **Butterfly Valves**

Butterfly valves shall conform to BS EN 593:1998: "Industrial valves. Metallic butterfly valves." The valves shall be tested in accordance with BS EN 1074-2:2000.

The use of butterfly valves as main line valves shall not be permitted.

#### **Check Valves**

Check valves shall comply with BS EN 12334:2001: "Industrial valves. Cast iron check valves." The valves shall be tested in accordance with BS EN 1074-3:2000.

The valves shall be installed in a horizontal position to avoid malfunctioning of the check.

### **Single Air Valves**

Single air release valves shall be of the small orifice type and shall have bodies of cast iron. The inlet shall be 25mm diameter fitted with an isolating plug cock and shall be screwed in an 80mm diameter blank flange drilled and tapped to BS 21. Single air valves shall be of pattern and manufacture approved by the Project Manager for the conditions under which they will operate, and be fitted with a pressure gauge tapping and plug. Floats are to be manufactured from high-density polyethylene.

The valves shall be tested in accordance with BS EN 1074-4:2000.

### **Double Air Valves**

Air release and vacuum break valves shall be of a compact, single chamber design with solid cylindrical high density polyethylene control floats housed in a tubular stainless steel body with stainless steel ends secured by stainless steel tie rods.

The valves shall have integral surge alleviation mechanisms that shall operate automatically to limit transient pressure rise or shock induced by closure due to high velocity air discharge or the subsequent rejoining of separated water columns. The limitation of pressure rise must be achieved by deceleration of approaching water before valve closure.

The intake/discharge orifice area shall be equal to the nominal size of the valve.

The valve design shall incorporate an overpressure safety feature that will fail without an explosive effect. This feature shall consist of easily replaceable components such as gaskets, seals or the like.

The valves shall be tested in accordance with BS EN 1074-4:2000.

### **Flow Control Valves**

Pressure and flow control valves shall be installed as shown on the Contract Drawings and be suitable for the operating conditions specified.

The basic valves shall be either of the pressure compensating globe valve design with externally arranged spring and diaphragm assembly or of the



streamline two chamber concentric plunger and pilot valve regulating assembly enclosed within the valve body as required for the particular applications.

Valve bodies shall be of a suitable grade of close-grained cast iron to BS EN 1561:1997.

Valves shall be sized such that the fully open capacity is more than adequate to accept the specified maximum flow at the minimum differential pressure.

The globe valve design shall have the main seat in the stream flow and an upper cylinder for the valve element control piston type and shall have the required number of bosses drilled and tapped to receive strainer unit, relay valves and pressure gauges. The cover plate shall include an air vent and lifting eyes. The main seat shall have a renewable element and the upper portion shall be in the form of a piston and the lower portion shall have a face ring and ported guide.

Valves shall be fitted with an external control relay system which shall be capable of controlling the required parameter of flow or pressure within + or -5 per cent of the set value. The relay system shall include connecting piping couplings and isolating valves to permit maintenance or replacement without interrupting supply.

The rate of response of opening and closing of the main valve shall be adjustable and means for external indication of the main valve element position shall be fitted.

The particular control system for the different duties shall be as specified below.

a) Altitude Valves

The main valve shall be controlled by a slave ball cock mounted in the controlled tank at top water level and connected to the valve operating mechanism by small-bore pipe work. The level of the ball shall be adjustable in service so that the main valve is fully drop-tight closed when the water level in the tank reaches top water level.

b) Flow Control Valves

Flow control valves shall be designed to prevent the flow downstream rising above that specified in the Particular Specification or shown on the Drawings for the particular application, regardless of the operating pressures in the system upstream or downstream of the valve. The relay system valve shall be operated by the pressure differential measured across the main flow orifice, which shall be fitted at the upstream end of the flow control valve.

c) Pressure Reducing Valves

Pressure reducing valves shall be designed to reduce a constant or variable inlet pressure to a predetermined constant outlet pressure, at flows varying from the maximum capacity of the valve to zero flow. Adjustment of the outlet pressure shall be made by a screw on the relay

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valve or by changing weights as appropriate. A pressure gauge indicating downstream pressure shall be incorporated.

#### d) Pressure Sustaining Valves

Pressure sustaining valves shall be designed to maintain the pressure in the pipeline immediately upstream of the valve at or above a preset value, irrespective of the flow and pressure conditions downstream of the valve. Adjustment of the upstream pressure shall be made by a screw on the relay valve or by changing weights as appropriate. A pressure gauge indicating upstream pressure shall be incorporated.

#### e) Pressure Relief Valves

Pressure relief valves shall be designed to prevent the pressure in the pipeline immediately upstream of the valve rising above a preset value. The valve shall remain closed at lower pressures. Adjustment of the pressure at which the valve opens to relieve pressure shall be made by a screw on the relay valve or by changing weights as appropriate. A pressure gauge indicating upstream pressure shall be incorporated.

### **Float Valves**

Float operated valves shall comply with BS 1212 and BS 1968 and BS 2456 “specifications for float ball valves”.

Ball valves shall be the plastic diaphragm type or similar approved with seatings to suit the working pressure of 5 bars with plastic float to BS 2456 and internal overflow.

### **Painting of Valves**

All valves shall be painted internally and externally to give the same standard of protection as for steel pipes and fittings. Surface protection shall be all to the approval of the Project Manager.

### **Laying Pipes in Trenches and Headings**

Immediately before pipes are placed in any trench, the bottom shall be cleared of all stones and other debris and shall be in a condition acceptable to the Project Manager. Prior to placing in the trench, all pipes shall be inspected for damage. Damaged pipes which in the opinion of the Project Manager cannot satisfactorily be made good shall not be used in the permanent works. End caps or discs placed on the pipes for protection during transit shall not be removed until immediately before the pipes are jointed.

Pipes shall be laid in straight lines unless otherwise shown on the drawings. No pipe shall deviate from the true line and level by more than 5mm. Pipes shall be firmly bedded throughout their length to the required alignment and

level so that they are concentric at each joint. All pipes shall be suitably wedged, shored or otherwise restrained to prevent movement during testing and backfilling but such restraints shall not be left in place permanently unless instructed or agreed by the Project Manager.

Pipes which are to receive a concrete bed and hauch or surround shall be set on suitable concrete blocks or bricks with a pad of hessian based damp proof course two millimetres thick interposed between the pipe and the block. Setting blocks shall not be used with other forms of bedding.

Unless otherwise agreed by the Project Manager a close fitting brush or swap shall be placed in pipelines having nominal diameters of 650mm or less and shall be drawn forward progressively as pipelaying proceeds by means of a suitable rope which shall be threaded through each pipe as it is laid. Pipelines having nominal diameters greater than 650mm shall be kept clean by suitable means as pipelaying proceeds. No debris of any kind shall be allowed to remain in the pipeline. Where the pipeline has internal lining, persons entering shall wear rubber boots and equipment trolleys shall have rubber tyred wheels. Pipes and joints shall be kept free of dirt, mud and other deleterious matter at all times. If pipelaying is stopped at any time, a cap shall immediately be placed on the end of the last pipe laid to exclude dirt.

Suitable precautions shall be taken to prevent the floating of pipes due to flooding of trenches. If floating should occur, the whole of the pipe run affected shall be removed and trench prepared again. No pipes shall be re-laid in trenches which have flooded until the trenches and the pipes have been inspected by the Project Manager. The Contractor shall be entirely responsible for the sufficiency of all temporary supports and side slopes to the excavations. The excavation shall be carried out in such a way as to maintain the stability of all roads and other adjacent structures or works.

Pipes having integral sockets shall be laid with sockets facing upstream unless otherwise agreed or instructed by the Project Manager.

Pipes in headings shall be laid in accordance with the requirements of this clause but pipe lengths shall not exceed 2.5 m unless otherwise agreed by the Project Manager.

### **Pipes Laid on Natural Ground**

Filling shall commence with selected fill consisting of easily compacted material from which all stones larger than 25mm and all lumps of clay larger than 75mm have been removed. The selected fill shall be deposited equally on each side of the pipe carefully compacted in layers not more than 150mm thick. Care shall be taken to ensure that no voids are left

under the pipe. The filling shall be continued to a level of 300mm above the crown of the pipe

In the case of steel, ductile iron and plastic pipes, the Contractor shall ensure that no distortion of the pipe takes place during the backfilling operation.

The remainder of the trench shall be filled with excavated material and compacted in 150mm thick layers by means of a vibrating plate compactor or a mechanical rammer. The trench shall be filled flush with the surrounding ground surface.

### **Pipes Laid on Granular Bedding**

Granular bedding material shall be placed and compacted generally on both sides of the pipe up to the horizontal diameter of the pipe. Care shall be taken to ensure that no voids are left under the pipe. Thereafter the selected fill shall be as described in Clause 5.8 above.

### **Pipes with Concrete Bedding and Surround**

The configuration of the concrete bedding, surround or arch shall be as shown on the drawings including the location of reinforcement if any is required. Pipes to be set in concrete shall be supported as set out in Clause 5.7. Small diameter pipes in short lengths shall be supported behind pipe socket. Large diameter pipes and long lengths shall be supported on two packers.

After jointing and testing as set out in the appropriate parts of this section, concrete of the class shown on the drawings shall be carefully placed and compacted under the pipes making sure that no voids are left, and brought up to the configuration shown on the drawings. The Contractor shall ensure that the pipes do not float or are in any way disturbed during concrete placing. The remainder of the backfill shall be placed as set out in Section 2 of this Specification.

Where pipes, which are laid on a bed of granular material, are to be protected by a concrete arch, the laying and jointing shall proceed as set out in the appropriate parts of the Specification and granular material shall be brought up to the horizontal diameters of the pipes.

After testing, concrete shall be placed over the pipes to the configuration shown on the drawings and the remainder of the backfill shall hereafter be placed as set out in Section 2 of this Specification.

Flexible joints shall be formed in concrete beddings, arches or surrounds in the location shown on the drawings. Such joints shall coincide with the pipe joint in such a way that the end of the socket is flush with one face of the joint and the socket faces into the joint space.

Joints in concrete beddings, arches and surrounds shall be 18 mm wide unless otherwise instructed by the Project Manager and shall be filled with a compressible material such as a sheet of cane fibre board or cork board. The material used shall be subject to the approval of the Project Manager.

## **Special Accessories for the Buried Pipe Network**

### **Scope**

This section of the specification concerns the supply and installation of accessories for the buried pipe network at the locations shown on the approved Drawings or as directed by the Project Manager.

The several parts of the accessories, as described below, shall be considered as a complete unit, which will serve to supply water to the hydrant outlets from the underground distribution network. Each part shall be fabricated by an internationally recognized manufacturer and shall conform to the conditions of operation, the characteristics, the testing and other requirements described below.

The several parts of the accessories, as described below, shall be considered as complete unit, which will serve to supply water to the hydrant outlets from the underground distribution network. Each part shall be fabricated by an internationally recognized manufacturer and shall conform to the conditions of operation, the characteristics, the testing and other requirements described below.

The Contractor shall at the time and place required, submit to the Project Manager proposals concerning the manufacturers selected by him for the supply of the accessories, accompanied by a detailed report, specifications and certificates showing that the proposed components have been successfully used in similar sprinkler systems, so as to prove that the proposed accessories conform to the requirements of this specification in a satisfactory manner.

Subsequent to the provision and acceptance of the proposals as above, the Project Manager may agree to the use of the proposed accessories, but his consent cannot be interpreted in any case whatsoever, as relieving the Contractor of his responsibilities for the supply of accessories which shall prove adequate and efficient during the testing procedure and the operation of the network.

The Project Manager reserves the right, on the other hand to reject the Contractor's proposals if he finds them incomplete or vague or if the proposed accessories do not conform to the requirements of this specification.

In such a case, within a reasonable period, not longer than one month, after communication of the above decision of the Project Manager to the Contractor, the latter is required to supplement and improve his original proposals and submit his revised recommendations.



If the Contractor fails to submit, within the above time limit, his final recommendations, or if the Project Manager for the same reasons rejects these for which his original proposals were rejected, he is required to supply accessories, which will satisfy the Project Manager. If, however, he does not agree and insists on supplying the accessories which he has proposed, he must deposit a guarantee to an amount equal to the value of these accessories. This guarantee will remain in the hands of the Employer until the final acceptance and will be forfeited to the latter if, during the test procedure and the operation of the network, it is ascertained that the accessories supplied by the Contractor are not satisfactory. It is understood that the Contractor is, in addition, required to fulfill all his other obligations for the restoration of all defective construction until final acceptance by the Project Manager.

### **Acceptance Tests**

Included with the specifications submitted by the Contractor, shall be copies of any relevant international standards to which the items are to be constructed. The Project Manager reserves the right to request independent authenticated tests at the point of manufacture and also similar tests in situ under operating conditions. All costs shall be borne by the Contractor who will promptly replace any components which, in the judgement of the Project Manager are found, either after testing or during operation and until final acceptance, as not conforming to the requirements of this Specification.

### **Measurement and Payment**

Measurement shall be by assessing the number of satisfactorily installed and accepted accessories.

Payment will be made for the number of accessories measured as described above and based on the respective contract unit prices. Such prices and payment constitute full compensation to the Contractor for supplying, hauling, storing and installing the accessories, for paying patent rights, for furnishing the equipment, materials and labour required for installing and checking the operation of the accessories in accordance with the foregoing requirements, and for any other related expense even if not explicitly stated above but necessary for the complete and proper performance of the work and the satisfactory operation of the accessories.

### **Irrigation Hydrants**

There are generally two types of hydrants as shown on the Drawings:

- . Type 1 Plot hydrant
- . Type 2 Field hydrant

**Pressure Reducing Valves**

There is a requirement for Pressure Reducing Valves, which will protect the installed pipelines against high pressures.

The Contractor shall submit to the Project Manager proposals referring to the valves to be used and the name of the manufacturer with whom he intends to place the purchase order, accompanied by a detailed report, specifications and certificates showing that the proposed valves have been successfully used in similar cases so as to prove that the proposed valves conform to the requirements of this specification in a satisfactory manner.

Following completion of the construction of the pipe network, and prior to its final acceptance, the Project Manager may demand the performance of tests to ascertain the efficiency and adequacy of the installed valves. To this effect, the Contractor shall, at his own expense, place at appropriate locations of the network to be designated by the Project Manager automatic recording manometers with the minimum possible inertia of moving parts so as to ascertain in an unquestionable manner, the adequacy of the valves, especially during filling and draining of the network as well as on sudden opening and immediate shut down of a riser located at a relatively unfavorable point.

The Contractor shall take into account the fact that the valves must be "drop tight" or "sealed" at no flow conditions and that the seals and operating mechanisms must be proof against suspended solids in the supply water (untreated river water). The valves shall operate automatically, hydraulically, without electricity.

## **Joints in Pipelines**

### **Concrete Pipes**

#### **Rigid Joints**

When laying rigidly jointed pipelines with pipes having integral sockets, before entering a pipe spigot into its socket, both spigot and socket shall be clean and free from mud, oil, grease or other deleterious matter. A gasket of tarred hemp yarn, cut to length so that it forms a butt joint at the crown of the pipe shall be wrapped round the spigot which shall then be fully entered into the socket and the gasket caulked up hard into the joint. The joint shall then be filled completely with a plastic mortar composed of one part of cement to two parts of sand.

The pipes shall not be pressure tested or disturbed in any way for at least 48 hours after jointing.

Rigidly jointed sleeves used to join two spigots shall be jointed in the same manner as integral sockets.

If the drawings require ogee jointed pipes to be laid with a mortar joint, the joint shall be made at the time of laying. Mortar as described above shall be applied to the lower semi-circumference of the socket and to the upper semi circumference of the spigot and the pipe shall be drawn hard into the socket. Excess mortar squeezed out of the joint shall be removed from both the inside and outside of the joint.

### **Flexible Joints**

Flexible joints between pipes having integral socket may be formed by a shaped rubber gasket fitted within the socket or by a rubber ring of circular cross section (O-ring) placed on the pipe spigot. The type of flexible joint to be used shall be subject to the approval of the Project Manager and shall be made strictly in accordance with the manufacturer's recommendations.

### **PVC-U Pipes**

Flexible jointed PVC-U pipes shall be jointed in accordance with the manufacturer's instructions.

Solvent welded joints shall be made strictly in accordance with the manufacturer's instructions using solvent supplied by him for exposed pipes.

### **Steel Pipes**

These shall be caulked in thread seal for rigid joints. Flexible joints incorporating rubber O-rings shall be made in accordance with the manufacturer's instructions. Joints incorporating bolted or screwed glands or couplings shall be made in accordance with the manufacturer's instructions.

Components of flexible joints from different manufacturers shall not be used together.

### **Connections to Existing Pipelines**

Where a connection is to be made to an existing water pipe other than that at a chamber, a pipe saddle of the correct size shall be used for this purpose. The hole in the pipe shall be cut precisely to fit the saddle.

Saddles for uPVC pipes shall be made of the same material as the pipes and shall be fixed with a solvent in accordance with the manufacturer's instructions.

### **Pipes through Structures**

Where a pipeline passes into or out of a structure, including a manhole cover or similar chamber, two flexible joints shall be formed. The flexible joint shall consist of a 500mm long pipe section connected along the main pipe, with the nearest end 500mm from the face of the structure. One joint will be made on the incoming pipe and another joint on the outgoing pipe.

When the structure is less than one pipe length wide, the above requirement shall not apply and a sleeve shall be formed through the structure so that there is a clear space at least 75mm wide all round the pipe. Adequate means shall be provided to prevent soil from entering this gap.

### **Pipelines within Concrete Structures**

Sections of pipelines which are to be cast into concrete may be installed in advance of the remaining parts of the pipeline subject to the agreement of the Project Manager. Such sections shall be placed accurately into position and fixed so that they cannot move during placing of concrete around them.

### **Pipes under Roads**

All pipes at the crossing of driveways and roads shall be surrounded with concrete for the entire length of crossing before trench backfilling.

Concrete surround shall be approved by the Project Manager on satisfactory compliance with protection of pipes as detailed in Section 5.9.

### **Cleaning**

The insides of all pipes, valves, tanks and fittings shall be clean, smooth, and free from blister, loose scale and dirt when erected. All lines shall be cleaned after all installation work.

When pipes are installed, all ends shall be suitably plugged until final fixing of fixtures can be carried out. Pieces of cloth or stone will not be permitted.

### **Pressure Testing of Pipelines**

As the installation of the pipe work proceeds, the various sections shall be tested before they are built in, concealed, or finally connected. The Contractor shall advise the Project Manager in writing at least three days in advance of the carrying out of such tests, and such tests shall, if

considered necessary by the Project Manager, be carried out in his presence.

All tests shall be at the expense of the Contractor and it shall be the responsibility of the Contractor to make all necessary records of the tests and results and submit these to the Project Manager in the final form agreed.

All pipe systems shall be tested hydraulically for a period of one hour to not less than one and a half times the design working pressure. Testing shall comply with BS EN 805:2000 for standard field-testing of pipelines.

If preferred, the Contractor may test the pipelines in sections. Any such section found to be satisfactory need not be the subject of a further test when the system has been completed, unless specifically requested by the Project Manager.

During the test, each branch and joint shall be examined carefully for leaks, any defects observed shall be made good by the Contractor, and the section re-tested.

### **Painting of Exposed Pipes and Fittings**

All metal surfaces within chambers shall be mechanically wire brushed to remove all loose scale, grease etc. Within two hours of cleaning, a primer shall be applied, followed after two hours by a first coat of heavy consistency bitumen paint all to the approval of the Project Manager. A second coat of the heavy consistency paint shall be applied after 24 hours. The final coating thickness shall not be less than 250 microns.

Preparation and application of the coating system shall be strictly in accordance with the Manufacturer's instructions.

This clause shall not be applied to chemically or thermally bonded coatings on steel pipes.

### **Marker Posts**

Precast concrete marker posts shall be set in concrete and fixed near valves, fire hydrants, washouts, changes in direction of the mains and where directed by the Project Manager. The posts shall be detailed as directed by the Project Manager.

### **Portable Sprinkler Irrigation Equipment**

#### **Scope**

The Tender involves the supply of sprinkler irrigation equipment for overhead irrigation.

The contractor shall have submitted with his Tender detailed specifications as to the dimensions, type and materials utilized in sprinkler construction, together with any detail that the Contractor may consider relevant.





The Contractor shall at the time and place required submit to the Project Manager proposals concerning the manufacturers selected by him for the supply of the portable sprinkler-irrigation equipment accompanied by a detailed report, specifications and certificates showing that the proposed components have been successfully used in similar sprinkler systems so as to prove that the proposed equipment conforms to the requirements of this specification in a satisfactory manner.

Subsequent to the provision and acceptance of the proposals as above, the Project Manager may agree to the use of the proposed equipment, but his consent cannot be interpreted in any case whatsoever, as relieving the Contractor of his responsibilities for the supply of equipment which shall prove adequate and efficient during the testing procedure and the operation of the network.

The Project Manager reserves the right, on the other hand, to reject the Contractor's proposals if he finds them incomplete or if the proposed equipment does not conform to the requirements of this specification.

In such a case, within a reasonable period, not longer than one month, after communication of the above decision of the Project Manager to the Contractor, the latter is required to supplement and improve his original proposals and submit his revised recommendations.

If the Contractor fails to submit, within the above time limit, his final recommendations or if these are rejected by the Project Manager for the same reasons for which his original proposals were rejected, he is required to supply portable sprinkler irrigation equipment which will supply the Project Manager. If, however, he does not agree and insists on supplying the equipment which he has proposed, he must deposit a guarantee to an amount equal to the value of the equipment. This guarantee will remain in the hands of the Employer until the final acceptance and will be forfeited to the latter if during the test procedure and the operation of the network, it is ascertained that the portable sprinkler irrigation equipment supplied by the Contractor is not satisfactory. It is understood that the Contractor is, in restoration of all defective construction until final acceptance by the Project Manager.

### **Acceptance Tests**

Included with the specifications submitted by the Contractor shall be copies of any relevant international standards to which the items are to be constructed. The Project Manager reserves the right to request independent authenticated tests at the point of manufacture and also similar tests at the point of manufacture and also similar tests in situ under operating conditions. All costs shall be borne by the Contractor who

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will promptly replace any equipment which in the judgment of the Project Manager is found, either after testing or during operation and until final acceptance, as not conforming to the requirements of this Specification.

## **Measurement and Payment**

Measurement shall be made by assessing the number of satisfactorily installed and accepted items of portable sprinkler irrigation equipment.

Payment will be made for the number of items measured as described above and based on the respective contract unit prices. Such prices and payment constitute full compensation to the Contractor for supplying, hauling, storing and installing the equipment for paying patent rights for furnishing the equipment, materials and labour required for installing and checking the operation of the items in accordance with the foregoing requirements, and for any other related expense even if not explicitly stated above, but necessary for the complete and proper performance of the work and the satisfactory operation of the portable sprinkler irrigation equipment.

## **Portable Sprinkling Irrigation Equipment**

This equipment comprises the following as shown in the drawings:

- HDPE pipes of 6 m lengths, 20 -25mm diameter and of class 4 (6 bar),
- HDPE/GI adaptors,
- GI equal tee,
- 15mm diameter GI riser pipe with support (tripod or equivalent),
- 45.72 mm sprinklers (single nozzle) to deliver on average 0.16m<sup>3</sup>/hr at 20m head and of highly durable plastic material,

Also, refer to sub-sections 5.21.1, 5.21.2 and 5.21.3.

All equipment should be of recognized standards.

## **STEELWORK**

### **General**

Except where otherwise specified, structural steel shall be grade 43, complying with BS 7668, "Specification for weldable structural steels"

All structural rolled steel members shall comply in dimension, weight and tolerance with that shown on the drawings and with BS 4, "Structural steel sections" and BS EN 10056, 10067 and 10210.

### **Bolts, Nuts and Fastenings**

Bolts, studs, nuts and washers etc, shall be of mild steel unless otherwise specified. The dimensions and tolerances of nuts and bolts shall comply with BS 4190, "Specification for ISO metric black hexagon bolts, screws and nuts" or where specified to BS 3692, "Specification for ISO metric precision hexagon bolts, screws and nuts" and the threads shall be to BS 3643, "ISO metric screw threads". The heads of the bolts shall be forged out of the solid bar, the ends shall be cleanly cut with standard threads, and the nuts must fit the bolts accurately and tightly. Washers of the shape and type indicated on the drawings shall comply with BS 4320, "Specification for metal washers for Project Managerring purposes"

Where nuts, bolts and washers are required to be galvanized, the galvanizing shall be to BS 3382, "Specification for electroplated coatings on threaded components".

### **Electrodes**

Electrodes used in welding mild steel shall comply with the requirements of BS 639, "Specification for covered carbon and carbon manganese steel electrodes for manual metal-arc welding".

### **Contractor's Shop Drawings**

Where the Contractor is required to undertake the detailed design of the steelwork components, he shall provide the Project Manager with copies of detailed shop drawings for approval at least fourteen (14) days before commencing fabrication. The Contractor shall be responsible for the detailed design of all connections and these shall be fully detailed on the shop drawings together with all dimensions, clearances, welding details and procedures, machining, marking, etc. The Contractor shall not commence fabrication until he has received the Project Manager's written approval of the shop drawings. Approval of such drawings shall in no way

relieve the Contractor of his responsibility for accuracy or the correct operation of the component Fabrication and Erection of Steelwork

The standard of workmanship and Project Managing practices to be adopted for fabrication and erection shall conform to BS 449, "Specification for the use of structural steel in building" and BS 5531, "Code of practice for safety in erecting structural frames".

The Contractor shall supply samples of materials and standards of workmanship as required by the Project Manager. All samples approved by the Project Manager shall be retained and shall be considered as setting the standard for all subsequent work.

Inspection of work will be carried out by the Project Manager and the Contractor shall give sufficient notice of the date when fabricated steelwork is ready for inspection. The Contractor shall provide particulars of places and dates of manufacture of all materials for the Permanent Works and the names of the manufactures. Copies in duplicate of all orders for materials shall be sent to the Project Manager at the time of placing such orders.

The Contractor shall ensure that all foundation bolts and supports including built-in bolts, etc upon which the steelwork is to be erected are in the correct position and that the steelwork fits correctly in required positions without forcing or straining in any way. Any check by the Project Manager of the Contractor's measurements shall not relieve him of his responsibility for obtaining this fit unless any errors in position are clearly not attributable to him.

No permanent bolting or site welding shall be done until proper alignment has been obtained. The Contractor may use temporary jigs, anchors or supports during erection, but must allow for thermal movement to take place freely at all times.

If the Contractor wishes to drill holes in or fix attachments to the steelwork to carry temporary work such as shuttering, he shall obtain the Project Manager's approval of the positions and details of all such holes or attachments and shall close such holes and remove the attachments to the satisfaction of the Project Manager.

On completion of erection of any part of the steelwork on which the Contractor wishes to add further works, such as roofing, he shall first obtain the Project Manager's approval of the steelwork and remedy any defects required by the Project Manager. Any approval given shall in no way relieve the Contractor of his responsibility for ensuring the

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subsequent correct positioning and behaviour of the steel work of other parts of the structure.

## **Welding**

All shop welds shall be carried out by qualified welders who shall be under competent supervision. All welding is to be carried out in accordance with BS 5135, "Specification for arc welding of carbon and carbon manganese steels". The Contractor's proposals for welding shall be submitted to the Project Manager for approval before any work is undertaken.

The Project Manager may call for a test of a welder's capabilities in accordance with BS 4872, "Specification for approval testing of welders when welding procedure is not required".

In the case of site welds, the welding procedure for making each type of joint shall be approved by the Project Manager before the work is commenced and the Contractor shall make such trial welds as the Project Manager may require to demonstrate the soundness of the proposed method and the competence of his workmen.

Where site welding is used, all welded joints shall be subject to inspection by the Project Manager. Any welds that are in the opinion of the Project Manager defective shall be cut out and the welds remade to the satisfaction of the Project Manager. The cost of such corrective measures including any resultant delays shall be borne by the Contractor.

## **Painting General**

The Contractor shall submit to the Project Manager for his approval details of the types and manufacturers of paints he is proposing to use, together with the manufacturer's recommendations concerning preparation of surfaces, primers and undercoats, application methods, safety precautions and drying times for each type of paint. All paints used in the Works must be supplied ready-mixed in unbroken, sealed containers, which clearly show the type, colour and manufacturer of the paint and carry detailed "instructions for use".

All metal surfaces on which paint is to be applied shall be blast cleaned as laid down in BS 7079, "Preparation of steel substrates before application of paints and related products", or other mechanical means and fully prepared in accordance with the manufacturer's recommendations. Applications of paint coatings on external work shall not be carried out or continued in mist, rain or excessively damp conditions. The Contractor shall take all necessary precautions to prevent dust and dirt coming into contact with freshly applied paint before it has dried.

Paints shall be applied either by brushing or spraying in accordance with the manufacturer's instructions. The thinning of paints shall not be permitted without the approval of the Project Manager. Unless otherwise recommended by the manufacturer, the minimum interval between the application of a first coat of paint and the second shall be twenty-four hours (24 Hr). Special care shall be taken to ensure complete coverage of all corners, arises and openings without causing an excessive build-up of paint and avoiding runs.

Steelwork to be painted shall be clean and free from all rust, grease, oil and mill scale.

### **Painting Steelwork Immersed in Water**

Steelwork subject to immersion in water shall be blast cleaned or thoroughly mechanically cleaned by an approved alternative process and immediately coated before leaving the factory with zinc phosphate or similar compatible metallic inhibitive primer with a minimum dry film thickness of 50 microns. Following drying of the primer, the steelwork shall be coated with one coat of non-toxic, non-tainting, high build bituminous paint to BS 3416, "Specification for bitumen-based coating for cold application, suitable for use in contact with potable water", having a minimum dry film thickness of 100 microns.

After erection, damaged areas of steelwork shall be mechanically cleaned and touched up with primer and bituminous paint to fully restore the factory applied coating system and thickness.

Finally, two overall finish coats of bituminous paint with a minimum dry film thickness per coat of 100 microns giving an overall minimum dry film thickness of the complete coating system of 350 microns.

### **Painting other steelwork**

Where steelwork, which is not galvanized and not subject to immersion in water is required to be painted, it shall be thoroughly cleaned and painted prior to leaving the factory with:

- One coat of zinc phosphate or similar compatible metallic inhibitive primer with a minimum dry film thickness of 50 microns.
- One coat of red lead primer with a minimum dry film thickness of 50 microns.
- Two coats of micaceous iron oxide undercoat paint with a minimum dry film thickness per coat of 50 microns.



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After erection, damaged areas of steelwork shall be mechanically cleaned and touched up with primer and under coat to fully restore; the factory applied coating system and thickness.

Finally, one overall finish coat of enamel gloss micaceous iron oxide paint with a minimum dry film thickness of 50 microns giving an overall minimum dry film thickness for the complete coating system of 250 microns.

### **Galvanising**

All steel and ironwork of whatever kind required to be galvanized is to be pickled in dilute hydrochloric acid and then washed, fluxed and stoved and coated with zinc by dipping in a bath of molten zinc. All components are to be immersed in the bath only for the time sufficient for them to attain the temperature of the bath, they are then to be withdrawn at such a speed that a coating of 80 microns thickness is achieved, or such other practical maximum thickness for the component as defined in BN EN ISO 1461:1999, "Specification for hot dip galvanized coatings on iron and steel articles".

The galvanizing is to be carried out after all drilling, chipping, trimming, filing; fitting and bending operations are complete and shall cover all faces evenly.

After erection of galvanized steel components, damaged or welded areas shall be painted immediately after cleaning with two coats of metallic zinc primer with each coat having a thickness of 50 microns. The paint shall be applied strictly in accordance with the manufacturer's instructions and shall be compatible with any subsequent paint systems to be applied.

### **Galvanised Handrails**

Handrail tubes shall be 38mm nominal diameter steel tube to BS 1387, "Specification for screwed and socketed steel tubes and tubulars and for plain end steel tubes suitable for welding or for screwing to BS 21 pipe threads". The top and bottom rails shall be 900mm and 450mm respectively above floor level. The rails and vertical standards shall be connected using screwed steel pipe fittings to BS 1740, "Specification for wrought steel pipe fittings (screwed BS 21 R-series threads)", where practical with the final connections being welded in accordance with Clause 6.6.

The handrail assembly shall be securely mounted on base plates fabricated of mild steel and attached to the base or foundation slab in a manner to be approved by the Project Manager.

All sharp edges and rough areas shall be carefully ground off and the entire handrail assembly cleaned and galvanized in accordance with Clause 6.10.

**Gates**

Gates of the types and sizes shown on the drawings shall be supplied and installed where indicated on the drawings. The gate shall be drop-tight and shall be suitable in all respects for use in raw water. The gates shall have flush inverts.

Gates shall be supplied complete with all frames, cills, gates, seals, spindles, hand wheels and headstocks as required.

The frames and gates shall be fabricated in galvanized steel.

All gates shall have rising spindles with protection tubes, headstock, hand wheel etc. and intermediate supports where the spindle is longer than 1500mm. Intermediate guide brackets are to be located 600mm above the gate frame, 400mm below the base of the headstock and at a maximum spacing of 1500mm, to suit or as recommended by the manufacturer and as approved by the Project Manager.

**Stoplogs**

Where shown on drawings the stop-logs shall be hardwood of the stated dimensions and shall be approved by the Project Manager before supplying to site. Where shown on the drawings stop-logs shall be bolted to steel frames of stated dimensions to form hardwood gates.



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## **ROAD WORKS**

### **General**

#### **Earthworks**

Earthworks shall be carried out in accordance with the requirements of Section 2 of this Specification.

In carrying out the earthworks, the Contractor shall take all necessary precautions to avoid damage to or deterioration of the earthwork materials. He shall so arrange his work that water, which is brought onto or enters the earthworks at any time either in advance of or during construction shall be rapidly dispersed until the permanent work is completed.

#### **Formation Level**

Formation level on embankments and in cuttings shall be the surface level of the ground obtained after completion of the earthworks.

#### **Preparation and Formation**

The formation to carriageways and verges shall be prepared to the satisfaction of the Project Manager, well cleaned, free from mud and slurry, properly shaped and compacted by rolling to an even and uniform surface as shown on the Drawings or directed by the Project Manager. Where soft pockets become evident during rolling, they shall be removed and replaced with sound compacted material.

Unless directed otherwise by the Project Manager the formation shall be covered by the sub-base within 48 hours after the preparation the formation.

Once the formation has been prepared, constructional traffic, other than that specifically required for subsequent roadwork operations, shall not be allowed to run thereon without the permission of the Project Manager.

#### **Gravel Wearing Course**

On completion of the road formation, the Contractor shall lay sufficient gravel wearing course over the full width of the carriageway to achieve the consolidated depth and camber shown on the drawings or as directed by the Project Manager.

Gravel wearing course shall consist of suitable natural gravel obtained from borrow pits approved by the Project Manager and complying with the wet sieve analysis given below:



The in-situ dry density of the compacted material will be determined by the sand replacement method described in Test No 15A in BS 1377 or such other test as the Project Manager shall consider appropriate. Each layer of fill material shall be approved by the Project Manager prior to the placing of subsequent layers. Where the material is too wet or too dry the Contractor shall have the option of collecting the moisture content by watering or drying as appropriate, or modifying his compaction procedure so as to obtain the required dry density.

### **Rehabilitation of Existing Access Roads**

#### **General**

The provisions of Clause 2 shall apply save where expressly varied hereunder.

All interventions shown on strip maps provided are subject to confirmation by the Project Manager on Site.

#### **Site Clearing**

The width and length over which site clearing is to be carried out shall be as instructed by the Project Manager.

#### **Spoil of Unsuitable Material**

This shall be in situ material, which is unsuitable to remain in the road, and has been instructed by the Project Manager to be spoilt. Unsuitable material shall be deposited in spoil areas located by the Contractor subject to the approval by the Project Manager. The rate for spoil shall include for the cost of excavating the material, loading, transporting, depositing, spreading and levelling the material in a spoil area, all to the satisfaction of the Project Manager.

#### **Earthworks Fill**

The Contractor shall supply from a source approved by the Project Manager, place and compact suitable borrow material having a minimum CBR of 10%, at 95% compaction as determined by AASHTO T99 to areas that require to be raised or where there is a deficiency of in situ material for reshaping.

#### **Light Grading**

Where this term is instructed, the road shall be graded to redistribute the existing material as required to achieve the specified cross section of the road, watered and compacted. This item applies where the required movement of material is not greater than 1m<sup>3</sup>/m





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## **Heavy Grading**

The Contractor shall scarify the road surface, add fill material where required, reshape and compact to achieve the specified cross section. This item applies where the required movement of material is greater than 1m<sup>3</sup>/m

## **Gravel Stockpiling**

No separate measurement shall be made for stockpiling gravel and the Contractor will be deemed to have allowed for the costs elsewhere in his rates.

## **Overburden Removal**

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

## **Haulage**

The rate for gravel wearing course includes for the supply of material inclusive of extraction, loading and transportation to Site for a maximum haulage distance of 30km. Where suitable gravel is not available within this distance, overhaul will be paid for. Measurement shall be the product of the volume of compacted material in situ and the haulage distance in excess of 30km, one way, along the shortest route, as determined by the Project Manager.

## **Drainage Works**

### **Culvert Installation**

This shall include the provision and installation of a specified internal diameter including excavation and backfill to a compaction of 95% of maximum dry density as determined by AASHTO T99. The backfill material is to be approved by the Project Manager. The rate includes any provisions necessary for diversion of traffic.

### **Mass Concrete, Beds and Surrounds**

Unless otherwise shown on the drawings, the concrete shall be class C20/20

### **7Mitre Drains and Catch Water Drains**

These will be formed at the locations and the lines and levels shown on the drawings or instructed by the Project Manager.

**Side Drains**

These will be formed to the lines and levels as shown in the drawings and at locations as instructed by the Project Manager. Material excavated from the side drains may be incorporated into the reshaped road if suitable. Otherwise, it shall be spoiled in approved spoil areas.

**Cleaning of Existing Drains**

The Contractor shall clean existing blocked culverts and clear side drains as may be directed by the Project Manager.

**Repair of Existing Drains**

The Contractor shall replace broken culverts, and repair or reconstruct broken wingwalls and headwalls as directed by the Project Manager.

## CONSTRUCTION TOLERANCES

The following are the tolerances within which the works are to be executed or as directed by the Project Manager:

### EARTHWORKS

Top level of Embankments after compaction +100/ -0mm		
Sides of Embankments over a 10 m length 0mm	+100/	-
Channel or Excavation cutting	+20/	-20mm
Channel Water Way Area	-	0
Horizontal Alignment of Channels:	Maximum	300mm
	Over 20m length	100 mm
Formation Level for Structures filled with concrete	+0/	-ve
Formation Level for Gabions 100mm	+0/	-

### CONCRETE STRUCTURES

The following tolerances shall apply to all wrought formed and fair or fine unformed finishes.

#### Tolerance from Specified Position

Maximum departure of plan position of structure  
150mm

#### Tolerance from Specified Dimension

Maximum departure in thickness, cross sectional dimension or position of columns, beams, walls, footings and the like  
10mm

+25/ -

#### Surface Tolerance on Straightness or Departure from Specified Curve

#### General Surfaces

Maximum deviation in horizontal or vertical direction

- gradual over a 10m length 25mm
- abrupt 10mm

### **Surfaces in Contact with Flowing Water**

Maximum deviation in direction of flow or normal to flow

- |                             |      |
|-----------------------------|------|
| • gradual over a 10m length | 15mm |
| • abrupt                    | 5mm  |

### **Reinforcement**

Maximum departure in required spacing	15mm
---------------------------------------	------

Minimum lap length shall be:

- |  |    |       |     |
|--|----|-------|-----|
| • In the case of mild steel reinforcing diameter       | 40 | times | bar |
| • in the case of high yield steel reinforcing diameter | 50 | times | bar |

### **Stonework**

Pitching and Masonry over a 2 m length

+100/ -25mm

Face of gabion basket

+75/ -25mm

Thickness of tipped rock or filter layer

+100/ - 0mm



<b>Specification</b>
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**PARTICULAR SPECIFICATIONS**

**A PRICING ITEMS OF PRELIMINARIES**

Prices **SHALL BE INSERTED** against items of “preliminaries” in the tenderer’s priced Bills of Quantities. The contractor is advised to read and understand all preliminary items.

**B DESCRIPTION OF THE WORKS**

The contract works include construction and Completion of:

1. intake works
2. sedimentation basin
3. conveyance pipeline
4. Main pipeline
5. Sub-main pipelines
6. Distribution pipelines
7. In field system

**LOCATION OF THE SITE**

The Proposed Kirumi Kiamunjari Irrigation Project is located in Ndunguri, Kariakomo, Kirumi and Ikumbo Sub-locations of Ganga Division and Kithare Sub-location of Chogoria Division in Maara Sub-County of Tharaka- Nithi County.

**C FLOOR AREAS**

To be done as per description in bill of quantities and technical drawings

**D MEASUREMENTS**

In the event of any discrepancies arising between the Bills of Quantities and the actual works, the site measurements shall generally take precedence. However, such discrepancies between any contract documents shall immediately be referred to the PROJECT MANAGER in accordance with the Conditions of Contract. The discrepancies shall then be treated as a variation and be dealt with in accordance with the said Conditions.

**E LOCATION OF SITE**

IS AS INDICATED ELSEWHERE

**F SIGNING OF THE TENDER DOCUMENTS**

The authorized person shall append his / her signature and / or company's rubberstamp on each and every page of tender document in which entries have been made.

**G DEMOLITIONS AND ALTERATIONS**

The Contractor is to allow for all temporary protection required during the works including ordinary and special dust screens, hoardings, barriers, warning signs, etc as directed by the Project Manager and as necessary for the adequate propping and protection of existing property, finishes, workmen employed on the site, employer's agents and the public. Any damage or loss incurred due to the insufficiency of such protection must be made good by the Contractor. All protective devices are to be removed on completion of the works and any necessary making good consequent upon this is to be executed to the satisfaction of the Project Manager

The works shall be propped, strutted and supported as necessary before any alteration or demolition work commences. Prices shall include for all cleaning and preparatory work to structure and finishes and for making good to all finishes on completion whether or not specifically described.

Unless described as set aside for re-use all arising debris and surplus materials shall be carefully removed from building and cart away from site.

The Contractor shall be entirely responsible for any breakage or damage which may occur to materials required for re-use during their removal unless it is certified by the Project Manager that such damage or breakage was inevitable as a result of the condition of the item concerned

**H CLEARING AWAY**

The Contractor shall remove all temporary works, rubbish, debris and surplus materials from the site as they accumulate and upon completion



of the works, remove and clear away all plant, equipment, rubbish, unused materials and stains and leave in a clean and tidy state to the reasonable satisfaction of the Project Manager.

The whole of the works shall be delivered up clean, complete and in perfect condition in every respect to the satisfaction of the Project Manager.

**I CLAIMS**

It shall be a condition of this contract that upon it becoming reasonably apparent to the Contractor that he has incurred losses and / or expenses due to any of the contract conditions, or by any other reason whatsoever, he shall present such a claim or intent to claim notice to the PROJECT MANAGER within the contract period. No claim shall be entertained upon the expiry of the said contract period.

**J PAYMENTS**

The tenderer's attention is drawn to the General Conditions of Contract and the Particular Conditions of Contract

**K PREVENTION OF ACCIDENT, DAMAGE OR LOSS**

The Contractor is notified that these works are to be carried out on a restricted site where the client is going on with other normal activities. The Contractor is thus instructed to take reasonable care in the execution of the works as to prevent accidents, damage or loss and disruption of activities being carried out by the Client. The Contractor shall allow in his rates any expense he deemed necessary by taking such care within the site.

**L WORKING CONDITIONS**

The Contractor shall allow in his rates for any interference that he may encounter in the course of the works for the Client may in some cases ask the Contractor not to proceed with the works until some activities within the site are completed, as the facility will be operating as usual during the course of the contract.

**M SIGNBOARD**

Allow for providing, erecting, maintaining throughout the course of the Contract and afterwards clearing away a signboard as designed, specified and approved by the Project Manager.

**N LABOUR CAMPS**

The Contractor shall be allowed to house labour on site

**O MATERIALS FROM DEMOLITIONS**

Any materials arising from demolitions and not re-used shall become the property of the Client.

**P PRICING RATES**

The tenderer shall include for all costs in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract.

**Q SECURITY**

The Contractor shall allow for providing adequate security for the works and the workers in the course of execution of this contract. No claim will be entertained from the Contractor for not maintaining adequate security for both the works and workers.

**R URGENCY OF THE WORKS**

The Contractor is notified that these “**works are urgent**” and should be completed within the period stated in these Particular Preliminaries.

The Contractor shall allow in his rates for any costs he/ she deems that he/she may incur by having to complete these works within the stipulated contract period.

**S PAYMENT FOR MATERIALS ON SITE**

All materials for incorporation in the works must be stored on site before payment is effected, unless specifically exempted by the Project Manager. This is to include materials of the Contractor, nominated sub-Contractors and nominated suppliers.

**T EXISTING SERVICES**

Prior to the commencement of any work, the Contractor is to ascertain from the relevant authority the exact position, depth and level of all existing services in the area and he/she shall make whatever provisions may be required by the authorities concerned for the support, maintenance and protection of such services.

**U CONTRACT COMPLETION PERIOD**

The contract completion period in accordance with clause 31 of the Conditions of Contract must be adhered to.

The '**PROJECT MANAGER**' shall strictly monitor the Contractors progress in relation to the progress chart and should it be found necessary the '**PROJECT MANAGER**' shall inform the Contractor in writing that his actual performance on site is not satisfactory .In all such cases the Contractor shall accelerate his rate of performance production and progress by all means such as additional labour, plant, e.t.c and working overtime all at his cost.

**V PERFORMANCE BOND**

A guarantee of 17 % of the contract sum will be required in accordance. No payment on account for the works executed will be made to the contractor until he has submitted the Performance guarantee to the Project Manager duly signed, sealed and stamped from an approved Bank.

**W DELIVERY OF TENDER**

Tenders and all documents in connection therewith, as specified above must be delivered in the addressed envelope which should be properly sealed and deposited at the offices as specified in the letter accompanying these documents or as indicated in the advertisement.

Tenders will be opened at the time specified in the letter accompanying these Tender Documents or as indicated in the advertisement. Tenders delivered/received later than the above time will not be opened.

**X VALUE ADDED TAX**

The Contractor's attention is drawn to the Legal Notice in the Finance Act part 3 Section 21(b) operative from 1<sup>st</sup> September, 1993 which requires payment of VAT on all contracts. The Contractor should therefore include allowance in his rates and prices for prices for VAT and any other Government taxes currently in force.

ITEM	DESCRIPTION
-	<b>GENERAL PRELIMINARIES</b>
<b>A.</b>	<b>PRICING ITEMS OF PRELIMINARIES AND PREAMBLES</b>
	<p>Prices will be inserted against items of Preliminaries in the Contractor's priced Bills of Quantities and Specification.</p> <p>The Contractor shall be deemed to have included in his prices or rates for the various items in the Bills of Quantities or Specification for all costs involved in complying with all the requirements for the proper execution of the whole of the works in the Contract.</p>
<b>B.</b>	<b>ABBREVIATIONS</b>
	<p>Throughout these Bills, units of measurement and terms are abbreviated and shall be all the requirements for the proper execution of the whole of the works in the Contract.</p>
	<i>Ha</i> Shall mean hectares
	<i>C.M.</i> Shall mean cubic metre
	<i>S.M.</i> Shall mean square metre
	<i>L.M.</i> Shall mean linear metre
	<i>MM</i> Shall mean Millimeter
	<i>Kg.</i> Shall mean Kilogramme
	<i>No.</i> Shall mean Number
	<i>Prs.</i> Shall mean Pairs
	<i>B.S.</i> - Shall mean the British Standard Specification Published by the British Standards Institution, 2 Park Street, London W.I., England.
	<i>Ditto</i> - Shall mean the whole of the preceding description except as qualified in the description in which it occurs.
	<i>m.s.</i> Shall mean measured separately.

	<p><i>a.b.d</i> Shall mean as before described.</p>
<b>A.</b>	<p><b>EXCEPTION TO THE STANDARD METHOD OF MEASUREMENT</b></p> <p><i>Attendance</i> ; Clause B19(a) of the Standard Method of Measurement is deleted and the following clause is substituted:-</p> <p>Attendance on nominated Sub-Contractors shall be given as an item in each case shall be deemed to include: allowing use of standing scaffolding, mess rooms, sanitary accommodation and welfare facilities; provision of special scaffolding where necessary; providing space for office accommodation and for storage of plant and materials; providing light and water for their work: clearing away rubbish; unloading checking and hoisting: providing electric power and removing and replacing duct covers, pipe casings and the like necessary for the execution and testing of Sub- Contractors' work and being responsible for the accuracy of the same.</p> <p><i>Fix Only</i>:-</p> <p>"Fix Only" shall mean take delivery at nearest railway station (Unless otherwise stated),pay all demurrage charges, load and transport to site where necessary, unload, store, unpack, assemble as necessary, distribute to position, hoist and fix only.</p>
<b>B.</b>	<p><b>EMPLOYER</b></p> <p>As defined in the conditions of contract</p>
<b>C.</b>	<p><b>PROJECT MANAGER</b></p> <p>The term "P.M." wherever used in these Bills of Quantities shall be deemed to imply the Project Manager as defined in of the Conditions of Contract or such person or persons as may be duly authorised to represent him on behalf of the Government.</p>
<b>D.</b>	<p><b>ARCHITECT</b></p> <p>The term "Architect" shall be deemed to mean "The P.M." as defined above</p>
<b>A</b>	<p><b>QUANTITY SURVEYOR</b></p>

The term "Quantity Surveyor" shall be deemed to mean "The P.M." as defined above.

**B ELECTRICAL ENGINEER**

The term "Electrical Engineer" shall be deemed to mean "The P.M." as defined above

**C MECHANICAL ENGINEER**

The term "Mechanical Engineer" shall be deemed to mean "The P.M." as defined

**D STRUCTURAL ENGINEER**

The term "Structural Engineer" shall be deemed to mean "The P.M." as defined above

Particulars of insertions to be made in the Appendix to the Contract Agreement will be found in the Particular Preliminaries part of these Bills of Quantities

**A BOND.**

The Contractor shall find and submit on the Form of Tender as given in the instructions to bid and SPN

**B PLANT, TOOLS AND VEHICLES**

Allow for providing all scaffolding, plant, tools and vehicles required for the works except in so far as may be stated otherwise herein and except for such items specifically and only required for the use of nominated Sub-Contractors as described herein. No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.

**C TRANSPORT.**

Allow for transport of workmen, materials, etc., to and from the site at such hours and by such routes as may be permitted by the competent authorities.

**D MATERIALS AND WORKMANSHIP.**

All materials and workmanship used in the execution of the work shall be of the best quality and description unless otherwise stated. The Contractor shall order all materials to be obtained from overseas immediately after the Contract is signed and shall also ensure they are onsite when required for use in the works. The Bills of Quantities shall not be used for the purpose of ordering materials.

**E SIGN FOR MATERIALS SUPPLIED.**

The Contractor will be required to sign a receipt for all articles and materials supplied by the **PROJECT MANAGER** at the time of taking deliver thereof, as having received them in good order and condition, and will thereafter be responsible for any loss or damage and for replacements of any such loss or damage with articles and/or materials which will be supplied by the **PROJECT MANAGER** at the current market prices including Customs Duty and V.A.T., all at the Contractor's own cost and expense, to the satisfaction of the **PROJECT MANAGER**

**A STORAGE OF MATERIALS**

The Contractor shall provide at his own risk and cost where directed on the site weather proof lock-up sheds and make good damaged or disturbed surfaces upon completion to the satisfaction of the **PROJECT MANAGER** Nominated Sub-Contractors are to be made liable for the cost of any storage accommodation provided especially for their use.

**B SAMPLES**

The Contractor shall furnish at his own cost any samples of materials or workmanship including concrete test cubes required for the works that may be called for by the **PROJECT MANAGER** for his approval until such samples are approved by the **PROJECT MANAGER** and the **PROJECT MANAGER**, may reject any materials or workmanship not in his opinion to be up to approved samples. The **PROJECT MANAGER** shall arrange for the testing of such materials as he may at his discretion deem desirable, but the testing shall be made at the expense of the Contractor and not at the expense of the **PROJECT MANAGER**. The Contractor shall pay for the testing in accordance with the current scale of testing charges laid down by the Ministry of Roads, Housing and Public Works.



The procedure for submitting samples of materials for testing and the method of marking for identification shall be as laid down by the **PROJECT MANAGER** The Contractor shall allow in his tender for such samples and tests except those in connection with nominated sub-contractors' work.

**C GOVERNMENT ACTS REGARDING WORK PEOPLE ETC.**

Allow for complying with all Government Acts, Orders and Regulations in connection with the employment of Labour and other matters related to the execution of the works. In particular the Contractor's attention is drawn to the provisions of the Factory Act 1950 and his tender must include for all costs arising or resulting from compliance with any Act, Order or Regulation relating to Insurances, pensions and holidays for workpeople or so the safety, health and welfare of the workpeople.

The Contractor must make himself fully acquainted with current Acts and Regulations, including Police Regulations regarding the movement, housing, security and control of labour, labour camps , passes for transport, etc. It is most important that the Contractor, before tendering, shall obtain from the relevant Authority the fullest information regarding all such regulations and/or restrictions which may affect the organisation of the works, supply and control of labour, etc., and allow accordingly in his tender. No claim in respect of want of knowledge in this connection will be entertained.

**A SECURITY OF WORKS ETC.**

The Contractor shall be entirely responsible for the security of all the works stores, materials, plant, personnel, etc., both his own and sub-contractors' and must provide all necessary watching, lighting and other precautions as necessary to ensure security against theft, loss or damage and the protection of the public.

**B PUBLIC AND PRIVATE ROADS.**

Maintain as required throughout the execution of the works and make good any damage to public or private roads arising from or consequent upon the execution of the works to the satisfaction of the local and other competent authority and the **PROJECT MANAGER**

**C EXISTING PROPERTY.**

The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains and other services and he will be held responsible for and shall make good all such damage arising from the execution of this contract at his own expense to the satisfaction of the **PROJECT MANAGER**

<p><b>D</b></p>	<p><b>VISIT SITE AND EXAMINE DRAWINGS.</b></p> <p>The Contractor is recommended to examine the drawings and visit the site the location of which is described in the Particular Preliminaries hereof. He shall be deemed to have acquainted himself therewith as to its nature, position, means of access or any other matter which, may affect his tender. No claim arising from his failure to comply with this recommendation will be considered.</p>
<p><b>E</b></p>	<p><b>ACCESS TO SITE AND TEMPORARY ROADS.</b></p> <p>Means of access to the Site shall be agreed with the <b>PROJECT MANAGER</b> prior to commencement of the work and Contractor must allow for building any necessary temporary access roads for the transport of the materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, crossings, bridges, or any other means of gaining access to the Site. Upon completion of the works, the Contractor shall remove such temporary access roads; temporary culverts, bridges, etc., and make good and reinstate all works and surfaces disturbed to the satisfaction of the <b>PROJECT MANAGER</b> The Contractor should also allow for relocating existing fence (approx. 30 metres long).</p>
<p><b>A</b></p>	<p><b>AREA TO BE OCCUPIED BY THE CONTRACTOR</b></p> <p>The area of the site which may be occupied by the Contractor for use of storage and for the purpose of erecting workshops, etc., shall be defined on site by the <b>PROJECT MANAGER</b>.</p>
<p><b>B</b></p>	<p><b>OFFICE ETC. FOR THE PROJECT MANAGER</b></p> <p>The Contractor shall provide, erect and maintain where directed on site and afterwards dismantle the site office of the standard type, complete with furniture. He shall also provide a strong metal trunk complete with strong hasp and staple fastening and two keys. He shall provide, erect and maintain a lock-up type water or bucket closet for the sole use of the <b>PROJECT MANAGER</b> including making temporary connections to the drain where applicable to the satisfaction of Government and Medical Officer of Health and shall provide services of cleaner and pay all conservancy charges and keep both office and closet in a clean and sanitary condition from commencement to the completion of the works and dismantle and make good disturbed surfaces. The office and closet</p>

	<p>shall be completed before the Contractor is permitted to commence the works. The Contractor shall make available on the Site as and when required by the "<b>PROJECT MANAGER</b>" a modern and accurate level together with leveling staff, ranging rods and 50 metre metallic or linen tape.</p> <p><b>C WATER AND ELECTRICITY SUPPLY FOR THE WORKS</b></p> <p>The Contractor shall provide at his own risk and cost all necessary water, electric light and power required for use in the works. The Contractor must make his own arrangements for connection to the nearest suitable water main and for metering the water used. He must also provide temporary tanks and meters as required at his own cost and clear away when no longer required and make good on completion to the entire satisfaction of the <b>PROJECT MANAGER</b>. The Contractor shall pay all charges in connection herewith. No guarantee is given or implied that sufficient water will be available from mains and the Contractor must make his own arrangements for augmenting this supply at his own cost. Nominated Sub--contractors are to be made liable for the cost of any water or electric current used and for any installation provided especially for their own use.</p> <p><b>D SANITATION OF THE WORKS</b></p> <p>The Sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Government and/or Local Authorities, Labour Department and the <b>PROJECT MANAGER</b>.</p>
<p><b>A</b></p>	<p><b>SUPERVISION AND WORKING HOURS</b></p> <p>The works shall be executed under the direction and to the entire satisfaction in all respects of the <b>PROJECT MANAGER</b> who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and sub-Contractors or other places where work is being prepared for the contract.</p>
<p><b>B</b></p>	<p><b>PROVISIONAL SUMS.</b></p>

	<p>The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7(i) of the Standard Method of Measurement. Such sums are net and no addition shall be made to them for profit.</p> <p><b>C PRIME COST (OR P.C.) SUMS.</b></p> <p>The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A item A7 (ii) of the Standard Method of Measurement. Persons or firms nominated by the <b>PROJECT MANAGER</b> to execute work or to provide and fix materials or goods are described herein as Nominated Sub-Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.</p> <p><b>D PROGRESS CHART.</b></p> <p>The Contractor shall provide within two weeks of Possession of Site and in agreement with the <b>PROJECT MANAGER</b> a Progress Chart for the whole of the works including the works of Nominated Sub-Contractors; one copy to be handed to the <b>PROJECT MANAGER</b> and a further copy to be retained on Site. Progress to be recorded and chart to be amended as necessary as the work proceeds.</p> <p><b>C. ADJUSTMENT OF P.C. SUMS.</b></p> <p>In the final account all P.C. Sums shall be deducted and the amount properly expended upon the <b>PROJECT MANAGER'S</b> order in respect of each of them added to the Contract sum. The Contractor shall produce to the <b>PROJECT MANAGER</b> such quotations, invoices or bills, properly receipted, as may be necessary to show the actual details of the sums paid by the Contractor. Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance"</p>
<p><b>A</b></p>	<p><b>ADJUSTMENT OF P.C. SUMS. Ctd.....</b></p> <p>Should the Contractor be permitted to tender and his tender be accepted of any work for which a P.C. Sum is included in these Bill of Quantities profit and attendance will be allowed at the same rate as it would be if the work were executed by a Nominated Sub-Contractor.</p>
<p><b>B</b></p>	<p><b>ADJUSTMENT OF PROVISIONAL SUMS.</b></p>

	<p>In the final account all Provisional Sums shall be deducted and the value of the work properly executed in respect of them upon the <b>PROJECT MANAGER's</b> order added to the Contract Sum. Such work shall be valued as described for Variations, but should any part of the work be executed by a Nominated Sub-Contractor, the value of such work or articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.</p> <p><b>C</b>      <b>NOMINATED SUB-CONTRACTORS</b></p> <p>When any work is ordered by the <b>PROJECT MANAGER</b> to be executed by nominated sub-contractors, the Contractor shall enter into sub-contracts and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such Sub-Contractors any or all of the facilities described in these Preliminaries. The Contractor should price for these with the nominated Sub-contract Contractor's work concerned in the P.C. Sums under the description "add for Attendance".</p> <p><b>D</b>      <b>DIRECT CONTRACTS</b></p> <p>Notwithstanding the foregoing conditions, the Government reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C. Sum in the Bills of Quantities and to pay for the same direct. In any such instances, profit relative to the P.C. Sum the priced Bills of Quantities will be adjusted as described for P.C. Sums and allowed.</p>
<b>A</b>	<p><b>ATTENDANCE UPON OTHER TRADESMEN, ETC.</b></p> <p>The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this Contract every facility for carrying out their work and also for use of his ordinary scaffolding. The Contractor, however, shall not be required to erect any special scaffolding for them. The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the <b>PROJECT MANAGER</b> and the work will be measured and paid for to the extent executed at rates provided in these Bills.</p>

<p><b>B</b></p>	<p><b>INSURANCE</b></p> <p>The Contractor shall insure as required in the Conditions of Contract. No payment on account of the work executed will be made to the Contractor until he has satisfied the <b>PROJECT MANAGER</b> either by production of an Insurance Policy or and Insurance Certificate that the provision of the foregoing Insurance Clauses have been complied with in all respects. Thereafter the <b>PROJECT MANAGER</b> shall from time to time ascertain that premiums are duly paid up by the Contractor who shall if called upon to do so, produce the receipted premium renewals for the <b>PROJECT MANAGER's</b> inspection.</p>
<p><b>C</b></p>	<p><b>PROVISIONAL WORK</b></p>
<p><b>D</b></p>	<p><b>ALTERATIONS TO BILLS, PRICING, ETC.</b></p> <p>All work described as "Provisional" in these Bills of Quantities is subject to remeasurement in order to ascertain the actual quantity executed for which payment will be made. All "Provisional" and other work liable to adjustment under this Contract shall left uncovered for a reasonable time to allow all measurements needed for such adjustment to be taken by the <b>PROJECT MANAGER</b> Immediately the work is ready for measuring, the Contractor shall give notice to the <b>PROJECT MANAGER</b>. If the Contractor makes default in these respects he shall if the <b>PROJECT MANAGER</b> so directs uncover the work to enable all measurements to be taken and afterwards reinstate at his own expense.</p>
<p><b>A</b></p>	<p><b>BLASTING OPERATIONS</b></p> <p>Any unauthorized alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items against which no price has been inserted in the priced Bills of Quantities. All items of measured work shall be priced in detail and the Tenders containing Lump Sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted.</p> <p>Blasting will only be allowed with the express permission of the <b>PROJECT MANAGER</b> in writing. All blasting operations shall be carried out at the Contractor's sole risk and cost in accordance with any Government regulations in force for the time being, and any special</p>

regulations laid down by the **PROJECT MANAGER** governing the use and storage of explosives.

**B MATERIALS ARISING FROM EXCAVATIONS**

Materials of any kind obtained from the excavations shall be the property of the Government. Unless the **PROJECT MANAGER** directs otherwise such materials shall be dealt with as provided in the Contract. Such materials shall only be used in the works, in substitution of materials which the Contractor would otherwise have had to supply with the written permission of the **PROJECT MANAGER**. Should such permission be given, the Contractor shall make due allowance for the value of the materials so used at a price to be agreed.

**C PROTECTION OF THE WORKS.**

Provide protection of the whole of the works contained in the Bills of Quantities, including casing, casing up, covering or such other means as may be necessary to avoid damage to the satisfaction of the **PROJECT MANAGER** and remove such protection when no longer required and make good any damage which may nevertheless have been done at completion free of cost to the Government.

**D REMOVAL OF RUBBISH ETC.**

Removal of rubbish and debris from the Buildings and site as it accumulates and at the completion of the works and remove all plant, scaffolding and unused materials at completion.

**E WORKS TO BE DELIVERED UP CLEAN**

Clean and flush all gutters, rainwater and waste pipes, manholes and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works and remove all marks, blemishes, stains and defects from joinery, fittings and decorated surfaces generally, polish door furniture and bright parts of metalwork and leave the whole of the buildings watertight, clean, perfect and fit for occupation to the approval of the **PROJECT MANAGER**

**A. GENERAL SPECIFICATION.**

For the full description of materials and workmanship, method of execution of the work and notes for pricing, the Contractor is referred to the Ministry of Roads, Public Works and Housing General Specification dated 19715 or any subsequent revision thereof which is issued as a separate document, and which shall be allowed in all respects unless it conflicts with the General Preliminaries, Trade Preambles or other items in these Bills of Quantities.

**B. MATERIALS ON SITE**

All materials for incorporation in the works must be stored on or adjacent to the site before payment is effected unless specifically exempted by the **PROJECT MANAGER**. This includes the materials of the Main Contractor, Nominated Sub-Contractors and Nominated Suppliers.

**C. HOARDING**

The Contractor shall enclose all the site under construction with a hoarding 2400 mm high consisting of iron sheets gauge 30 on 170 x 50 mm 2nd grade treated sawn cypress timber posts firmly secured at 1800 mm centre with two 75 x 50 mm 2nd grade treated sawn cypress timber rails. The Contractor is in addition required to take all precautions necessary for the safe custody of the works, materials, plant, public and Employer's property on the site.

**E. CONTRACTOR'S SUPERINTENDENCE/SITE AGENT**

The Contractor shall constantly keep on the works a literate English speaking Agent or Representative, competent and experienced in the kind of work involved who shall give his whole experience in the kind of work involved and shall give his whole time to the superintendence of the works. Such Agent or Representative shall receive on behalf of the Contractor all directions and instructions from the Project Manager and such directions shall be deemed to have been given to the Contractor in accordance with the Conditions of Contract.



**Drawings**

**See separate file /CD**

**Supplementary Information**

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## **PART 3 – Conditions of Contract and Contract Forms**



## **Section VII. General Conditions (GC)**

These **General Conditions (GC)**, read in conjunction with the **Particular Conditions (PC)** and other documents listed therein, should be a complete document expressing fairly the rights and obligations of both parties.

## Table of Clauses

<b>1</b>	<b>General Provisions .....</b>	<b>417</b>
1.1	Definitions .....	417
1.2	Interpretation .....	420
1.3	Communications .....	421
1.4	Law and Language .....	422
1.5	Priority of Documents .....	423
1.15	Contract Agreement .....	423
1.7	Assignment.....	423
1.8	Care and Supply of Documents.....	423
1.9	Confidential Details .....	424
1.17	Compliance with Laws .....	424
1.11	Joint and Several Liability .....	425
1.12	Inspections and Audit by the Bank .....	426
1.13	Project Manager’s Decisions.....	426
1.14	Delegation .....	426
1.15	Subcontracting.....	426
1.115	Personnel and Equipment.....	426
1.17	Other Contractors.....	427
1.18	Employer’s and Contractor’s Risks.....	427
1.19	Employer’s Risks .....	428
1.20	Contractor’s Risks .....	428
1.21	Insurance .....	428
1.22	Site Investigation Reports .....	429
1.23	Contractors to Construct the Works.....	429
1.24	The Works to Be Completed by the Intended Completion Date .....	429
1.25	Approval by the Project Manager.....	430
1.215	Safety .....	430
1.27	Discoveries .....	430
1.28	Possession of the Site .....	430
1.29	Access to the Site.....	430
1.30	Instructions.....	430
1.31	Appointment of the Adjudicator .....	431
1.32	Procedure for Disputes .....	431
<b>2</b>	<b>Time Control.....</b>	<b>431</b>
2.1	Programme .....	431
2.2	Extension of the Intended Completion Date .....	432
2.3	Acceleration.....	432
2.4	Delays Ordered by the Project Manager.....	433
2.5	Management Meetings .....	433
2.15	Early Warning .....	434

---

<b>3 Quality Control .....</b>	<b>434</b>
3.1 Identifying Defects .....	434
3.2 Tests .....	434
3.3 Correction of Defects .....	434
3.4 Uncorrected Defects.....	434
<b>4 Cost Control.....</b>	<b>435</b>
4.1 Contract Price.....	435
4.2 Changes in the Contract Price.....	435
4.3 Variations.....	436
4.4 Cash Flow Forecasts .....	436
4.5 Payment Certificates .....	437
4.15 Payments.....	437
4.7 Compensation Events .....	438
4.8 Tax .....	439
4.9 Currencies.....	439
4.17 Price Adjustment .....	439
4.11 Retention.....	440
4.12 Liquidated Damages .....	440
4.13 Bonus.....	441
4.14 Advance Payment .....	441
4.15 Securities .....	442
4.115 Dayworks .....	442
4.17 Cost of Repairs .....	442
<b>5 Staff and Labour.....</b>	<b>443</b>
5.1 Forced Labour .....	443
5.2 Child Labour .....	443
5.3 Workers' Organizations.....	443
5.4 Non-Discrimination and Equal Opportunity .....	444
<b>15 Force Majeure .....</b>	<b>445</b>
15.1 Definition of Force Majeure .....	445
15.2 Notice of Force Majeure .....	445
15.3 Duty to Minimise Delay .....	446
15.4 Consequences of Force Majeure .....	446
15.5 Force Majeure Affecting Subcontractor.....	446
15.15 Optional Termination, Payment and Release .....	447
15.7 Release from Performance.....	447
<b>7 Finishing the Contract .....</b>	<b>448</b>
7.1 Completion .....	448

---

7.2	Taking Over .....	448
7.3	Final Account .....	448
7.4	Operating and Maintenance Manuals.....	448
7.5	Termination.....	449
7.15	Fraud and Corruption.....	450
7.7	Payment upon Termination.....	452
7.8	Property.....	453
7.9	Release from Performance.....	453
7.17	Suspension of Bank Financing.....	453
7.11	Eligibility .....	453



## Section VII. General Conditions

[Name of Employer] \_\_\_\_\_

[Name of Contract] \_\_\_\_\_

### 1. General Provisions

#### 1.1 Definitions

In the Conditions of Contract (“these Conditions”), which include **Particular Conditions**, and these **General Conditions**, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

##### 1.1.1 The Contract

1.1.1.1 “Contract” means the Contract Agreement, the Letter of Acceptance, the Letter of Bid, these Conditions, the Specification, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

1.1.1.2 “Contract Agreement” means the contract agreement referred to in **GC** Clause 1.15 [Contract Agreement].

1.1.1.3 “Letter of Acceptance” means the letter of formal acceptance, signed by the Employer, of the Letter of Bid, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression “Letter of Acceptance” means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.

1.1.1.4 “Letter of Bid” means the document entitled letter of bid, which was completed by the Contractor and includes the signed offer to the Employer for the Works.

1.1.1.5 “Specification” means the document entitled specification, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

1.1.1.15 “Drawings” means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.

- 1.1.1.7 “Schedules” means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Bid, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices.
- 1.1.1.8 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.
- 1.1.1.17 “Bid” means the Letter of Bid and all other documents which the Contractor submitted with the Letter of Bid, as included in the Contract.
- 1.1.1.11 **PC** means **Particular Conditions**
- 1.1.2 Parties and Persons**
- 1.1.2.1 “Party” means the Employer or the Contractor, as the context requires.
- 1.1.2.2 “Employer” means the person named as employer in the **Particular Conditions** and the legal successors in title to this person.
- 1.1.2.3 “Contractor” means the person(s) named as contractor in the Letter of Bid accepted by the Employer and the legal successors in title to this person(s).
- 1.1.2.4 “Project Manager” is the person named in the **PC** (or any other competent person appointed by the Employer 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.
- 1.1.2.5 “Subcontractor” means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.
- 1.1.2.15 “Bank” means the financing institution (if any) named in the **PC**.
- 1.1.2.7 “Borrower” means the person (if any) named as the borrower in the **PC**.
- 1.1.2.8 The “Adjudicator” is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in **GC** Clause 1.32.
- 1.1.3 Dates, Tests, Periods and Completion**

- 1.1.3.1 “Base Date” means the date 28 days prior to the latest date for submission of the Bid.
- 1.1.3.2 “Commencement Date” means the date notified under the **PC**.
- 1.1.3.3 “Completion Date” means the date for completion of the Works, or a Section (as the case may be) as certified by the Project Manager, in accordance with **GC** Clause 7.1.1, and as stipulated in the **PC**.
- 1.1.3.4 “Test on Completion” means the tests (if any) which are specified in the Contract and which are carried out in accordance with the Specification for the purpose of issuing the “Certificate of Completion of the Works”.
- 1.1.3.5 “Taking-Over Certificate” or “Certificate of Completion of the Works” means a certificate issued under **GC** Clause 7.1 [Completion].
- 1.1.3.15 “day” means a calendar day and “year” means 3155 days.
- 1.1.3.7 “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.
- 1.1.4 Money and Payments**
- 1.1.4.1 “Initial Contract Amount” means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.
- 1.1.4.2 “Contract Price” means the price defined in **GC** Clause 4.1 [Contract Price], and includes adjustments in accordance with the Contract.
- 1.1.4.3 “Compensation Events” are those defined in **GC** Clause 4.7 [Compensation Events] hereunder.
- 1.1.5 Works and Goods**
- 1.1.5.1 “Contractor’s Equipment” means all apparatus, machinery, vehicles and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor’s Equipment excludes Temporary Works, Employer’s Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.
- 1.1.5.2 “Goods” means Contractor’s Equipment, Materials, Plant and Temporary Works, or any of them as appropriate.
- 1.1.5.3 “Materials” means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.

- 1.1.5.4 “Permanent Works” means the permanent works to be executed by the Contractor under the Contract.
- 1.1.5.5 “Plant” means the apparatus, machinery and other equipment intended to form or forming part of the Permanent Works, including vehicles purchased for the Employer and relating to the construction or operation of the Works.
- 1.1.5.15 “Section” means a part of the Works specified in the **PC** as a Section (if any).
- 1.1.5.7 “Temporary Works” means all temporary works of every kind (other than Contractor’s Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.
- 1.1.5.8 “Works” mean the Permanent Works and the Temporary Works, or either of them as appropriate, and as described in the **PC**.

### **1.1.15 Other Definitions**

- 1.1.15.1 “Contractor’s Documents” means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.
- 1.1.15.2 “Country” means the country in which the Site (or most of it) is located.
- 1.1.15.3 “Force Majeure” is defined in **GC** Clause 15.1 [Force Majeure].
- 1.1.15.4 “Laws” means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.
- 1.1.15.5 “Performance Security” means the security (or securities, if any) under **GC** Clause 4.15 [Securities].
- 1.1.15.15 “Site” means the places where the Permanent Works are to be executed including storage and working areas and to which Plant and Materials are to be delivered, and any other places as may be specified in the **PC** as forming part of the Site.
- 1.1.15.8 “Unforeseeable” or “Unforeseen” means not reasonably foreseeable by an experienced Contractor by the Base Date.
- 1.1.15.9 “Variation” means any change to the Works, which is instructed or approved as a variation under **GC** Clause 4.3 [Variations].

### **1.2 Interpretation**

- 1.2.1 Interpretation In the Contract, except where the context requires otherwise:

- (a) words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word “agree”, “agreed” or “agreement” require the agreement to be recorded in writing;
- (d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record;
- (e) the word “tender” is synonymous with “bid” and “tenderer” with “bidder” and the words “tender documents” with “bidding documents”.

1.2.2 The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

1.2.3 If sectional completion is specified in the **PC**, references in the **GC** 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).

### **1.3 Communications**

1.3.1 Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices, requests and discharges, these communications shall be:

- (a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the **PC**; and
- (b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the **PC**. However:
  - (i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
  - (ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued

1.3.2 Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party.

1.3.3 When a notice is issued to a Party, by the other Party or the Project Manager, a copy shall be sent to the Project Manager or the other Party, as the case may be.

**1.4 Law and Language**

1.4.1 The Contract shall be governed by the law of the country or other jurisdiction stated in the **PC**.

The ruling language of the Contract shall be that stated in the **PC**.

The language for communications shall be that stated in the **PC**. If no language is stated there, the language for communications shall be the ruling language of the Contract.

1.4.2 Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified, in which case, for purposes of interpretation of the Contract, this translation shall govern.

The Contractor shall bear all costs of translation to the governing language and all risks of the accuracy of such translation, for documents provided by the Contractor.

## **1.5 Priority of Documents**

1.5.1 The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

- (a) the Contract Agreement (if any),
- (b) the Letter of Acceptance,
- (c) the Bid,
- (d) the Particular Conditions
- (e) these General Conditions,
- (f) the Specification,
- (g) the Drawings, and
- (h) the Schedules and any other documents forming part of the Contract.

1.5.2 If an ambiguity or discrepancy is found in the documents, the Project Manager shall issue any necessary clarification or instruction.

## **1.15 Contract Agreement**

1.15.1 The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless the **Particular Conditions** establish otherwise. The Contract Agreement shall be based upon the relevant form provided in Section IX, Contract Forms. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.

## **1.7 Assignment**

1.7.1 Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party:

- (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party, and
- (b) may, as security in favour of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.

## **1.8 Care and Supply of Documents**

- 1.8.1 The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.
- 1.8.2 Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Project Manager six copies of each of the Contractor's Documents.
- 1.8.3 The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times.
- 1.8.4 If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.

## **1.9 Confidential Details**

- 1.9.1 The Contractor's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow its proper implementation.

Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.

- 1.9.2 Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this Clause.

## **1.17 Compliance with Laws**



1.17.1 The Contractor shall, in performing the Contract, comply with applicable Laws.

1.17.2 Unless otherwise stated in the **Particular Conditions**:

- (a) the Employer shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the Employer's Country, which (i) such authorities or undertakings require the Employer to obtain in the Employer's name, and (ii) are necessary for the execution of the Contract, including those required for the performance by both the Contractor and the Employer of their respective obligations under the Contract;
- (b) the Contractor shall acquire and pay for all permits, approvals and/or licenses from all local, state or national government authorities or public service undertakings in the Employer's Country, which such authorities or undertakings require the Contractor to obtain in its name and which are necessary for the performance of the Contract, including, without limitation, visas for the Contractor's and Subcontractor's personnel and entry permits for all imported Contractor's Equipment. The Contractor shall acquire all other permits, approvals and/or licenses that are not the responsibility of the Employer under **GC** Clause 1.17.2(a) hereof and that are necessary for the performance of the Contract. The Contractor shall indemnify and hold harmless the Employer from and against any and all liabilities, damages, claims, fines, penalties and expenses of whatever nature arising or resulting from the violation of such laws by the Employer or its personnel, including the Subcontractors and their personnel, but without prejudice to **GC** Clause 1.17.1 hereof.

## **1.11 Joint and Several Liability**

1.11.1 If the Contractor is a joint venture, consortium, or association (JVCA) of two or more persons, all such persons shall be jointly and severally bound to the Employer for the fulfilment of the provisions of the Contract, unless otherwise specified in the **PC**, and shall designate one of such persons to act as a leader with authority to bind the JVCA. The composition or the constitution of the JVCA shall not be altered without the prior consent of the Employer.

**1.12 Inspections and Audit by the Bank**

- 1.12.1 The Contractor shall permit the Bank and/or persons appointed by the Bank to inspect the Site and/or the Contractor's accounts and records relating to the performance of the Contract and to have such accounts and records audited by auditors appointed by the Bank if required by the Bank.
- 1.12.2 The Contractor shall maintain all documents and records related to the Contract for a period of three (3) years after completion of the Works. The Contractor shall provide any documents necessary for the investigation of allegations of fraud, collusion, coercion, obstruction or corruption and require its employees or agents with knowledge of the Contract to respond to questions from the Bank.

**1.13 Project Manager's Decisions**

- 1.13.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.

**1.14 Delegation**

- 1.14.1 The Project Manager may delegate any of his duties and responsibilities and may cancel any delegation after notifying the Contractor.

**1.15 Subcontracting**

- 1.15.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.

**1.115 Personnel and Equipment**

- 1.115.1 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.

- 1.115.2 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.

**1.17 Other Contractors**

- 1.17.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as referred to in the **PC**. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

**1.18 Employer's and Contractor's Risks**

- 1.18.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.

**1.19 Employer's Risks**

1.19.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer'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 Employer 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 Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.

1.19.2 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 an Employer's risk except loss or damage due to

- (a) a Defect which existed on the Completion Date,
- (b) an event occurring before the Completion Date, which was not itself an Employer's risk, or
- (c) the activities of the Contractor on the Site after the Completion Date.

**1.20 Contractor's Risks**

1.20.1 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 Employer's risks are Contractor's risks.

**1.21 Insurance**

1.21.1 The Contractor shall provide, in the joint names of the Employer 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 **PC** 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.
- 1.21.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Commencement 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.
- 1.21.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums the Employer 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.
- 1.21.4 Alterations to the terms of insurance shall not be made without the approval of the Project Manager.
- 1.21.5 Both parties shall comply with any conditions of the insurance policies.
- 1.22 Site Investigation Reports**
- 1.22.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to in the **PC**, supplemented by any information available to the Bidder.
- 1.23 Contractors to Construct the Works**
- 1.23.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.
- 1.24 The Works to Be Completed by the Intended Completion Date**
- 1.24.1 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.

**1.25 Approval by the Project Manager**

- 1.25.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, who is to approve them if they comply with the Specifications and Drawings.
- 1.25.2 The Contractor shall be responsible for design of Temporary Works.
- 1.25.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.
- 1.25.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.
- 1.25.5 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.

**1.215 Safety**

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

**1.27 Discoveries**

- 1.27.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

**1.28 Possession of the Site**

- 1.28.1 The Employer 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 **PC**, the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a Compensation Event.

**1.29 Access to the Site**

- 1.29.1 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.

**1.30 Instructions**

- 1.30.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.

**1.31 Appointment of the Adjudicator**

- 1.31.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the **PC**, to appoint the Adjudicator within 14 days of receipt of such request.
- 1.31.2 Should the Adjudicator resign or die, or should the Employer 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 Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority designated in the **PC** at the request of either party, within 14 days of receipt of such request.

**1.32 Procedure for Disputes**

- 1.32.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager's decision.
- 1.32.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.
- 1.32.3 The Adjudicator shall be paid by the hour at the rate specified in the **PC**, together with reimbursable expenses of the types specified in the **PC**, and the cost shall be divided equally between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.
- 1.32.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified in the **PC**.

**2. Time Control****2.1 Programme**

- 2.1.1 Within the time stated in the **PC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Programme 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 Programme shall be consistent with those in the Activity Schedule.
- 2.1.2 An update of the Programme 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.
- 2.1.3 The Contractor shall submit to the Project Manager for approval an updated Programme at intervals no longer than the period stated in the **PC**. If the Contractor does not submit an updated Programme within this period, the Project Manager may withhold the amount stated in the **PC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Programme 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.
- 2.1.4 The Project Manager's approval of the Programme shall not alter the Contractor's obligations. The Contractor may revise the Programme and submit it to the Project Manager again at any time. A revised Programme shall show the effect of Variations and Compensation Events.

## **2.2 Extension of the Intended Completion Date**

- 2.2.1 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.
- 2.2.2 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.

## **2.3 Acceleration**



- 2.3.1 When the Employer 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 Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.
- 2.3.2 If the Contractor's priced proposals for acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.
- 2.4 Delays Ordered by the Project Manager**
- 2.4.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.
- 2.5 Management Meetings**
- 2.5.1 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.
- 2.5.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. 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.

**2.15 Early Warning**

- 2.15.1 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.
- 2.15.2 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.

**3. Quality Control****3.1 Identifying Defects**

- 3.1.1 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.

**3.2 Tests**

- 3.2.1 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.

**3.3 Correction of Defects**

- 3.3.1 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 **PC**. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

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.

**3.4 Uncorrected Defects**

- 3.4.1 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.

## **4. Cost Control**

### **4.1 Contract Price**

- 4.1.1 In the case of an admeasurement contract, 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.
- 4.1.2 In the case of a lump sum contract, 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.

### **4.2 Changes in the Contract Price**

- 4.2.1 In the case of an admeasurement contract:
- (a) 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.
  - (b) 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 Employer.
  - (c) 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.
- 4.2.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Contractor to accommodate changes of Programme 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.

**4.3 Variations**

- 4.3.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Contractor.
- 4.3.2 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.
- 4.3.3 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.
- 4.3.4 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.
- 4.3.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.
- 4.3.15 In the case of an admeasurement contract, 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 **GC** Clause 4.2.1 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.

**4.4 Cash Flow Forecasts**

- 4.4.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, 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.

**4.5 Payment Certificates**

- 4.5.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
- 4.5.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.
- 4.5.3 The value of work executed shall be determined by the Project Manager.
- 4.5.4 The value of work executed shall comprise:
- (a) In the case of an admeasurement contract, the value of the quantities of work in the Bill of Quantities that have been completed; or
  - (b) In the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.
- 4.5.5 The value of work executed shall include the valuation of Variations and Compensation Events.
- 4.5.15 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.

**4.15 Payments**

- 4.15.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer 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.
- 4.15.2 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.

4.15.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.

4.15.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

#### **4.7 Compensation Events**

4.7.1 The following shall be Compensation Events:

- (a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to **GC** Clause 1.29.
- (b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.
- (c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.
- (d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.
- (e) The Project Manager unreasonably does not approve a subcontract to be let.
- (f) 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.
- (g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.
- (h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
- (i) The advance payment is delayed.
- (j) The effects on the Contractor of any of the Employer's Risks.

(k) The Project Manager unreasonably delays issuing a Certificate of Completion.

4.7.2 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.

4.7.3 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.

4.7.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

#### **4.8 Tax**

4.8.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 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 **GC** Clause 4.17.

#### **4.9 Currencies**

4.9.1 Where payments are made in currencies other than the currency of the Employer's country specified in the **PC**, the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Contractor's Bid.

#### **4.17 Price Adjustment**

4.17.1 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the **PC**. 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 indicated below applies to each Contract currency:

$$P_c = A_c + B_c \text{ Imc/Ioc}$$

where:

**P<sub>c</sub>** is the adjustment factor for the portion of the Contract Price payable in a specific currency “**c**.”

**A<sub>c</sub>** and **B<sub>c</sub>** are coefficients<sup>16</sup> specified in the **PC**, representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency “**c**,” and

**Imc** is the index prevailing at the end of the month being invoiced and **Ioc** is the index prevailing 28 days before Bid opening for inputs payable; both in the specific currency “**c**.”

- 4.17.2 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.

#### **4.11 Retention**

- 4.11.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the **PC** until Completion of the whole of the Works.

- 4.11.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with **GC** Clause 7.1.1, 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.

#### **4.12 Liquidated Damages**

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<sup>16</sup> The sum of the two coefficients  $A_c$  and  $B_c$  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  $A_c$ , for the nonadjustable portion of the payments, is a very approximate figure (usually 0.15) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency is added to the Contract Price.



4.12.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the **PC** 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 **PC**. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.

4.12.2 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 **GC** Clause 4.15.1.

#### **4.13 Bonus**

4.13.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day stated in the **PC** 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.

#### **4.14 Advance Payment**

4.14.1 The Employer shall make advance payment to the Contractor of the amounts stated in the **PC** by the date stated in the **PC**, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer 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.

4.14.2 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.

4.14.3 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.

#### **4.15           Securities**

4.15.1           The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount specified in the **PC**, by a bank or surety acceptable to the Employer, 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 days 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.

#### **4.115          Dayworks**

4.115.1          If applicable, the Dayworks rates in the Contractor's Bid shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

4.115.2          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.

4.115.3          The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

#### **4.17           Cost of Repairs**

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.

## **5. Staff and Labour**

### **5.1 Forced Labour**

5.1.1 The Contractor shall not employ forced labour, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty, and includes any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.

### **5.2 Child Labour**

5.2.1 The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where the relevant labour laws have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.

### **5.3 Workers' Organizations**

5.3.1 In countries where the relevant labour laws recognize workers' rights to form and to join workers' organisations of their choosing without interference and to bargain collectively, the Contractor shall comply with such laws. Where the relevant labour laws substantially restrict workers' organisations, the Contractor shall enable alternative means for Contractor's Personnel to express their grievances and protect their rights regarding working conditions and terms of employment. In either case described above, and where the relevant labour laws are silent, the Contractor shall not discourage Contractor's Personnel from forming or joining workers' organisations of their choosing or from bargaining collectively, and shall not discriminate or retaliate against the Contractor's Personnel who participate, or seek to participate, in such organisations and bargain collectively. The Contractor shall engage with such workers representatives. Worker organisations are expected to fairly represent the workers in the workforce.

**5.4 Non-Discrimination and Equal Opportunity**

- 5.4.1 The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where the relevant labour laws provide for non-discrimination in employment, the Contractor shall comply with such laws. When the relevant labour laws are silent on non-discrimination in employment, the Contractor shall meet this Clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on inherent requirements of the job shall not be deemed discrimination.

## **15. Force Majeure**

### **15.1 Definition of Force Majeure**

15.1.1 In this Clause, “Force Majeure” means an exceptional event or circumstance:

- (a) which is beyond a Party’s control,
- (b) which such Party could not reasonably have provided against before entering into the Contract,
- (c) which, having arisen, such Party could not reasonably have avoided or overcome, and
- (d) which is not substantially attributable to the other Party.

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

- (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (ii) rebellion, terrorism, sabotage by persons other than the Contractor’s Personnel, revolution, insurrection, military or usurped power, or civil war,
- (iii) riot, commotion, disorder, strike or lockout by persons other than the Contractor’s Personnel,
- (iv) munitions of war, explosive materials, ionising radiation or contamination by radio-activity, except as may be attributable to the Contractor’s use of such munitions, explosives, radiation or radio-activity, and
- (v) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

### **15.2 Notice of Force Majeure**

15.2.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

15.2.2 The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.

15.2.3 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract

### **15.3 Duty to Minimise Delay**

15.3.1 Each Party shall at all times use all reasonable endeavours to minimise any delay in the performance of the Contract as a result of Force Majeure.

15.3.2 A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

### **15.4 Consequences of Force Majeure**

15.4.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under **GC** Clause 15.2 [Notice of Force Majeure], and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to **GC** Clause 1.32.1 [Procedure for Disputes] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under **GC** Clause 2.2 [Extension of the Intended Completion Date], and
- (b) if the event or circumstance is of the kind described in subparagraphs (i) to (iv) of **GC** Clause 15.1 [Definition of Force Majeure] and, in the case of **GC** Clause 15.1.1(d)(ii) to (iv), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destroyed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in **GC** Clause 1.21 [Insurance].

15.4.2 After receiving this notice, the Project Manager shall proceed in accordance with **GC** Clause 1.13 [Project Manager's Decisions] to agree or determine these matters.

### **15.5 Force Majeure Affecting Subcontractor**

15.5.1 If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

### **15.15 Optional Termination, Payment and Release**

15.15.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under **GC** Clause 15.2 [Notice of Force Majeure], or for multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with **GC** Clause 7.5.5.

15.15.2 Upon such termination, the Project Manager shall determine the value of the work done and issue a Payment Certificate which shall include:

- (a) the amounts payable for any work carried out for which a price is stated in the Contract;
- (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;
- (c) other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;
- (d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and
- (e) the Cost of repatriation of the Contractor's staff and labour employed wholly in connection with the Works at the date of termination.

### **15.7 Release from Performance**

- 15.7.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfill its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance:
- (a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and
  - (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under **GC** Clause 15.15 [Optional Termination, Payment and Release] if the Contract had been terminated under **GC** Clause 15.15.

## **7. Finishing the Contract**

### **7.1 Completion**

- 7.1.1 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.

### **7.2 Taking Over**

- 7.2.1 The Employer shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.

### **7.3 Final Account**

- 7.3.1 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 515 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 515 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.

### **7.4 Operating and Maintenance Manuals**



- 7.4.1 If “as built” Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the **PC**.
- 7.4.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the **PC** pursuant to **GC** Clause 7.4.1, or they do not receive the Project Manager’s approval, the Project Manager shall withhold the amount stated in the **PC** from payments due to the Contractor.

## **7.5 Termination**

- 7.5.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.
- 7.5.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:
- (a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Programme 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 28 days;
  - (c) the Employer 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 Employer 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 **PC**; or
  - (h) if the Contractor, as determined by the Employer, based on reasonable evidence, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, pursuant to **GC** Clause 7.15 [Fraud and Corruption].

- 7.5.3 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 **GC** Clause 7.5.2 above, the Project Manager shall decide whether the breach is fundamental or not.
- 7.5.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.
- 7.5.5 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.

### **7.15 Fraud and Corruption**

- 7.15.1 If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days' notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of **GC** Clause 7.5 [Termination] shall apply as if such expulsion had been made under **GC** Clause 7.5.2.
- 7.15.2 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, coercive or obstructive practice during the execution of the work then that employee shall be removed in accordance with **GC** Clause 1.115.2.
- 7.15.3 It is the Bank's policy to require that Borrowers (including beneficiaries of Bank Financing), as well as bidders, suppliers, and contractors, and their agents (whether declared or not), subcontractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of Bank-financed contracts<sup>17</sup>. In pursuance of this policy, the Bank:
- (a) defines, for the purposes of this provision, the terms set forth below as follows:
- (i) "Corrupt Practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party<sup>18</sup>;
  - (ii) "Fraudulent Practice" is any act or omission, including a misrepresentation that knowingly or recklessly misleads, or

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

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

- attempts to mislead, a party<sup>19</sup> to obtain financial or other benefit or to avoid an obligation;
- (iii) “Collusive Practice” is an arrangement between two or more parties<sup>20</sup>, designed to achieve an improper purpose, including to influence improperly the actions of another party; and
  - (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<sup>21</sup>;
  - (v) “obstructive practice” is
    - (v.1) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
    - (v.2) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under clause 1.12 [Inspections and Audits by the Bank]
- (b) will reject a proposal for award if it determines that the bidder recommended for award or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly engaged in Corrupt, Fraudulent, Collusive, Coercive or Obstructive Practices in competing for the contract in question;
  - (c) will declare misprocurement and cancel the portion of the Financing allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of such Financing engaged in Corrupt, Fraudulent, Collusive, Coercive or Obstructive Practices during the procurement or the implementation of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including

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

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

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

by failing to inform the Bank in a timely manner at the time they knew of the practices;

- (d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank's sanctions procedures<sup>22</sup>, including by publicly declaring such firm or individual ineligible either indefinitely or for a stated period of time, (i) to be awarded Bank-financed contracts and (ii) to be a nominated<sup>23</sup> sub-contractor, consultant, supplier, or service provider of an otherwise eligible firm being awarded a Bank-financed contract; and
- (e) will require that a clause be included in bidding documents and in contracts financed by the Bank, requiring bidders, suppliers and contractors and their sub-contractors, agents, personnel, consultants, service providers, or suppliers to permit the Bank to inspect all accounts and records and other documents relating to the submission of bids and contract performance and to have them audited by auditors appointed by the Bank.

## **7.7 Payment upon Termination**

- 7.7.1 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 indicated in the **PC**. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

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<sup>22</sup> A firm or an individual may be declared ineligible to be awarded a Bank financed contract: (i) upon completion of the Bank's sanctions proceedings as per its sanctions procedures, including, inter alia, cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks, or otherwise decided by the Bank; and through the application of the Proposal for the Implementation of a Sanctions Process within the African Development Bank Group; and (ii) as a result of temporary suspension or early temporary suspension in connection with an on-going sanction proceeding. See footnote 18 and paragraph 9 of Appendix 1 of the Rules and Procedures for Procurement of Goods and Works.

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

7.7.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, 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.

## **7.8 Property**

7.8.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.

## **7.9 Release from Performance**

7.9.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer 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.

## **7.17 Suspension of Bank Financing**

7.17.1 In the event that the Bank suspends the Financing to the Employer, from which part of the payments to the Contractor are being made:

- (a) The Employer is obligated to notify the Contractor of such suspension within 7 days of having received the Bank's suspension notice.
- (b) If the Contractor has not received sums due it within the 28 days for payment provided for in **GC** Clause 4.15.1, the Contractor may immediately issue a 14-day termination notice.

## **7.11 Eligibility<sup>24</sup>**

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<sup>24</sup> For the purposes of Eligibility, the provisions of the Bank's *Rules and Procedures for Procurement of Goods and Works* have been presented in detail at Section V, Eligible Countries.

- 7.11.1 The Contractor shall have the nationality from an eligible country of the Bank in accordance with the Bank's **Rules and Procedures for Procurement of Goods and Works**, as listed in Section V, Eligible Countries. The Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
- 7.11.2 The materials, equipment and services to be supplied under the Contract shall have their origin in eligible source countries and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment and services.
- 7.11.3 For purposes of **GC** Clause 7.11.1, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

## Section VIII. Particular Conditions

<b>1. General Provisions</b>	
<b>GC 1.1.2.2</b>	The Employer is: <b>Principal Secretary, State Department for Crops Development and Agricultural Research.</b>
<b>GC 1.1 .2.4</b>	The Project Manager is: <b>Project Engineer SIVAP Hill Plaza 9<sup>th</sup> Floor</b>
<b>GC 1.1.2.15</b>	The Bank is: <b>Africa Development Bank</b>
<b>GC 1.1.2.7</b>	The Borrower is: <b>Republic of Kenya</b>
<b>GC 1.1.3.2</b>	The Commencement Date shall be: <b><i>not later than 14 days after site handing over</i></b>
<b>GC 1.1.3.3</b>	The Completion Date for the whole of the Works shall be: <b><i>7 months after commencement of the works.</i></b>
<b>GC 1.1.5.15</b>	If Sections are to be used: <b>N/A</b>
<b>GC 1.1.5.8</b>	<b>Description of the works</b> The contract works include construction and Completion of: <ol style="list-style-type: none"> <li>1. intake works</li> <li>2. sedimentation basin</li> <li>3. conveyance pipeline</li> <li>4. Main pipeline</li> <li>5. Sub-main pipelines</li> <li>6. Distribution pipelines</li> <li>7. In field system</li> </ol>
<b>GC 1.1.15.15</b>	<b>LOCATION OF THE SITE</b> The proposed Kirumi Kiamunjari Irrigation Scheme is located in Ndunguri, Kariakomo, Kirumi and Ikumbo Sub-locations of Ganga Division and Kithare Sub-location of Chogoria Division in Maara Sub-County of Tharaka- Nithi County.
<b>GC 1.2.3</b>	Sectional Completions <b>shall not be</b> applicable.
<b>GC 1.2.4(i)</b>	The following documents also form part of the Contract: <ol style="list-style-type: none"> <li>a) the Letter of Acceptance</li> <li>b) the Bid</li> <li>c) All Addenda, if any</li> </ol>

	<p>d) the Particular Conditions  e) the General Conditions  f) the Specification  g) the Drawings; and  h) the completed Schedules,</p>
<b>GC 1.3.1(a)</b>	The Electronic Transmission System is: <b>None</b>
<b>GC 1.3.1(b)</b>	<p>The Employer's address for the purpose of communications is:  <b>Project Coordinator,  Attention : Project coordinator  Small Scale Irrigation and Value Addition Project  State Department for Crops Development  Ministry of Agriculture, Livestock, Fisheries and  Cooperatives  Hill Plaza, 9<sup>th</sup> Floor  P.O. Box 30028, 00170 Nairobi  Email: <a href="mailto:npcshoa@kilimo.go.ke">npcshoa@kilimo.go.ke</a></b></p> <p>The Contractor's address for the purpose of communications is:  <b>[state full address, telephone, fax and e-mail]</b></p>
<b>GC 1.4.1</b>	<p>The governing law is that of: <b>Republic of Kenya</b></p> <p>The ruling language is: <b>English</b></p> <p>The language for communications is: <b>English</b></p>
<b>GC 1.15.1</b>	The Parties <b>shall</b> enter into contract within 28 days after the Contractor receives the Letter of Acceptance.
<b>GC 1.17.2(a)</b>	Permits, approvals and/or licenses, or public service undertakings to be acquired by the Employer: <b>as in the specifications</b>
<b>GC 1.17.2(b)</b>	Permits, approvals and/or licenses, or public service undertakings to be acquired by the Contractor: <b>as in the specifications</b>
<b>GC 1.11.1</b>	The individuals or firms in a joint venture, consortium or association <b>shall be</b> jointly and severally liable.
<b>GC 1.17.1</b>	Schedule of Other Contractors: <b>None</b>
<b>GC 1.21.1</b>	<p>The minimum insurance amounts and deductibles shall be:</p> <p>(a) for loss or damage to the Works, Plant and Materials: <b>KES 170,000.00</b></p>



	<p>(b) for loss or damage to Equipment: <b>KES 50,000.00</b></p> <p>(c) for loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract: <b>KES 50,000.00</b></p> <p>(d) for personal injury or death:</p> <p>(i) of the Contractor's employees: <b>KES 50,000.00</b></p> <p>(ii) of other people: <b>KES 170,000.00</b></p>
<b>GC 1.22.1</b>	Site Investigation Reports shall include: <b>design report, drawings and any other investigation as may be required by the engineer</b>
<b>GC 1.28.1</b>	The Site Possession Date(s) shall be <b><i>not later than 14 days after contract signing</i></b>
<b>GC 1.31.1 &amp; 1.31.2</b>	Appointing Authority for the Adjudicator: <b>Chartered Institute of Arbitrators, Kenya</b> <b>P.O. Box 501153 - 00200 Nairobi, Kenya</b> <b>Email Address: <a href="mailto:info@ciarbkkenya.org">info@ciarbkkenya.org</a></b>
<b>GC 1.32.3</b>	Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: <b>as per as body's policy</b>
<b>GC 1.32.4</b>	Institution whose arbitration procedures shall be used: <b>Chartered Institute of Arbitrators, Kenya</b> The place of arbitration shall be: <b>Nairobi, Kenya]</b>
<b>2. Time Control</b>	
<b>GC 2.1.1</b>	The Contractor shall submit for approval a Programme for the Works within 7 days from the date of the Letter of Acceptance.
<b>GC 2.1.3</b>	The period between Programme updates is <b>30</b> days.  The amount to be withheld for late submission of an updated Programme is: <b>10% of amount due in next certificate</b>
<b>3. Quality Control</b>	
<b>GC 3.3.1</b>	The Defects Liability Period is: <b>180</b> days.
<b>4. Cost Control</b>	
<b>GC 4.9.1</b>	The currency of the Employer's country is: <b>Kenya Shillings</b>

<b>GC 4.17.1</b>	The Contract <b>“shall not”</b> be subject to price adjustment, in accordance with <b>GC</b> Clause 4.17.1, and the following information regarding coefficients
<b>GC 4.11.1</b>	The proportion of payments retained is: <b>10%</b>
<b>GC 4.12.1</b>	The Liquidated Damages for the whole of the Works are <b>0.05</b> of the final Contract Price, per day. The maximum amount of Liquidated Damages for the whole of the Works is <b>5%</b> of the final Contract Price.
<b>GC 4.13.1</b>	The Bonus for the whole of the Works is <b>0%</b> of the final Contract Price, per day. The maximum amount of Bonus for the whole of the Works is <b>0%</b> of the final Contract Price.
<b>GC 4.14.1</b>	The Advance Payment shall be: <b>10% of the contract sum</b> and shall be paid to the Contractor no later than: <b>150 days</b>
<b>GC 4.15.1</b>	The Performance Security amount is: <b>10% of contract sum</b> in the form of:  (a) Bank Guarantee:  [A <b>Bank Guarantee</b> shall be unconditional (on demand) (see Section IX, Contract Forms).
<b>7. Finishing the Contract</b>	
<b>GC 7.4.1</b>	The date by which operating and maintenance manuals are required shall be: <b>date of completion of works</b>  The date by which “as built” drawings are required shall be: <b>date of completion of works</b>
<b>GC 7.4.2</b>	The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required in <b>GC</b> Clause 7.7.1 shall be: <b>KES 170,000.00</b>
<b>GC 7.5.2 (g)</b>	The maximum number of days is: <b>30 days</b>
<b>GC 7.7.1</b>	The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, shall be: <b>100% of work not done</b>

## **Section IX. Contract Forms**

This Section contains Contract Forms which, once completed, will constitute part of the Contract. The forms for Contract Agreement, Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder, after contract award

### **Table of Forms**

<b>Letter of Acceptance</b>	<b>460</b>
<b>Contract Agreement</b>	<b>462</b>
<b>Option I: Performance Security</b>	<b>464</b>
<b>Option II: Performance Bond</b>	<b>466</b>
<b>Advance Payment Security</b>	<b>468</b>
<b>Retention Money Security</b>	<b>470</b>

**Letter of Acceptance**

**[on letterhead paper of the Employer]**

..... **[date]**. .....

To: **[name and address of the Contractor]** .....

Subject: **[Notification of Award Contract No.]**. .....

This is to notify you that your Bid dated . . . . **[Insert date]** . . . . for execution of the . . . . .**[insert name of the contract and identification number]** . . . . . for the amount of . . . . . **[insert amount (s) in figures and words and name(s) of currency(ies)]**, as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by us.

You are requested to furnish the Performance Security in the amount of **[insert amount (s) in figures and words and name(s) of currency(ies)]** within 28 days<sup>25</sup> in accordance with the Conditions of Contract, using for that purpose the Performance Security Form included in Section IX (Contract Forms) of the Bidding Document.

We accept the appointment of **[Employer to insert full name and address of alternative appointee proposed by Bidder in Letter of Bid]** as the Adjudicator. / We do not accept the appointment of **[Employer to insert full name and address of alternative appointee proposed by Bidder in Letter of Bid]** as the Adjudicator. And, consequently, the provisions of **GC** Clause 1.31 shall apply.<sup>26</sup>

Authorized Signature: .....

Name and Title of Signatory: .....

Name of Agency: .....

Attachment: Contract Agreement

<sup>25</sup> Or, the alternative deadline stipulated in the **Particular Conditions**.

<sup>26</sup> Use one of the two options as appropriate.



## Contract Agreement

THIS CONTRACT AGREEMENT is made on the [ **insert: number** ] day of [ **insert: month** ], [ **insert: year** ].

BETWEEN

(1) [ **insert complete name of the Employer** ], a [ **insert description of type of legal entity, for example, an agency of the Ministry of ....** ] of the Government of { **insert name of Country of the Employer** }, or corporation incorporated under the laws of { **insert name of Country of the Employer** } and having its principal place of business at [ **insert address of the Employer** ] (hereinafter called “the Employer”),

and

(2) [ **insert name of the Contractor** ], a corporation incorporated under the laws of [ **insert: country of Contractor** ] and having its principal place of business at [ **insert: address of Contractor** ] (hereinafter called “the Contractor”).

WHEREAS the Employer invited bids for the Works, described as [ **insert brief description of the Works** ] and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein, and the Employer agrees to pay the Contractor 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.

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

- (a) the Letter of Acceptance
- (b) the Bid
- (c) the Addenda Nos . . . . . [ **insert addenda numbers if any** ]. . . . .
- (d) the Particular Conditions
- (e) the General Conditions
- (f) the Specification

- (g) the Drawings; and  
 (h) the completed Schedules,

3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

Agreement to be executed in accordance with the laws of . . . . . **[insert name of the borrowing country]** . . . . . on the day, month and year indicated above.

Signed by:

Signed by:

For and on behalf of the Employer  
 Contractor

for and on behalf the

In the presence of:

in the presence of:

**Witness, Name, Signature, Address, Date**

**Witness, Name, Signature, Address, Date**

## Option I: Performance Security

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

Date: **[insert date (e.g., day, month, and year)]**

Bidding Process Reference: **[insert no. and title of bidding process]**

Bank's Branch or Office: **[insert complete name of Guarantor]**

**Beneficiary: [insert complete name of Employer]**

**PERFORMANCE GUARANTEE No.: [insert Performance Guarantee number]**

We have been informed that **[insert complete name of the Contractor]** (hereinafter called "the Contractor") has entered into Contract No. **[insert number]** dated **[insert day and month]**, **[insert year]** with you, for the execution and completion of **[insert description of the Works]** and the remedying of any defects therein (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a Performance Guarantee is required.

At the request of the Employer, we hereby irrevocably undertake to pay you any sum(s) not exceeding **[insert amount(s)<sup>27</sup> in figures and words]** such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing declaring the Contractor to be in default under the Contract, without cavil or argument,

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<sup>27</sup> The Bank shall insert the amount(s) specified in the PC and denominated, as specified in the PC, either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Employer.



or your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This Guarantee shall expire no later than the **[insert number]** day of **[insert month]**, **[insert year]**,<sup>28</sup> and any demand for payment under it must be received by us at this office on or before that date. This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

**[signatures of authorized representatives of the bank]**

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<sup>28</sup> Insert the date twenty-eight days after the expected completion date. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”]

## Option II: Performance Bond

By this Bond \_\_\_\_\_ as Principal (hereinafter called “the Contractor”) and \_\_\_\_\_] as Surety (hereinafter called “the Surety”), are held and firmly bound unto \_\_\_\_\_] as Obligee (hereinafter called “the Employer”) in the amount of \_\_\_\_\_, for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Contractor has entered into a written Agreement with the Employer dated the \_\_\_\_\_ day of \_\_, 20 \_\_, for \_\_\_\_\_ in accordance with the documents, plans, specifications, and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW, THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Contractor shall be, and declared by the Employer to be, in default under the Contract, the Employer having performed the Employer’s obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) complete the Contract in accordance with its terms and conditions; or
- (2) obtain a Bid or bids from qualified Bidders for submission to the Employer for completing the Contract in accordance with its terms and conditions, and upon determination by the Employer and the Surety of the lowest responsive Bidder, arrange for a Contract between such Bidder and Employer and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term “Balance of the Contract Price,” as used in this paragraph, shall mean the total amount payable by Employer to Contractor under the Contract, less the amount properly paid by Employer to Contractor; or

(3) pay the Employer the amount required by Employer to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Employer named herein or the heirs, executors, administrators, successors, and assigns of the Employer.

In testimony whereof, the Contractor has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_.

## Advance Payment Security

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated.]

Date: **[insert date (e.g., day, month, and year) of Bid Submission]**

Bidding Process Reference: **[insert number and title of bidding process]**

**[bank's letterhead]**

**Beneficiary:** **[insert legal name and address of Employer]**

**ADVANCE PAYMENT GUARANTEE No.:** **[insert Advance Payment Guarantee no.]**

We have been informed that . . . . . **[insert name of the Contractor]**. . . . . (hereinafter called "the Contractor") has entered into Contract No. . . . . **[insert reference number of the Contract]**. . . . dated **[insert day and month]**, **[insert year]**. . . . . with you, for the execution of . . . . . **[insert name of contract and brief description of Works]** (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum . . . **[insert currency and amount in figures]**<sup>29</sup>. . . . (**[insert currency and amount in words]**. . . .) is to be made against an advance payment guarantee.

At the request of the Employer, we . . . . . **[insert name of the Bank]**. . . . . hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of . . . . . **[insert currency and amount in figures]\***. . . . . (**[insert currency and amount in words]**. . . . .) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than performing his obligations under the Contract or the costs of mobilization in respect of the Works.

<sup>29</sup> The Guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number . . . . . **[insert Contractor’s account number]**. . . . . at . . . . . **[insert name and address of the Bank]**. . . .

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated 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 eighty (80) percent of the Contract Price has been certified for payment, or on the . . . day of . . . . . , . . . .<sup>30</sup>, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded..

. . . . . **[Seal of Bank and Signature(s)]**. . . . .

**Note –**

**All italicized text (including footnotes) is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.**

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<sup>30</sup> Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [insert number of months], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.]

## Retention Money Security

### Demand Guarantee

\_\_\_\_\_ **[insert Bank's Name, and Address of Issuing Branch or Office]**

**Beneficiary:** \_\_\_\_\_ **[insert Name and Address of Employer]**

**Date:** \_\_\_\_\_ **[insert date (e.g., day, month, and year)]**

**RETENTION MONEY GUARANTEE No.:** **[insert Retention Money Guarantee no.]**

We have been informed that \_\_\_\_\_ **[insert name of Contractor]** (hereinafter called "the Contractor") has entered into Contract No. \_\_\_\_\_ **[insert reference number of contract]** dated \_\_\_\_\_ **[insert date]** with you, for the execution of \_\_\_\_\_ **[insert name of contract and brief description of Works]** (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of **[insert either "the second half of the Retention Money", or, if the amount guaranteed under the Performance Guarantee, when the Taking-Over Certificate is issued, is less than half of the Retention Money, "the difference between half of the Retention Money and the amount guaranteed under the Performance Security"]** is to be made against a Retention Money guarantee.

At the request of the Employer, we \_\_\_\_\_ **[insert name of Bank]** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of \_\_\_\_\_ **[insert amount in figures]** ( ) **[insert amount in words]**<sup>1</sup> upon receipt by us of your first demand in writing

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<sup>1</sup> *The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or, if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Employer.*

accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number \_\_\_\_\_ **[insert Contractor's account number]** at \_\_\_\_\_ **[insert name and address of the Bank]**.

This guarantee shall expire, at the latest, 21 days after the date when the Employer has received a copy of the Performance Certificate issued by the Project Manager. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

\_\_\_\_\_  
**[signature(s)]**

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

