REPUBLIC OF KENYA

MINISTRY OF SPORTS, CULTURE AND HERITAGE

STATE DEPARTMENT OF SPORTS

PROPOSED WANG'URU STADIUM IN KIRINYAGA COUNTY

W.P ITEM NO. D113 CE/KYA/1902 JOB NO. 10749A

VOLUME 3 OF 5

SPECIFICATIONS AND BILLS OF QUANTITIES
FOR
SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING
OF
WATER STORAGE, WATER RETICULATION AND FIELD IRRIGATION SYSTEM INSTALLATIONS
AND
SANITARY FITTINGS, INTERNAL PLUMBING & DRAINAGE AND FIRE PROTECTION EQUIPMENT INSTALLATION WORKS

CLIENT
THE PRINCIPAL SECRETARY,
STATE DEPARTMENT OF SPORTS
MINISTRY OF SPORTS, CULTURE AND HERITAGE
P.O BOX 49849 - 00100,
NAIROBI

PROJECT MANAGER
THE WORKS SECRETARY
STATE DEPARTMENT FOR PUBLIC WORKS
P.O. BOX 30743-00100
NAIROBI

CHIEF ARCHITECT
STATE DEPARTMENT FOR PUBLIC WORKS
P.O. BOX 30743-00100
NAIROBI

CHIEF QUANTITY SURVEYOR
STATE DEPARTMENT FOR PUBLIC WORKS
P.O. BOX 30743-00100
NAIROBI

CHIEF ENGINEER STRUCTURAL
STATE DEPARTMENT FOR PUBLIC WORKS
P.O. BOX 30743-00100
NAIROBI

CHIEF ENGINEER ELECTRICAL (BS)
STATE DEPARTMENT FOR PUBLIC WORKS
P.O. BOX 41191 – 00100
NAIROBI

CHIEF ENGINEER MECHANICAL (BS)
STATE DEPARTMENT FOR PUBLIC WORKS
P.O. BOX 41191-00100
NAIROBI

April, 2020

TABLE OF CONTENTS

SECTION A

GENERAL CONDITIONS FOR TENDER

TENDER EVALUATION CRITERIA

After tender opening, the tenders will be evaluated in 4 stages, namely:

1. Preliminary examination;
2. Technical evaluation;
3. Financial Evaluation; and
4. Recommendation for Award.

STAGE 1: PRELIMINARY EXAMINATION

This stage of evaluation shall involve examination of the mandatory requirements as set out in the Tender Advertisement Notice or Letter of Invitation to tender and any other conditions as stated in the bid document.

These conditions include the following:

i. Current **Category of Registration** and **Valid Practicing Licenses** with National Construction Authority (NCA) for **ALL** the categories as listed below. The **LEAD** bidder who does not have ALL the requisite qualification shall seek joint ventures with other qualified bidders and **MUST** attach **Consortium (joint venture)** agreements certified by a **COMMISIONER OF OATHS**. (Failure to comply with **ANY** will lead to automatic disqualification). The Joint venture agreements shall include CR 12 for all the parties and a power of attorney for all signatories.
   - **"NCA 5" in the Plumbing and Drainage Works, Water Tanks/Storage Works Categories**

ii. Compliance with Technical Specifications for ALL the below categories
   - **Plumbing and Drainage works specifications**

iii. The Bid has been submitted in the format required by the procuring entity for the bidder (and all joint venture bids);

iv. **Valid Tax Compliance Certificate** for the bidder (and all consortium/Joint venture bids contractors);

v. **Dully filled and stamped** Confidential Business Questionnaire (and all consortium/Joint venture bids contractors);

vi. **Dully signed and stamped** Statement of Compliance (and all consortium/Joint venture bids contractors);

vii. Submission of original & a copy of tender document properly **book bound** and **paginated** in the correct sequence and all pages **MUST** be initialled. NB: Spiral Binding and use of Spring or Box Files **will not be allowed** and will result in automatic disqualification. Failure to submit **ANY** required sub-bids will lead to automatic disqualification).

viii. Signed Pre-tender site visit form if pre-tender site visit is required;

ix. Proof of authorization shall be furnished in form of a written power of attorney which shall accompany the tender if the signatory to the tender is not a director of the company (provide name and attach proof of citizenship of the signatory to the tender). Provide also Form CR12 from the Registrar of Companies.

x. A copy of valid business permit for the bidder (and all consortium/Joint venture bids);

xi. A copy certificate of registration/Incorporation for the bidder (and all consortium/Joint venture bids);

xii. A copy pin certificate for the bidder (and all joint venture bids);

xiii. A copy of company's list of directors, beneficial owners, name if proprietor or names of partners (copy of CR 12) for the bidder (and all consortium/Joint venture bids);

xiv. **Dully filled** bills of quantities in the format provided **(item by item)**

xv. Signed and stamped statement of verification that no debarment in matters of public procurement proceedings for the bidder (and all consortium/Joint venture bids);

xvi. Declaration that the firm has not been convicted of corrupt or fraudulent practices and will not engage in any corrupt or fraudulent practices for the bidder (and all consortium/joint venture bids);

Note :

The tender document shall be examined based on clause 2.2 of the Instruction to Tenderers which states as follows: *'In accordance with clause 2.2 of Instruction to Tenderers, The tenderers will be required to provide evidence for eligibility of the award of the tender by satisfying the employer of their eligibility under sub clause 2.1 of Instruction to Tenderers and their capability and adequacy of resources to effectively carry out the subject contract. In order to comply with provisions of clause 2.2 of Instruction to Tenderers, the tenderers shall be required;*

a) *To fill the Standard Forms provided in the bid document for the purposes of providing the required information. The tenderers may also attach the required information if they so desire;*
b) *To supply equipment/items which comply with the* ***technical specifications*** *set out in the bid document. In this regard, the bidder will be required to submit relevant technical brochure/catalogues with the tender document, highlighting the Catalogue Number of the proposed items. Such brochures/ catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include bit not limited to the following:*
    (i) Standards of manufacture;
    (ii) Performance ratings/characteristics;
    (iii)Material of manufacture;
    (iv)Electrical power ratings; and
    (v) Any other necessary requirements (specify).

The bid will then be analyzed, using the information in the technical brochures, to determine compliance with General and Particular technical specifications for the works as indicated in the tender document. The tenderer **MUST ALSO** fill in the Technical Schedule as specified in the tender document for Equipment's and Items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/Equipment's they propose to supply. The employer/procuring entity may seek further clarification/confirmation if necessary, to confirm authenticity/compliance of any condition of the tender. Further, in case of a discrepancy between the amounts stated in the appendix to instruction to tenderers in Section A of this tender document and the one stated in the tender advertisement or invitation letter, the bid security shall be taken as the amount in the advertisement/ letter of invitation. The tenderers who do not satisfy any of the above requirements shall be considered Non-Responsive and their tenders will not be evaluated further

STAGE 2 TECHNICAL EVALUATION

A) Assessment for eligibility

The tender document shall be examined based on clause 2.2 of the Instruction to Tenderers which states as follows: *'In accordance with clause 2.2 of Instruction to Tenderers, the tenderers will be required to provide evidence for eligibility of the award of the tender by satisfying the employer of their eligibility under sub clause 2.1 of Instruction to Tenderers and adequacy of resources to effectively carry out the subject contract. The tenderers shall be required to fill the Standard Forms provided for the purposes of providing the required information. The tenderers may also attach the required information if they so desire.*

The award of points for the STANDARD FORMS considered in this section shall be as shown below

	PARAMETER	MAXIMUM POINTS
(i)	Tender Questionnaire ----------	5
(ii)	Key personnel ----------	20
(iii)	Contract Completed in the last Five (5) years ----------	20
(iv)	Schedules of on-going projects ----------	8
(v)	Schedules of contractors equipment ----------	20
(vi)	Audited Financial Report for the last 3 years ----------	10
(vii)	Evidence of Financial Resources ----------	15
(viii)	Litigation History ----------	2
	TOTAL	**100**

The detailed scoring plan shall be as shown in table 1 below: -

TABLE 1: Assessment for Eligibility

Item	Description	Point Scored	Max. Point	
i.	**Tender Questionnaire Form** • Completely filled ---------- 5 • Partially or Not filled ---------- 0		**5**	
ii	**Key Personnel (Attach evidence)**			**20**
	Director of the firm • Holder of degree in relevant Engineering field ---------- 6 • Holder of diploma in relevant Engineering field ---------- 5 • Holder of certificate in relevant Engineering field ---------- 3 • Holder of trade test certificate in relevant Engineering field --2 • No relevant certificate ---------- 1		**6**	
	At least 1No. degree/diploma of key personnel in relevant Engineering field • With over 10 years relevant experience ---------- 6 • With over 5 years relevant experience---------- 4 • With under 5 years relevant experience ---------- 2		**6**	
	At least 1No certificate holder of key personnel in relevant Engineering field • With over 10 years relevant experience---------- 4 • With over 5 years relevant experience ---------- 3 • With under 5 years relevant experience ----------1		**4**	
	At least 2No artisan (trade test certificate in relevant Engineering field) • Artisan with over 10 years relevant experience ---------- 2 • Artisan with under 10 years relevant experience ---------- 1 • Non skilled worker with over 10 years relevant experience --- 1		**4**	
iii	**Contract completed in the last five (5) years (Max of 5 No. Projects**)- **<u>Provide Evidence</u>** • Project of similar nature, complexity and magnitude ---------- 4 • Project of similar nature but of lower value than the one in consideration ---------- 3 • No completed project of similar nature ----------0		**20**	

iv	**On-going projects – <u>Provide Evidence</u>** • Four and above Project of similar nature, complexity and magnitude ---------- 8 • Three and below Project of similar, nature complexity and magnitude ---------- 6 • No project of similar, nature complexity and magnitude ----- 4		**8**	
v	**Schedule of contractors equipment and transport (proof or evidence of ownership/Lease)** **a) Relevant Transport** • Means of transport (Vehicle) ---------- 10 • No means of transport ---------- 0		10	**20**
	b) Relevant Equipment • Has relevant equipment for work being tendered---------- 10 • No relevant equipment for work being tendered---------- 0		10	
vi	**Financial report** **a) Audited financial report (last three (3) years)** • Average Annual Turn-over equal to or greater the cost of the project ---------- **10** • Average Annual Turn-over above 50% but below 100% of the cost of the project ---------- **6** • Average Annual Turn-over below 50% of the cost of the project -- ---------- **3**		**10**	
	b) Evidence of Financial Resources (cash in hand, lines of credit, over draft facility etc.) • Has financial resources to finance the projected **monthly cash flow*** for three months ----------**15** • Has financial resources equal to the projected **monthly cash flow*** ----------**10** • Has financial resources less than the projected **monthly cash flow*** ----------**5** • Has not indicated sources of financial resources ---------- **0**		**15**	
vii	**Litigation History** • Filled ---------- **2** • Not filled ---------- **0**		**2**	
	TOTAL		**100**	

Any bidder who scores 60 points and above shall be considered for further evaluation
Monthly Cash Flow = Tender Sum/Contract Period

B) Compliance with Specialist Works specifications

In this section, the bid will be analyzed to determine compliance with General and Particular technical specifications for the works as indicated in the tender document. The tenderer shall fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer of the Item/Equipment they propose to supply.

The tenderer shall also submit relevant technical brochures/catalogues with the tender document, highlighting the catalogue Numbers of the proposed items. Such brochures/catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:

a) Standards of manufacture;
b) Performance ratings/characteristics;
c) Material of manufacture;
d) Electrical power ratings; and
e) Any other necessary requirements (Specify).

Following the above analyses, where the proposed equipment is found not to conform to the stipulated specifications, the tender will be deemed Non–Responsive and will not be evaluated further.

C) Assessment of deviations

Pursuant to section 64 of the act, a tender is deemed responsive if it conforms to all the mandatory requirements and it **does not contain major** deviations. Section 23.2 of the instruction to tenderers, defines major deviations as

a) One that affects in a substantial way the scope, quality, completion timing, administration of works to be undertaken by the tenderer under the contract, inconsistent with the tender document; or
b) Which limits in any substantial way the rights of the employer or the tenderers obligations; or
c) Whose rectification would affect unfairly the competitive position of other tenderers presenting substantially responsive tenders.

Where the deviations are minor in the view of the evaluation committee, with the concurrence of the procuring entity representative, the evaluation committee shall quantify such deviations pursuant to section 64 (3) of the act which requires that a minor deviation shall:

a) Be quantified to the extent possible; and

Be taken into account in the evaluation and comparison of tenders. Where the deviation in the view of the evaluation committee with the concurrence of the procuring entity representative is major, the tender shall *be deemed non-responsive and will not be evaluated further*

TABLE 2: Assessment of Deviations

Item	Does the Deviation Substantively Affect the following:	YES	NO
1	Scope of the Works or Services to be delivered		
2	Quality of the Works or Services to be delivered		
3	Completion Timing		
4	Administration of the Works		
5	Consistency with the tender document		
6	Rights of the Employer in a negative manner		
7	Limit the Tenderer's Obligation		
8	Affect unfairly the competitive position of other tenderers		
	COMMENT		

Any bidder who OBTAINS A YES in the above table shall be considered NON-RESPONSIVE and shall not be evaluated further.

STAGE 3 - FINANCIAL EVALUATION

Upon completion of the technical evaluation a detailed financial evaluation shall follow. The financial evaluation shall proceed in the manner described in the Public Procurement and Disposal Act (2005) of the laws of Kenya (Section 66) and the Public Procurement and Disposal Regulations, 2006 specifically section 50 (1), (2), and (3).

The evaluation shall be in **three stages**

a) Preliminary examinations;
b) Comparison of Rates; and
c) Consistency of the Rates.

A) Preliminary Examinations

The preliminary examination in the Financial Evaluation shall be in accordance with clause 26 of Instruction to Tenderers.

The parameter to be considered under this section includes;

Arithmetic Errors

The bid shall be checked for arithmetic errors based on the rates and the total sums indicated in the bills of quantities.

a) Confirmation shall be sought in writing from the tenderers whose tender sums will be determined to have a significant arithmetic error to their disadvantage, to confirm whether they stand by their tender sums. The error shall be treated as per **clause 24 of Instructions to Tenderers**.

Non compliance with the above shall lead to **automatic disqualification from further evaluation.**

Discount if any shall be treated as an error in pursuant to **clause 26.3** of Instructions to Tenderers

B) Comparison of rates-

Items that are underpriced or overpriced may indicate potential for non-delivery and front loading respectively. The committee shall promptly write to the tenderer asking for detailed breakdown of costs for any of the quoted items, relationship between those prices, proposed construction/installation methods and schedules.

The evaluation committee shall evaluate the responses and make an appropriate recommendation to the procuring entity's Accounting Officer giving necessary evidence. Such recommendations may include but not limited to:

(i) Recommend no adverse action to the tenderer after a convincing response;
(ii) Employer requiring that the amount of the performance bond be raised at the expense of the successful tenderer to a level sufficient to protect the employer against potential financial losses;
(iii) Recommend non-award based on the response provided and the available demonstrable evidence that the scope, quality, completion timing, administration of works to be undertaken by the tenderer, would adversely be affected or the rights of the employer or the tenderers obligations would be limited in a substantial way.

C) Consistency of the Rates

The evaluation committee will compare the consistency of rates for similar items and note all inconsistencies of the rates for similar items.

STAGE 4 - RECOMMENDATION FOR AWARD

The successful bidder shall be the tenderer with the lowest evaluated tender price

SECTION B

GENERAL MECHANICAL SPECIFICATIONS

SECTION B

GENERAL MECHANICAL SPECIFICATION

SECTION B:

GENERAL MECHANICAL SPECIFICATION

2.01 **General**

This section specifies the general requirement for plant, equipment and materials forming part of the Sub-contract Works and shall apply except where specifically stated elsewhere in the Specification or on the Contract Drawings.

2.02 **Quality of Materials**

All plant, equipment and materials supplied as part of the Sub-contract Works shall be new and of first class commercial quality, shall be free from defects and imperfections and where indicated shall be of grades and classifications designated herein.

All products or materials not manufactured by the Sub-contractor shall be products of reputable manufacturers and so far as the provisions of the Specification is concerned shall be as if they had been manufactured by the Sub-contractor.

Materials and apparatus required for the complete installation as called for by the Specification and Contract Drawings shall be supplied by the Sub-contractor unless mention is made otherwise.

Materials and apparatus supplied by others for installation and connection by the Sub-contractor shall be carefully examined on receipt. Should any defects be noted, the Sub-contractor shall immediately notify the Engineer.

Defective equipment or that damaged in the course of installation or tests shall be replaced as required to the approval of the Engineer.

2.03 **Regulations and Standards**

The Sub-contract Works shall comply with the current editions of the following:

a) The Kenya Government Regulations.

b) The United Kingdom Institution of Electrical Engineers (IEE) Regulations for the Electrical Equipment of Buildings.

c) The United Kingdom Chartered Institute of Building Services Engineers (CIBSE) Guides.

d) British Standard and Codes of Practice as published by the British Standards Institution (BSI)

e) The Local Council By-laws.

f) The Electricity Supply Authority By-laws.

g) Local Authority By-laws.

h) The Kenya Building Code Regulations.

i) The Kenya Bureau of Standards

2.04 **Electrical Requirements**

I.

Plant and equipment supplied under this Sub-contract shall be complete with all necessary motor starters, control boards, and other control apparatus. Where control panels incorporating several starters are supplied they shall be complete with a main isolator.

The supply power up to and including local isolators shall be provided and installed by the Electrical Sub-contractor. All other wiring and connections to equipment shall form part of this Sub-contract and be the responsibility of the Sub-contractor.

The Sub-contractor shall supply three copies of all schematic, cabling and wiring diagrams for the Engineer's approval.

The starting current of all electric motors and equipment shall not exceed the maximum permissible starting currents described in the Kenya Power and Lighting Company (KPLC) By-laws.

All electrical plant and equipment supplied by the Sub-contractor shall be rated for the supply voltage and frequency obtained in Kenya, that is 415 Volts, 50Hz, 3-Phase or 240Volts, 50Hz, 1-phase.

Any equipment that is not rated for the above voltages and frequencies shall be rejected by the Engineer.

2.05 **Transport and Storage**

All plant and equipment shall, during transportation be suitably packed, crated and protected to minimise the possibility of damage and to prevent corrosion or other deterioration.

On arrival at site all plant and equipment shall be examined and any damage to parts and protective priming coats made good before storage or installation.

Adequate measures shall be taken by the Sub-contractor to ensure that plant and equipment do not suffer any deterioration during storage.

Prior to installation all piping and equipment shall be thoroughly cleaned.

If, in the opinion of the Engineer any equipment has deteriorated or been damaged to such an extent that it is not suitable for installation, the Sub-contractor shall replace this equipment at his own cost.

2.06 **Site Supervision**

The Sub-contractor shall ensure that there is an English-speaking supervisor on the site at all times during normal working hours.

2.07 **Installation**

Installation of all special plant and equipment shall be carried out by the Sub-contractor under adequate supervision from skilled staff provided by the plant and equipment manufacturer or his appointed agent in accordance with the best standards of modern practice and to the relevant regulations and standards described under Clause 2.03 of this Section.

2.08 **Testing**

2.08 General

The Sub-contractor's attention is drawn to Part 'C' Clause 1.38 of the "Preliminaries and General Conditions".

2.08.2 Material Tests

All material for plant and equipment to be installed under this Sub-contract shall be tested, unless otherwise directed, in accordance with the relevant B.S Specification concerned.

For materials where no B.S. Specification exists, tests are to be made in accordance with the best modern commercial methods to the approval of the Engineer, having regard to the particular type of the materials concerned.

The Sub-contractor shall prepare specimens and performance tests and analyses to demonstrate conformance of the various materials with the applicable standards.

If stock material, which has not been specially manufactured for the plant and equipment specified is used, then the Sub-contractor shall submit satisfactory evidence to the Engineer that such materials conform to the requirements stated herein in which case tests of material may be partially or completely waived.

Certified mill test reports of plates, piping and other materials shall be deemed acceptable.

2.08.3 Manufactured Plant and Equipment – Work Tests

The rights of the Engineer relating to the inspection, examination and testing of plant and equipment during manufacture shall be applicable to the Insurance Companies or Inspection Authorities so nominated by the Engineer.

The Sub-contractor shall give two week's notice to the Engineer of the manufacturer's intention to carry out such tests and inspections.

The Engineer or his representative shall be entitled to witness such tests and inspections. The cost of such tests and inspections shall be borne by the Sub-contractor.

Six copies of all test and inspection certificates and performance graphs shall be submitted to the Engineer for his approval as soon as possible after the completion of such tests and inspections.

Plant and equipment which is shipped before the relevant test certificate has been approved by the Engineer shall be shipped at the Sub-contractor's own risk and should the test and inspection certificates not be approved, new tests may be ordered by the Engineer at the Sub-contractor's expense.

2.08.4 Pressure Testing

All pipework installations shall be pressure tested in accordance with the requirements of the various sections of this Specification. The installations may be tested in sections to suit the progress of the works but all tests must be carried out before the work is buried or concealed behind building finishes. All tests must be witnessed by the Engineer or his representative and the Sub-contractor shall give 48 hours notice to the Engineer of his intention to carry out such tests.

Any pipework that is buried or concealed before witnessed pressure tests have been carried out shall be exposed at the expense of the Sub-contractor and the specified tests shall then be applied.

The Sub-contractor shall prepare test certificates for signature by the Engineer and shall keep a progressive and up-to-date record of the section of the work that has been tested.

2.09 **Colour Coding**

Unless stated otherwise in the Particular Specification all pipework shall be colour coded in accordance with the latest edition of B.S 1710 and to the approval of the Engineer or Architect.

2.10 **Welding**

2.10.1 Preparation2

Joints to be made by welding shall be accurately cut to size with edges sheared, flame cut or machined to suit the required type of joint. The prepared surface shall be free from all visible defects such as lamination, surface imperfection due to shearing or flame cutting operation, etc., and shall be free from rust scale, grease and other foreign matter.

2.10.2 Method

All welding shall be carried out by the electric arc processing using covered electrodes in accordance with B.S. 639.

Gas welding may be employed in certain circumstances provided that prior approval is obtained from the Engineer.

2.10.3 Welding Code and Construction

All welded joints shall be carried out in accordance with the following Specifications:

a) Pipe Welding

All pipe welds shall be carried out in accordance with the requirements of B.S.806.

b) General Welding

All welding of mild steel components other than pipework shall comply with the general requirements of B.S. 1856.

2.10.4 Welders Qualifications

Any welder employed on this Sub-contractor shall have passed the trade tests as laid down by the Government of Kenya.

The Engineer may require to see the appropriate to see the appropriate certificate obtained by any welder and should it be proved that the welder does not have the necessary qualifications the Engineer may instruct the Sub- contractor to replace him by a qualified welder.

SECTION C:

PARTICULAR SPECIFICATIONS
FOR
PLUMBING AND DRAINAGE

SECTION C:

PARTICULAR PLUMBING AND DRAINAGE SPECIFICATIONS

SECTION C:

PARTICULAR SPECIFICATIONS FOR PLUMBING AND DRAINAGE

3.1 GENERAL

This section specifies the general requirements for plant, equipment and materials forming part of the plumbing and drainage installations.

3.2 MATERIALS AND STANDARDS

3.2.1 Pipework and Fittings

Pipework materials are to be used as follows:

a. Galvanized Steel Pipework

Galvanized steel pipe work up to 65mm nominal bore shall be manufactured in accordance with B.S. 1387 Medium Grade, with tapered pipe threads in accordance with B.S. 21. All fittings shall be malleable iron and manufactured in accordance with B.S. 143.

Pipe joints shall be screwed and socketed and sufficient coupling unions shall be allowed so that fittings can be disconnected without cutting the pipe. Running nipples and long screws shall not be permitted unless exceptionally approved by the Engineer.

Galvanized steel pipe work, 80mm nominal bore up to 150mm nominal bore shall be manufactured to comply in all respects with the specification for 65mm pipe, except that screwed and bolted flanges shall replace unions and couplings for the jointing of pipes to valves and other items of plant. All flanges shall comply with the requirements of B.S. 10 to the relevant classifications contained hereinafter under Section 'C' of the Specification.

Galvanizing shall be carried out in accordance with the requirements of B.S. 1387 and B.S. 143 respectively.

b) Polypropylene Pipes –Random (PP-R) Type 3

PP-R type3 pipe work shall be manufactured in accordance with B.S. 7291part 2001.Dimesnsions and quality of PP-R Pipes shall be in accordance with DIN 8077 and pipelines in plastics materials joints, Components parts, Installation to be in accordance DIN 16928. joints And fittings to be in accordance DIN16962.

c) P.V.C. (Hard) Pressure Pipes and Fittings

All P.V.C. pipes and fittings shall be manufactured in accordance with B.S. 3505: 1968.

Jointing

The method of jointing to be employed shall be that of solvent welding, using the pipe and manufacturer's approved cement. Seal ring joint shall be introduced where it is necessary to accommodate thermal expansion.

Testing

Pipelines shall be tested in sections under an internal water pressure normally one and a half times the maximum allowable working pressure of the class of pipe used. Testing shall be carried out as soon as practical after laying and when the pipeline is adequately anchored. Precautions shall be taken to eliminate all air from the test section and to fill the pipe slowly to avoid risk of damage due to surge.

d) A.B.S. Waste System

Where indicated on the Drawings and Schedules, the Sub-contractor shall supply and fix A.B.S. waste pipes and fittings.

The pipes, traps and fittings shall be in accordance with the relevant British Standards, including B.S. 3943, and fixed generally in accordance with manufacturer's instructions and B.S. 5572: 1978.

Jointing of pipes shall be carried out by means of solvent welding, the manufacturer's instructions and B.S. 5572: 1978.

Jointing of pipes shall be carried out by means of solvent welding. The manufacturer's recommended method of joint preparation and fixing shall be followed.

Standard brackets, as supplied for use with this system, shall be used wherever possible. Where the building structure renders this impracticable the Sub-contractor shall provide purpose made supports, centers of which shall not exceed one meter.

Expansion joints shall be provided as indicated. Supporting brackets and pipe clips shall be fixed on each side of these joints.

e) PVC Soil System

The Sub-contractor shall supply and fix PVC soil pipes and fittings as indicated on the Drawings and Schedules.

Pipes and fittings shall be in accordance with relevant British Standards, including B.S. 4514 and fixed to the manufacturer's instructions and B.S. 5572.

The soil system shall incorporate synthetic rubber gaskets as provided by the manufacturer whose fixing instructions shall be strictly adhere to.

Connections to WC pans shall be effected by the use of a WC connector, gasket and cover, fixed to suit pan outlet.

Suitable supporting brackets and pipe clips shall be provided at maximum of one metre centres.

The Sub-contractor shall be responsible for the joint into the Gully Trap on Drain as indicated on the Drawings.

3.2.2 **Valves**

a) Draw-off Taps and Stop Valves (Up to 50mm Nominal Bore)

Draw-off taps and valves up to 50mm nominal bore, unless otherwise stated or specified for attachment or connection to sanitary fitment shall be manufactured in accordance with the requirements of B.S.1010.

b) Gate Valves

All gate valves 80mm nominal bore and above, other than those required for fitting to buried water mains shall be of cast iron construction, in accordance with the requirements of B.S. 3464. All gate valves required for fitting to buried water mains shall be of cast iron construction in accordance with the requirements of B.S.1218.
All gate valves up to and including 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S. 1952.
The pressure classification of all valves shall depend upon the pressure conditions pertaining to the site of works.

c) Globe Valves

All globe valves up to and including 65mm nominal bore shall be of bronze construction in accordance with the requirements of B.S.3061.

The pressure classification of all globe valves shall depend upon the pressure conditions pertaining to the site of works.

3.2.3 **Waste Fitment Traps**

a) Standard and Deep Seal P & S Traps

Where standard or deep seal traps are specified they shall be manufactured in suitable non-ferrous materials in accordance with the full requirements of B.S. 1184.

In certain circumstances, cast iron traps may be required for cast iron baths and in these instances bath traps shall be provided which are manufactured in accordance with the full requirements of B.S.1291.

b) Anti-Syphon Traps

Where anti-syphon traps are specified, these shall be similar or equal to the range of traps manufactured by Greenwood and Hughes Limited, Deacon Works Littleshampton, Sussex, England.

The trade name for traps manufactured by this company is 'Grevak'.

3.2.4 **Pipe Supports**

a) General

This sub-clause deals with pipe supports securing pipes to the structure of buildings for above ground application.

The variety and type of support shall be kept to a minimum and their design shall be such as to facilitate quick and secure fixings to metal, concrete, masonry or wood.

Consideration shall be given, when designing supports, to the maintenance of desired pipe falls and the restraining of pipe movements to a longitudinal axial direction only.

The Sub-contractor shall supply and install all steelwork forming part of the pipe support assemblies and shall be responsible for making good damage to builders work associated with the pipe support installation.

The Sub-contractor shall submit all his proposals for pipe supports to the Engineer for approval before any erection works commence.

b) Steel and Copper Pipes and Tubes

Pipe runs shall be secured by clips connected to pipe angers, wall brackets, or trapeze type supports. 'U' bolts shall not be used as a substitute for pipe clips without the prior approval of the Engineer.

An approximate guide to the maximum permissible supports spacing in metres for steel and copper pipe and tube is given in the following table for horizontal runs.

Size Nominal Bores	Copper Tube to B.S. 659	Steel Tube to B.S. 1387
15mm	1.25m	2.0m
20mm	2.0m	2.5m
25mm	2.0m	2.5m
32mm	2.5m	3.0m
40mm	2.5m	3.0m
50mm	2.5m	3.0m
65mm	3.0m	3.5m
80mm	3.0m	3.5m
100mm	3.0m	4.0m
125mm	3.0m	4.5m
150mm	3.5m	4.5m

The support spacing for vertical runs shall not exceed one and a half times the distances given for horizontal runs.

c) Expansion Joints and Anchors

Where practicable, cold pipework systems shall be arranged with sufficient bends and changes of direction to absorb pipe expansion providing that the pipe stresses are contained within the working limits prescribed in the relevant B.S. specification.

Where piping anchors are supplied, they shall be fixed to the main structure only. Details of all anchor design proposals shall be submitted to the Engineer for approval before erection commences.

The Sub-contractor when arranging his piping shall ensure that no expansion movements are transmitted directly to connections and flanges on pumps or other items of plant.

The Sub-contractor shall supply flexible joints to prevent vibrations and other movements being transmitted from pumps to piping systems or vice versa.

3.2.5 **Sanitary Appliances**

All sanitary appliances supplied and installed as part of the Sub-contract works shall comply with the general requirements of B.S. Code of Practice 305 and the particular requirements of the latest B.S. Specifications.

3.2.6 **Pipe Sleeves**

Main runs of pipework are to be fitted with sleeves where they pass through walls and floors. Generally the sleeves shall be of P.V.C. except where they pass through the structure, where they shall be mild steel. The sleeves shall have 6mm – 12mm clearance all around the pipe or for insulated pipework all around the installation. The sleeve will then be packed with slag wool or similar.

3.3 **INSTALLATION**

3.3.1 **General**

Installation of all pipework, valves, fittings and equipment shall be carried out under adequate supervision from skilled staff to the relevant codes and standards as specified herein. The Sub-contractor shall be responsible to the Main Contractor for ensuring that all builders work associated with his piping installation is carried out in a satisfactory manner to the approval of the Engineer.

3.3.2 **Above Ground Installation**

a) Water Services

Before any joint is made, the pipes shall be hung in their supports and adjusted to ensure that the joining faces are parallel and any falls which shall be required are achieved without springing the pipe.

Where falls are not shown on the Contract Drawings or stated elsewhere in the Specification, pipework shall be installed parallel to the lines of the buildings and as close to the walls, ceilings, columns, etc., as is practicable.

All water systems shall be provided with sufficient drain points and automatic air vents to enable them to function correctly.

Valves and other user equipment shall be installed with adequate access for operation and maintenance. Where valves and other operational equipment are unavoidably installed beyond normal reach or in such position as to be difficult to reach from a small step ladder, extension spindles with floor or wall pedestals shall be provided.

Screwed piping shall be installed with sufficient number of unions to facilitate easy removal of valves and fittings, and to enable alterations of pipework to be carried out without the need to cut the pipe.

Full allowances shall be made for the expansion and contraction of pipework, precautions being taken to ensure that any force produced by the pipe movements are not transmitted to valves, equipment or plant.
All screwed joints to piping and fittings shall be made with P.T.F.E. tape.
The test pressure shall be maintained by the pump for about one hour and if there is any leakage, it shall be measured by the quantity of water pumped into the main in that time. A general leakage of 4.5 litres per 25mm of diameter, per 1.6 kilometres per 24 hours per 30 metres head, may be considered reasonable but any visible individual leak shall be repaired.

b) Sanitary Services

Soil, waste and vent pipe system shall be installed in accordance with the best standard of modern practice as described in B.S. 5572 to the approval of the Engineer.

The Sub-contractor shall be responsible for ensuring that all ground waste fittings are discharged to a gully trap before passing to the sewer via a manhole.

The Sub-contractor shall provide all necessary rodding and inspection facilities within the draining system in positions where easy accessibility is available.

Where a branch requires rodding facilities in a position to which normal access is unobtainable, then that branch shall be extended so as to provide a suitable purpose made rodding eye in the nearest adjacent wall or floor to which easy access is available.

The vent stacks shall terminate above roof level and where stack passes through roof, a weather skirt shall be provided. The Sub-contractor shall be responsible for sealing the roof after installation of the stacks.

The open end of each stack shall be fitted with a plastic coated or galvanised steel wire guard.

Access for rodding and testing shall be provided at the foot of each stack.

c) Sanitary Appliances

All sanitary appliances associated with the Sub-contract works shall be installed in accordance with the best standard of modern practice as described in C.P. 305 to the approval of the Engineer.

1.1. TESTING AND INSPECTION

3.4.1 Site Tests – Pipework Systems

a) Above Ground Internal Water Services Installation

All water service pipe system installed above ground shall be tested hydraulically for a period of one hour to not less than one and half times to design working pressure.

If preferred, the Sub-contractor may test the pipelines in sections. Any such section found to be satisfactory need not be the subject of a further test when system has been completed, unless specifically requested by the Engineer.
During the test, each branch and joint shall be examined carefully for leaks and any defects revealed shall be made good by the Sub-contractor and the section re-tested.

The Sub-contractor shall take all necessary precautions to prevent damage occurring to special valves and fittings during the tests. Any item damaged shall be repaired or replaced at the Sub-contractor's expenses.

b) Above Ground Soil Waste and Ventilation System

All soil, waste and ventilating pipe system forming part of the above ground installation, shall be given appropriate test procedures as described in B.S. 5572, 1972.

Smoke tests on above ground soil, waste and ventilating pipe system shall not be permitted.

Pressure tests shall be carried out before any work which is to be concealed is finally enclosed.

In all respects, tests shall comply with the requirements of B.S. 5572.

3.4.2 **Site Test – Performance**

Following satisfactory pressure test on the pipework system operational tests shall be carried out in accordance with the relevant B. S. Code of practice on the systems as a whole to establish that special valves, gauges, control, fittings, equipment and plant are functioning correctly to the satisfaction of the Engineer.

All hot water pipework shall be installed with pre-formed fibre glass lagging to a thickness of 25mm where the pipe runs above a false ceiling or in areas where the ambient temperature is higher than normal with the result that pipe "sweating", due to condensation will cause nuisance.

All lagged pipes which run in a visible position after erection shall be given a canvas cover and prepared for painting as follows:

i) Apply a coating of suitable filler until the canvas weave disappears and allow to dry.

ii) Apply two coats of an approved paint and finish in suitable gloss enamel to colors approved by the Engineer.

All lagging for cold and hot water pipes erected in crawlways, ducts and above false ceiling which after erection are not visible from the corridors of rooms, shall be covered with a reinforced aluminium foil finish banded in colours to be approved by the Engineer.

In all respects, unless otherwise stated, the hot and cold-water installation shall be carried out in accordance with the best standard of modern practice and described in C.P.342 and C.P.310 respectively to the approval of the Engineer.

The test pressure shall be applied by means of a manually operated test pump or, in the case of long main or mains of large diameter, by a power driven test pump which shall not be left unattended. In either case precautions shall be taken to ensure that the required pressure is not exceeded.

Pressure gauges should be recalibrated before the tests.

The Sub-contractor shall be deemed to have included in his price for all test pumps, and other equipment required under this specification.

The test pressure shall be one and a half times the maximum working pressure except where a pipe is manufactured from a material for which the relevant B.S. specification designates a maximum test pressure.

3.5 **STERILISATION OF COLD WATER SYSTEM**

All water distribution system shall be thoroughly sterilised and flushed out after the completion of all tests and before being fully commissioned for handover.

The sterilisation procedures shall be carried out by the Sub-contractor in accordance with the requirements of B.S. Code of Practice 301, Clause 409 and to the approval of the Engineer.

PART D:

PARTICULAR SPECIFICATION FOR PORTABLE FIRE EXTINGUISHER BOOSTED HOSE REEL SYSTEM, HOSE REEL, AND FIRE HYDRANT INSTALLATIONS

PART D:

PARTICULAR SPECIFICATION FOR PORTABLE FIRE EXTINGUISHER BOOSTED HOSE REEL SYSTEM, HOSE REEL, AND FIRE HYDRANT INSTALLATIONS

PART F

PARTICULAR SPECIFICATIONS FOR PORTABLE FIRE EXTINGUISHER AND HOSE REEL INSTALLATIONS

4.1 GENERAL

The particular specification details the requirements for the supply and installation and commissioning of the Portable Fire Extinguishers and Boosted Hose Reel System. The Sub-contractor shall include for all appurtenances and appliances not necessarily called for in this specification or shown on the contract drawings but which are necessary for the completion and satisfactory functioning of the works.

If in the opinion of the Sub-contractor there is a difference between the requirements of the Specifications and the Contract Drawings, he shall clarify these differences with the Engineer before tendering.

4.2 SCOPE OF WORKS

The Sub-contractor shall supply, deliver, erect, test and commission all the portable fire extinguishers and Hose Reel which are called for in these Specifications and as shown on the Contract Drawings.

4.3 WATER/CO2 EXTINGUISHERS

These shall be 9-litre water filled CO2 cartridge operated portable fire extinguishers and shall comply with B.S. 1382: 1948 and to the requirements of B.S.4523: 1977. Unless manufactured with stainless steel, bodies shall have all internal surfaces completely coated with either a lead tin, lead alloy or zinc applied by hot dipping. There shall be no visibly uncoated areas.

The extinguishers shall be clearly marked with the following:

a) Method of operation.

b) The words 'WATER TYPE' (GAS PRESSURE) in prominent letters.

c) Name and address of the manufacturer or responsible vendor.

d) The nominal charge of the liquid in imperial gallons and litres.

e) The liquid level to which the extinguisher is to be charged.

f) The year of manufacture.

g) A declaration to the effect that the extinguisher has been tested to a pressure of 24.1 bar (350 psi.).

h) The number of British Standard 'B.S' 1382 or B.S. 5423: 1977.

4.4 PORTABLE CARBON DIOXIDE FIRE EXTINGUISHERS

These shall be portable carbon dioxide fire extinguishers and shall comply with B.S. 3326: 1960 and B.S. 5423: 1977.

The body of extinguisher shall be a seamless steel cylinder manufactured to one of the following British Standards; B.S. 401 or B.S. 1288.

The filling ratio shall comply with B.S. 5355 with valves fittings for compressed gas cylinders to B.S.341. Where a hose is fitted it shall be flexible and have a minimum working pressure of 206.85 bar (3000 p.s.i.). The hose is not to be under internal pressure until the extinguisher is operated.

The nozzle shall be manufactured of brass gunmetal, aluminium or stainless steel and may be fitted with a suitable valve for temporarily stopping the discharge if such means are not incorporated in the operating head.

The discharge horn shall be designed and constructed so as to direct the discharge and limit the entrainment of air. It shall be constructed of electrically non-conductive material.

The following markings shall be applied to the extinguishers:-

a) The words "Carbon Dioxide Fire Extinguisher" and to include the appropriate nominal gas content.

b) Method of operation.

c) The words "Re-charge immediately after use".

d) Instructions for periodic checking.

e) The number of the British Standard B.S. 3326: 1960 or B.S. 5423.

f) The manufacturers name or identification markings

4.5 DRY CHEMICAL POWDER PORTABLE FIRE EXTINGUISHER

The portable dry powder fire extinguishers shall comply with BS3465: 1962 and BS 5423. The body shall be constructed to steel not less than the requirements of BS 1449 or aluminium to BS 1470: 1972 and shall be suitably protected against corrosion.

The dry powder charge shall be not-toxic and retain it s free flowing properties under normal storage conditions. Any pressurizing agent used as an expellant shall be in dry state; in particular compressed air.

The discharge tube and gas tube if either is fitted shall be made of steel, brass, copper or other not less suitable material. Where a hose is provided it shall not exceed 1,060mm and shall be acid and alkali resistant. Provision shall be made for securing the nozzle when not in use.

The extinguisher shall be clearly marked with the following information

a) The word "Dry Powder Fire Extinguisher"

b) Method of operation in prominent letters.

c) The working pressure and the weight of the powder charge in Kilogramme.

d) Manufacturers name or identification mark

e) The words "RECHARGE AFTER USE" if rechargeable type.

f) Instructions to regularly check the weight of the pressure container (gas Cartridge) or inspect the pressure indicator on stored pressure types when fitted, and remedy any loss indicated by either.

g) The year of manufacture.

h) The Pressure to which the extinguisher was tested.

i) The number of this British Standard BS 3465 or BS 5423: 1977.

j) When appropriate complete instructions for charging the extinguisher shall be clearly marked on the extinguisher or otherwise be supplied with the refill.

4.6 AIR FOAM FIRE EXTINGUISHER

These shall be of 9 litres capacity complete with refills cartridges and wall fixing brackets and complying with B.S. 5423 with the following specifications:-

Cylinder: to B.S. 1449

Necking: to be 76mm outside diameter steel EN 3A $2^3/_4$ X 8TPI female thread**.**

Head cap: to be plastic moulding acetyl resin.

CO_2 Cylinder: to be 75gm P.V.C coated.

Internal Finish: to be polythene lining on phosphate coating.

External finish: to be phosphated - One coat primer paint and one coat stove enamel B.S. 381 C.

4.7 FIRE BLANKET

The fire blanket shall be made from cloth woven with pre-asbestos yarn or any other fire proof material and to measure 1800 x 1210 mm and shall be fitted with special tapes folded so as to offer instantaneous single action to release blanket from storing jacket.

4.8 BOOSTED HOSE REEL SYSTEM

4.8.1 General

The Particular Specification details the requirements for the supply, installation and commissioning of the hose reel installation. The hose reel installation shall comply in all respects to the requirements set out in C.O.P 5306 Part 1: 1976, B.S 5041 and B.S 5274. The System shall comprise of a pumped system.

4.8.2 Hose Reel Pumps

The fire hose reel pumps shall consist of a duplicate set of multi-line centrifugal pumps from approved manufacturers. The pumps shall be capable of delivering 0.76 lit/sec at a running pressure of 2 bars.

The pump casing shall be of cast iron construction with the impeller shaft of stainless steel with mechanical seal.

4.8.3 Control Panel

The control panel shall be constructed of mild steel 1.0mm thick sheet, be moisture, insect and rodent proof and shall be provided complete with circuit breakers and a wiring diagram enclosed in plastic laminate.

The pump shall be controlled by a flow switch therefore, the control panel shall include the following facilities:

(a) 'On' push button for setting the control panel to live.

(b) Green indicator light for indicating control panel live.

(c) Duty / Stand-by pump auto change over.

(d) Duty pump run green indicator light.

(e) Stand-by pump run green indicator light.

(f) Duty pump fail red indicator light.

(g) Stand-by pump fail red indicator light.

(h) Low water condition pump cut-out with red indicator light.

The pumps are to be protected by a low level cut-out switch to prevent dry pump run when low level water conditions occur in the water storage tank.

4.8.4 Hose Reel

The hose reel to the installation shall consist of a recessed, swing-type hose reel as Angus Fire Armour Model III or from other approved manufacturers.

The hose reel shall comply with B.S. 5274: 1975 and B.S 3161: 1970 and is to be installed to the requirements of C.P. 5306 Part 1: 1976.

The hose reel shall be supplied and installed complete with a first-aid Non-kinking hose 30 meters long with a nylon spray / jet / shut-off nozzle fitted. A screw down chrome - plated globe valve to B.S 1010 to the inlet to the reel is to be supplied.

The orifice to the nozzle is to be not less than 4.8mm to maintain a minimum flow of 0.4 lit / sec to jet.

The hose reels shall be installed complete with electro-galvanised cabinet recessed on the wall.

The hose reels shall be installed at 1.5 metres centre above the finished floor level in locations shown in the contract drawings.

4.8.5 Pipe Work

The pipe work for the hose reel installation shall be galvanised wrought steel tubing heavy grade Class C to B.S 1387: 1967 with pipe threads to B.S 21. The pipe work and all associated fittings shall be in approved colour for fire fittings.

4.8.6 Pipe Fittings

The pipe fittings shall be wrought steel pipe fittings, welded or seamless fittings conforming to B.S. 1740 or malleable iron fittings to B.S 143.
All changes in direction will be with standard bends or long radius fittings. No elbows will be provided.

4.8.7 Non-return Valves

The non-return valves up to and including 80mm diameter shall be to B.S. 5153: 1974.
The valves shall be of cast iron construction with gunmetal seat and bronze hinge pin.

4.8.8 Gate Valves

The gate valves up to and including 80mm diameter shall be non-rising stem and wedge disc to B.S 5154: 1974 with screwed threads to B.S. 21 tapes thread

4.8.9 Sleeves

Where pipe work passes through walls, floors or ceilings, a sleeve shall be provided one diameter larger than the diameter of the pipe, the space between them to be packed with mineral wool, to the Engineer's approval.

4.8.10 Earthing

The hose reel installation shall be electrically earthed by a direct earth connection. The installation of the earthing shall be carried out by the Electrical Sub- contractor.

4.8.11 Finish Painting

Upon completion of testing and commissioning the hose reel installation, the pipework shall be primed and finish painted with 2 No. coats of paints to the Engineer's requirements.

4.8.12 Testing and Commissioning

The hose reel installation shall be flushed out before testing to ensure that no builder's debris has entered the system. The installation is to be then tested to one and half times the working pressure of the installation to the approval of the Engineer. Simulated fault conditions of the pumping equipment are to be carried out before acceptance of the System by the Engineer.

4.8.13 Instruction Period

The Sub-contractor shall allow in his contract sum for instructing of the use of the equipment to the Client's maintenance staff. The period of instruction may be within the contract period but may also be required after the contract period has expired.

The period of time required shall be stipulated by the Client but will not exceed two days in which time the Client's staff shall be instructed on the operation and maintenance of the equipment.

4.8.14 Signage-Fire Instruction /Fire Exit

4.8.14.1 Fire Instruction Notice

Print fire instruction on the Perspex plates with White Colour Background measuring 510mm length x 380mm width x 4mm thick as follows;

FIRE INSTRUCTION NOTICE

In the event of fire;

1. Raise the alarm by actuating the nearest alarm system point, Sound Siren /gong or **Shout Fire**
2. Attack fire using the nearest available equipment
3. Call nearest fire Brigade or Police 999 and inform your switchboard (PABX) Operator
4. Ensure that all personnel not involved in fire fighting evacuation to safety outside the building.
5. Close but **DO NOT LOCK** doors behind as you leave.
6. Evacuate the building using stairs or fire escapes. Do not use Lifts/Escalators. Walk calmly. Avoid panic. Do not stop or return for personal belongings.
7. Assemble as per floor outside the building for roll call.

4.8.14.2 Fire Exit Sign

Print Fire Exit signs on the Perspex plate, 4mm thick, with white colour background as follows:-

1. Lettering IN RED COLOUR of not less than 50mm in height.
2. A pendant sign bearing words, FIRE EXIT and with a directional arrow.

The sign must be capable of being read from both approaches to exit and so is double sided.

4.8.14.3 Hose Reel Label

Print Fire Exit signs on the Perspex plate, 4mm thick, with white colour background as follows:-

1. Lettering IN RED COLOUR of not less than 50mm in height.
2. A pendant sign bearing words, HOSE REEL and with a directional arrow.

The sign must be capable of being read from both approaches to exit and so is double sided.

PART E

PARTICULAR SPECIFICATION FOR THE DESIGN SUPPLY AND ERECTION OF WATER STORAGE TANKS AND BOOSTER PUMPS

PART E

PARTICULAR SPECIFICATION FOR THE DESIGN SUPPLY AND ERECTION OF WATER STORAGE TANKS AND BOOSTER PUMPS

6.10 DESCRIPTION OF SITE

The contractor is deemed to have visited the site and if unable to locate it or its details apply to the Principal Secretary, State Department of Public Works, Ministry of Transport, Infrastructure, Public Works, Housing and Urban Development, Ngong Road, Nairobi.

No claims will be allowed for the traveling or other expenses, which may be incurred by the sub-contractor's works. However, the sub-contractor may allow that he may have to, during contract time, do part of the works and therefore three visits may be catered for.

6.11 SCOPE OF CONTRACT

The work to be carried out under, this sub-contract comprises the designs, manufacture, supply, delivery, erection, together with testing and commissioning of Water tanks as here-in specified and shown on the contract drawings.

All work shall be performed in straightforward manner by competent workmen under skilled supervision to the entire satisfaction of the project manager.

6.12 COMPLIANCE WITH REGULATIONS.

The sub-contractor shall comply in all respects to the provisional and regulations of the By-laws of the Local Authority, Kenya Building Code, as 449 Part B5 1964. BS 4211, CP2 chapters V part 1 and 2 MOPW Structural steel work specification (1973) code of practice for design and construction of buildings and structures in Relation to Earthquake (1972) wherever applicable to the contract works.

The Ministry of Roads and Public Works are responsible for the design of the foundation subject to giving approval of the sub-contractor's design of the tower and due allowance should be given for this work to be carried out in sub-contractor programmed of works. The main contractor is responsible for the construction of the foundation in accordance to approved designs.

6.13 STRUCTURAL DRAWINGS AND CALCULATIONS

2No copies of general arrangement and fabrication drawings properly dimensioned and detailed showing the whole tower and its accessories together with 2No copies of the structural calculations complying with all the relevant BS and CP are to be submitted for approval prior to the commencement of the work.
The calculation is to indicate the maximum downward and upward loads on the foundations for the Ministry of Roads and Public Works Structural Department to design the foundation.

6.20 STEEL WATER TANKS

a) The tanks shall be pressed steel sectional tanks complying in all respects to BS 1564 Types 1 or 2. The jointing materials shall be non-toxic and non-soluble to water and the tank cover shall be joined throughout the tank top ensuring that the joint is both water proof and dust proof.

b) Cover framing and members shall be designed to withstand supper-imposed loading complying with the requirement complying with the requirements of CP2 Chapter V part 1 and BS 149 Part 2.

c) All internal stays are to be provided as required by the tank manufacture and the Sub-contractor shall be responsible for ensuring the stays are adequate in number and position and properly tightened. These are to be manufactured from steel to BS 4360, Grade 43 A.

d) All Bolts, nuts and washers used in the construction should comply with BS 4190. The contractor to allow in his pricing, for a complete set of spanners, spare bolts and Washers for maintenance purposes.

e) Access manhole with hinged cover together with a filtered vent outlet shall be installed.

f) The Sub-contractor is to notify the Project Manager of the type of panel he is proposing to use and the manufacturer who is to be approved.

g) The inflow and outflow connection shall be as shown on the drawing.

h) The outflow supply pipe shall be at least 50mm above the tank bottom while the inflow pipe shall be 200mm below the tank rim. The overflow pipe shall be about 1000mm long, away from the tank. The drain pipe shall be at the lowest part of the tank.

6.21 LOW LEVEL TANK

Tank Capacity: **217,378 Litres (47,817 Gal) Cold Pressed Steel**

Preferred dimensions:
8 metres length

7 metres width

4 metres height

Plate thickness- 6mm

Tank to be supplied completed with: -
a) 50 mm diameter inflow connection
b) 150 mm diameter outflow connections
c) 150 mm diameter outflow connections
d) 100 mm diameter washout pipe
e) 100 mm diameter overflow pipe
f) Level Electrode pair fully wired.
g) 1No. water level indicator
h) 2No. cover and manhole
i) 1No. internal ladder
j) 1No. external ladder

The Structural Department will give details of foundations and R.C walls for the low level tank.

The base is to be cast by the Main Contractor unless otherwise instructed by the Project Manager.

6.221 HIGH LEVEL TANK

Tank Capacity: **84,401 Litres (18,866 Gal) Cold Pressed Steel**

Preferred Dimensions

6 metres length

5 metres width

3 metres height
plate thickness: **6mm**

Height from ground level to the underside of the tank will be **18 metres.**
Tank to be supplied with:

1. 50- mm diameter inflow connection
2. 150- mm diameter outflow connection
3. 100- mm diameter washout pipe
4. 100- mm diameter overflow pipe
5. 1No. level regulator
6. 2No. Water level indicator
7. 1No. steel cover and manhole
8. 1No. internal ladder
9. 1No. external ladder to ground level with cage
10. 1No. perimeter walkway and handrail

6.23 Pipework

The sub-contractor shall supply and fix all pipe work and fitting up to ground level as detailed on the drawing or in this specification. All pipe work shall be adequately supported and secured to the tank structure. The washout pipe will have a bend leading to a reasonable place where the drainage will not interfere with the structure.

The inflow outflow and washout pipes shall be fixed against the tower structure so as to facilitate fixing and good support.

The following pipework shall be used depending on the condition: -

(a) Medium Grade Galvanized steel and must conform with BS 1987 1967 class 'B'
(b) PP-R pipe work to be manufactured in accordance with the current European standards i.e DIN 8077 and DIN 8078 for PN 20 tubing, with metallic joints to DIN 8076, joints and fittings for tubing to DIN 16962.
(c) HDPE PN 16

The sub-contractor shall provide high pressure ball valve capable of coping with the maximum area's local water supply pressure.

6.24 Access Ladder

Internal ladder shall be supplied for the tank and shall be fixed adjacent at the manhole but easily removable for cleaning the inside of the tank (i.e hooked connection).

The tanks shall be provided with an external ladder leading to the manhole and complying to BS 4211. The stringers shall be parallel, minimum width 15 inches apart and of flat bar of minimum dimensions 1½" by 2/8 inches. The rugs shall be of round bars not less than ¾ inches diameter and the distance between centers shall be 9 – 10 inches. The external ladder shall be fitted with safety hoofs made to conform with BS 4211.

6.25 Platform

The tower is to have a periphery walkway at tank level having minimum width of 600mm clear between the edge of the tank and the inside of the protective safety handrail. The platform is to be provided with a steel chequered place floor of similar approved and to be completely sealed so as not to allow anybody or items such as bolts and spanners to fall on persons on the ground.

All loading for the design of such platform are to be provided in the structural calculations.

6.26 Painting

The tank shall be painted inside with one coat of bituminous non-toxic paint (or any other equivalent and approved) and on the outside with coat of primer before erection. After erection, the tank inside shall be painted with two coats of aluminium paint. The other structures shall be cleaned and painted one coat lead oxide or red lead before erection and two coats of aluminium paints after erection.

All the painting shall be approved by the Engineer.

6.27 Erection

The sub-contractor shall erect the tank complete, on foundation prepared and designed by others and with all necessary pipes, ladders, tower etc. as listed herein and shown on the drawing.

The main contractor shall prepare the foundation to the sub-contractor's and Public Works Structural Department's details. The main contractor shall also concrete or grount in the HD bolts to the sub-contractor's requirements.

6.30 POLYETHYLENE WATER STORAGE TANKS

(a) The tanks are made of graded polyethylene that has been effectively stabilized against the harmful effects of sunlight. This being achieved by incorporating more than 2% carbon black into the melt.
(b) The tank to manufactured as per the relevnt Kenyan Starndard.

6.40 Booster pumps

2 No. electrically operated pumps capable of pumping 15 Litres per second (110 gallons per minute) of water against 20 metres static head shall be installed. The pumps to be as '**Grundfos CR 15-3'** or equal and approved.

Each pump shall be directly driven by a three phase motor; the pump motor being mounted on a common base.

Pump casing shall be manufactured from good quality cat iron and impellers, shafts and other material in contract with water shall be of corrosion resistant metal. The pumps shall be suitable for pumping filtered water treated for human consumption.

The motor shall be completed protected against possible damage due to entry of water, dust etc. the shall be fitted with glands for the entry of PVC armoured cables with overall PVC sheath. The completed cable connection to the motor terminal box shall be proof against ingress of water or dust.

The pump shall be mounted on concrete plinth which shall be constructed by the main contractor in accordance with specifications form the sub-contractor.

Holes for holding down bolts shall be left in concrete and after the concrete has cured the pumps shall be placed in position and bolts grounded into position. A grout shall be floated under pump motor base to ensure an even surface for the pump to rest upon.

6.50 Electrical works

It shall be the responsibility of the sub-contractor to provide all electrical wiring between all items of his sub-contract works to ensure the correct functioning of his equipment. The sub-contractors electric works shall start from nearest electrical isolator.

6.60 Control panel

The sub-contractor shall provide an electric control panel and shall be responsible for its fixing and satisfactory operation. The panel shall be fabricated from minimum thickness. 1.2mm steel sheet and finished grey stoved enamel.

The panel shall be wall mounted with a removable hinged front access panel. Motor control switch gear shall be of approved type. The panel shall have an integral isolator.

Pump changeover shall be automatic alternating after each duty cycle. A green 'running' red 'trip' lamp shall be provided for each pump. The control system (float switches etc.) shall be energized when a pump is started.

The motor system shall be wired so that they operate only automatically as called for by the switches except that starter push button shall be connected so as to enable the pumps to be started and run and cease to run when the push button is allowed to its normal position.

An emergency stop button shall be located adjacent to each pump.

The level regulator shall be wired and set in such a manner that the duty pumps shall be called to start when the high level tank is full.

The electrode in the low level tank shall override instructions form high level regulator and stop when the water is approximately 600mm high.

Where a three-phase motor is used, a single phasing protector shall be provided if the motor does not have one.

A phase failure relay shall be installed in 3 phase – operated pumps.

6.70 Testing

Testing shall be done by filling the tank with water after erection. The water will be from the local supply and the main contractor shall apply from the Authority for connection.

In cases where water is already on site and being used by the client, the contractor will make necessary arrangements and reimburse the client amount equivalent to volume of water used.

Testing shall be witnessed by the Project Manager or his representative.

6.80 Guarantee

The sub-contractor shall guarantee the tanks against leaks, and the tower for a period of (12) months form the testing date. Any damage incurred due to bad workmanship shall be made good by the contractor.

6.90 SCHEDULES

6.91 Introduction

The tenderer shall complete all schedules. The schedules shall be read in conjunction with the specification. The GRAND TOTAL of prices in the main summary of prices schedule shall be deemed to have been included in another part of section.

Note: -

The list of recommended initial spare parts prices are to be submitted separately on tenderer's own paper. The spares prices are not to be included in the GRAND TOTAL or prices as the spares are an extra item only to be purchased if and when convenient to the Government of Kenya.

All prices shall be in Kenya shillings and shall be inclusive of all taxes and duties current at the time of tendering.

SECTION F:

BILLS OF QUANTITIES

AND

SCHEDULE OF UNIT RATES

SECTION F:

BILLS OF QUANTITIES AND SCHEDULE OF UNIT RATES

CONTENTS

5.01 SPECIAL NOTES

1. The Bills of Quantities form part of the contract documents and are to be read in conjunction with the contract drawings and general specifications of materials and works.

2. The prices quoted shall be deemed to include for all obligations under the sub-contract including but not limited to supply of materials, labour, delivery to site, storage on site, installation, testing, commissioning and all taxes (**including 16% VAT**).

   In accordance with Government policy, **6% withholding VAT and 3% Withholding Tax shall be deducted** from all payments made to the Tenderer, and the same shall be forwarded to the **Kenya Revenue Authority (KRA).**

3. All prices omitted from any item, section or part of the Bills of Quantities shall be deemed to have been included to another item, section or part there of.

4. The brief descriptions of the items given in the Bills of Quantities are for the purpose of establishing a standard to which the sub-contractor shall adhere. Otherwise alternative brands of **equal** and **approved** quality will be accepted.

   Should the sub-contractor install any material not specified here in before receiving **written approva**l from the Project Manager, the sub-contractor shall remove the material in question and, **at his own cost**, install the proper material.

5. The grand total of prices in the price summary page must be carried forward to the **Form of Tender for the tender to be deemed valid**.

   Tenderers must enclose, together with their submitted tenders, detailed manufacturer's Brochures detailing Technical Literature and specifications on all the equipment they intend to offer.

5.02 STATEMENT OF COMPLIANCE

a) I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.

b) I confirm I have not made and will not make any payment to any person, which can be perceived as an inducement to win this tender.

Signed: ……..…….*for and on behalf of the Tenderer*

Date: ……..

Official Rubber Stamp: ……..……

5.03 BILLS OF QUANTITIES

A) PRICING OF PRELIMINARIES ITEMS.

Prices will be inserted against item of preliminaries in the sub-contractor's Bills of Quantities and specification. These Bills are designated as Bill 1 in this Section. Where the sub-contractor fails to insert his price in any item he shall be deemed to have made adequate provision for this on various items in the Bills of Quantities. The preliminaries form part of this contract and together with other Bills of Quantities covers for the costs involved in complying with all the requirements for the proper execution of the whole of the works in the contract.

The Bills of Quantities are divided generally into three sections:-

a. Preliminaries – Bill 1

Sub-contractors preliminaries are as per those described in section C – sub-contractor preliminaries and conditions of contractor. The sub-contractor shall study the conditions and make provision to cover their cost in this Bill. The number of preliminary items to be priced by the Tenderer has been limited to tangible items such as site office, temporary works and others. However the Tenderer is free to include and price any other items he deems necessary taking into consideration conditions he is likely to encounter on site.

b. Installation Items – Other Bills

i. The brief description of the items in these Bills of Quantities should in no way modify or supersede the detailed descriptions in the contract Drawings, conditions of contract and specifications.
ii. The unit of measurements and observations are as per those described in clause 3.05 of the section

c. Summary

The summary contains tabulation of the separate parts of the Bills of Quantities carried forward with provisional sum, contingencies and any prime cost sums included. The sub-contract shall insert his totals and enter his grand total tender sum in the space provided below the summary.
This grand total tender sum shall be entered in the Form of Tender provided elsewhere in this document

BILL No. 1 PRELIMINARIES

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
1	Discrepancies clause 1.02				
2	Conditions of sub-contract Agreement clause 1.03				
3	Payments clause1.04				
4	Site location clause 1.06				
5	Scope of Contract Works clause 1.08				
6	Extent of the Contractor's Duties clause 1.09				
7	Firm price contract clause 1.12				
8	Variation clause 1.13				
9	Prime cost and provisional sum clause 1.14 (insert profit and attendance which is a percentage of expended PC or provisional sum.)				
10	Bond clause 1.15				
11	Government Legislation and Regulations clause 1.16				
12	Import Duty and Value Added Tax clause 1.17 (Note this clause applies for materials supplied only. VAT will also be paid by the sub-contractor as allowed in the summary page)				
13	Insurance company Fees clause 1.18				
14	Provision of services by the Main contractor clause 1.19				
15	Samples and Materials Generally clause 1.21				
SUB-TOTAL CARRIED TO PAGE…… F-6					

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
16	Supplies clause 1.20				
17	Bills of Quantities clause 1.23				
18	Contractor's Office in Kenya clause 1.24				
19	Builder's Work clause 1.25				
20	Setting to work and Regulating system clause 1.29				
21	Identification of plant components clause 1.30				
22	Working Drawings clause 1.32				
23	Record Drawings (As Installed) and Instructions clause 1.33				
24	Maintenance Manual clause 1.34				
25	Hand over clause 1.35				
26	Painting clause 1.36				
27	Testing and Inspection – manufactured plant clause 1.38				
28	Testing and Inspection – Installation clause 1.39				
29	Storage of Materials clause 1.41				
30	Initial Maintenance clause 1.42				
SUB-TOTAL CARRIED TO PAGE……. F-6					

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
31	Attendance Upon Tradesmen, etc. (Insert percentage only) clause 1.58				
32	Local and other Authorities notices and fees clause 1.60				
33	Temporary Works clause 1.63				
34	Patent Rights clause 1.64				
35	Mobilization and Demobilization Clause 1.65				
36	Extended Preliminaries Clause 1.66(see appendix on page C- 17)				
37	Supervision by Engineer and Site Meetings Clause 1.67				**400,000.00**
38	Allow for profit and Attendance for the above				
39	Amendment to Scope of Sub-contract Works Clause 1.68				
40	Contractor Obligation and Employers Obligation clause 1.69(see appendix page C- 18)				
41	Any other preliminaries;				
	Subtotal above				
	Sub-total brought forward from page…… F-4				
	Sub-total brought forward from page……. . F-5				
TOTAL FOR BILL NO. 1- PRELIMINARIES CARRIED FORWARD TO PRICE MAIN SUMMARY PAGE…….…… F-52					

WATER STORAGE, RETICULATION AND IRRIGATION WORKS

Bill No. 2: High and Low Level Water Tanks

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	HIGH AND LOW LEVEL WATER TANKS				
A	**Low Level Water Tank**				
	Low level water storage tank as **"Braithwaite"** or approved equiavalent made from **6mm thick** cold pressed mild steel sectional plates of size **1000mm x 1000mm**. Capacity of tank to be **217,378 Litres** with preferred dimensions **8,000 x 7,000 by 4,000mm** high. The tank to have an inside finish of uniform black bituminous paint and the outside to have a zinc phosphate primer before application of two coats of silver aluminium paint All nozzles/pipe connections to be flanged. these are; supply inlet pipe, outlet pipe, overflow pipe, tank washout, warning pipe and vent pipe to be in place. The tank to come complete with: - 1 No. Highly visible Water Level Indicator - 1 No. Lockable, hinged Steel Cover Manhole - 1 No. internal ladder - Appropriate float valve chamber - 1 No. external cat ladder to ground Level with a hooped safety cage - Pitched dustproof and weatherproof tank cover made of flat 4mm thick steel sheets capable of withstanding loading imposed by the maintenance personnel. - All necessary cleats, stays, braces, rafters and reinforcements - All necessary high zinc coated tensile steel bolts, nuts, washers, none toxic strip sealant to make all joints leak proof. The tank to come accompanied by 10 No., 4mm thick, 50mm wide flate plate 9,200mm long for laying above the concrete piers before tank placement. Tank connections include 50mm inlet, 150mm outlet, 150mm overflow, 100mm washout, 150mm Irrigation	1	Item		
B	**Builders Works** Allow for builders works associated with the installation of the above pressed steel sectional ground tank. This shall include but not limited to site and ground clearance, excavation and levelling, building of 10 no. reinforced concrete support piers along the seams of the tank in one direstion. The piers to have a 300mm wide footing, and to be 200mm wide with a tapering top. To be 600mm above ground and 9,200mm long to Structural Engineers approval	1	Item		
Sub-total c/f to the High and Low Level Water Tanks collection page.... F-11					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**High Level Water Tank** High level water storage tank as **"Braithwaite"** or approved equiavalent made of 6mm thick cold pressed mild steel sectional plates of size 1000mm x 1000mm. Capacity of tank to be **84,401 Litres** of preferred dimensions **6,000 x 5,000 by 3,000mm** high. The tank to have an inside finish of uniform black bituminous paint and the outside to have a zinc phosphate primer before 3 coats of silver aluminium paint All nozzles/pipe connections to be flanged. these are; supply inlet pipe, outlet pipe, overflow pipe, tank washout, warning pipe and vent pipe to be in place. The tank to come complete with: - 1 No. Highly visible Water Level Indicator - 1 No. Lockable, hinged Steel Manhole Cover - 1 No. internal Ladder - Appropriate float valve chamber - 1 No. External Ladder to platform level with safety cage - Pitched dustproof and weatherproof tank cover made of flat 4mm thick steel sheets. - All necessary cleats, stays, braces, rafters and reinforcements - All necessary high zinc coated tensile bolts, nuts, washers, none toxic strip sealant to make all joints leak proof. Tank connections include 50mm inlet, 75mm outlet, 100mm overflow and 100mm washout The tank to come accompanied by 7 No. 4mm thick, 50mm wide flate plate 6,200mm long for laying below tank flanges.	1	Item		
B	**18 Meter Steel Tower** Mild steel tower **18 metres** high from Ground to the Bottom of the High Level Tank. The tower to fit and carry the **84,401 Litres** high level water tank above of dimensions 6,000 x 5,000 by 3,000mm. The tower structure to comprise of: - Reinforced concrete stub columns to carry tower stancheons complete with fixing bolts - Mild steel structure comprising SHS stancheons bolted to stub columns, diagonal angle-line bracings, I-beams, SHS platform bedding and chequered plate - Ballustrading made of SHS ballusters, CHS top railing welded and finished in 3 coats of metallic gloss oil paint - All to have a zinc phosphate primer before application of 3 coats of silver aluminium paint - All to the approval of the Chief Engineer Structural	1	Item		
Sub-total c/f to the High and Low Level Water Tanks collection page.... F-11					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Builders Works**				
	Allow for builders works associated with the installation of the above high level pressed steel sectional tank. This shall include but not limited to site and ground clearance, excavation, building of 6 no. concrete support stub columns to support steel tower columns. The stub columns to have a 600x600mm wide footing, to be 300x300mm wide at the top with 4 No. J-bolts to accept steel plate. To be 300mm above ground and 9,200mm long to Structural Engineers approval.	1	Item		
	Water Tanks Associated Pipework				
	Supply and installation of Galvanised mild steel piping and fittings with flanged & socketed joint to medium grade class "B" to BS.				
	GMS Pipework				
B	150mm diameter pipe	24	LM		
C	100mm ditto	52	LM		
D	75mm ditto	18	LM		
E	63mm ditto	18	LM		
	Extra over Pipework				
F	150mm diameter elbow	12	No		
G	100mm -ditto-	8	No		
H	75mm -ditto-	8	No		
I	63mm -ditto-	6	No		
J	150mm equal tee	3	No		
K	100mm equal tee	3	No		
L	75 x 75 x 65mm reducing tee	3	No		
	Valves				
M	150mm diameter approved medium pressure screw down full way non-rising stem wedge gate valve to BS 1952, with wheel and head joints to steel tubing. The gate valve to be as '**PEGLER'** or approved equivalent.	3	No.		
N	100mm ditto	4	No.		
O	75mm ditto	1	No.		
P	50mm ditto	1	No.		
Q	**Valve Chamber**				
	Standard precast concrete valve chamber of size 450 x 450 x 450mm deep made of concrete (1:3:6) base, including formwork, excavations backfilling and disposal.	4	No		
Sub-total c/f to the High and Low Level Water Tanks collection page.... F-11					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Water Connection** Allow for connection from the local Government Water Company to the ground wter tank above	1	Item		
B	**Water Transfer Pumpset** Supply and install a water transfer pumpset comprising the following components: - Two identical centrifugal pumps, one duty, the other standby mounted on a common base frame together with the other components. Each pump shall have a duty of **18m^3/hr** against a **24m head** as **'Grundfos CR 15-3'** series or approved equivalent. - 60 L diaphragm tank (pressure vessel) as **Varem** or approved equivalent). - Pressure switch and pressure gauge - GMS Pipe work connections including tank connections, 50mm foot valve with strainer, suction & discharge manifold, isolating valves, non-return valves Control shall be effected via a pressure switch through a pre-wired control panel which shall give automatic change-over from duty to standby pump within 5 seconds should the duty pump fail to deliver for any reason. - **Control panel** mounted on the same base frame as pumpset and presure vessel with contactors, over voltage and under voltage protection relays, MCBs, phase failure protection, timer. All these shall be housed in a lockable cabinet (with integral isolator) made from SWG 18 mild steel sheet in oven baked 'white' powder coated colour c/w with indicator lights. It should include a change-over switch to enable the pumps to work alternately.	1	Set		
C	**Electrical Works** Allow for electrical works incuding wiring and fitting to all pumps, control panel and float switches, from isolator provided by others within 5 metres distance.	1	Item		
D	**Sterilization** Allow for flushing out and sterilizing the whole system with chlorine to approval	1	Item		
E	**Testing and commissioning** Allow for testing and commissioning of the Tanks and associated pipework installations	1	Item		
Sub-total c/f to the High and Low Level Water Tanks collection page.... F-11					

Bill No. 2: High and Low Level Water Tanks Collection Page

Item	Description	Amount (Kshs)
A	Sub-total b/f from Page…….…. F-7	
B	Sub-total b/f from Page…….…. F-8	
C	Sub-total b/f from Page…….…. F-9	
D	Sub-total b/f from Page…….…. F-10	
E	Allow a provisional Sum for a Pump House	650,000
Total for High and Low Level Water Tanks C/F to the Water Storage, Reticulation and Irrigation Works Collection Page ……. F-22		

Bill 3: Water Reticulation

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Water Reticulation ***Supply of HDPE materials-*** *All Polyethylene material shall be 16.0 KG/SQ.CM (unless otherwise stated) suitable for butt fusion jointing and the rate shall include for supply and delivery to the work site of all pipes, fittings & specials including all other associated accessories such as gaskets, backing rings (to suite PN 16 flange), bolts and nuts, etc. required for complete installation.*				
	HDPE Pipework				
A	110mm OD diameter HDPE pipe work	268	Lm		
B	63mm ditto	162	Lm		
C	50mm ditto	72	Lm		
D	40mm ditto	54	Lm		
E	32mm ditto	123	Lm		
	Extra over HDPE Pipework for the following:				
	Elbow				
F	110mm diameter bend/elbow	8	No		
G	63mm ditto	8	No		
H	50mm ditto	11	No		
I	40mm ditto	16	No		
J	32mm ditto	18	No		
	Tees				
K	110mm diameter tees	4	No		
L	63mm ditto	8	No		
M	50mm ditto	10	No		
N	40mm ditto	8	No		
O	32mm ditto	8	No		
	HDPE to Brass Threaded Fittings				
P	110mm x 4" BSP brass threaded male adapter	12	No.		
Q	110mm x 4" BSP brass threaded female adapter	8	No.		
R	65mm x 2" BSP brass threaded male adapter	14	No.		
S	50mm x 11/2" BSP brass threaded male adapter	6	No.		
T	50mm x 11/2" BSP brass threaded female adapter	4	No.		
U	32mm x 1" BSP brass threaded male adapter	2	No.		
V	32mm x 1" BSP brass threaded male adapter	2	No.		
Sub-total c/f to the Water Reticulation Collection Page…… F-15					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Valves				
A	110mm diameter Gate valve as '**Pegler**'.	4	No		
B	63mm-ditto-	4	No.		
C	50mm-ditto-	4	No.		
D	32mm-ditto-	2	No.		
E	**Valve/ Water Meter Chamber** Standard precast concrete valve chamber of size 450 x 450 x 450mm deep made of concrete (1:3:6) base, including formwork, excavations backfilling and disposal.	12	No		
F	50mm diameter bulk water meter as '**Kent**' approved by the local water supply authority for the connection to the water main supply.	1	No.		
G	Allow for connection to water supply from the Local Authority including but not limited the connection charges and fees.	1	Sum		
H	**Excavations** Excavate trench in hard soil/murram 400mm wide and depth not exceeding 750mm deep and average 500mm deep, prepare bed with red soil/murram of particle size not more than 20 mm to a depth of 250mm. Bed shall be approved by Engineer before laying of pipes. Fill with same material as above and compact in layers of 75 mm. Cart away surplus soil.	750	LM		
I	**Pipe Sleeves** 100mm diameter heavy duty PVC Class 41 pipe sleeves for crossing over pathways and driveways. The sleeves will be encased in 150mm concrete sorround.	36	Lm		
J	**Sluice Valve/Gate Indicator Plates** Standard precast concrete Sluice valve marker post marked '**SV**'/ '**GV**' set in concrete (1:3:6) base, including formwork, excavations backfilling and disposal. The plate to be painted with blue gloss oil paint.	8	No		
Sub-total c/f to the Water Reticulation Collection Page…… F-15					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Water Line Markers** Standard precast concrete water line marker, post marked '**WL**' set in concrete (1:3:6) base, including formwork, excavations backfilling and disposal. The plate to be painted with blue gloss oil paint.	10	No		
B	**Testing and Commissioning** Allow for setting to work, testing and commissioning of the whole external water reticulation system to approval.	1	Item		
	Sluice Valve - Flanged				
C	110mm diameter flanged sluice valve as "**Pegler**" or approved equivalent	4	No		
D	65mm -ditto-	4	No		
E	50mm threaded gate valve as	18	No.		
F	32mm -ditto-	18	No.		
	VJ Coupling				
H	150mm diameter pipe VJ coupling complete with seals bolts	10	No		
I	63mm -ditto-	8	No		
J	**Stand Pipes - Water Point** 20mm diameter water points/ Standpipe complete with 20mm rising pipe, 'Cobra' bib tap. Stand pipes base to be anchored to the ground on a 450 x 600mm cement splash slab	6	No		
E	**Testing and commissioning** Allow for testing and commissioning of the Reticulation pipework installations	1	Item		
Sub-total c/f to the Water Reticulation Collection Page…… F-15					

Bill 3: Water Reticulation Collection Page

Item	Description	Amount (Kshs)
A	Total carried forward from page……..…… F-12	
B	Total carried forward from page……..…… F-13	
C	Total carried forward from page……..…… F-14	
Total for Water Reticulation C/F to the Water Storage, Reticulation and Irrigation Works Collection Page …… F-22		

Bill 3: Field Irrigation System

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Supply, deliver and install the following irrigation system equipment, fittings and accessories in positions indicated on the contract drawings or as shall be instructed by the Engineer. Tenderers should allow for all fittings, jointings couplings including unions and clamps where necessary for the proper functioning of the installation when pricing.				
A	**Pop-up Rotor type Sprinkler - Full Circle** Gear driven rotor type pop-up sprinkler head with full circle operation, with corrosion resistant, impact resistant, heavy-duty A.B.S body, a stainless steel spring retraction spring and top access for maintenance. Sprinkler head to have the capacity to attain: - 24.1 meter radius spray - operation pressure of 5.5 bar - operation of flow 8.736m^3/h - $1^1/_2$" BSP female threaded inlet with a plastic rising stem - Nozzle outlet trajectory is 25^o The sprinkler to be as "**Hunter, I-90-36V** " or approved equivalent.	8	Item		
B	**Pop-up Rotor type Sprinkler - Half Circle** Gear driven rotor type pop-up sprinkler head with full circle operation, with corrosion resistant, impact resistant, heavy-duty A.B.S body, a stainless steel spring retraction spring and top access for maintenance. Sprinkler head to have the capacity to attain: - 21.9 meter radius spray - operation pressure of 5.5 bar - operation of flow 8.988m^3/h - $1^1/_2$" BSP female threaded inlet with a plastic rising stem - Nozzle outlet trajectory is 25^o The sprinkler to be as "**Hunter, I-90-ADV** " or approved equivalent.	16	Item		
C	**Quick Coupler Valve** 110mm quick coupler valve as '**Hunter**' or approved equivalent.	6	No.		
sub-total c/f to the Field Irrigation System collection Page …….. F-21					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Swing Joint** 32mm BSP PVC swing joint in SCH 80 to connect to rotor sprinkler to lateral pipes with swept elbows and double o rings to prevent leaks. Joint to have operating pressures of upto 21.7 bar and to be as **"Hunter"** or approved equivalent.	20	No.		
B	**Electric Valve with manual isolating valve** 2" valve complete with a manual isolating valve. Valve to be as '**Hunter ICV**' or approved equivalent.	12	No.		
C	**Back Flow Preventor** 110mm back flow preventor as '**Hunter**' or approved equivalent.	1	No.		
D	**Water Meter** 110mm water meter as '**Hunter**' or approved equivalent.	1	No.		
E	**Water Flow Sensor** 110mm water water flow semsor as '**Hunter**' or approved equivalent.	1	No.		
F	**Valve Box** Rectangular valve box easily instalable of dimensions 70.1 x 53.3 x 30.7 cm complete with green cover with locking mechanism as **"VBJMB"** or equivalent.	10	No.		
G	**Station Controller** 20 station Irrigation controller operating on 240V, 50/60 Hz with non volatile long term memory even with power outages. The controller to have a large LCD screen, weater proof cabinet, capable of central control, irrigation scheduling, seasonal programming as **''Hunter ACC2'** or approved equivalent	1	No.		
H	**Rain Sensor** Weather sensor compatible with the above controller allowing automatic irrigation shut off to avoid overwatering. Sensor to be as **''Hunter Solar-Sync Sen"** on site weather sensor or approved equivalent.	1	No.		
sub-total c/f to the Field Irrigation System collection Page …….. F-21					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Field Irrigation Pumpset** Supply and install a water transfer pumpset comprising the following components: - Two identical centrifugal pumps, one duty, the other standby mounted on a common base frame together with the other components. Each pump shall have a duty of **20m^3/hr** against a **80m head** as **'Grundfos CR 20-7'** series or approved equivalent. - 60 L diaphragm tank (pressure vessel) as **Varem** or approved equivalent. - Pressure switch and pressure gauge - GMS Pipe work connections including tank connections, 150mm inlet strainer, suction & discharge manifold, isolating valves, non-return valves etc. Control shall be effected via a pressure switch through a pre-wired control panel which shall give automatic change-over from duty to standby pump within 5 seconds should the duty pump fail to deliver for any reason. - **Control panel** mounted on the same base frame as pumpset and presure vessel with contactors, over voltage and under voltage protection relays, MCBs, phase failure protection, timer. All these shall be housed in a lockable cabinet (with integral isolator) made from SWG 18 mild steel sheet in oven baked 'white' powder coated colour c/w with indicator lights. It should include a change-over switch to enable the pumps to work alternately.	1	Set		
B	**Electrical Works** Allow for electrical works incuding wiring and fitting to all pumps, control panel and float switches, from isolator provided by others within 5 metres distance.	1	Item		
C	**Electrical Cabling** 1 x 1.5 mm^2 electric cable, double insulation.	738	Lm		
	HDPE Pipe Work: PN16				
D	160mm diameter HDPE PN16 pipe work	24	Lm		
E	110mm -ditto-	570	Lm		
F	90mm -ditto-	193	Lm		
G	75mm -ditto-	180	Lm		
H	63mm -ditto-	195	Lm		
I	50mm -ditto-	98	Lm		
sub-total c/f to the Field Irrigation System collection Page …….. F-21					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	HDPE 90° Elbows				
A	110mm diameter HDPE pipe bend	6	No.		
B	90mm -ditto-	10	No.		
C	75mm -ditto-	14	No.		
D	63mm -ditto-	18	No.		
E	50mm -ditto-	24	No.		
	HDPE Tees				
F	110mm diameter HDPE pipe equal tee	4	No.		
G	90mm -ditto-	6	No.		
H	75mm -ditto-	10	No.		
I	63mm -ditto-	14	No.		
J	110mm x 90mm diameter HDPE pipe reducing tee	4	No.		
K	90mm x 75mm -ditto-	10	No.		
L	75mm x 63 -ditto-	8	No.		
M	63mm x 50 -ditto-	6	No.		
	HDPE Reducing Coupling				
N	110mm x 90 diameter HDPE pipe equal tee	6	No.		
O	90mm x 75mm -ditto-	8	No.		
P	75mm x 63mm -ditto-	12	No.		
Q	63mm x 50 -ditto-	18	No.		
R	63mm x 38 -ditto-	12	No.		
S	50mm x 38 -ditto-	16	No.		
	HDPE Threaded Fittings				
T	75mm dia HDPE threaded female/male adapter	26	No.		
U	63mm -ditto-	16	No.		
V	50mm -ditto-	16	No.		
W	38mm -ditto-	18	No.		
X	90mm diameter HDPE pipe threaded elbow	10	No.		
Y	75mm -ditto-	14	No.		
Z	63mm -ditto-	10	No.		
AA	38mm -ditto-	18	No.		
AB	160mm flanged adapter	8	No.		
AC	110mm -ditto-	16	No.		
AD	90mm -ditto-	16	No.		
AE	75mm -ditto-	16	No.		
sub-total c/f to the Field Irrigation System collection Page …….. F-21					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Sluice Valve**				
	160mm diameter flanged sluice valve as '**PEX**'	2	No.		
B	110mm -ditto-	4	No.		
C	90mm -ditto-	2	No.		
D	75mm -ditto-	2	No.		
E	**Valve Chamber**				
	Standard precast concrete valve chamber of size 6000 x 450 x 450mm deep made of concrete (1:3:6) base, plastered masonry sides, including formwork, excavations backfilling and disposal.	8	No		
F	**Excavations**				
	Excavate trench in hard soil/murram 400mm wide and depth not exceeding 500mm deep and average 500mm deep, prepare bed with red soil/murram of particle size not more than 20 mm to a depth of 250mm. Bed shall be approved by Engineer before laying of pipes. Fill with same material as above and compact in layers of 75 mm. Cart away surplus soil.	1140	LM		
G	**Pipe Sleeves**				
	100mm diameter heavy duty PVC Class 41 pipe sleeves for crossing over pathways and driveways. The sleeves will be encased in 150mm concrete sorround.	42	Lm		
H	**Testing and commissioning**				
	Allow for testing and commissioning of the Reticulation pipework installations	1	Item		
sub-total c/f to the Field Irrigation System collection Page …….. F-21					

Bill No. 4: Field Irrigation System Collection Page

Item	Description	Amount (Kshs)
A	Total carried forward from page……..…… F-16	
B	Total carried forward from page……..…… F-17	
C	Total carried forward from page……..…… F-18	
D	Total carried forward from page……..…… F-19	
E	Total carried forward from page……..…… F-20	
Total for Field Irrigation Systemc/f to the Water Storage, Reticulation and Irrigation Works Collection Page …… F-22		

Water Storage, Reticulation and Irrigation Works Collection Page

Item	Description	Amount (Kshs)
A	Total b/f from High and Low Level Water Tanks Collection page… F-11	
B	Total b/f from Water Reticulation Collection page…….. F-15	
C	Total B/F from Pitch Irrigation System Collection page…….. F-21	
Total for Water Storage, Reticulation and Irrigation Works c/f to the Volume 3 of 5 Main Collection Page ……..... F-52		

INTERNAL PLUMBING AND DRAINAGE WORKS

Bill No. 5: Sanitary Fittings

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	SANITARY FITTINGS *Supply, deliver, install, test and commission the following sanitary appliances complete with all the accessories including all connections to the services, waste, jointing to water supply overflows, supports and all plugging and screwing to walls and floors.* *Note: (i) All sanitary fittings shall be in approved colour.* *(ii) The Model and Ref No. indicated is only a guide to the type and quality of fittings.* *(iii) Equivalent & Approved models may be acceptable.* **VIP Pavillion: Wash Areas**				
A	**Disabled (Ambulant) facility** Disabled Facility comprising of: **a. Low Level Cistern, Water Closet Suite** Back to wall floor mounted water closet suite comprising: - a floor mounted white ceramic WC pan 380mm x 450mm with horizontal outlet and chrome fasteners as **'Ideal Standard'** **-** Low level ceramic cistern with with **long lever action** flushing mechanism. - soft close sturdy white seat and seat cover with stainless steel hinges as **'Ideal Standard'**. - fixings, caps and drain outlets. **b. Wash Hand Basin set** White wall mounted ceramic wash hand basin with single taphole. Prefered dimension: 450 x 400mm x 145mm as **'Ideal Standard'** The basin set to come complete with a **long lever chrome disabled basin faucet** Other accessories to include; white plastic slotted waste, basin siphon, overflow, clip, fixings 32mm bottle trap with 75mm water seal, pipes, gaskets and wall flange. **c. Hinged Support Items** 2 No. hinged support rail **with toilet roll holder** made of satin finish stainless steel with stainless steel fasteners for securing to solid wall. As **'Ideal Standard'**. **d. Horizontal Grab Rail** 1 No. 610mm horizontal grab rails in stainless steel with satin finsh as **'Ideal Standard'** **e. Vertical Grab Rail** 2 No. 455mm vertical grab rails in stainless steel with satin finsh as **'Ideal Standard'**	2	Item		
	Sub-total carried forward to the Sanitary Fittings collection page…….. F-28				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Water Closet - Close Coupled - Lever Action Cistern - Upper Floors**				
	Close coupled white ceramic WC suite complete with white ceramic cistern with lever action flushing mechanism, stainless steel wall and floor fixings, inlet pipe, inlet gasket, outlet and all drainage fitments. The suite to come with heavy duty melamine seat with rubber paddings and cover with stainless steel hinges. All as '**Ideal Standard**' or approved equivalent.	11	No.		
B	**Squating Water Closet Suite Mid-levelCistern - Ground Floor**				
	White ceramic squating Water Closet Suite with non-slip treads and a mid-level white ceramic lever action cistern. Prefered water closet suite pan dimensions to be 455mm x 625mm by 215mm deep. The pan to come complete with, inlet gaskets, ceramic water seal trap and all drainage fitments. The pan to be as "**Ideal Standard**" or approved equivalent.	19	No.		
C	**Toilet Roll Holder**				
	Fully recessed toilet roll holder in white vitreous china of size 165 x 165mm in approved colour as '**Ideal Standard**' or equal and approved.	30	No.		
D	**Robe Hook**				
	Robe hook in satin Aluminium to be door mounted by countersunk stainless steel screws with concealing caps. To be as '**Ideal Standard**' or equal and approved.	30	No.		
E	**Wash Hand Basin - Counter Top**				
	White countertop ceramic wash hand basin with single taphole. Prefered dimension: 565 x 500mm x 205mm. Basin to be as "**Ideal Standard**" or approved equivalent. Other accessories to include; chrome plated waste spring loaded pop-up, 32mm white plastic bottle trap with 75mm water seal, pipes, gaskets and wall flange.	11	No.		
	Sub-total carried forward to the Sanitary Fittings collection page…….. F-28				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Wash Hand Basin - Half Pedestal** White half pedestal wall mounted ceramic wash hand basin with single taphole. Prefered dimension: 650 x 500mm x 200mm. Basin to be as **"Ideal Standard"** or approved equivalent. Other accessories to include; chrome plated waste spring loaded pop-up, 32mm chrome plated bottle trap with 75mm water seal, pipes, gaskets and wall flange and stainless steel fixing studs/bolts.	22	No.		
B	**Pillar Tap - Press-Down Delay (Metering)** Press-down delay chrome plated metering basin faucet complete with aerator cartridge. Faucet to be as **"Schell"** or approved equivalent.	34	No.		
C	**Soap Dispenser** Stainless steel bright finish soap dispenser. Top filling lid and press button dispenser of preferred dimension 220mm x 435mm x 120mm. Dispenser to be as **'Ideal Standard, IOM'** or approved equivalent.	22	No		
D	**Mirror** 6mm thick polished plate glass silver backed mirror with decorativeborders and beveled edges, size 610 x 610mm, plugged and screwed to wall with 4 No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	34	No.		
E	**Hand drier** Automatic Hand Drier white in colour, operating on an infra-red automatic sensing system with safety cut-out complete with plastic rawl plugs and fixing screws. The hand drier to have a heating capacity of 1.8 kw and to be of size 270 x 64 x 143mm deep as **'Mediclinics, Smartflow'** or approved equivalent.	6	No.		
F	**Tissue Dispensing Unit** Stainless steel flat sheets tissue dispensing unit to hold 250 sheets. To be as **'Mediclinics, DT0106C'** or approved equivalent.	13	No.		
	Sub-total carried forward to the Sanitary Fittings collection page…….. F-28				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Urinal Bowl** White ceramic wall hung urinal bowl consisting of: - urinal bowl with back inlet complete with mounting braces and stainless steel fasteners - spreader nozzle complete with concealed spreader pipes all in stainless steel - white plastic drain grating, 40mm drain siphon, pipe connetction and wall flange Urinal bowl to be as **'Ideal Standard'** or approved equivalent.	7	No		
B	**Press Button Urinal Flushing System** Press Button urinal flushing system comprising: - concealed behind tiles complete with wall fixing braces and fasteners as **'Cobra'**. - press action operated actuator chrome plated complete with chrome pipe and wall flange as **'Cobra'**.	7	No		
C	**Urinal Bowl Divisions** White ceramic urinal division separating the above described urinal bowls fixed firmly on the wall with stainless steel fasteners. The fittings shall be as **'Ideal Standard'**, or equal and approved.	7	No		
D	**Shower Fixture** Concealed shower fixture mounted under the tiles comprising: - chrome plated 2 No (hot/cold) Star handles shower stop cocks colour coded and c/w chrome wall flanges, - adjustable shower head with adjustable water spray settings complete with a chrome extension pipe and wall flange - chrome plated star handles downspout - concealed cold and hot pipe work and interconnections All to be chrome plated and to be as **'Cobra'** or approved equivalent.	8	No.		
E	**Sponge Soap & Holder/Basket** Stainless Steel, two tier shower basket/soap and sponge holder that is wall mounted using steel fasteners. To be as **'Ideal Standard'** or approved equivalent.	8	No.		
	Sub-total carried forward to the Sanitary Fittings collection page…….. F-28				

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Kitchen				
A	**Undersink Water Heater** 10 Litres Instanteneous Undersink Heater. The Heater to be suitable for under the counter installations and to serve both the hand basin and the shower. Heater to be as "**ARISTON, ZWTRHTR50**" or approved equivalent.	2	No.		
B	**Kitchen sink** Double Bowl Double Drainer sink size 2400 x 600mm with bowl size 420 x 355 x 150mm deep made out of 18/8 stainless steel complete with sink waste with 70mm diameter flange 40mm shanks with brackets, plug and chain including a bottle trap and all other drainage fitments. Sink shall be as "**ASL**' or approved equavalent The sink to come complete with a long stem chrome plated Bib tap as '**Cobra**' or approved equivalent.	2	No.		
Sub-total carried forward to the Sanitary Fittings collection page…….. F-28					

Bill No. 5: Sanitary Fittings Collection Page

Item	Description	Amount (Kshs)
A	Sub-total b/f from Page……... F-23	
B	Sub-total b/f from Page……... F-24	
C	Sub-total b/f from Page……... F-25	
D	Sub-total b/f from Page……... F-26	
E	Sub-total b/f from Page……... F-27	
Total for Sanitary Fittings c/f to the Internal Plumbing & Drainage and Fire Protection Equipment Works Collection Page……..….. F-40		

Bill No. 6: Internal Plumbing

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	INTERNAL PLUMBING *Supply and Install the following Plumbing installation as described and shown on the drawing.All pipework and fittings in this installation to be to Chlorinated Poly Vinyl Chloride (CPVC) to SDR 11 jointed by manufacturer approved solvent cement. Tenderers must allow for jointings, couplings, plugging, clampings, reducers, mortices, hangers, clippings etc necessary for the proper functioning of the installation when pricing.*				
	CPVC Pipework - SDR 11				
A	20mm diameter pipework	117	Lm		
B	25mm -ditto-	134	Lm		
C	32mm -ditto-	98	Lm		
D	40mm -ditto-	64	Lm		
E	50mm -ditto-	125	Lm		
F	65mm -ditto-	67	Lm		
	Extra-over CPVC pipework for the following:-				
	Bends				
G	20mm diameter bend	52	No.		
H	25mm -ditto-	34	No.		
I	32mm -ditto-	35	No.		
J	40mm -ditto-	22	No.		
K	50mm -ditto-	46	No.		
L	65mm -ditto-	19	No.		
	Tees				
M	20mm equal tee	54	No.		
N	25mm -ditto-	133	No.		
O	32mm -ditto-	45	No.		
P	40mm -ditto-	34	No.		
Q	50mm -ditto-	120	No.		
R	65mm -ditto-	25	No.		
	Reducers				
S	25 x 20mm diameter reducer	38	No.		
T	32 x 25mm -ditto-	45	No.		
U	40 x 32mm -ditto-	18	No.		
V	50 x 32mm -ditto-	25	No.		
W	50 x 40mm -ditto-	15	No.		
X	65 x 50mm -ditto-	28	No.		
Sub-total c/f to the Internal Plumbing collection page…….. F-32					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Reducing Tees				
A	25 x 25 x 20mm diameter reducing tee	38	No.		
B	32 x 32 x 20mm -ditto-	51	No.		
C	32 x 32 x 25mm -ditto-	18	No.		
D	65 x 65 x 50mm -ditto-	8	No.		
	Valves				
E	20mm diameter high pressure screw down, full way non-rising stem wedge gate valve to BS 5154 standards. The gate valve to be as **"Pegler"** or approved equivalent.	6	No.		
F	32mm -ditto-	8	No.		
G	40mm -ditto-	4	No.		
H	50mm -ditto-	6	No.		
I	65mm -ditto-	4	No.		
	Unions				
J	20mm diameter pipe union	55	No.		
K	25mm -ditto-	39	No.		
L	32mm -ditto-	24	No.		
M	40mm -ditto-	20	No.		
N	50mm -ditto-	67	No.		
O	65mm -ditto-	23	No.		
	CPVC to Brass Threaded Fittings				
P	20mm x 1/2" BSP brass threaded male adapter	116	No.		
Q	20mm x 1/2" BSP brass threaded female adapter	123	No.		
R	20mm x 1/2" BSP brass threaded male elbow	116	No.		
S	20mm x 1/2" BSP brass threaded female elbow	140	No.		
T	20mm x 1/2" BSP brass threaded male tee	78	No.		
U	20mm x 1/2" BSP brass threaded female tee	67	No.		
V	25mm x 3/4" BSP brass threaded male adapter	241	No.		
W	32mm x 1" BSP brass threaded male adapter	75	No.		
X	40mm x 11/4" BSP brass threaded male adapter	66	No.		
Y	40mm x 11/4" BSP brass threaded male tee	48	No.		
Z	50mm x 11/2" BSP brass threaded male adapter	57	No.		
AA	50mm x 11/2" BSP brass threaded male tee	87	No.		
AB	65mm x 3" BSP brass threaded male adapter	18	No.		
Sub-total c/f to the Internal Plumbing collection page…….. F-32					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Flexible Tubing + Angle Valve** 15mm diameter x 450mm long flexible connectors complete with integral chrome plated angle valve. To be as **'Cobra'** or equal and approved.	53	No.		
B	**Sterilization** Allow for flushing out and sterilizing the whole system with chlorine to the satisfaction of the engineer	1	Item		
C	**Stand Pipe** 15mm diameter chrome plated bib tap as **'Cobra'** suitable for hose pipe connection complete with 15mm diameter 750mm high GMS pipe stem firmly anchored to the ground on one edge of a mass concrete slab 600mm x 400mm	4	No		
D	**Testing and commissioning** Allow for testing and commissioning of the Internal plumbing installations	1	Item		
Sub-total c/f to the Internal Plumbing collection page…….. F-32					

Bill No. 6: Internal Plumbing Collection Page

Item	Description	Amount (Kshs)
A	Sub-total b/f from Page……..…. F-29	
B	Sub-total b/f from Page……..…. F-30	
C	Sub-total b/f from Page……..…. F-31	
Total for Internal Plumbing c/f to the Internal Plumbing & Drainage and Fire Protection Equipment Works Collection Page…….……... F-40		

Bill No 7: Foul and Rain Water Drainage

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Supply and fix uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc. for the proper and satisfactory functioning of the system.				
	MuPVC and uPVC Waste and Soil pipework				
A	100mm diameter heavy gauge grey mUPVC pipe	172	Lm		
B	50mm ditto	115	Lm		
C	40mm ditto	68	Lm		
D	32mm ditto	82	Lm		
	Bends				
E	100mm diameter long radius bend	18	No.		
F	100mm diameter sweep bend	43	No.		
G	50mm ditto	42	No.		
H	40mm ditto	33	No.		
I	32mm ditto	34	No.		
	Tees				
J	100mm diameter sweep tee	36	No.		
K	50mm ditto	52	No.		
L	40mm ditto	27	No.		
M	32mm ditto	55	No.		
	Access Caps				
N	100mm diameter access cap	28	No.		
O	50mm ditto	18	No.		
P	40mm ditto	12	No.		
Q	32mm ditto	21	No.		
	Boss Connectors				
R	100 x 50mm diameter boss connector	15	No.		
S	100 x 40mm ditto	10	No.		
	WC Connectors				
T	100mm diameter WC connector	25	No.		
	Branches				
U	100mm diameter double branch	8	No.		
V	100mm diameter single branch	14	No.		
Sub-total c/f to the Foul and Rain Water Drainage collection page…….. F-35					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Reducers				
A	50 x 32mm diameter reducer	34	No.		
B	50 x 40mm ditto	23	No.		
C	40 x 32mm ditto	69	No.		
E	**Floor Traps**				
	Four-way floor trap with 50mm diameter outlet and 100mm cover grating	36	No.		
F	**Gully Traps**				
	Standard 300 x 300 x 450mm masonry gully trap plastered, water proofed and complete with 125mm thick reinforced concrete cover.	6	No.		
G	**Inspection Chamber**				
	Standard 600 x 450 x (600-750)mm masonry inspection chamber, plastered, water proofed and complete with heavy duty Cast Iron cover as **'East african Foundry'** approved equivalent.	10	No.		
H	**Testing and commissioning**				
	Allow for testing and commissioning of the Internal plumbing installations	1	Item		
	RAIN WATER DRAINAGE *Supply and fix uPVC pipes to BS 4660 and BS 4515 and MuPVC pipes. Solvent welded joints shall be as per the system's manufacturer's written instructions.* *Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc. as required in the running lengths of pipework and also where necessary, for pipe fixing clips, holder bats plugged and screwed for the proper and satisfactory functioning of the system.*				
	Pipes				
I	100mm diameter heavy gauge grey mUPVC down pipes	198	Lm		
	Bends				
J	100mm diameter 45^0 bend	14	No.		
K	100mm diameter 90^0 bend	42	No.		
	Tees				
L	100mm diameter tee	14	No.		
	Access plugs				
M	100mm diameter acess bends	14	No.		
	In-gutter Drain gratings				
N	100mm diameter in-gutter drain gratings.	7	No.		
Sub-total c/f to the Foul and Rain Water Drainage collection page…….. F-35					

Bill No. 7: Foul and Rain Water Drainage Collection Page

Item	Description	Amount (Kshs)
A	Sub-total b/f from Page……..……...…. F-33	
B	Sub-total b/f from Page……..……...…. F-34	
Total for Foul Water Drainage c/f to the Internal Plumbing & Drainage and Fire Protection Equipment Works Collection Page…….…….... F-40		

Bill No. 8: Fire Protection Equipment

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	FIRE PROTECTION EQUIPMENT *Supply, deliver and install the following fire fighting equipment in positions indicated on the contract drawings or as shall be instructed by the Engineer.*				
	Hose Reel System				
	Hose Reel				
A	Swinging type hosereel fitted with **30 Metres Long**, 20mm diameter reinforced non-kink rubber hose with 5/6 mm lever operated shut-off nozzle, mild steel feed pipe, isolation valve, guide and all other accessories as '**Angus Fire Armour**' or equal and approved.	4	No.		
	GMS Pipes Class B				
B	25mm diameter pipework	18	Lm		
C	50mm diameter pipework	142	Lm		
	Extra Over Pipework				
	Bends				
D	25mm diameter bend	16	No.		
E	50mm diameter bend	25	No.		
	Tees				
F	50mm diameter equal tee	17	No.		
	Reducers				
G	50 x 25 mm diameter reducer	7	No.		
H	65 x 50 mm diameter reducer	6	No.		
	Valves				
I	25mm diameter approved medium pressure screw down full way non-rising stem wedge gate valve to BS 1952, with wheel and head joints to steel tubing. The gate valve to be as '**PEGLER**' or approved equivalent.	4	No.		
F	50mm -ditto-	6	No.		
	Unions				
J	25mm diameter pipe union	6	No.		
K	50mm -ditto-	7	No.		
C	**Painting**				
	Allow for painting of the entire hose reel pipework to red.	1	Item		
Sub-total c/f to the Fire Protection Equipment collection page……..... F-39					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Hosereel Pumpset** Supply and install a hose reel pumpset comprising the following components: - Two identical centrifugal pumps, one duty, the other standby mounted on a common base frame together with the other components. Each pump shall have a duty of **5m^3/hr** against a **40m head** as '**Grundfos CMV 5-6**' series or approved equivalent. - 60 L diaphragm tank (pressure vessel) as **Varem** or approved equivalent). - Pressure switch and pressure gauge - GMS Pipe work connections including tank connections, 50mm foot valve with strainer, suction & discharge manifold, isolating valves, non-return valves Control shall be effected via a pressure switch through a pre-wired control panel which shall give automatic change-over from duty to standby pump within 5 seconds should the duty pump fail to deliver for any reason. - **Control panel** mounted on the same base frame as pumpset and presure vessel with contactors, over voltage and under voltage protection relays, MCBs, phase failure protection, timer, All these shall be housed in a lockable cabinet (with integral isolator) made from SWG 18 mild steel sheet in oven baked 'fire-red' powder coated colour. It should include a change-over switch to enable the pumps to work alternately.	1	Set		
B	**Electrical Works** Allow for electrical works wiring and fitting to all pumps, control panel and float switches, from isolator provided by others with 3 metres distance.	1	Item		
C	**Hose Reel Water Storage - 3,000L** Cylindrical roof water tank, made from rotational moulded LDPE of 1,580mm diameter and 1,680mm height and capacity of **3,000 litres** (652 gallons). The tank to come complete with 3/4" high pressure ball valve, lockable tank cover, 25mm dia threaded inlet, 40mm dia threaded overflow, 50mm dia threaded outlet. All pipe connections to have rubber washers. The tank to be as "**Roto**" or approved equivalent.	1	No.		
Sub-total c/f to the Fire Protection Equipment collection page……..... F-39					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	PORTABLE FIRE EXTINGUISHERS *Supply, deliver, install, test and commission the following portable fire extinguishers and conforming to BS EN 3 / BS 1449.*				
A	**Carbon Dioxide Gas Fire Extinguisher** 5 Kg carbon dioxide gas portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	4	No		
B	**Dry Chemical Powder Fire Extinguisher** 6kg dry chemical podwer portable fire extinguisher complete with pressure gauge, initial charge and mounting brackets.	4	No		
C	**Manual Alarm Bell- Restore** Repair and restore exixting manual operated alarm bell (Gong) tightening the fasteners and ensuring proper functioning	4	No		
D	**Fire Notices** Allow for fire signage for the hose reel system, fire exits and fire instructions as directed by the Project Engineer.	4	No		
E	**Fire Blanket** 1200x1800mm fibreglass fire blanket to BS. 6575	2	No.		
	Stationery *Tenderers shall price for the following stationery items. These shall then be delivered, upon their first demand to the Mechanical Engineer (BS) immediately after the tender award.*				
F	Laptop with the following features: - 15.6 in screen FHD (1920 x 1080), anti-glare LEDbacklit - 9th Gen Core i7-9750H, - NVIDIA Geforce GTX 1650 4GB GDDR5 - 16 GB DDR4-2666MHz - 512 GB SSD Hard Drive - Backlit keyboard - Windows 10 pro - 64 bit (registered), Microsoft Office - HDMI 2.0; USB Type-C & USB 3.1 - Complete with durable elegant backpack bag Laptop to be as '**Dell, XPS 15**'.	1	No.		
G	Photocopy paper, size A4, 80g/cm3, White, 500 sheets	20	Rms		
H	High Back swivel Chair with adjustable Fabric/Meshback, Headrest, adjustable arm rests as **'FURSYS ITIS2'**	2	No.		
I	Toner Cartrigees for HP Laser jet Printer as **HP 53A**	2	No.		
Sub-total c/f to the Fire Protection Equipment collection page……..... F-39					

Bill No. 8: Fire Protection Equipment Collection Page

Item	Description	Amount (Kshs)
A	Sub-total b/f from Page……..……..…. F-36	
B	Sub-total b/f from Page……..……..…. F-37	
C	Sub-total b/f from Page……..……..…. F-38	
Total for Fire Protection Equipment c/f to the Internal Plumbing & Drainage and Fire Protection Equipment Works Collection Page…….... F-40		

Internal Plumbing & Drainage and Fire Protection Equipment Works Collection Page

Item	Description	Amount (Kshs)
A	Total for Sanitary Fittings b/f from Page……...……...…. F-28	
B	Total for Internal Plumbing b/f from Page……..……..…...…. F-32	
C	Total for Foul and Rain Water Drainage b/f from Page…….…….. F-35	
D	Total for Fire Protection Equipment b/f from Page……..……...…. F-39	
Total Amount for Internal Plumbing & Drainage and Fire Protection Equipment Works c/f to the Volume 3 of 5 Main Collection Page F-52		

ABLUTION BLOCK

Bill No. 9: Sanitary Fittings

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	SANITARY FITTINGS *Supply, deliver, install, test and commission the following sanitary appliances complete with all the accessories including all connections to the services, waste, jointing to water supply overflows, supports and all plugging and screwing to walls and floors.* *Note: (i) All sanitary fittings shall be in approved colour.* *(ii) The Model and Ref No. indicated is only a guide to the type and quality of fittings.* *(iii) Equivalent & Approved models may be acceptable.*				
A	**Ablution Block + Gate House** **Disabled (Ambulant) facility** Disabled Facility comprising of: **a. Low Level Cistern, Water Closet Suite** Back to wall floor mounted water closet suite comprising: - a floor mounted white ceramic WC pan 380mm x 450mm with horizontal outlet and chrome fasteners as **'Ideal Standard'** **-** Low level ceramic cistern with with **long lever action** flushing mechanism. - sturdy white seat and seat cover with stainless steel hinges as **'Ideal Standard'**. - fixings, caps and drain outlets. **b. Wash Hand Basin set** White wall mounted ceramic wash hand basin with single taphole. Prefered dimension: 450 x 400mm x 145mm as '**Ideal Standard**' The basin set to come complete with a **long lever chrome disabled basin faucet** Other accessories to include; white plastic slotted waste, basin siphon, overflow, clip, fixings 32mm bottle trap with 75mm water seal, pipes, gaskets and wall flange. **c. Hinged Support Items** 2 No. hinged support rail **with toilet roll holder** made of satin finish stainless steel with stainless steel fasteners for securing to solid wall. As '**Ideal Standard**'. **d. Horizontal Grab Rail** 1 No. 610mm horizontal grab rails in stainless steel with satin finsh as '**Ideal Standard**' **e. Vertical Grab Rail** 2 No. 455mm vertical grab rails in stainless steel with satin finsh as '**Ideal Standard**'	2	Item		
Sub-total carried forward to the Sanitary Fittings collection page…….. F-44					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Squating Water Closet Suite Mid-level Cistern - Ground Floor**				
	White ceramic squating Water Closet Suite with non-slip treads and a mid-level white ceramic lever action cistern. Prefered water closet suite pan dimensions to be 455mm x 625mm by 215mm deep. The pan to come complete with, inlet gaskets, ceramic water seal trap and all drainage fitments. The pan to be as "**Ideal Standard**" or approved equivalent.	32	No.		
B	**Toilet Roll Holder**				
	Fully recessed toilet roll holder in white vitreous china of size 165 x 165mm in approved colour as '**Ideal Standard**' or equal and approved.	32	No.		
C	**Wash Hand Basin - Counter Top**				
	White countertop ceramic wash hand basin with single taphole. Prefered dimension: 565 x 500mm x 205mm. Basin to be as "**Ideal Standard**" or approved equivalent. Other accessories to include; chrome plated waste spring loaded pop-up, 32mm white plastic bottle trap with 75mm water seal, pipes, gaskets and wall flange.	15	No.		
D	**Pillar Tap - Press-Down Delay (Metering)**				
	Press-down delay chrome plated metering basin faucet complete with aerator cartridge. Faucet to be as "**Schell**" or approved equivalent.	15	No.		
E	**Mirror**				
	6mm thick polished plate glass silver backed mirror with decorativeborders and beveled edges, size 610 x 610mm, plugged and screwed to wall with 4 No. chrome plated dome capped screws. The mirror shall rest against a layer of 5mm thick foam.	15	No.		
Sub-total carried forward to the Sanitary Fittings collection page……. F-44					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Urinal Trough** 16 SWG stainless steel urinal tough 6 meters long and 1 meter high. Trough to come complete with a stainless steel domed drain grating and to be mounted against the the wall. Urinal bowl to be as **"ASL"** or approved equivalent. The urinal to come complete with a stainless steel 2m long, 3/8" diameter drop pipe, and 5.5m long spreader pipe with orifices 250mm apart.	1	No.		
B	**Urinal Cistern - 6 liter** White ceramic 6 liter urinal cistern to be wall mounted as "**Twyford** "or approved equivalent. The cistern to come complete with an automatic flushing mechanism.	1	No.		
Sub-total carried forward to the Sanitary Fittings collection page……. F-44					

Bill No. 9: Sanitary Fittings Collection Page

Item	Description	Amount (Kshs)
A	Sub-total b/f from Page……..…….. F-41	
B	Sub-total b/f from Page……..…….. F-42	
C	Sub-total b/f from Page……..…….. F-43	
Total for Sanitary Fittings c/f to the Ablution Block Works Collection Page……..... F-51		

Bill No. 10: Internal Plumbing

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	INTERNAL PLUMBING				
	Supply and Install the following Plumbing installation as described and shown on the drawing.All pipework and fittings in this installation to be to Chlorinated Poly Vinyl Chloride (CPVC) to SDR 11 jointed by manufacturer approved solvent cement. Tenderers must allow for jointings, couplings, plugging, clampings, reducers, mortices, hangers, clippings etc necessary for the proper functioning of the installation when				
	CPVC Pipework - SDR 11				
A	20mm diameter pipework	53	Lm		
B	25mm -ditto-	72	Lm		
C	32mm -ditto-	65	Lm		
D	40mm -ditto-	68	Lm		
E	50mm -ditto-	52	Lm		
	Extra-over CPVC pipework for the following:-				
	Bends				
F	20mm diameter bend	51	No.		
G	25mm -ditto-	37	No.		
H	32mm -ditto-	38	No.		
I	40mm -ditto-	27	No.		
J	50mm -ditto-	15	No.		
	Tees				
K	20mm equal tee	37	No.		
L	25mm -ditto-	39	No.		
M	32mm -ditto-	27	No.		
N	40mm -ditto-	14	No.		
O	50mm -ditto-	12	No.		
	Reducers				
P	25 x 20mm diameter reducer	22	No.		
Q	32 x 25mm -ditto-	18	No.		
R	40 x 32mm -ditto-	17	No.		
S	50 x 32mm -ditto-	12	No.		
T	50 x 40mm -ditto-	14	No.		
	Reducing Tees				
U	25 x 25 x 20mm diameter reducing tee	26	No.		
V	32 x 32 x 20mm -ditto-	15	No.		
W	32 x 32 x 25mm -ditto-	8	No.		
Sub-total carried forward to the Internal Plumbing collection page….. F-47					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	Valves				
A	20mm diameter high pressure screw down, full way non-rising stem wedge gate valve to BS 5154 standards. The gate valve to be as **"Pegler"** or approved equivalent.	2	No.		
B	32mm -ditto-	2	No.		
C	50mm -ditto-	4	No.		
	Unions				
D	20mm diameter pipe union	12	No.		
E	25mm -ditto-	16	No.		
F	32mm -ditto-	7	No.		
G	40mm -ditto-	9	No.		
H	50mm -ditto-	13	No.		
	CPVC to Brass Threaded Fittings				
I	20mm x 1/2" BSP brass threaded male adapter	21	No.		
J	20mm x 1/2" BSP brass threaded female adapter	15	No.		
K	20mm x 1/2" BSP brass threaded male elbow	34	No.		
L	20mm x 1/2" BSP brass threaded female elbow	15	No.		
M	20mm x 1/2" BSP brass threaded male tee	43	No.		
N	20mm x 1/2" BSP brass threaded female tee	15	No.		
O	25mm x 3/4" BSP brass threaded male adapter	14	No.		
P	32mm x 1" BSP brass threaded male adapter	10	No.		
Q	40mm x 11/4" BSP brass threaded male adapter	8	No.		
R	40mm x 11/4" BSP brass threaded male tee	8	No.		
S	50mm x 11/2" BSP brass threaded male adapter	12	No.		
T	50mm x 11/2" BSP brass threaded male tee	8	No.		
U	**Flexible Tubing + Angle Valve** 15mm diameter x 450mm long flexible connectors complete with integral chrome plated angle valve. To be as **'Cobra'** or equal and approved.	38	No.		
V	**Washing Stand Pipe** 15mm diameter chrome plated bib tap as **'Cobra'** suitable for hose pipe connection complete with 15mm diameter 750mm high GMS pipe stem firmly anchored to the ground on one edge of a mass concrete slab 600mm x 400mm	2	No		
W	**Testing and commissioning** Allow for testing and commissioning of the internal plumbing installations	1	Item		
Sub-total carried forward to the Internal Plumbing collection page….. F-47					

Bill No. 10: Internal Plumbing Collection Page

Item	Description	Amount (Kshs)
A	**Sub-total b/f from Page……..…. F-45**	
B	**Sub-total b/f from Page……..…. F-46**	
Total for Internal Plumbing c/f to the Ablution Block Works Summary Page…..... F-51		

Bill No. 11: Foul & Rain Water Drainage

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
	FOUL WATER DRAINAGE *Supply and fix uPVC soil system to BS 4660 and BS 4515 and MuPVC waste systems to BS 5255 with screwed and socketed joints to BS 21. Solvent welded joints shall be as per the system's manufacturer's written instructions. Tenderers must allow in their pipework prices for all the couplings, clippings, connectors, joints etc. for the proper and satisfactory functioning of the system.*				
	MuPVC and uPVC Waste and Soil pipework				
A	100mm diameter heavy gauge golden brown UPVC pipe	88	Lm		
B	100mm diameter heavy gauge grey mUPVC pipe	35	Lm		
C	50mm ditto	92	Lm		
D	40mm ditto	37	Lm		
E	32mm ditto	56	Lm		
	Bends				
F	100mm diameter long radius bend	25	No.		
G	100mm diameter sweep bend	47	No.		
H	50mm ditto	67	No.		
I	40mm ditto	36	No.		
J	32mm ditto	65	No.		
	Tees				
K	100mm diameter sweep tee	6	No.		
L	50mm ditto	31	No.		
M	40mm ditto	28	No.		
N	32mm ditto	34	No.		
	Access Caps				
O	100mm diameter access cap	8	No.		
P	50mm ditto	10	No.		
Q	40mm ditto	19	No.		
R	32mm ditto	15	No.		
	WC Connectors				
S	100mm diameter WC connector	24	No.		
	Reducers				
T	50 x 32mm diameter reducer	37	No.		
U	50 x 40mm ditto	45	No.		
V	40 x 32mm ditto	27	No.		
W	**Floor Traps**				
	Four-way floor trap with 50mm diameter outlet and 100mm white plastic cover grating.	8	No.		
Sub-total carried forward to the Foul & Rain Water Drainage collection page…. F-50					

Item	Description	Qty	Unit	Rate (Kshs)	Amount (Kshs)
A	**Gully Traps** Standard 300 x 300 x 450mm masonry gully trap complete with 125mm thick reinforced concrete cover.	4	No.		
B	**Inspection Chamber** Standard 600 x 450 x (600-750)mm inspection chamber complete with heavy duty Cast Iron cover as **'East African Foundry'** approved equivalent.	12	No.		
	Weathering Slates and Vent Cowl				
C	100mm diameter weathering slate and apron.	2	No.		
D	100mm diameter vent cowl	2	No.		
E	**Excavation** Excavate trench for 100mm pipe not exceeding 1500mm deep and average 250mm deep, part return in, fill & surplus cart away.	97	Lm		
	RAIN WATER DRAINAGE				
	Rain water Down Pipes				
F	100mm diameter heavy gauge grey mUPVC down pipes	18	Lm		
	Bends				
G	100mm diameter 45^0 bend	8	No.		
H	100mm diameter sweep bend	8	No.		
I	100mm diameter tee connector	6	No.		
J	100mm diameter stainless steel clip with stainless steel wall screws	18	No.		
K	**Fulbora Outlet** 150mm diameter cast iron outlet cast in reinforced concrete gutter.	4	No.		
L	**Rain Water Gully** Standard 300 x 300 x 450mm masonry rain water gully complete with uPVC p-trap and airtight 75mm thick reinforced concrete cover.	4	No.		
M	Allow for testing & commissioning of the rain water drainage installations.	1	Item		
Sub-total carried forward to the Foul & Rain Water Drainage collection page…. F-50					

Bill No. 11: Foul & Rain Water Drainage Collection Page

Item	Description	Amount (Kshs)
A	**Sub-total b/f from Page…….....……..…. F-48**	
B	**Sub-total b/f from Page…….....……..…. F-49**	
Total for Foul & Rain Water Drainage c/f to the Ablution Block Works Collection Page…….. F-51		

Ablution Block Works Collection Page

Item	Description	Amount (Kshs)
A	Total for Sanitary Fittings b/f from Page……..…….... F-44	
B	Total for Internal Plumbing b/f from Page…..... F-47	
C	Total for Foul Water Drainage b/f from Page……..…..……..….F-50	
Total Amount for the Ablution Block Plumbing and Drainage Works c/f to Volume 3 of 5 Main Collection Page …..... F-52		

PLUMBING AND DRAINAGE MAIN SUMMARY PAGE

ITEM	DESCRIPTION	AMOUNT(KSHS)
A	Total for preliminaries brought forward from Collection Page. **F-6**	
B	Total for Water Storage, Reticulation and Field Irrigation System Installation Works b/f from page……..…..…..…. **F-22**	
C	Total for Internal Plumbing & Drainage and Fire Protection Equipment Installations b/f from Page…..... **F-40**	
D	Total for Ablution Block Plumbing & Drainage Works b/f from Page……..…..…….....….**F-51**	
E	Add Contingency	**1,500,000.00**
TOTAL FOR WATER STORAGE, RETICULATION AND INTERNAL PLUMBING & DRAINAGE WORKS CARRIED FORWARD TO VOLUME 1 OF 5s GRAND SUMMARY PAGE		

Amount in Kenya Shillings ……...…….

……..……

……...……

Period of Execution of the works……..…….

Tenderers Name & Stamp……...……

……..…….

SIGNATURE……...…….. **DATE**…….

IN NO……. **VAT CERTIFICATE NO**……...…..……
(Provide copy) (Provide copy)

WITNESS' NAME……..…

OCCUPATION…….

SIGNATURE…….

DATE…….

5.05 SCHEDULE OF UNIT RATES

ITEM	DESCRIPTION	UNIT	RATE (KShs)
1.	65mm PP-r pipe	LM	
2.	25mm –ditto-	LM	
3.	50 mm Pressure Reducing valve (Pegler)	No.	
4.	Close coupled water closet, white (Dual flush 4/6 L "Twyford")	No.	
5.	Stainless Steel Squatting Water Closet Pan as "Franke"	No.	
6.	100mm PVC WC P-trap	No.	
7.	Electronic sensor activated Faucet for Wash Hand Basin "Geberit"	No.	
8.	Foot Pedal Flush valve for squatting water closet as "Sloan"	No.	
9.	Electronic sensor activated Flush Valves for water closet as "Sloan"	No.	
10.	Full circle Pop-up Irrigation nozzle 68.9 l/m, 18.0m radius as Hunter I-40-04-SS-ON-B-XX or approved equivalent	No.	
11.	Adjustable circle Pop-up Irrigation nozzle 84.7 l/m, 20.1m radius as Hunter I-40-04-SS-B-XX or approved equivalent	No.	
12.	Irrigation Pumpset (Duty and Standby): 16.5m3/hr, 80m head c/w control cabling and protection as Grundfos or approved equivalent	No.	
13		No.	

SECTION G:

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

SECTION G:

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

CONTENTS

6.01 General Notes to the Tenderer

1.1 The tenderer shall submit technical schedules for all materials and equipment upon which he has based his tender sum.

1.2 The tenderer shall also submit separate comprehensive descriptive and performance details for all plant apparatus and fittings described in the technical schedules. Manufacturer's literature shall be accepted. Failure to comply with this may have his tender disqualified.

1.3 Completion of the technical schedule shall not relieve the Contractor from complying with the requirements of the specifications except as may be approved by the Engineer.

6.02 TECHNICAL SCHEDULE

The tenderer must complete in full the technical schedule. Apart from the information required in the technical schedule, the tenderer **MUST SUBMIT** comprehensive manufacturer's technical brochures and performance details for all items listed in this schedule (fill forms attached).

ITEM	DESCRIPTION	MANUFACTURER	COUNTRY OF ORIGIN	REMARKS (Catalogue No. etc.)
1.	CPVC Pipe work			
2.	HDPE pipe work			
3.	Gate Valve			
4.	Water Closet			
5.	Hose Reel			
6.	Transfer Pumpset			
7.	Irrigation Pumpset			
8.	Irrigation Nozzle			
9.	Irrigation Controller			
10.	Sectional Water Tank			
11.	Tank Tower			
12.				
13.				

SECTION H:

DRAWING SCHEDULE

CONTENTS

7.01 DRAWING SCHEDULE:

As shall be provided during project implementation.

SECTION I:

STANDARD FORMS

NOTE:

ALL FORMS IN THIS SECTION MUST BE FILLED AS THEY SHALL BE PART OF THE EVALUATION CRITERIA

STANDARD FORMS

CONTENTS

8.01 PERFORMANCE BANK GUARANTEE

To: The Principal Secretary,
State Department of Sports,
Ministry of Sports, Culture and Heritage,
P.O. Box 49849 - 00100,
Nairobi.

Dear Sir,

WHEREAS ……. (hereinafter called "the Contractor") has

undertaken, in pursuance of Contract No. …… dated …… to

execute …… (hereinafter called "the Works");

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of:

Kshs…… (*Amount of Guarantee in figures*)

Kenya Shillings ……

……..(*amount of Guarantee in words*),
and we undertake to pay you, upon your first written demand and without cavil or argument, any

sum or sums within the limits of Kenya Shillings …….

…….. (*amount of Guarantee in words*) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change, addition or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any change, addition, or modification.

This guarantee shall be valid until the date of issue of the Certificate of Completion.

SIGNATURE AND SEAL OF THE GUARANTOR …….

Name of Bank …….
Address ……..…

Date ……

8.02 TENDER QUESTIONNAIRE

Please fill in block letters.

1. Full names of Tenderer:

   ……

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

   ……

3. Telephone number (s) of Tenderer:

   ……

4. Telex/Fax Address of Tenderer:
   ……

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

6. Details of Tenderer's nominated agent (if any) to receive tender notices. This is essential if the Tenderer does not have his registered address in Kenya (name, address, telephone, telex):

   ……

   ……

_____
Signature of Tenderer

8.03 CONFIDENTIAL BUSINESS QUESTIONNAIRE

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

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

Part 1 – General

Business Name ……

Location of business premises: Country/Town…….

Plot No…… Street/Road ……

Postal Address…… Tel No……..

Nature of Business……..

Current Trade Licence No…… Expiring date……

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

Name of your bankers……

Branch……

Part 2 (a) – Sole Proprietor

Your name in full…… Age……

Nationality…… Country of Origin……

Citizenship details ……

Part 2 (b) – Partnership

Give details of partners as follows:

	Name in full	*Nationality*	*Citizenship Details*	*Shares*
1.	……	……..……..		……..
2.	……	……..……..		……
3.	…….	……	……	……
4.	……	……	……	……

Part 2(c) – Registered Company

Private or Public ……

State the nominal and issued capita of the company:

Nominal KShs. ……..

Issued KShs. ……..

Give details of all directors as follows:

	Name in full	*Nationality*	*Citizenship Details**	*Shares*
1.	……..	……	……..	……..
2.	……..	……	……..	……..
3.	……..	……	……..	……..
4.	……..	……	……..	……..

Part 2(d) Interest in the Firm:

Is there any person/persons in the employment of the Government of Kenya WHO has interest in this firm? Yes/No ……. (Delete as necessary)

I certify that the above information is correct.

……..	…….	…….
Title	Signature	Date

* *Attach proof of citizenship*

8.04 KEY PERSONNEL

Qualifications and experience of key personnel proposed for administration and execution of the Contract.

POSITION	NAME	YEARS OF EXPERIENCE (GENERAL)	YEARS OF EXPERIENCE IN PROPOSED POSITION
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

I certify that the above information is correct.

…….. …….. ……. …….. ……

Title Signature Date

8.04 CONTRACTS COMPLETED IN THE LAST FIVE (5) YEARS

Work performed on works of a similar nature and volume over the last five years.

PROJECT NAME	**NAME OF CLIENT**	**TYPE OF WORK AND YEAR OF COMPLETION**	**VALUE OF CONTRACT (Kshs.)**

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

…….. …….. …….

Title Signature Date

8.06 SCHEDULE OF ON-GOING PROJECTS

Details of on-going or committed projects, including expected completion date.

PROJECT NAME	**NAME OF CLIENT**	**CONTRACT SUM**	**% COMPLETE**	**COMPLETION DATE**

I certify that the above works are currently being carried out by ourselves.

……. …… …….

Title Signature Date

8.07 FINANCIAL REPORTS FOR THE LAST FIVE YEARS

**(Balance sheets, Profits and Loss Statements, Auditor's reports, etc.
List below and attach copies)**

1. ._____.

2. ._____.

3. ._____.

4. ._____.

5. ._____.

6. ._____.

7. ._____.

8. ._____.

9. ._____.

10 ._____.

8.08 EVIDENCE OF FINANCIAL RESOURCES TO MEET QUALIFICATION REQUIREMENTS

(Cash in Hand, Lines of credit, etc. List below and attach copies of supportive documents.)

1. ._____.

2. ._____.

3. ._____.

4. ._____.

5. ._____.

6. ._____.

7. ._____.

8. ._____.

9. ._____.

10 ._____.

8.09 NAME, ADDRESS AND TELEPHONE, TELEX AND FACSIMILE OF BANKS

(This should be for banks that may provide reference if contacted by the employer)

NAME	ADDRESS	TELEPHONE	TELEX	FACSIMILE

8.10 DETAILS OF LITIGATIONS OR ARBITRATION PROCEEDINGS IN WHICH THE TENDERER IS INVOLVED AS ONE OF THE PARTIES

1. ._____.

2. ._____

3. ._____.

4. ._____.

5. ._____.

6. ._____.

7. ._____.

8. ._____.

9. ._____.

10 ._____.

8.11 SCHEDULE OF MAJOR ITEMS OF CONTRACTOR'S EQUIPMENT PROPOSED FOR CARRYING OUT THE WORKS

ITEM OF EQUIPMENT	DESCRIPTION, MAKE AND AGE (Years)	CONDITION (New, good, poor) and number available	OWNED, LEASED (From whom?), or to be purchased (From whom?)