REPUBLIC OF KENYA

**MINISTRY OF HEALTH**

**EAST AFRICA'S CENTERS OF EXCELLENCE FOR SKILLS AND TERTIARY EDUCATION IN BIOMEDICAL SCIENCES**

PROPOSED CONSTRUCTION OF EAST AFRICA'S CENTRE FOR EXCELLENCE NAIROBI, KENYA

**Contract Identification No: MOH/EACE/OCBI/001/2024-2025**

**ADB Loan Number: 2100150043449**

**PROJECT ID NO -P-Z1-IB0-023**

**ADB Loan Name: EAST AFRICA CENTERS OF EXCELLENCE; KENYA**

**Works Programme No: D108 NB/NB/2401 JOB NO. 10398B**

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# BIDDING DOCUMENT-VOL 4.5

# BORE HOLE DRILLING AND EQUIPING INSTALLATIONS

**(ALL RATES EXCLUSIVE OF TAXES)**

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**EMPLOYER:**

PRINCIPAL SECRETARY,
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**EMPLOYER'S REPRESENTATIVE:**

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**MARCH, 2025**

# Contents

# GENERAL MECHANICAL SPECIFICATONS

**SECTION F**

**GENERAL MECHANICAL SPECIFICATION**

## 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.

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

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

c) 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

j) Registration by National Construction Authority rules and Regulations

### 2.04 Electrical Requirements

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**

2.08.1 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 weeks' 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 pipe work 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 pipe work 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 pipe work shall be color 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 Preparation

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.

## PARTICULAR SPECIFICATIONS FOR BOREHOLE DRILLING AND EQUIPPING

### 1. Purpose

The borehole to be drilled, constructed, test pumped and equipped with a submersible pump under this contract will be to provide water intended for domestic use. The maximum ground water abstraction permitted from the borehole shall be $90m^3$/day with the maximum abstraction period not exceeding 10 hours per day.

The execution of the works shall be in full compliance with relevant provisions of the Water

Act.

The proposed drilling site will be at **East Africa Centre for Excellence**. The Contractor is deemed to have visited the site at **East Africa Centre for Excellence** – Nairobi County, and if unable to locate it or its details apply to the Chief Engineer(Mechanical), Ministry of Transport, Infrastructure ,Housing, Public Works and Urban Development, State Department for Public Works, Ngong Road, Nairobi.

No claims will be allowed for the traveling or other expenses, which may be incurred by the contractor's works.

### 2. Scope of the Work

(i) The supply and installation of 1No. Submersible borehole pump, complete with the necessary controls.

(ii) Connection of the water from the borehole to the water storage tank.

### 3. Local Conditions

The borehole was drilled, constructed and test pumped in both unconsolidated and consolidated formation and the contractor must be prepared to carry out the required work through any type of formation in the project area.

### 4. Borehole Data

(a) Total depth – 300m of 200mm diameter from surface (**Provisional**)

(b) Casings to be153mm diameter and screened depth to be determined after borehole construction.

(c) Static water level – not known

(d) Dynamic water level – not known

(e) Recommended pumping rate – $15m^3$/hr (for the purpose of quotation but to be confirmed after testing)

(f) (Pump) setting level – 250m (for the purpose of quotation but to be confirmed after testing)

(g) Total dynamic head to be determined on site

### 5. Casings

(a) Casings to be used as part of the permanent borehole structure shall be black steel pipe conforming to BS 1387 and having nominal diameter of 200mm.

(b) If any casing other than that to be left permanently in the borehole is required temporarily for execution of work, it shall be supplied by the contractor at the borehole free of charge.

**6. Screens**

The screens to be furnished and installed shall be of the pipe size variety having a minimum nominal diameter of 152mm and can be fabricated in three meter lengths. The screens shall be of continuous slot type and constructed entirely of stainless steel. The screen shall have slot size opening of 1.4m.

**7. Grouting**

Grouting shall be done by either cement or bentomite to seal off unwanted upper aquifers under direction of the Engineer.

**8. Construction Method**

The borehole to be constructed shall be drilled by cable-tool percussion method or the combination air/ hydraulic rotary method. The method of drilling shall be left to the discretion of the Contractor. After drilling to the final depth the Contractor shall proceed to insert permanent casings and screens as directed by the Engineer.

**8. Gravel Pack**

If filter gravel will be necessary, it will consist of durable, naturally rounded quartzite particles properly washed and cleaned prior to insertion in the borehole. The gravel shall be introduced in the annular space between the wall of the borehole and the 200mm casing from the bottom to about 2 meters below surface. The final casing and screens must be centralized before gravel back and the Contractor must supply suitable equipment for lowering of gravel pack.

**10. Cementation**

The space above the gravel pack shall be grouted with a mix of one part of cement to two parts of sand and two parts of ballast, in order of 1:2:2 concrete may be used near the surface to form an annular plug around the casing of dimensions 1.0 x 1.0 x 1.0 meters. There shall be 2000mm diameter concrete plinth on top of the borehole and shall be constructed as shall be directed by the Project Engineer and the Structural Engineer.

Any other cementation works to be done as directed by the Project Engineer.

**11. Development**

The Contractor shall furnish all necessary pumps, compressor, plungers, bailing or other needed equipment and shall develop the borehole by such approved methods as shall be necessary to give the maximum yield of water per increment of drawdown and extract from the formation of maximum practical quality of such sands as may, during the life of the borehole, be drawn through the screens when the borehole is operating under maximum conditions of draw down.

**12. Test Pumping**

After the borehole has been completed, constructed and developed, the subcontractor shall make necessary arrangements for conducting a 24 hour continuous test pumping up to a maximum of 30hr and 12 hour recovery test under the supervision of the Engineer. Where the Engineer or his representative cannot be present on such pumping test, the Contractor may continue without him keeping accurate records of the test in terms of discharge and drawn down but must seek

permission from the Project Engineer. Should the Contractor fail to keep such records, the Engineer shall order the test to be repeated at no extra cost.

**13. Sample Formation**

The Contractor shall keep an accurate record of the top and bottom of each stratum penetrated and shall save and deliver to the Engineer a sample of materials taken from each 1m of formation, or at every change of formation and at such other intervals as may be ordered by the Engineer. Those samples shall be placed in approved Contractor supplied containers with labels which indicate the depth at which the sample was obtained.

**14. Water Samples**

Water samples shall be collected at every water struck while drilling and also shall be collected at the start of every test and toward the end of the test in a three litre sterilized plastic container for both chemical and bacteriological analysis and submitted in a competent laboratory for analysis.

**15. Reports**

The contractor shall submit to the Engineer daily progress reports showing:-

(i) The depth each day indicating drilling in meters per hour with comments on degree of hardness of materials being penetrated.

(ii) Depth at which each water bearing zone is encountered and the rise and fall of water level in different formations.

(iii) The full details of work carried out in respect of operations which are paid for at hourly rate.

(iv) The full details of the number of hours worked each day.

**16. Cessation of Work**

The Engineer reserves the rights to stop drilling operations if in his opinion:- (a) A sufficient supply of water has been obtained.

(b) The work is not being carried out in a satisfactory manner or

(c) Further drilling is unlikely to be advantageous or for any other reason

In this event, payment shall be made only for the amount of work done up to the date of stoppage.

**17. Retention Time**

Waiting time shall be such time as the whole of the drilling equipment and staff is on site and is available for use, and all the operation connected with the Contact are at a standstill due to the absence of instructions from the Engineer.

The request for the necessary instructions and/ or guidance to the Project Manager by the Contractor shall be within 48 hours, provided that the Project Manager does not delay the said instructions/ or guidance to the Contractor unnecessarily.

All claims for waiting time shall be made on the basis of a normal 8 hour day, including Sundays and Public holidays.

## 18. Supply and Installation of Pump

The Contractor shall supply and install:-

(a) One electric submersible pump which will conform to the specification stated, for operation on 415 volt, 3-phase.

(b) All necessary electrical equipment for the pump such as control panel with starter, ammeter, single phasing cut-out, low voltage cut-out and all necessary cables for connection.

(c) Suitable diameter Galvanized Steel pipe class 'C' to carry water to the surface/ to water storage tank

(d) Low level cut-out switch

(e) Airline 20mm galvanized steel pipe/PVC for water level measurements

(f) Pressure gauge

(g) The gate valves, non-return valves before the master meter

(h) Master meter for measuring the water from the borehole.

(i) The pump equipment and accessories to be warranted for 12 months after issuance of the completion certificate. The warranty should be from authorised local dealer of the manufacturer.

In addition the Contractor shall carry out 24 hours test run at the completion of the works. This test has to be certified by the Project Manager.

### Note on Pump Installation

The Contractor shall make the necessary electrical connections and include in his prices all cable, starter-panel, switches etc required to put the pump in operation while tendering for this part of the document and return it will full description literature and performance curves for the proposed equipment together with the tender for drilling works.

The installation of the submersible pump into the borehole shall be done immediately as the borehole drilling is completed, test pumped and water analysed for suitability for human consumption.

The final production pump to be installed in the newly drilled borehole shall be determined and installed as per the actual conditions encountered on completion of the drilling works. Hence the specifications given under the section of 'borehole data' are only for the purpose of quotation. After establishing the actual conditions of the drilled borehole, only the engineer's approved submersible pump shall be installed.

## 19. Electrical works

It shall be the responsibility of the Contractor to provide all electrical wiring between all items of his Contract to ensure the correct function of his equipment. The Contractor's electrical works shall start from the nearest electrical isolator which will be supplied by others within five metres.

ALL ELECTRICAL FITTINGS, CABLES AND CONTROL PANEL SHOULD HAVE A WARRANTY OF AT LEAST 6 MONTHS FROM AUTHORISED LOCAL VENDORS.

# BILLS OF QUANTITIES

VOL 4.5/14

## 4. BILLS OF QUANTITIES

### 4.1 GENERAL NOTES TO TENDERERS

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 (**excluding 16% VAT**).

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 thereof.

4. The brief description 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.

5. 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.

6. The grand total of prices in the Summary of Volume 1 must be carried forward to the **Form of Tender for the tender to be deemed valid**.

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

### a. Contractual Requirements – Bill 1

Sub-contractors contractual requirements as called for the bill of quantities shall be priced and included in the tender. 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

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. The unit of measurements and observations are as per Volume 1 or as indicated in the Bills of Quantities.

### c. Summary

The summary contains tabulation of the separate parts of the Bills of Quantities carried forward with provisional sum, summary volume included. The sub-contractor shall insert his totals and enter his grand total tender sum in the summary of prices of Volume 1.

# 4.2 BILLS OF QUANTITIES

**EAST AFRICAN KIDNEY INSTITUTE**

**BOREHOLE INSTALLATION**

**PRICE SCHEDULES AND BILLS OF QUANTITIES**

**SECTION D.W. 1 PRELIMINARIES**

| ITEM | | DESCRIPTION | Unit | Qty | Rate | Cost Ksh, |
|---|---|---|---|---|---|---|
| A | | Allow for Environmental Impact Assessment and Clearance with NEMA | Item | 1 | | |
| B | | Allow for hydrological survey & report write up. | Item | 1 | | |
| C | | Application, follow up and acquisition of drilling authority | Item | 1 | | |
| D | | Mobilization of drilling unit to site, erect at position of borehole, dismantle and demobilise on completion. | Item | 1 | | |
| E | | Mobilization of test pumping unit equipment for test pumping the borehole including all pumping plant, generator, rising main and discharge pipework and all equipment for measurements of discharge, drawdown, recovery; erect, dismantle and demobilize on completion. | Item | 1 | | |
| F | | Provide all other plant equipment, stores, personnel materials and all required supplies necessary for carrying out and completing the works and remove from site on completion. | Item | 1 | | |
| G | | Allow for clearance of site on completion. | Item | 1 | | |
| H | | Supervision from WARMA | Item | 1 | | |

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**SECTION D.W. 2 BOREHOLE DRILLING**

| | | DESCRIPTION | UNIT | QTY | RATE | Cost KSH |
|---|---|---|---|---|---|---|
| | | Drilling of one borehole Max(350m) of sufficient diameter to provide for finished cased diameter of 150mm (6") . Rate should consider drilling in hard rock | | | | |
| A | | 0 - 200m | LM | 200 | | |
| B | | 200 - 300m | LM | 100 | | |
| C | | 300 - 350m | LM | 50 | | |
| D | | Supply and install 150mm (6") plain steel casing (Class B) | LM | 250 | | |
| E | | Supply and install 150mm (6") steel slotted casing (Class B). **It must not be torch-cut** | LM | 100 | | |
| F | | Supply and install gravel pack with average grain size 2mm | Ton | 6 | | |
| G | | Insertion and removal of surface temporary casing | LM | 10 | | |
| H | | Install permanent surface casing | LM | 10 | | |
| I | | Insertion of bentonite seal and topping of annular space with ballast chips. | Item | 1 | | |
| J | | Form concrete surface plug around casing with dimensions 1000 x 1000 x 1000mm. | Item | 1 | | |
| K | | Well development using air or water jetting as recommended by the Project Mechanical Engineer. | Item | 1 | | |
| L | | Test Pumping | Item | 1 | | |
| M | | Recovery monitoring | Item | 1 | | |
| N | | Supply and install 200mm (8") diameter borehole cap | Item | 1 | | |
| O | | Chemical Analysis of water | Item | 1 | | |

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**SECTION D.W. 3 BOREHOLE PUMP INSTALLATION**

| Item | | Description | Unit | Qty | Rate | Cost KShs. |
|---|---|---|---|---|---|---|
| | | To supply, install, test and commission the following pumping and pipeline equipment and labours to complete 1 No. already drilled and cased borehole at the above site. | | | | |
| | | The rates tendered shall include for all obligations and no claims for extra payment shall be entertained for a tenderer's failure to understand the requirements or failure to take into consideration of existing site conditions | | | | |
| | | **Pumps** | | | | |
| A | | Supply and install submersible borehole pump set at a depth of 280m and capable of a duty of 15 cubic metres per day against 280m head complete with submersible cable, level controls and their cabling for a pump as Grundfos SP 17-24 power rated at 13kW, with a maximum assembly diameter of 138mm. | Set | 1 | | |
| B | | 20mm dia. uPVC heavy duty air lines. | LM | 300 | | |
| C | | Pumps control panel for control of the pump to allow automatic duty operation of the pump with a manual switch override allow manual operation of the pump. The panel to have an isolator switch indicator lights for pump status, ammeter, voltmeter, hour meter and a main switch and power available light indication for the panel. The panel to have among other items over and under voltage, phase failure, overload relays, connections for tank and borehole level controls, and volt free contacts for remote indication all housed in stove baked enamel painted cabinet mounted on wall and with a plastic envelope sheathed circuit wiring diagram locked in the cabinet to approval. Panel to be BMS Compatible via Modbus Protocol | | | | |
| | | Panel as "Dayliff CU Borehole control unit" | Set | 1 | | |

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**SECTION D.W. 3 BOREHOLE PUMP INSTALLATION**

| Item | | Description | Unit | Qty | Rate | Cost KShs. |
|---|---|---|---|---|---|---|
| | | **Brought Forward** | Sum | | | |
| A | | Level control and dry run protection electrodes for the borehole and their inter- connecting cable, connecting pump and control box. | Lots | 1 | | |
| B | | Level control electrodes for the ground tank. | Set | 1 | | |
| C | | The ground tank is approximately 40m pipeline distance from the borehole and the signal shall be effected by cable laid along pipeline to approval. | LM | 40 | | |
| D | | Provide all materials and labour and install a well-head complete with test tap, pressure gauges, sockets for services as Grundfoss well discharge head and as shown for the well diameter to approval. | Lot | 1 | | |
| | | **<u>Drop Pipes</u>** | | | | |
| E | | 50mm dia. heavy duty class C GMS submersible pump support pipe system including for all sockets and adaptors to set the pump at 20m depth including support clamps and cable ties to the bottom (54 x 6m) Pieces | Set | 1 | | |
| F | | 50mm dia. Kent water meter for borehole. | No. | 1 | | |
| G | | Allow for fittings including pipe flanges for the different pipe diameters bushes, connectors, sockets tees, bends etc. to complete pipework and meters to within 4m radius area of the borehole as shown on drawing. | Lot | 1 | | |
| H | | 20mm dia. loose key test tap. | No. | 1 | | |
| I | | Pressure gauge with a 100mm dia. clock face dial and capable of indicating upto 100m pressure head its connecting copper pipe and stop cock valves. | Set | 2 | | |
| | | Carried to collection page | | | | |

**SECTION D.W. 3 BOREHOLE PUMP INSTALLATION**

| Item | | Description | Unit | Qty | Rate | Cost KShs. |
|---|---|---|---|---|---|---|
| | | **Brought forward** | Sum | | | |
| A. | | 50mm dia. HDPE 15 bar pressure pipe with fittings. | LM | 250 | | |
| B | | 750mm trench including pipe bedding and making good to approval | LM | 40 | | |
| C | | Allow for measuring, recording and reporting of the depth of borehole. | Item | 1 | | |
| D | | 50mm dia. gate valve as peglar or equal and approved. | No. | 1 | | |
| E | | 50mm dia. non return valve peglar installed on to the rising. | No. | 2 | | |
| F | | 25mm air valve as Glenfield or equal and approved. | No. | 1 | | |
| G | | Allow for preparation and submission of operation and maintenance manuals including all circuit diagrams for the installations to be submitted in 3 copies all to approval. | Item | 1 | | |
| H | | Allow for testing and commissioning the whole installation to approval. | Item | 1 | | |

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| Item | | Description | Unit | Qty | Rate | Cost KShs. |
|---|---|---|---|---|---|---|
| | | **PROPOSED EAKIP** | | | | |
| | | **BOREHOLE DRILLING, EQUIPPING & COMMISSIONING** | | | | |
| | | **COLLECTION PAGE** | | | | |
| | | Preliminaries and General Conditions | | | | |
| | | Borehole Drilling | | | | |
| | | Borehole Pump installation | | | | |
| | | **TOTAL** | | | | |
| Carried to Main Summary (M/S1) | | | | | | |
| | | | | | | KShs. |

**PROPOSED EAKIP**

**DRILLING, EQUIPPING & COMMISSIONING.**
**MAIN SUMMARY**

| **SECTION ITEM** | | **FROM PAGE** |
|---|---|---|
| I | Contarctual Requirements and General conditions | |
| II. | Boreholes Drilling Equipping & Commissioning | 5/6 |

Total Carried to Main Summary Page Vol.1

Contractor's Signature: ……

……..

Address: ……

Witness's Signature: …….

Address: …….

…….

M/S1

# SECTION G
# SCHEDULE OF CONTRACT DRAWINGS

## SCHEDULE OF CONTRACT DRAWINGS

There are **NO** drawings in this contract.

# SECTION H
# TECHNICAL SCHEDULE
# OF
# ITEMS TO BE SUPPLIED

## TECHNICAL SCHEDULE

1. The technical schedule shall be submitted by tenderers to facilitate and enable the Project Manager to evaluate the tenders, especially where the tenderer intends to supply or has based his tender sum on equipment which differs in manufacture, type or performance from the specifications indicated by the Project Manager.
2. This schedule shall form part of the technical evaluation criterion, and tenderers are therefore advised to complete the schedule as they shall be considered non responsive.

**NB.** The tenderer must complete in full the technical schedule. Apart from the information required in the technical schedule, the tenderer **MUST SUBMIT LEGIBLE** comprehensive manufacturer's technical brochures and performance details for all items listed in this schedule and **CLEARLY HIGHLIGHT THE SPECIFIC REQUIRED ITEM ONLY.**

**TECHNICAL SCHEDULE**

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

| | **ITEM** | **MANUFACTURER** | **COUNTRY OF ORIGIN** | **REMARKS (Catalogue No. etc.)** |
|---|---|---|---|---|
| 1 | $15M^3$/hr @300m submersible borehole pump | | | |
| 2 | Electrodes | | | |
| 3 | 6mm galvanized steel plates | | | |
| 4 | Control pannel | | | |
| 5 | High pressure pipework | | | |
| 6 | PVC hardened power cable | | | |

**Catalogue must be attached for all the items in the technical schedule of material above**

# SECTION I
# SCHEDULE OF UNIT RATES

## SCHEDULE OF UNIT RATES

1. The tenderer shall insert unit rates against the items in the following schedules and may add such other items as he considers appropriate.
2. The unit rates shall include for supply, transport, insurance, delivery to site, storage as necessary, assembling, cleaning, installing, connecting, profit and maintenance in defects liability and any other obligation under this contract.
3. The unit rates will be used to assess the value of additions or omissions arising from authorized variations to the contract works.
4. Where trade names or manufacturer's catalogue numbers are mentioned in the specification, the reference is intended as a guide to the type of article or quality of material required. Alternative brands of **equal** and **approved** quality will be accepted.

**SCHEDULE OF UNIT RATES**

| ITEM | DESCRIPTION | UNIT | RATES(KSHS) |
|---|---|---|---|
| 1. | Chlorine-dosing pump with fixed feed rate of 13.8 litres per second | NO. | |
| 2. | 50MM, GMS PIPE | NO. | |
| 3. | Submersible Pump c/w motor with flowrate of 8m3/hr of water against a total head of 250m | NO. | |
| 4. | Pump c/w motor with flowrate of 8m3/hr of water aainst a total head of 300m. | NO. | |
| 5. | Reverse Osmosis Plant DRO4 with flow rate of 5m3/hr permeate | NO. | |
| | Reverse Osmosis Plant DRO8 with flow rate of 8m3/hr permeate. | NO. | |
| 6. | Complete UV Water Purifiers flow rate of 2m3/hr | NO. | |
| 7. | Complete UV Water Purifiers flow rate of 1m3/hr | NO. | |
| 8. | 24000LITRES PLASTIC TANK C/W PLINTH PLATFORM | LM. | |
| | 16mm2 4 core pvc/swa/pvc copper cable | LM. | |

**(To be completed by the Tenderer)**