

|             |                                                                                                                                                                                                                                                 |             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|             | <b>DRILLING AND EQUIPING OF NOONTOTO BOREHOLE IN SAMBURU COU</b>                                                                                                                                                                                |             |
| <b>ITEM</b> | <b>DESCRIPTION</b>                                                                                                                                                                                                                              | <b>UNIT</b> |
|             | <b>BILL NO. 1: PRELIMINARY AND GENERAL ITEMS</b>                                                                                                                                                                                                |             |
|             | <b>PROVISIONAL SUMS</b>                                                                                                                                                                                                                         |             |
|             | <b>Site clearance and sign board</b>                                                                                                                                                                                                            |             |
| 1.1         | Provide for site clearing, boulder removal and levelling to allow access to site (only when instructed by the engineer)                                                                                                                         | Sum         |
| 1.2         | Allow for provisional sum for fabrication, instalation and branding of sign board as provided in the drawing( including any payments for it to local authorities)                                                                               | Item        |
| 1.3         | Allow provisional sum of Ksh.500,000.00 to cover supervision costs of engineers assigned on the project from the employer's head office to cover for visits and other supervision expenses to be spendes as directed by the project manager.    | Item        |
| 1.4         | Allow a provisional sums for access road to site(ksh150,000) and site meetings ksh 150,000 as shall be directed by the engineer.                                                                                                                | item        |
|             | <b>CONTRACTOR'S MOBILIZATION</b>                                                                                                                                                                                                                |             |
| 1.5         | Mobilization and demolition of contractor's plant and equipment including but not limited to drilling units, tank erection equipment, test pumping equipment, borehole development equipment, materials, personnel and other required supplies. | Sum         |
|             | <b>CONTRACTOR'S CAMP, PLANT &amp; WRA APPROVALS</b>                                                                                                                                                                                             |             |
| 1.6         | Establish, maintain and remove Contractor's camps, facilities, etc at the end of the contract.                                                                                                                                                  | Sum         |
| 1.7         | Erecting and dismantling of contractor's borehole plant and equipment including but not limited to drilling unit, test pumping and borehole development units.                                                                                  | Sum         |
| 1.8         | Provisional sum for WRA drilling approval and abstraction permits( WRA mandatory requirement)                                                                                                                                                   | sum         |
| 1.9         | Provisional sum for hydrogeological survey;KVDA to undertake approval of Qualified hydrogeologist to be engaged by the contractor.                                                                                                              | sum         |
|             | <b>SUB TOTAL</b>                                                                                                                                                                                                                                |             |
|             | Percentage 15% adjustment to provisional sums                                                                                                                                                                                                   |             |
|             | <b>TOTAL FOR BILL NO.1 CARRIED TO SUMMARY PAGE</b>                                                                                                                                                                                              |             |
|             | <b>BILL NO. 2: BOREHOLE DRILLING, DEVELOPMENT &amp; TESTING</b>                                                                                                                                                                                 |             |
| 2.1         | Provide for drilling additives and water for all requirements                                                                                                                                                                                   | Sum         |
| 2.2         | Drilling of borehole minimum diameter 215mm from ground level until stable formation is encountered                                                                                                                                             | Lm          |
| 2.3         | Ditto item 2.2 but between 25 - 100m                                                                                                                                                                                                            | Lm          |
| 2.4         | Extra for borehole drilling below 100m                                                                                                                                                                                                          | Lm          |
|             | <b>CASING AND SCREENS</b><br><b>(To be approved before supply and installation, please provide manufacturers specification documents for approval)</b>                                                                                          |             |
| 2.5         | Supply and Install 8" surface casing and retrieve on completion                                                                                                                                                                                 | Lm          |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |
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| 2.6  | Supply and Install 6" diameter borehole carbonized Steel Plain Casings class - B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Lm   |
| 2.7  | Supply and Install 6" diameter borehole carbonized Steel Slotted Casings class B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Lm   |
| 2.8  | Extra over for casing 6" diameter carbonized steel pipe class B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Lm   |
| 2.9  | Supply and install well graded gravel pack (size 2-4mm entire borehole)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ton  |
|      | <b>BOREHOLE DEVELOPMENT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |
| 2.10 | Physical and chemical development of the borehole                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Hr   |
| 2.11 | Grout between the casing and borehole for top 8m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Item |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |
|      | <b>AQUIFER TESTING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |
| 2.12 | Undertake constant discharge test for 24 hrs to determine borehole parameters (Test pumping report required)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Hr   |
| 2.13 | Undertake water level observation and record recovery measurements of completed well                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Hr   |
| 2.14 | Physical and chemical analysis of water(approved LAB Report required )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Item |
| 2.15 | Install well head, well cap serial number and well apron of of dimmensions 1.0mx1.0mx1.0m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Sum  |
| 2.16 | Logging of samples at 2m intervals and preparation of Borehole Completion Report to WRA standards.This shall be approved by WRA as a statutory requirement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Sum  |
| 2.17 | UPVC casing/screen pipes DN 150/6" class D (Provisional in-case of saline water)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | M    |
|      | <b>TOTAL FOR BILL NO.2 CARRIED TO SUMMARY PAGE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |
|      | <b>BILL NO.3: EQUIPPING OF BOREHOLE<br/>( Installation equipment to be approved and witnessed by KVDA engineer)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |
| 3.1  | <b>Submersible pump and accessories:</b> Supply deliver to site and install a <u>suitable submersible pump</u> set complete with compatible a water cooled motor 5kw or equivalent as shall be approved by the supervising engineer , cables and compatible electrical control panel comprising of well low level, overhead tank level control,overload,and power failure relays, main circuit breakers ammeter and voltmeter, Star/Delta starter, auto/manual switch start/stop button, run/trip lights ,tank float switch fully protected system . <b>Note:</b> i)Pump rating and head may change depending on maximum flow rate determined after aquifer yield testing results.ii) The pump brand shall be of high quality ,to be approved by the engineer before purchase and installation - preferably dayliff,petrollo or grundfos brands.Please state the brand to be supplied. The pump unit including all the accessories shall have a warranty of 12 months) | Item |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |
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| 3.2 | <b>Solar Power Supply:</b> Supply, deliver and install complete compatible solar array of 6kw (high quality <b>monocrystalline brand</b> to be approved by engineer before purchase and installation ) and all its accessories including but not limited to, hybrid inverter;preferably hybrid sunverter or hober or other to be approved by engineer for automatic control, cables,earthing, lighthning arresters, control panel and heavy duty metallic panel support stand-see attached drawing ( <b>With 2 years warranty</b> ) . <b>Note;i)</b> The specification may may change depending on maximum flow rate determined after aquifer yield testing results ii) solar panel brand to be preferably solarworld -german and dayliff sunverter inverter ;Please state the brands to be supplied.and ( <b>NB ;provide manufactures data sheet for approval</b> ) | Item |
|     | <b>TOTAL FOR BILL NO.3 CARRIED TO SUMMARY PAGE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |
|     | <b>BILL NO.4: AUXILLIARY WORKS-</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |
| 4.1 | Supply , deliver materials & construct a communal water point. Rate to include four GI 3/4 " dia taps,gates valves for control , GI pipes,plastering , fittings and connections,1.2 m high by 2000 mm wide apron and 150mm thick masonry wall support <b>see the attached drawing.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | No.  |
| 4.2 | Construction of perimeter fence around the borehole site rates to include supply and installation of 150x125mm cranked precast concrete posts mortised in concrete at 2.5m center to centre complete with 14 gauge triple twist chainlink net fence ,top three strand barbed wire , 4 stands galvanized wire and grilled steel gate.The chaink link to be mortised in concrete all round . <b>as detailed in the attached drawing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                | Lm   |
| 4.3 | Supply delivery to site all materials and construct standard cattle trough. Rate to include BRC A142 floor setting,10m long,1.0m wide and 0.5m high masonry wall 200mm thick all round, water proofing material and GI 3/4"piping, float valve chamber ,control gates /gate vales and all fittings connections as <b>detailed in the drawing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Item |
| 4.4 | Provide for reinforced concrete class 25 <b>cattle ramp</b> , 4m wide all around the trough and 200mm thickness .The base foundation works shall be of compacted hard stones material with blinding material with standard BRC A 142 as shall be directed by engineer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | m3   |
| 4.5 | Ditto 4.3 and 4.4 but for goats and sheep ; trough height of 0.3M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Item |
| 4.6 | Supply, deliver and hoist 1 No. 10,000 litres plastic tank;specifically double layer Roto type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Item |

|                                                                    |                                                                                                                                                                                                                                                                                                                        |   |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 4.8                                                                | Allow sum for pipe works and fittings for water distribution from the borehole discharge to the storage tank and from the storage tank to the community water point; 1 1/2 inch and water troughs ; 1 1/2 inch as shall be directed by the engineer; (Provide manufacturers specification sheet and QR code reference) | M |
| 4.9                                                                | HDPE DN 40mm/ PN 12.5 (provisional in case of saline water)                                                                                                                                                                                                                                                            | M |
|                                                                    | TOTAL FOR BILL NO.4 CARRIED TO SUMMARY PAGE                                                                                                                                                                                                                                                                            |   |
|                                                                    | <b>SUMMARY PAGE</b>                                                                                                                                                                                                                                                                                                    |   |
| <b>BILL NO</b>                                                     | <b>ITEM</b>                                                                                                                                                                                                                                                                                                            |   |
| 1                                                                  | <b>PRELIMINARY AND GENERAL ITEMS (provisional)</b>                                                                                                                                                                                                                                                                     |   |
|                                                                    |                                                                                                                                                                                                                                                                                                                        |   |
| 2                                                                  | <b>BORE HOLE DRILLING, DEVELOPMENT &amp; TESTING</b>                                                                                                                                                                                                                                                                   |   |
|                                                                    |                                                                                                                                                                                                                                                                                                                        |   |
| 3                                                                  | <b>EQUIPPING OF BORE HOLE</b>                                                                                                                                                                                                                                                                                          |   |
|                                                                    |                                                                                                                                                                                                                                                                                                                        |   |
| 4                                                                  | <b>AUXILLARY WORKS</b>                                                                                                                                                                                                                                                                                                 |   |
|                                                                    |                                                                                                                                                                                                                                                                                                                        |   |
| Add 5% Contingency ;to be expended with instructions of the client |                                                                                                                                                                                                                                                                                                                        |   |

**NB: To all bidders:-**

1. All rates are inclusive of VAT,
2. 0.03 percent (of the contract value) capacity building levy will be deducted and submitted to PPR
3. All provisional sums shall be approved before committing
4. The first operation is borehole drilling. Any other subsequent works will depend on availability of
5. Implementation of all works must be supervised by KVDA (Client) representative. The Contractor
6. Drawing shall be read together with bill of quantities for completeness

| NTY (PROPOSED DEPTH 170 M) |                     |                     |
|----------------------------|---------------------|---------------------|
| QTY                        | UNIT PRICE<br>(KSH) | VALUE (KSHS)        |
|                            |                     |                     |
|                            |                     |                     |
|                            |                     |                     |
| 1                          | 200,000.00          | 200,000.00          |
| 2                          | 45,000.00           | 90,000.00           |
| 1                          | 500,000.00          | 500,000.00          |
| 1                          | 300,000.00          | 300,000.00          |
|                            |                     | -                   |
| 1                          | 300,000.00          | 300,000.00          |
|                            |                     |                     |
| 1                          | 100,000.00          | 100,000.00          |
| 1                          | 200,000.00          | 200,000.00          |
|                            |                     |                     |
| 1                          | 80000               | 80,000.00           |
|                            |                     |                     |
| 1                          | 150000              | 150,000.00          |
|                            |                     | <b>1,920,000.00</b> |
|                            |                     | <b>288,000.00</b>   |
|                            |                     | <b>2,208,000.00</b> |
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approval from client's side .