SOS CHILDREN VILLAGES, KENYA

TENDER DOCUMENTS FOR

DRILLING AND EQUIPPING OF 2No BOREHOLES, WATER KIOSK AND MINOR CIVIL WORKS FOR SOS CHILDREN VILLAGES, ELDORET

TENDER NO: SOSCV/ELD/MUNYCV/AMAF/ T2/2019 – 2020/2

PROCUREMENT ENTITY: SOS CHILDREN VILLAGES

FUNDED BY: AMAF

ISSUED ON: 26TH JUNE 2020
Contents

SECTION I: INVITATION FOR TENDER NOTICE................................................................. 4
Submission ................................................................................................................. 4

SECTION II: INSTRUCTION TO THE BIDDERS (ITB) .................................................. 5
PREPARATION OF TENDERS ....................................................................................... 9
OPENING AND EVALUATION OF TENDERS ............................................................. 11

SECTION III: CONTRACT DATA SHEET (CDS)/ TENDER DATA SHEET ......................... 13

SECTION IV: TECHNICAL SPECIFICATION ................................................................ 16
Section A. General requirements ............................................................................... 16
Location ....................................................................................................................... 16
1.1 Scope of Works .................................................................................................... 17
1.2 Quality and Approvals ....................................................................................... 17
1.3 Construction Documents .................................................................................... 17
1.6 Setting Out of the Works .................................................................................... 19
1.11 Records and Drawings ..................................................................................... 20
1.20 Project Management ......................................................................................... 23
1.20.1 Project Control .............................................................................................. 23
1.21 Equipment for the Employer ........................................................................... 24
1.22 Facilities for Survey and Inspection by the Project Manager ......................... 24
1.23 Inspections by the Project Manager during Defects Liability Period .............. 24
1.27 Standards and Regulations .............................................................................. 25
1.29 Quality Control ................................................................................................ 25
3.4. Sampling and logging ....................................................................................... 28
3.3. Drilling Sequence .............................................................................................. 28
3.5. Borehole development and clean up ................................................................. 29
3.6. Borehole Disinfection ....................................................................................... 29
3.7. Concrete slab, well heads and capping of boreholes ....................................... 30
4. AQUIFER TESTING AND WATER QUALITY ......................................................... 31
4.2. Calibration test .................................................................................................. 31
4.3. Tests sequence and duration ........................................................................... 31
4.8. Water samples and analysis ............................................................................ 33
5. QUALITY OF MATERIALS AND WORKS .............................................................. 34
5.1. Erection of drilling machine at borehole site ................................................... 34
5.2. Verticality and alignment of boreholes .......................................................... 34
5.3. Assembling of casing, tubes and screens ......................................................... 34
5.4. Characteristics of the drilling fluid and additives ............................................ 35
5.5. Characteristics of the casings and screens ....................................................... 35
5.6. Characteristics of the gravel pack ................................................................... 37
5.7. Characteristics of the cement .......................................................................... 37
PRICED BILLS OF QUANTITIES ........................................................................... 37
1.1 Preamble To Bill of Quantities ........................................................................ 37
BILL OF QUANTITIES .......................................................................................... 40
Bill No 1 Drilling of 1No borehole at SOS Children Villages, Eldoret .................... 40
Bill No 1 Solar equipping ..................................................................................... 41
Bill No 1 Rising Main ............................................................................................ 41
Bill No 1 summery ................................................................................................ 42
Bill No 2 Drilling and equipping of 1No borehole at Munyaka Primary school, Eldoret .......................... 42
Bill No 2 Construction of water kiosk with reinforced concrete platform for tank .................................. 43
Bill No 2- equipping using solar pump ................................................................ 45
Bill No 2- pipe works ............................................................................................ 45
Total grand summery carried to letter of bid ........................................................ 46
TENDER FORMS .................................................................................................... 46
LETTER OF BID ..................................................................................................... 46
Form of Bid bond security .................................................................................... 48
Confidential Business Questionnaire ................................................................... 49
EVALUATION AND QUALIFICATION CRITERIA ............................................. 50
Equipment type and characteristics ..................................................................... 50
Required personnel with experience in works of equivalent and/or similar volume .................................. 50
Evaluation Criteria: ............................................................................................... 50
PRELIMINARY EVALUATION ............................................................................. 50
TECHNICAL EVALUATION ............................................................................... 50
FINANCIAL EVALUATION: ............................................................................... 51
Evaluation guidelines ............................................................................................ 51
SECTION I: INVITATION FOR TENDER NOTICE

The SOS Children Villages, Kenya has received funds from AMAF to undertake project mentioned below. This is therefore invites for bids from eligible bidders registered in category NCA 7 and above by the National Construction Authority for the drilling and equipping and civil works involving the following.

<table>
<thead>
<tr>
<th>Tender No</th>
<th>Project Name</th>
<th>Project scope</th>
<th>Category and class of registration</th>
</tr>
</thead>
</table>
| SOSCV/KSM/BARCV/AMAF/T2/2019-2020/1 | Kisumu WASH project | - Drilling and equipping 2 No boreholes.  
- Construction of water kiosk, water tanks and minor civil works | NCA 7 and above civil/water works |
| SOSCV/ELD/MUNYCV/AMAF/T2/2019-2020/2 | Eldoret WASH project | - Drilling and equipping 2 No boreholes.  
- Construction of water kiosk, water tanks and minor civil works | NCA 7 and above civil/water works |

Obtaining bidding documents

Interested bidders may obtain the tender documents by downloading from SOS Children Villages, Kenya website through the link provided.

Submission

Complete tender documents to be submitted by email to Nationaloffice.procurement@soskenya.org on or before 10th July, 2020 1700 hrs. The technical and financial proposals should be submitted in separate paginated PDF files, clearly indicating the tender number and name on the email subject line.

Interested bidders have until 3rd July, 2020 1700hrs to ask any questions and or clarifications to the procuring entity through email address provided.

The procuring entity shall provide addendum if necessary or feedback to the questions raised by 6th July, 2020 1700 hrs

Email address: Nationaloffice.procurement@soskenya.org
<table>
<thead>
<tr>
<th>Introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Scope of tender</strong></td>
</tr>
<tr>
<td>1.1</td>
</tr>
<tr>
<td>1.2</td>
</tr>
<tr>
<td>1.3</td>
</tr>
<tr>
<td><strong>B. Source of funds</strong></td>
</tr>
<tr>
<td>2.1</td>
</tr>
<tr>
<td>2.2</td>
</tr>
<tr>
<td><strong>C. Eligible bidders</strong></td>
</tr>
<tr>
<td>3.1</td>
</tr>
<tr>
<td>3.2</td>
</tr>
<tr>
<td>3.3</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
purposes of this Tender; or

d) Have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Tender of another Tenderer, or influence the decisions of the Procuring Entity regarding this Tendering process; or

e) Submit more than one Tender in this Tendering process; however, this does not limit the participation of subcontractors in more than one Tender, or as Tenderer and subcontractor simultaneously.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3.4</td>
<td>Tenderers shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Government of Kenya</td>
</tr>
<tr>
<td>3.5</td>
<td>Government owned enterprises in Kenya may participate only if they are legally and financially autonomous, if they operate under commercial law, are registered by the relevant registration board or authorities and if they are not a dependent agency of the Government.</td>
</tr>
<tr>
<td>3.6</td>
<td>Tenderers shall provide such evidence of their continued eligibility satisfactory to the Procuring Entity, as the Procuring Entity shall reasonably request.</td>
</tr>
</tbody>
</table>

**D. One tender per tenderer**

| 4.1 | A firm shall submit only one Tender, in the same Tendering process. |
| 4.2 | A firm, if acting in the capacity of subcontractor in any Tender, may participate in more than one Tender but only in that capacity. |

**E. Alternative tenders by tenderers**

| 5.1 | Tenderers shall submit offers that comply with the requirements of the Tendering documents, including the basic Tenderer’s technical design as indicated in the specifications and Drawings and Bill of Quantities. Alternatives will not be considered, unless specifically allowed for in the Tender Data Sheet. |

**F. Cost of tendering**

| 6.1 | The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process. |

**G. Site visit and pre-tender meeting**

| 7.1 | The Tenderer, at the Tenderer’s own responsibility and risk, is advised to visit and examine the Site of |
Works and its surroundings and obtain all information that may be necessary for preparing the Tender and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Tenderer’s own expense.

7.2 The Procuring Entity may conduct a site visit and a pre-Tender meeting. The purpose of the pre-Tender meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

7.3 The Tenderer’s designated representative is invited to attend a site visit and pre-Tender meeting which, if convened, will take place at the venue and time stipulated in the Tender Data Sheet.

7.4 The Tenderer is requested as far as possible, to submit any questions in writing or by electronic means to reach the procuring Entity before the pre-Tender meeting. It may not be practicable at the meeting to answer all questions, but questions and responses will be transmitted in accordance with sub-Clause 7.5.

7.5 Minutes of the pre-Tender meeting, including the text of the questions raised and the responses given together with any responses prepared after the pre-Tender meeting will be transmitted within the time stated in the Tender Data Sheet to all purchasers of the Tendering documents. Any modification of the Tendering documents listed in sub-Clause 8.1 that may become necessary as a result of the pre-Tender meeting shall be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to ITT sub Clause 10.2 and not through the minutes of the pre-Tender meeting.

H. Contents of tendering documents

8.1 The works required, Tendering procedures, and contract terms are prescribed in the Tendering Documents. In addition to the Section I Invitation for Tenders, Tendering documents which should be read in conjunction with any addenda issued in accordance with ITT sub Clause 10.2 include:

Section I Instructions to bidders
Section II Tender Data Sheet
Section III Technical specification
Section IV Bill of Quantities
Section V Forms of Tender
- Letter of bid
- Confidential Business Questionnaire
Agreement Section
<table>
<thead>
<tr>
<th>Section</th>
<th>8.2</th>
<th>8.4</th>
<th>I. Clarification of tendering documents</th>
<th>9.1</th>
<th>9.2</th>
<th>9.3</th>
<th>9.4</th>
<th>J. Amendments of the tendering documents</th>
<th>10.1</th>
<th>10.2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The number of copies to be completed and returned with the Tender is specified in the <strong>Tender Data Sheet</strong>.</td>
<td>The Procuring Entity is not responsible for the completeness of the Tendering Documents and their addenda, if they were not obtained directly from the authorized staff of the Procuring Entity.</td>
<td></td>
<td>A prospective Tenderer requiring any clarification of the Tendering documents may notify the Procuring Entity in writing, e-mail or facsimile at the Procuring Entity's address indicated in the <strong>Tender Data Sheet</strong>.</td>
<td>The Procuring Entity will within the period stated in the <strong>Tender Data Sheet</strong> respond in writing to any request for clarification provided that such request is received no later than the period indicated in the <strong>Tender Data Sheet</strong> prior to deadline for the submission.</td>
<td>Copies of the procuring entity's response will be forwarded to all Purchasers of the Tendering documents, including a description of the inquiry, but without identifying its source.</td>
<td>Should the Procuring Entity deem it necessary to amend the Tendering documents as a result of a clarification, it shall do so following the procedure under ITB Clause 10.</td>
<td>Before the deadline for submission of Tenders, the Procuring Entity may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Tenderer, modify the Tendering documents by issuing addenda.</td>
<td>Any addendum issued shall be part of the Tender documents pursuant to sub-Clause 8.1 and shall be communicated in writing, by e-mail or facsimile to all who have obtained the Tendering documents directly from the Procuring Entity.</td>
<td></td>
</tr>
</tbody>
</table>
### K. Language of tender

11.2 The Tender, and all correspondence and documents related to the Tender exchanged by the Tenderer and the Procuring Entity shall be written in the Tender language stipulated in the **Tender Data Sheet**. Supporting documents and printed literature furnished by the Tenderer may be in another language provided they are accompanied by an accurate translation of the relevant passages in the above stated language, in which case, for purposes of interpretation of the Tender, the translation shall prevail.

### L. Documents constituting tender

12.1 The Tender submitted by the Tenderer shall consist of the following components:
   a) Letter of bid
   b) Tender Security
   c) Priced Bill of Quantities;
   d) Written confirmation authorizing the signatory of the Tender to commit the Tenderer in accordance with Instructions to Tenderers ITB.

### M. Tenders package

13.1 When Tendering for more than one contract under the Tender’s arrangements, the Tenderer must provide evidence that it meets or exceeds the sum of all the individual requirements for the tenders being tendered in regard to:
   a) Average annual turnover;
   b) Particular experience including key production rates;
   c) Financial means, etc;
   d) Personnel capabilities;
   e) Equipment capabilities.

### N. Letter of bid

14.1 The Tenderer shall fill the Form of Tender furnished in the Tendering Documents. The Form of Tender must be completed without any alterations to its format and no substitute shall be accepted.

### O. Tender prices

15.1 The Contract shall be for the whole Works, as described in sub-Clause 1.1, based on the priced Bill of Quantities submitted by the Tenderer.

15.2 The Tenderer shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items for which no rate or price is entered by the Tenderer will not be paid for by the Procuring Entity when executed and shall be deemed covered by the other rates and prices in the Bill of quantities.

15.3 All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 15 days prior to the deadline for submission of Tenders, shall be included in the rates, prices and total Tender price submitted by the Tenderer.
15.4 The rates and prices quoted by the Tenderer shall be subject to adjustment during the performance of the Contract if provided for in the Tender Data Sheet and the provisions of the Conditions of Contract. The Tenderer shall submit with the Tender all the information required under the Contract Data Sheet.

P. Tender currencies

The unit rates and prices shall be quoted by the Tenderer in the currency as specified in the Tender Data Sheet.

Q. Tender validity period

Tenders shall remain valid for the period specified in the Tender Data Sheet. A Tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.

R. Tender Security

The Tender Security shall be denominated in the currency of the Tender and shall be in one of the following forms:
   a) Cash;
   b) A Bank Guarantee;
   c) An Insurance Bond issued by an insurance firm approved by the PPOA located in Kenya;
   d) An irrevocable letter of credit issued by a reputable bank.

S. Format of signing tenders

The Tenderer shall prepare technical and financial proposal and submit by email provided.

19.2 The Tenders shall be typed and shall be signed by a person or persons duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written confirmation as specified in the Tender Data Sheet and shall be attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender, except for un-amended printed literature, shall be initialized by the person or persons signing the Tender.

19.3 Any interlineations, erasures, or overwriting shall be valid only if they are initialized by the person or persons signing the Tender.
<table>
<thead>
<tr>
<th>Section</th>
<th>Subsection</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T. Opening of Tenders</strong></td>
<td>20.1</td>
<td>The Procuring Entity will open all Tenders after closing of the application on 10th July, 2020.</td>
</tr>
<tr>
<td></td>
<td>20.2</td>
<td>All Tenders shall be opened one at a time. The Tenderers’ names, the Tender prices, the total amount of each Tender and of any alternative Tender (if alternatives have been requested or permitted), any discounts, the presence or absence of Tender security, and such other details as the appropriate tender opening committee may consider appropriate, will be announced by the Secretary of the Tender Opening Committee at the opening.</td>
</tr>
<tr>
<td><strong>U. Confidentiality</strong></td>
<td>21.1</td>
<td>Information relating to the examination, clarification, evaluation, and comparison of Tenders and recommendations for the award of a Contract shall not be disclosed to Tenderers or any other persons not officially concerned with such process until the award to the successful Tenderer has been announced.</td>
</tr>
<tr>
<td><strong>V. Clarification of Tenders</strong></td>
<td>22.1</td>
<td>To assist in the examination, evaluation, comparison of Tenders and post-qualification of the Tenderer, the Procuring Entity may, at its discretion, ask a Tenderer for clarification of its Tender including breakdown of prices. Any clarification submitted by a Tenderer that is not in response to a request by the Procuring Entity shall not be considered.</td>
</tr>
<tr>
<td></td>
<td>22.2</td>
<td>The request for clarification and the response shall be in writing. No change in the prices or substance of the Tender shall be sought, offered, or permitted except to confirm the correction of arithmetic errors discovered by the Procuring Entity in the evaluation of Tenders in accordance with ITB.</td>
</tr>
<tr>
<td></td>
<td>22.3</td>
<td>From the time of Tender opening to the time of Contract award if any Tenderer wishes to contact the Procuring Entity on any matter related to the Tender it should do so in writing.</td>
</tr>
</tbody>
</table>
| **W. Correction of Errors** | 23.1 | Tenders determined to be substantially responsive will be checked by the Procuring Entity for any arithmetic errors. Errors will be corrected by the Procuring Entity as follows:  
   a) If there is a discrepancy between unit prices and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected, unless in the opinion of the Procuring Entity there is an obvious misplacement of the decimal point in the unit price, in which the total price as quoted shall govern and the unit price shall be corrected;  
   b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and |
Where there is a discrepancy between the amounts in figures and in words, the amount in words will govern.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>23.2</td>
<td>The amount stated in the Tender will, be adjusted by the Procuring Entity in accordance with the above procedure for the correction of errors and, with, the concurrence of the Tenderer, shall be considered as binding upon the Tenderer. If the Tenderer does not accept the corrected amount, its Tender will then be rejected, and the Tender security may be forfeited and tender securing declaration may be executed.</td>
</tr>
</tbody>
</table>

**X. Comparison of tenders**

| 24.1 | The Procuring Entity shall evaluate and compare only the Tenders determined to be substantially responsive in accordance with ITB. |
| 24.2 | In evaluating the Tenders, the Procuring Entity will determine for each Tender the evaluated Tender price by adjusting the Tender price as follows: Making any correction for errors pursuant to ITB Excluding provisional sums and the provision, if any for contingencies in the Bill of Quantities, but including Day work, where priced competitively; and Making appropriate adjustments to reflect discounts or other price modifications offered in accordance. |

| 24.3 | The Procuring Entity may waive any minor informality or non-conformity, which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative standing of any Tenderer. Variations, deviations, and alternative offers and other factors, which are in excess of the requirements of the Tendering documents or otherwise result in unsolicited benefits for the Procuring Entity will not be taken into account in Tender evaluation. |

**Y. Regional Preference**

| 25.1 | In the evaluation of Tenders the Procuring Entity shall apply exclusive preference to citizens of Kenya, to those bidders who hail from the project site regions due to timelines and COVID – 19. |

**Z. Procuring entity to vary quantities at the time of Award**

| 26.1 | The Procuring Entity reserves the right at the time of contract award to increase or decrease the quantity of goods or related services originally specified in these Tendering documents (schedule of requirements) provided this does not exceed by the percentage indicated in the Tender Data Sheet, without any change in unit price or other terms and conditions of the Tender and Tendering documents. |

**Notification of Award**

| 27.1 | The Tenderer whose Tender has been accepted will be notified of the award by the Procuring Entity prior to expiration of the Tender validity period by e-mail or facsimile confirmed by registered letter. This letter (hereinafter and in the Conditions of Contract called the "Letter of Acceptance") will state the sum that the Procuring Entity will pay the Contractor in |
consideration of the provision and maintenance of the Work(s) as prescribed by the Contract (hereinafter and in the Contract called the “Contract Price”).

**Signing of the contract**  
28.1 Promptly, and in no case later than 3 days, after notification, Procuring Entity shall send the successful Tenderer the Agreement and Contract Data Sheet, incorporating all agreements between the parties obtained as a result of Contract negotiations.

**Advance payment**  
29.1 The Procuring Entity will provide an Advance Payment as stipulated in the Conditions of Contract, subject to a maximum amount, as stated in the Tender Data Sheet.

**Adjudicator**  
30.1 The Procuring Entity proposes the person named in the Tender Data Sheet to be appointed as Adjudicator under the Contract, at an hourly fee specified in the Tender Data Sheet, plus reimbursable expenses. If the Tenderer disagrees with this proposal, the Tenderer should so state in the Tender. If, in the Letter of Acceptance, the Procuring Entity has not agreed on the appointment of the Adjudicator, the Adjudicator shall be appointed by the Appointing Authority designated in the Contract Data Sheet at the request of either party.

**SECTION III: CONTRACT DATA SHEET (CDS)/ TENDER DATA SHEET**

<table>
<thead>
<tr>
<th>CDS clause</th>
<th>Instruction to the bidders</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1          | 1.1                        | The procuring entity is:  
SOS Children Villages, Kenya  
Marcus Garvey Road, Off Argwings Kodhek Road  
Gate No7/Hurlingham  
P.O.Box 40653-00100, Nairobi Kenya.  

The **adjudicator** is the name suggested by the Kenya Chapter of the Chartered Institute of Arbitrators,  
P.O.Box 50163-00200 Nairobi.  

The Defects Liability Period is **six (6) months**.
The Project Manager is,
The Program Director(s), Eldoret
SOS Children Villages, Kenya
P.O.Box 40653-00100, Nairobi

The name and identification of the contract is
WASH project; drilling and equipping

Tender No 2 – drilling and equipping of 2No boreholes,
1No water kiosks, elevated tank and pipe works

Contract No is
**SOSCV/ELD/MUNYCV/AMAF/T2/2019-2020/2.**

**Scope of Works**
- Drilling and equipping of 2No boreholes.
- Construction of 1No water kiosks and 2No
  elevated plastic water tanks
- Rising main

The start date shall be within 5 days after the issuance of
Engineers notice to commence the works.

The intended completion date for the whole works from
contract signing shall be **Forty (40) days**

The following documents form the part of contract
- Letter of acceptance
- Letter of bid/form of tender
- Technical specifications.
- Bills of quantities
- Drawings
- Work program
- Schedule of personnel
- General conditions

<table>
<thead>
<tr>
<th>2</th>
<th>1.2</th>
<th>Indicate where there is sectional completion <strong>N/A</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>12.1</td>
<td>List other documents that form part of the contract; <strong>Hydrogeological survey report and EIA report</strong></td>
</tr>
<tr>
<td>4</td>
<td>11.2</td>
<td>The language of the contract document is <strong>English</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The law that applies to the contract is <strong>Kenyan law</strong></td>
</tr>
<tr>
<td>5</td>
<td>13.1</td>
<td>Include schedule of personnel</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>The minimum insurance cover shall be <strong>as per Kenyan law</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a) Loss of or damage to the works, plant and materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Loss of or damage of equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c) Loss of or damage to property (except the plant, works, materials and equipment ) in connection to the contract</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7</td>
<td>7.1</td>
<td>Site investigation reports available to the tenders; <strong>Hydrogeological and EIA reports</strong></td>
</tr>
</tbody>
</table>
| 8 |   | The other measures include;  
- Minimize the number of migrant’s workers employed on the project and household in the site camp.  
- Adherence to SOS CV, Kenya child protection policy.  
- Maintain the Ministry of Health and/or World Health Organization guidelines on curbing COVID-19. |
| 9 | 30.1 | Hourly rate of fees payable to the adjudicator is to be agreed by the parties |
| 10 | 30.1 | The arbitration shall take place in Nairobi, in accordance with the rules and regulations published by the Kenya Chapter of Arbitrators |
| 11 | 30.1 | The appointing authority for the Adjudicator is the Kenya chapter of institute of Arbitrators |

### Time control

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>The contractor shall submit program of works within <strong>3 days</strong> of submission of letter of acceptance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td></td>
<td>The period between program updates is <strong>14 days</strong></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>The amount to be held by the project manager in the case of the contractor does not submit updated program is <strong>0.05% of the contract sum.</strong></td>
</tr>
</tbody>
</table>

### Cost control

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>The minimum amount of interim/advance payment will be <strong>20% of the contract sum, upon mobilizing machine on site.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td></td>
<td>The interest rate shall be <strong>as agreed by parties</strong> for commercial borrowing from contractors’ bank</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>The contract is not subject to price adjustments.</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>The amount of retention is <strong>10% of the contract sum.</strong></td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>The rate of liquidated damages is <strong>0.075% of contract price per day.</strong></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>The maximum amount of liquidation is <strong>7.5% of contract sum</strong></td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>The bonus for early completion is <strong>N/A</strong></td>
</tr>
<tr>
<td>22</td>
<td>29.1</td>
<td>The amount of advance payment shall be recovered is <strong>N/A</strong></td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>The performance security shall be <strong>10% of the contract price for non bank guarantee</strong></td>
</tr>
<tr>
<td>Section</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td></td>
</tr>
</tbody>
</table>
| 24 | Finishing the contract  
As built drawings shall be supplied by the contractor by **15 days upon substantial completion date**  
Operating manual shall be supplied by the contractor by **15 days upon substantial completion date** |
| 25 | The amount to be withheld by the Project Manager in the case the contractor does not submit as built drawings is: **to be agreed by both parties**  
The amount to be withheld by the Project Manager in the case the contractor does not submit operating manual is: **to be agreed by both parties** |
| 26 | The percentage to apply to the value of the work not completed, representing the Procuring Entity's additional cost for completing the Works, is **N/A** |
| 27 | 191  
The number of copies shall be two; **one technical and one financial** |
| 28 | CLARIFICATION DURING TENDERING PERIOD  
Interested bidders have until 3rd of July 1700 hrs to raise any question or seek clarifications through email [Nationaloffice.procurement@soskenya.org](mailto:Nationaloffice.procurement@soskenya.org) concerning the tender. |
| 29 | The procuring entity to provide any addendum or feedback to the questions raised by the bidders before 6th July, 2020 1700hrs. |
| 30 | All communication will be channeled through [Nationaloffice.procurement@soskenya.org](mailto:Nationaloffice.procurement@soskenya.org) |

**SECTION IV: TECHNICAL SPECIFICATION**

**Section A. General requirements**

**Introduction**

These specifications cover the drilling and construction of the works as shown on the drawings and listed in the Bills of Quantities and shall be read in conjunction with the Contract Documents as listed in section I, II and III, Instructions to Bidders.

All references given are intended solely for the convenience of those using the above documents and shall be in no way exclude the application of the other clauses in the documents which may, in the opinion of the Engineer have any bearing on the point in question.

**Location**
SOS CV Kenya Eldoret CV is located in Kapsoya village, Kapsoya sub location, Kapsoya Location, Ainabkoi sub county, Lake Victoria North Development Agency, Uasin Ngishu County. The main lithological units encountered within the project area is Achaean basement system of rocks characterized by gneisses, schist and granulite and is over laid by volcanic flows.

1.1 Scope of Works

1. Drilling and equipping 2 No. Boreholes,
2. Construction of 1 No. Water kiosks and 1 No 10m³ plastic tanks.
3. Laying of rising main and distribution pipework.

1.2 Quality and Approvals

In view of the specialized nature of the drilling work, drilling may only take place under the direct supervision of the Supervising Engineer who will provide an on-site supervision at all times. The Supervising Engineer will provide instructions regarding borehole depths and depths for screen installation and will supervise the placing of the gravel pack as well as borehole development and aquifer testing and water quality sampling.

When the Contractor experiences particular technical problems and he or his operator seeks help or advice from the Employer and/or the Supervising Engineer and this is granted, it will only be on the condition that the Employer and/or the Supervising Engineer does not accept responsibility, if such advice or help does not lead to a successful solution of the problem, or results in damage to the Contractor.

The Contractor shall provide all ladders, access lighting facilities and assistance and all things necessary required by the Supervising Engineer to inspect any part of the Works.

The materials and workmanship shall be the best of their respective kinds and to the approval of the Supervising Engineer. The words “to the approval of the Supervising Engineer” shall be deemed to be included in the description of all items relating to design, construction, installation and materials and workmanship for the due execution of the Works.

The Contractor shall submit all data, details and samples as necessary and as reasonably requested by the Supervising Engineer of all materials that the Contractor proposes to use in the Works. Method statements which adequately demonstrate the Contractor’s proposed method of working, methods of maintaining safety and compliance with the programme shall be submitted for the Supervising Engineer approval prior to the commencement of work on any area of the Site.

Where the Contractor is responsible for the preparation of construction documents to describe the permanent works, such construction documents shall be approved prior to the procurement of any materials or commencement of any work to which the documents relate. No materials, Plant or equipment shall be procured for the Contract and no work, permanent or temporary, shall commence without first obtaining the Supervising Engineer approval.

All materials, Plant and equipment supplied shall be designed for operation under the above described conditions.

1.3 Construction Documents
Drawings and Documents which are to be submitted by the Contractor to describe the Permanent Works shall become Construction Documents upon their approval.

All drawings, technical specifications, bill of quantities, schedules, cost estimates; programme and other information to be submitted by the contractor shall be in English and shall be submitted for approval in triplicate.

Construction Documents shall not be departed from without the approval of the Project Manager.

All drawings and documents submitted by the Contractor shall have been checked, signed and be ready for issue and shall bear:

- Title of the drawing or document;
- Scale;
- Date;
- Work item reference number complying with an approved numbering system;
- Name and references of the Contractor;
- Names of the employer and the Supervising Engineer;
- Date of approval by the Contractor and the signature of the person responsible for approval.

Drawings and documents submitted for approval shall be delivered to the Supervising Engineer office as designated by the Project Manager.

Unless otherwise specified the Contractor shall allow a minimum of 14 days, after the date of receipt by the Supervising Engineer for approval of drawings and documents by the Supervising Engineer.

1.4 Operation and Maintenance Manuals

The Contractor shall submit to the Supervising Engineer for approval two copies of the Operation and Maintenance (O&M) Manuals.

The Contractor shall supply the final version of the O&M Manuals prior to the issue of the Taking-Over Certificate for either the whole of the Works or the respective Section or part of the Works. Each set shall be bound together in a stout plastic or other approved cover.

O&M Manuals shall be supplied written in English language, all parts and equipment listings shall be in English.

1.5 Level Datum

Before the commencement of drilling and constructional works the Contractor shall establish, in a position to the approval of the Supervising Engineer, steel datum pegs which shall be securely concreted in. The level of these pegs shall be established and agreed with the Supervising Engineer and all levels used in the construction of the Works shall be referred to these established datum points. The correctness of this datum shall be checked at regular intervals during the construction period as agreed with the Supervising Engineer.

Where possible construction drawings and all levels used for construction shall be referred to the national height datum as defined by the Survey of Kenya. The Contractor shall be responsible for obtaining the location and values of the permanent bench marks. In cases where such bench marks do not exist, the site datum shall be agreed with the Project Manager.
1.6 Setting Out of the Works

The site layout drawings show indicative site layouts. Prior to commencing construction, the Supervising Engineer will agree with the Contractor the basic information supplementary to that shown on the Drawings such as the position of manholes, chambers, centre-lines and base-lines sufficient for the Contractor to locate the Works.

The Contractor shall prepare detailed setting out drawings and data sheets as necessary and submit them to the Supervising Engineer in duplicate for approval. Any modifications to the setting out drawings or data sheets required by the Supervising Engineer shall be made by the Contractor and resubmitted for final approval. Should it be necessary during setting out or during construction for the approved setting out details to be amended, the Contractor shall amend the drawings or data sheets or make new ones for approval as required by the Supervising Engineer.

For pipelines, the Contractor shall in the presence of the Supervising Engineer set-out the pipeline alignments in accordance with the indicative alignments shown on the drawings taking into account physical features on the ground, any existing services, any requirements of relevant Authorities and any changes deemed necessary by the Supervising Engineer, confirming the locations of all valves, air valves, washouts, hydrants and bends.

The Contractor shall prepare and submit to the Supervising Engineer, at an approved scale, plans of the pipeline route and profiles of ground levels after any initial clearing of the wayleave or easement showing the proposed pipe invert levels and precise chainages for all valves and fittings for approval. Following approval the Contractor shall submit to the Supervising Engineer two copies of the agreed alignment and profiles.

1.7 Boundaries of Works

The Employer shall provide the Site upon which the Permanent Works are to be constructed. Where a drain or pipeline is to be within an existing road or track reservation or is otherwise located in land designated Public Domain the Site width will be restricted to the limit of the public land. The existing boundary fences and walls shall not be disturbed without prior approval of the Project Manager and, unless road diversions and closure notices are approved and posted, carriageways shall be left available for the safe passage of traffic.

The Employer will obtain the necessary permission for access to the drilling sites, but if any access road or bush clearing to provide access to the drill sites will be the responsibility of the drilling Contractor. The contractor shall make own investigation to satisfy themselves on level of scope related to site access and maintain the access throughout the contract It is a recommended to use locally available unskilled labour for this purpose. The Contractor at his own cost will repair any damage to the surface of any private roads, fences or gates by the contractor's plant and equipment. Drilling mud pits and others must be properly filled and leveled after completion of the drilling activities.

Any other damage to private property will be handled strictly according to the General Conditions of Contract.

The Contractor shall not enter upon or occupy with men, tools, equipment or materials any land other than the site without the written consent of the owner of such land.
On occupation of the Site or other land the Contractor shall provide such fencing, as required.

1.8 Work through Private Land

In order that the necessary parts of the Site which are on private land may be obtained the Contractor shall supply the Project Manager with full information of his programme sufficiently in advance of the dates upon which the Contractor proposes to enter upon each areas of the Site. The Contractor shall where required, in consultation with the Project Manager, programme the Works to designate the areas of the Site to which the Contractor is to be given possession and the sequence of taking possession.

The Contractor shall obtain written approval before entering upon any private land or cutting through ditch, bank, hedge, wall, fence or any other form of boundary marking and he shall carry out all reasonable requirements as approved by the Project Manager in the matter of reinstatement.

1.9 Public Utility Mains and Services

Where the Contract indicates the positions of existing services or apparatus the positions shown are believed to be correct but no warranty is given as to the accuracy or completeness of the information.

It shall be the responsibility of the Contractor to obtain all information available from the Public Utility Authorities regarding the position of existing mains and services and he shall copy this information to the Project Manager as soon as he obtains it.

The Contractor shall carry out excavation works in a manner which safeguards any existing services, including hand excavation as necessary and shall be responsible for the cost of any repair work necessitated by damage caused by him to any main or service and for any costs arising from the disruption.

The Contractor shall obtain all information and assistance from the Public Utility Authorities for the locating of the mains and services and shall agree with the Project Manager any trial excavation which may be necessary to confirm or establish these locations.

The Contractor shall be responsible for locating all existing services, whether known to the Public Utility Authorities or not, and shall conduct his own survey as necessary to accurately locate all services. All efforts to identify these existing services shall be carried out in advance of conducting excavation for the permanent works. Any temporary or permanent diversion of mains and services shall be agreed with the appropriate Authority.

1.10 Safeguards to Existing Pipes, Cables, Structures

It shall be the Contractor’s responsibility to safeguard by means of temporary or permanent supports or otherwise all existing sewers, pipes, cables, structures or other things which would be liable to suffer damage if such precautionary measures were not taken. Safeguards shall be to the approval of the Project Manager and of the undertaker or owner concerned.

1.11 Records and Drawings
Daily drilling records must be kept in duplicate by the contractor for each borehole in progress on the form provided. In addition the contractor shall provide separate records for each borehole upon completion (borehole completion form). The relevant information needed to be contained in these records.

The daily drilling record must be signed by both the drill operator for the contractor, and the Project Manager’s representative on site at the end of each daily shift. It shall be prepared in duplicate in English language. The Project Manager will retain the original. The contractor for invoice completion shall use the completed daily drilling records.

The work sheets will contain the following information:

(a) Drilling Rig
   1) The location of drilling site.
   2) Make, model, type & size of drilling rig.
   3) Statement of each operation conducted and time taken, including breakdowns, including type of work performed and number of hours on each type of work.
   4) Names of all crewmembers.
   5) Size of hole and meters drilled per shift.
   6) Log of soils penetrated.
   7) Length and size of casing installed.
   8) Length and size of screen installed.
   9) Length and size of observation pipe installed.
   10) Length and volume of gravel pack, seal or back fill emplaced.
   11) Any problems encountered.
   12) The result of bail tests, mud monitoring or other tests carried out.
   13) Total standby time to the nearest minute.
   14) Well logging.
   15) Development method and time to the nearest minute.

(b) Test pump Unit
   1) Location.
   2) Make, model & capacity of test pump.
   3) Statement of each operation conducted and time taken, including breakdowns, including type of work performed and number of hours on each type of work.
   4) Names of all crewmembers.
   5) Test pump setting.
   6) Size of test pump column.
   7) Total test-pumping time in minutes (total time must agree with pumping test data sheet).
   8) Total standby time to the nearest ¼ hour.

For sites where the Contractor undertakes permanent works Record Drawings shall be submitted to the Supervising, for approval, in the form of As Built Drawings. Record Drawings shall be prepared to an approved format, and scale in line with the construction drawing.

1.12 Connections to Existing Pipes, Cables and Equipment

The Contractor shall be responsible for joining up and making connections between pipes and cables laid by him and existing pipes and cables. The Contractor shall submit to the Supervising Engineer a drawing showing the details of the connection, and shall state the date on which the particular connection is required, and the work shall not proceed until the Supervising Engineer approval has been given.
The Contractor shall be responsible for ensuring the compatibility of new pipes and cables with existing pipework, cables, tubing and equipment.

1.13 Lighting, Watching and Traffic Control

Where necessary for safety of the public or where required by the Project Manager, the Works shall be properly fenced and signed. In addition, the Works shall be lighted from half an hour before sunset until half-an-hour after sunrise and at other times when visibility is poor. The position and number of the lamps shall be such that the extent and position of the Works are clearly defined. Each Site shall be provided with watchmen as required.

1.14 Contractor’s Offices

The Contractor shall provide and maintain offices for the use of his representative and staff to which written instructions by the Project Manager can be delivered. Any instructions delivered to such offices shall be deemed to have been delivered to the Contractor. Offices shall be located to give convenient access to the Works and shall be subject to the approval of the Project Manager. The Contractor shall be responsible for obtaining the land on which to establish any temporary site offices. The contractor shall be responsible for making all arrangements for the proper disposal of waste.

1.18 Water and Electricity Supplies

The Contractor shall make all arrangements for and provide adequate supply of potable water to each site as necessary for the execution and testing of the Works and for use by his workmen. The Contractor shall make arrangements for and provide any electricity supply required for the execution of the Works, including the Tests on Completion.

1.19 Contractor’s Staff and Workmen

The Contractor shall agree to employ Kenyan workers to the maximum extent possible. The Contractor shall provide a competent Site Agent to the approval of the Supervising Engineer to be in charge of the work who shall not be changed except with the consent of the Supervising Engineer.

The Contractor agrees that his workmen and employees shall be considered for all purposes in his direct pay and employ and under his supervision and control. He shall be directly and personally responsible for discharging all obligations, financial or other, which may be or becoming owing to any such workman or employee or to his successors, assigns or personal representatives. There shall be no contractual or legal relations of any kind whatsoever between the Employer and any such workman, employee or any person employed in the performance of the Contractor’s obligations under this Contract.

The Supervising Engineer may request and the Contractor agrees to accept the request for the immediate removal from the site of any employee or worker of the Contractor adjudged by the Supervising Engineer to be incompetent, disorderly, unreliable or of bad character. Such employee shall not again be employed on the Works.
1.20 Project Management

1.20.1 Project Control

The Contractor shall provide within his site organization a project management capability to advise and be directly responsible to the Site Agent. (Contractor’s chief site representative) The duties of the section shall include the following:

a) Planning and programme preparation particularly in relation to the requirements of the Employer and the public authorities, and the requirements to maintain water supply and waste water disposal services where careful detailed arrangements have to be made and adhered to.

b) Planning the execution of the Works in a manner which minimizes disruption to the water supply system and will permit the efficient and effective commissioning of the water supply system and their respective components.

c) Ensuring adequate potable water supplies and wastewater disposal services are maintained to all consumers.

d) Continuous surveillance of progress and anticipation of factors likely to affect the timely performance of the Contract.

e) Making proposal for modification to forward planning and to the programme at an early stage in the light of factors resulting from (d) above.

f) Continuous appraisal of the Contractor’s methods and routines particularly as to their effect on the community and property.

g) Forward planning for resource requirements taking due account of possible shortages and delays in the arrival on site of materials, equipment, plant and personnel and their mobilization for effective usage.

h) Acquisition and process of up-to-date information for progress meetings with the Supervising Engineer. The preparation of monthly progress reports including an update of the detailed programme and cash flow forecast which shall include progress photographs as directed by the Supervising Engineer.

The Contractor’s project management staff shall be of adequate ability and experience. Programmes shall be based upon Critical Path Management (CPM) networks in precedence format and shall be prepared using a suitable PC-based project management software package approved by the Project Manager.

Reporting shall be in a manner compatible with the Employers project management procedures and shall use the Earned Value (EV) Technique and shall monitor the actual gross value of work completed against the predicted value.
1.20.2 **Monthly Statements and Certificates**

Monthly statements and certificates shall be submitted in an approved manner and format. In addition to the statements submitted in hard copy the Contractor shall submit a computer copy using data base software as prescribed by the Project Manager. The statements and certificates shall detail the measured value of the work completed on each item of the Works in such detail that the Project Manager can identify location and measurement of each item. A location shall constitute a single structure such as a reservoir, pump station or section of a pipeline or a component of a system such as a pipeline valve complex. Each item shall be uniquely identified in accordance with the numbering system as instructed by the Supervising Engineer.

**Progress Meetings**

The Employer shall provide a suitable venue, near the vicinity of the Site, and arrange progress review meetings to be chaired by the Supervising Engineer at monthly intervals to coincide with submission of monthly progress submissions. The Contractor shall allow for attendance by the Supervising Engineer and up to 3 representatives of the Employer. The meetings shall be attended by the Contractor’s senior representatives, Site Agent and other members of his senior staff as may be deemed necessary.

1.21 **Equipment for the Employer**

The Contractor shall hand over to the Employer on completion of the Works a complete set of tools and equipment together with spare parts and fittings to facilitate the maintenance and operation of the installed works.

1.22 **Facilities for Survey and Inspection by the Project Manager**

The Contractor shall make available technicians and such labour, materials and safety equipment as the Project Manager may require for inspections and survey work in connection with the Works. The Contractor shall provide all necessary tackle, test equipment, access, labour, staff and any other thing the Project Manager may reasonably require in order that he may safely, conveniently and quickly carry out such inspections as he deems necessary at anytime during the execution of the Works and during the Defects Liability Period. The Project Manager, his representative and assistants, shall not inspect any area of the Works where they deem the safety provision to be inadequate and the Contractor shall undertake any work required by the Project Manager in order to make it safe.

1.23 **Inspections by the Project Manager during Defects Liability Period**

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

1.24 Protection Clothing and Safety Equipment

The Contractor shall provide for the Project Manager, his Representative and assistants any additional
protective clothing and safety equipment necessary for the proper discharge of their duties on the Site.
The Contractor shall provide any necessary protective clothing and safety equipment for the use of
authorized visitors to the site including the Employer and his staff and representatives and those of any
relevant authority who have reason to visit the Site.

1.26 Language of Correspondence and Records

All communications from the Contractor to the Project Manager shall be in the English language. All
books, timesheets, records, notes, drawings, documents, specifications and manufacturers’ literature shall
be in the English language. If any of the aforementioned is in another language a certified translation in
English shall be submitted to the Project Manager.

1.27 Standards and Regulations

Each and every part of the Works shall be designed, constructed, manufactured, tested and installed in
accordance with an internationally recognized standard, Code of Practice, or Regulation applicable to that
part of the Works. Such standards and codes shall include:

a) British Standard Specification last published.
b) International Electromechanical Commission, where available (IEC).
c) International Organization for Standardization (ISO).
The Contractor shall provide and keep permanently on site copies of such standards as may be directed
by the Supervising Engineer.

1.28 Equivalency of Standards and Codes

Wherever reference is made in the Contract, including Specifications, Drawings and Bill of Quantities, to
specific standards and codes to be met by the goods and materials to be furnished, and work performed or
tested, the provisions of the latest current edition or revision of the relevant standards and codes in effect
shall apply, unless otherwise stated in the Contract. Where such standards and codes are national, or relate
to a particular country or region, other authoritative standards that ensure a substantially equal or higher
quality than the standards and codes specified will be accepted subject to the Supervising Engineer prior
review and written consent. In the event the Supervising Engineer determines that such proposed
deviations do not ensure substantially equal or higher quality, the Contractor shall comply with the
standards specified in the Contract.

1.29 Quality Control

The Contractor shall be responsible for his own quality control and shall provide sufficient competent
personnel for supervising the Works, taking and preparing samples and for carrying out all necessary
tests.
Units

The International System of (metric) Units as set out in ASTM E380 shall be used throughout the Contract except where otherwise provided.

1.31 Inspection and Testing during Manufacture

The performance of each item of Plant or Pipe shall be tested in accordance with the Specification to the requirements of the Project Manager.

Test certificates in duplicate shall be submitted by the Contractor to the Project Manager within 2 weeks of the date of the tests. Type tests are not acceptable. Test certificates shall be supplied for tests carried out on the actual Plant being supplied.

Plant shall not be dispatched from the manufacturer’s works until it has passed the specified tests and approval been given by the Project Manager.

The Project Manager shall at his discretion witness tests of individual items of Plant at the manufacturer’s works. The Project Manager shall be given three weeks’ notice in writing before such tests are to take place.

The acceptance by the Project Manager of any item of Plant or equipment after testing at the manufacturer’s works shall in no way relieve the Contractor of his responsibility for the correct performance.

2. Conformity Visit for Drilling Rigs and Contractor’s Equipment

Before erection of the drilling rig at the first borehole location, the Supervising Engineer will verify that the Contractor’s has mobilized the equipment listed in the Contract. No authorization to start the drilling works will be given if equipment is not mobilized as listed.

At any moment during drilling operations, the Project Manager may interruption works operations if the equipment mobilized by the Contractor differs from those listed in the Contract.

3. Method for Boreholes Construction

3.1. Location of boreholes
The final locations of boreholes will be given by the Project Manager, with a minimum 3 days’ notice before erection of rig at site.

Drilling techniques

a) Depth and boreholes design
The boreholes to be drilled will be required to penetrate thickness up to 10 m to 20 m soil or poorly consolidated sediments. The contractor should indicate clearly in his proposal the drilling technique he will operate for drilling the first poorly consolidated levels.
The required drilling technique down to a depth of about 180m is rotary drilling with bentonite accepted in the drilling fluid (for characteristics of the drilling fluid).

b) Centralisers and end plug
In order to achieve the required borehole linearity, all casing permanently installed in wells should be fitted with centralisers at 6 meter intervals or as otherwise directed by the Project Manager. The centralisers should be factory manufactured from spring steel straps welded to hinged steel collars to the approval and direction of the Project Manager.
A factory manufactured stainless steel end plug will be installed at the bottom of the screen and tubes.

c) Gravel pack installation
A special attention will be paid to quality of gravel pack installation. The mud circulation should be maintained during gravel pack installation.
No gravel pack could be installed in the well without use of a cross-over tool. With this tool, the fluid and filter pack pumped down through the drill pipe will discharge bellow the packed associated to the cross-over tool while the return flow will be conducted up through the packer into the annular space around the drill pipe. The stinger pipe below cross-over tool will extend to some 1 m of the bottom of the screen.
In order to prevent undesirable separation of coarse and fine fraction of the gravel pack, the uniformity coefficient of the mixture will be lower than 2.5 (Characteristics of the gravel pack). In order to check the perfect installation of the gravel pack, a 3m piece of telltale screen will be installed above the production screen, inside the telescoped section.

d) Partial backfilling of wells
The Contractor may be required to backfill an existing well to a depth specified by the Project Manager. The backfill material will consist of sand and ten millimeters by twenty millimeters crushed or graded gravel or other sized gravel. All such backfill material must be approved by the Project Manager before being used in the well.

e) Cementation under pressure
The Cementation under pressure should be done from the bottom through a cementing shoe: the annular space shall be filled in by cement up to cement appears at the surface. If cement fail to reach the surface, the Contractor, should at his own cost and to the satisfaction of the Project Manager, demonstrate that the cement is continuously sealing the casing from the bottom to half of the cemented depth. It should then continue the cementation from the surface and finally demonstrate at his own cost and to the satisfaction of the Project Manager, that cement is continuously sealing the whole casing.
3.4. Sampling and logging

a) Formation Sampling
Representative samples of the strata penetrated will be collected every meter (or as otherwise directed and approved by the Supervising Engineer), by whatever method is standard for the drilling technique in use. A sample of the formation cuttings will be removed from the drilling medium by collecting the sample in a screen, or by collecting a large sample of the drilling fluid and allowing the

Should the Contractor fail to conduct these operations to the satisfaction of the Project Manager, the borehole may be declared lost.

f) Failure of casing strings to enter well
In the event that any string of casing will not enter the well, the casing will be removed and the well will be reamed or re-drilled. If the string of casing still does not enter the well, the well will be declared lost.

3.3. Drilling Sequence
• Drilling of the poorly unconsolidated levels, up to 10 to 20 m
• Installing of a surface casing from the bottom of the hole to the surface
• The surface casing will be fixed in position by cement being placed in the bottom half meter of the hole by organi pipe installed inside the casing, to ensure that the surface pipe remains plumb, and that there is an annular seal for the cement. The annular space between the well and the surface casing will then be filled with cement up to 1 m below ground surface. Once in place the cement will be allowed to set for a period of 12 hours
• Drilling of the borehole down to a depth of about 200 m (diam. 8") below the ground.
• An electrical well logging shall be performed and decision can be taken to continue drilling (come back to previous indented line)
• The extrados of the casing is cemented under pressure from the bottom up to the surface. The Contractor will provide all necessary equipment to ensure the correct and successful displacement of the cement. Before proceeding with the cementing of the casing, circulation should be established around the casing without any loss and on completion of the cementing some cement should return to the surface.
• The cement is allowed to set for 24 hours minimum
• Gravel pack shall be installed beneath the screens and tubes using a cross-over tool.
• The borehole is then developed
• A full pumping test is completed
• The well head is constructed
cuttings to settle out. Care will be taken to ensure that the sample is representative of the material being
drilled and not contaminated by hole erosion or cavings.
The samples will be placed in approved and appropriately marked heavy plastic sample bags and handed
over in a sturdy box to the Supervising Engineer. The sample box will be a container fitted with
individual compartments for the samples. A card will be inserted into each compartment along with the
sample, indicating, in water-proof ink, the depth from which the sample was recovered.
When requested by the Project Manager, the samples will be displayed in a neat and organized manner so
that the entire geologic section is clearly represented.

b) Well head logging
Penetration rates, measured as minutes per meter drilled, must be recorded for every meter in the drillers
log in regard with the pressure on the tool. The Contractor must report immediately to the Project
Manager’s representative on site any changes in the penetration rate. The penetration rate report must
include the method of drilling used and if any changes in the drilling method must be recorded its depth
and time of change. Drilling interruption for flushing without drilling, stoppage during installation of
additional drill pipes; breakdowns, etc must be properly recorded so that the drilling rates can be properly
interpreted purely based on time taken for drilling.
The contractor shall endeavour to operation in such a way as to detect water strikes by noting increases in
flow rates. For this purpose marsh funnel and stopwatch must be available. In order to measure yield rates
during drilling and so to obtain an indication of water strikes, the return water must be directed through a
gauging weir consisting of a 900 weir plate (V – Notch) installed at a suitable point in the return water
circulation system. The dimension of the V-Notch should be at least 800mm wide across the top and the
V and 400 mm vertical depth.

3.5. Borehole development and clean up
Well development will be conducted with successively both airlift pump system and interrupted over-
pumping. All well development methods and chemicals must be approved by the Project Manager.
For airlift pump system, it is a requirement that the double-tube airlift method to be used by the drilling
contractor for the development of boreholes. Development must begin from the bottom of the borehole,
the apparatus being placed about 1 m above the base of the borehole. The air is turned on and off
repeatedly to agitate the fine material within the gravel pack and the surrounding formation. This process
continued every two meters upward within the borehole until the static water level is reached. Once this is
completed the apparatus is lowered to the bottom of the borehole to remove sand and gravel and the
borehole is then further airlifted until the water is totally clean to the satisfaction of the Project Manager.
For interrupted pumping, the pumping shall be done at rates up to 2 times the design capacity. The
pumping should be carried out in at least 5 steps, which should include pumping rates of 0.25, 0.5, 1, 1.5
and 2 times the design capacity, with no check valve nor foot valve present. Pumping shall be conducted
in 5 minute cycles.
Development shall continue for a minimum of 6 hours air-lift development plus 3 hours interrupted
pumping development and until the discharge water is clean and free of sand (i.e. no more than 1 cm
diam. Sand stain test) or until such time as the Supervising Engineer finds acceptable. No payment shall
be made for the extra hours necessary after 15 hours of development.

3.6. Borehole Disinfection
The Contractor shall at all times take every precaution to ensure that the borehole is kept free of
contamination. The Contractor will ensure that formation stabilizer material is disinfected prior to
installation.
Disinfection of the borehole shall be undertaken immediately after the borehole development process has
been completed. The Contractor will devise a method for the disinfection procedure that meets the
approval of the Supervising Engineer. The Contractor will include the cost of the disinfection process in
his unit process for borehole construction.
The Contractor shall ensure that the disinfecting agent is uniformly applied throughout the entire water depth of the borehole. The disinfecting agent may be placed by a tremie pipe of sufficient length to extend to the bottom of the borehole. The disinfecting agent shall be applied through the hose that shall be raised and lowered to achieve uniform distribution of the solution throughout the borehole.

3.7. Concrete slab, well heads and capping of boreholes

a) Sanitary seal
The annular space between the borehole and wall of the surface casing shall be grouted for sanitary seal for a depth not less than 2 m below ground surface with mixture of cement and water slurry by a pour-in method from the top.
Cement grouting shall be carried out in one continuous operation before initial setting of the cement occurs. Regardless of the method used, the grout shall be introduced at the bottom of the space to be grouted. In no circumstance will this be less than 2 m below the wellhead. The method proposed by the Contractor will be changed or modified if and required to suit the local conditions.

b) Construction of concrete slab
After the completion of the borehole to the satisfaction of the Project Manager, the Contractor if must excavate around the sanitary seal until reasonably firm formation is reached.
The ends of the surface casing shall be cut off 0.5 m below the surface level.
The Contractor shall construct a reinforced concrete block (with 12 mm steel reinforcing rods at equal spacing) with the surface dimension of 1 m width, 1 m length and 1.5 m high (1 m below the surface level, 0.5 m above the surface level). Surface of the concrete block will have a divergent slope.
The well casing must protrude 0.2 m above the concrete block unless otherwise specified by the Supervising Engineer.
The wellhead block shall be cast around the surface casing in accordance with the Contract drawings, with 0.5 m inside the concrete slab.

c)) Wellhead block and capping
The wellhead block without artesian pressure is detailed in the drawings section. The Contractor shall supply all materials and carry out the construction of the wellhead according to the following instructions:
• on the top of this casing, a welded flange (stainless steel, 10 mm tick);
• over the flange, a capping plate (stainless steel, 10 mm tick) bolted together with the coupling in 8 points and welded in 10 points.

The wellhead block with artesian pressure will be equivalent to the above, but should stand up to 3 bars pressure.
The well head shall be marked with the well number, in a manner approved by the Project Manager.

i) Lost boreholes and abandonment

a) Failure to complete wells
Should any accident to the plant, jamming of the tools or casing, collapse of the borehole, or any other causes due to the Contractor’s negligence, prevent the satisfactory completion of the works, the borehole shall be deemed to be lost and no payment shall be made for that borehole or for any material not recovered there from, nor for any time spent during operations or while attempting to overcome the problems. The option of declaring such lost well shall rest with the Contractor.
In the event of a well potentially being deemed lost, the Project Manager may where possible redesign the well so that it is of use to the Employer and payment will be made in accordance with quantities and rates written in the Contract document. Should it not be possible to do this, the well shall be declared ‘lost’.
A well may also be declared lost by the Supervising Engineer if it is not completed as required due to uncontrolled caving, lost tools down-hole which cannot be recovered, lost circulation zones, unsuccessful cementing or any other reason which leads to failure of completion and which renders the well useless or of little value to the Employer.

A lost hole should be organized by a full cementation at the satisfaction of the Project Manager. No payment shall be made for a lost well. In the event of lost well the Contractor shall drill a new well at a site indicated by the Project Manager.

b) Fishing

Under no circumstances will the Employer pay any charge for time spent on fishing operations due to the Contractor’s negligence, broken drill string components, stuck pipe, junk in the hole or any other reason. Contractors are advised to assure themselves of the good condition of all drill string components and maintain adequate wellhead security at all times.

c) Abandonment

The Project Manager shall have the right at any time during the progress of the work to order the abandonment of a borehole.

The Contractor thereupon shall withdraw the casing from the borehole, if applicable, and salvage or attempt to salvage all such materials as the Project Manager shall direct and/or up until the Project Manager revokes such direction and shall fill in or leave the borehole to the satisfaction of the Project Manager. Aquifers may be sealed by cement. Payment shall be made for such abandoned boreholes at the rates and tariffs shown in the Bill of Quantities.

4. AQUIFER TESTING AND WATER QUALITY

4.1. Introduction

The aquifer pumping test is a thorough and precise test of the characteristics of the water bearing formation in the vicinity of the well. It is of prime importance that the Contractor correctly monitors test pumping operations to ensure that accurate data is obtained. Testing work will be carried out with the intent the chances of success in completing tests within the allocated period of time. For testing operations, the pump test will be installed at the bottom of the pump house, i.e. the bottom of the casing.

4.2. Calibration test

Before beginning the actual tests on each well, a calibration test must be undertaken. This involves checking that all equipment including the pump, generator, manometer and pipes are working satisfactorily. The discharge pipeline shall be checked for leaks. The gate valve shall be graduated and relative discharge positions marked in preparation for the step test. Once the calibration test has been completed the well must be allowed to recover to the satisfaction of the Project Manager, before the actual test pumping operations can begin. The cost of the calibration test shall be uniformly spread over the pump test items of the Bill of Quantities.

4.3. Tests sequence and duration

If calibration test shows that a well has sufficient capacity to be interest, pump testing shall be carried out. The following two types of test may be conducted according to the instruction of the Supervising Engineer.
Continuous Step Draw-Down test: The Step Draw-Down test shall have six (6) steps of one (1) hour each, without rest period. The test shall begin with the lowest discharge rate (about 1/5 of the pump capacity) and increase consecutively until the maximum discharge rate is reached. (about 150% of the planned well yield). Upon completion of the step drawdown test, a step recovery test shall be undertaken, which should normally last for at least two (2) hours or as otherwise directed by the Project Manager.

Constant discharge test. Constant discharge tests will be hundred twenty (120) hours in length followed by a twenty four (24) hours recovery period, at a pumping rate close to the planned well yield (70 l/s or 115 l/s). The Project Manager or his representative during the test on the basis of the measurements made and his analysis may increase or reduce both periods thereof.

The pump test shall be terminated only upon the written notice of the Project Manager or his representative.

The test pump cannot be removed from the well during the recovery periods.

The pumped water during pumping test should not be allowed to from pools to avoid re-infiltration in the vicinity of the wells. If the Project Manager feels that infiltration would take place around the well he can order the Contractor to dispose the water by means of discharge pipes toward a nearby natural drain over a distance where infiltration in to the aquifer during testing is negligible.

### 4.4. Water level measurements

During the period of the tests, the Contractor shall measure and record water levels in the pumped well. For measurement of water levels in wells, pressure meter or electric water level indicators shall be used. If water level indicator is used, the Contractor shall have at lest two water level indicators on each site. In the tested well, the measurement will be done through a temporary measurement pipe which shall be deep enough to reach the top of the pump.

For the tested borehole, the following time intervals are recommended:

| Every 1 minutes from 0 to 10 minutes of pumping | Every 2 minutes from 10 to 30 minutes of pumping | Every 5 minutes from 30 to 60 minutes of pumping | Every 10 minutes from 60 to 360 minutes of pumping | Every 15 minutes from 360 to 600 minutes of pumping | Every 30 minutes from 10 to 24 Hours of pumping | Every 60 minutes from 24 to 72 hours of pumping |

### 4.5. Flow measurements

Flow measurements shall be made by means of a gauging weir consisting of a 90° weir plate (V – Notch) as described in the drawing section.

Flow measurements will be made for any water level measurement.

The contractor is responsible with testing pump with sufficient capacity to meet the planned well yield.

### 4.6. Interruption of the test pumping

The discharge rate during the pumping shall be maintained within five per cent of the rate established by the Project Manager and the Contractor shall maintain uninterrupted pumping during the period of all tests. If not so, the Project Manager may declare the test interrupted. Shall the Contractor fail to provide accurate water level and flow measurement with the recommended frequency, the Project Manager may also declare the test interrupted. No payment will be made for the elapsed time of the test prior to the interruption.
Unless otherwise directed by the Project Manager, interrupted tests shall not be restarted until sufficient time has elapsed for complete recovery of the water levels in the pump or observation well and shall not be considered to be a part of the pumping test for purposes of payment even though water level measurements shall be made during that period by the Contractor if so directed by the Project Manager.

4.7. Reporting
The contractor shall record test-pumping data on prepared sheets after the approval of the Project Manager. The data sheet shall be filled in the English language. The data sheets prepared in triplicate shall include the following information:

1) The location of the well being tested.
2) The physical characteristic of the well including depth, diameter, size length of casing screen setting and length of screen.
3) Characteristics of the test pump.
4) Depth of setting of the test pump in meters.
5) Date and time of start and finish of pumping test.
6) Static water level at commencement of test, dynamic water levels and discharge rates at prescribed time intervals.
7) Draw-down recovery after pumping is completed.
8) Date and time of start of removal of test pump from the borehole.

4.8. Water samples and analysis
Water samples for water quality analysis must be collected during the pumping test as directed by the Project Manager. Each sample consists of 4 containers as in a glass or suitable plastic container of 1-liter capacity each.

Water samples should be clearly marked showing name and number of well, date of sampling, hour of sampling, temperature and conductivity of water during sampling and signature of person taking the sample.

j) sets of samples are dedicated for future ICP-MS analyses and will be stored. 1 set will be stored for cross-check analysis if required.

One sample shall be sent to a Laboratory approved by the Project Manager within 12 hours after sampling. During transportation, the sample shall be kept in an isotherm box.

The contractor shall carry out water analysis for at least the following:

- Temperature
- Electrical conductivity at 25°C
- pH at 20°C
- Cations: Ca++, Mg++, Na+, K+ and total Fe
- Anions: Cl-, NO3-, SO4—and HCO3-

Note:
a) The Project Manager may order additional analyses if deemed necessary to achieve project objectives
b) Contractor is responsible in ensuring that the samples are stored in correct temperature condition throughout the contract, if deemed necessary the contractor shall provide air-conditioned room exclusively for storing the samples.

c) Time of storing: till the demobilization.

---

5. QUALITY OF MATERIALS AND WORKS

5.1. Erection of drilling machine at borehole site
The drilling machine must be erected at the borehole site in such a way that the hole will be drilled within 1 m of the marks which is shown to the contractor by the Project Manager. No payment will be made for a well not located at the designed site.

5.2. Verticality and alignment of boreholes
The wells will be drilled and cased straight and vertical, and all casing, screen or liners will be set plumb and true to line.

Upon completion of drilling or at any other time, the borehole shall be tested for verticality and straightness using deviation-measuring instruments like Inclinometer, Draft Indicator…etc provided and operated by the Contractor at the Contractor’s own expenses. Readings of deviation and direction will be taken at three meters depth intervals. Deviation shall be no more than 10%.

After pump house casing installation, verticality will be tested by the plumb-bob method. The dummy will consist of an axially suspended cylinder (or cage-ring) at least 7 m long with an external diameter as specified in the Conventional Code of Testing Boreholes. The suspending wire should be less than 5 milimetres diameter of uniform cross section with no kinks. Dummy should freely be passed down the borehole without force. Dummy is provided and operated by the Contractor at the Contractor’s own expenses.

Should the plumb or dummy fail to move freely throughout the length of the casing or hole to the bottom of the housing line or should the borehole vary from the vertical in excess of above specified value, or beyond limitations of this test, the plumbness and alignment of the borehole shall be corrected by the contractor at his own expense. Should the contractor fail to correct such faulty alignment or verticality, the well may be deemed lost. The Project Manager may waive the requirements of this paragraph for verticality if in his judgment he establish that:

- The Contractor has exercised all possible care in constructing the borehole and the defect is due to circumstances beyond his control.
- The usefulness of the completed borehole will not be materially affected.
- The cost of necessary remedial measures will be excessive.

In no event will the provisions of this paragraph with respect to alignment be waived.

5.3. Assembling of casing, tubes and screens
The assembling methodology for casing, tubes and screen will be submitted to and approved by the Project Manager before operation. A particular attention will be paid to the external
diameter of tubes and screens, and his compatibility with cementing or gravel pack installation. The 18”5/8 casing may be coupled to each other either with welds. In order to secure mechanical and corrosion resistances, the Contractor should submit the certificates and qualifications of the welding operator as well as the welding procedures to the Project Manager and get his approval before starting operations. All welding electrodes must comply with the Standard Specifications DIN 1913 or AWS (American Welding Society) standards.

The 13”3/8 tubes and screens may be coupled to each other either with tight sleeve connection (ZSM connection 2 rods version).

The 8”5/8 and 10”3/4 (type 2) tubes and screens may be coupled to each other either with tight sleeve connection (ZSM connection 2 rods version) or with API round threaded connection.

The 10”3/4 (type 1) tubes and screens may be coupled to each other either with API round threaded connection.

In case of threaded connections, the lubricating compound shall not contain any heavy metal or hydrocarbon.

5.4. Characteristics of the drilling fluid and additives

In order to limit the environmental impact and to improve the mud quality, the contractor should use mud tanks. Hand dug pits for mud are forbidden.

Drilling mud should of biodegradable type and non-toxic and amenable to degradation by an appropriate chemical agent. The use of bentonite mud is only authorized for drilling of the sealed terrain, i.e. less than about 230 m.

The Contractor must ensure that if the Employer or Project Manager specifies mud drilling, he has the necessary equipment including mud pumps, viscosity-measuring apparatus, water tanks etc., to enable him successfully complete the works.

The Contractor shall specify the brand name and manufacturer of any mud or chemicals or additives proposed to be used and include technical specifications or any other relevant data. Readings of the mud condition (pH, viscosity, density and sand content) will be collected and recorded as directed by the Project Manager. Steps will be taken immediately to correct any variations of the preferred values.

A special and permanent attention should be paid to the density of the drilling mud, in regard to the expected high artesianism of the aquifer. Balanced mud weights will be used for control of the artesian conditions. Barite may be used for mud weight control.

Where applicable and required, mud dispersing agents (such as glassy phosphate), acids for washing limestone, and other chemicals applicable to standard procedures may be used as. If polyphosphates are used, it must be followed by well disinfection. It is recommended, however, to provide a polyphosphate product that already contains disinfecting agents (i.e. „Weltone“ or equivalent).

5.5. Characteristics of the casings and screens

Surface casing can be standard black steel casing. All other casing, plain tubes and screens will be made of 304L stainless steel or equivalent.

The 10 ¾” tubes and screens characteristics should be:

- Tubes: Internal and external longitudinally welded pipe AISI 304L according to ASTM A312 or DIN 4922 with ferrite content <5% and OD 273 mm
- Tubes and screens: the minimum collapse resistance will be 65 bars for the type 1 (the standard pipe 273 x 9.27 mm should meet this requirement) and 50 bars for the type 2.
- Before shipment material will be picked and passivated according to ASTM A380

The 8 5/8” tubes and screens characteristics should be:
• Tubes: Internal and external longitudinally welded pipe AISI 304L according to ASTM A312 or DIN 4922 with ferrite content <5% and OD 219 mm

• Tubes and screens: the minimum collapse Strength will be 70 bars (the standard pipe 219 x 8.18 mm (Sch 40) should meet this requirement).

• Before shipment material will be picked and passivated according to ASTM A380

All screens to be installed into the boreholes would be with 0.75 mm slot (tolerance 0.2 mm). This slot might be modified to 1 mm (tolerance 0.2 mm) slot after the first series of tests. The authorized open area will range from 6.5% to 9.5%, in order to maintain an entry velocity from 2 to 3 cm/s. In case of use of pipe base wire wound screens, the pipe has to offer an open area significantly higher than the continuous wire open area, and 13% minimum.

All casing and tubes supplied by the Contractor and which will be installed permanently in the boreholes must be with no circular welding; only longitudinally welding is allowed except to connect the fittings. None of the pipes will made of short pieces welded together.

All casing and tubes supplied by the Contractor and which will be installed permanently in the boreholes must be new and must comply with the ASTM standards. The appropriate manufacturer’s product information pamphlets with full details of the offered casing, tubes and screens, including method of joining must be provided to the Project Manager and accepted before installation in the hole. The following information should be engraved on equipments:

• Customer project name
• Supplier name
• Material
• OD and slot for screens, OD and nominal thickness for tubes

The Contractor will organize at his own costs a qualitative inspection, carried out by a recognized international certification company (third party inspection – choice of the third party to be given to Project Manager). It must be held for the release of the equipment at supplier site to check conformity of:

• Origin of stainless steel, traceability during manufacturing process to avoid mix of different stainless steel.
• Quality plan, quality certificate and qualification of manufacturer, welding operators qualifications, welding procedures

Material manufacturer certificates according to EN 10204 / 3.1

• Dimensional results (slot measurements, tally list)
• X-Ray control of the longitudinal welded joint (for 2% of length over 10% of the pipes number randomly selected)
• Before shipment material will be picked and passivated according to ASTM A380
• Destructive tensile test (on a partial length of 13”3/8, 10 ¾ and 85/8”screen). The Contractor should demonstrate that these figures are compatible with the weight of columns of screen and tubes.
• Full length destructive collapse test (on pipes and screens 13”3/8 , 10 ¾ and 85/8”)
• Internal pickling report and internal acceptance report of the production, as well as environmental report on passivation plan

The Contractor will organize at his own costs (covering travel, accommodation for a minimum of 3 days, subsidence) the participation of two (2) representatives of the Client to the qualitative inspection.
5.6. Characteristics of the gravel pack

The gravel pack will consist of quartz sand and gravel will not contain any carbonate calcium. The material must be clean well-rounded 90% composed of quartz. The use of angular crushed material is not acceptable. Considering the nature of the aquifer material and the specified screen aperture, the required grain size for 95% of the gravel pack material should be 1.0 mm to 2.5 mm.

1 kg sample of the gravel pack material must be submitted to the Project Manager for approval before use. Such approval shall be issued in writing and under no circumstances is the contractor to produce gravel for the work until such approval has been received.

5.7. Characteristics of the cement

Cement

All cement, which is used, must comply with the Standard Specification DIN 1164, EN 197, DIN 18555 and must not be older than three months. Unless otherwise instructed by the Project Manager or the Employer, a hardening agent such as calcium chloride should not be used to accelerate the cement setting process. The normal aggregate size for use with the cement may not exceed 19 mm unless otherwise stated.

Cement slurry

The cement used for cement slurry will be PORTLAND artificial CPA325 type.

The water used shall be potable water. No less than 800 kg of cement will be used per cubic meter of water.

Cement mortar

The cement used for cement slurry will be PORTLAND artificial CPA325 type.

The water used shall be potable water. No less than 50 kg of cement will be used for 100 l of water. A minimum of 600 kg of cement shall be used per cubic meter of sand.

5.7. Tools and accessories

For accessories listed below, the contractor should provide and get approved drawings including all technical details, quality plan, reference and origin:

Production well head with and without artesian pressure

- Bottom plug;
- Centralizers;
- Handling tools and clamps for pipes and screens (according to EEC safety rules), and;
- Cross-over tool.

PRICED BILLS OF QUANTITIES

1.1 Preamble To Bill of Quantities

a) The Bill of Quantities shall form part of the Contract Documents and is to be read in conjunction with the Instructions to Tenderers, Conditions of Contract Parts I and II, Specifications and Drawings.
b) The brief description of the items in the Bill of Quantities is purely for the purpose of identification, and in no way modifies or supersedes the detailed descriptions given in the conditions of Contract and Specifications for the full direction and description of work and materials.

c) The Quantities set forth in the Bill of Quantities are estimated and provisional, representing substantially the work to be carried out, and are given to provide a common basis for tendering and comparing of Tenders. There is no guarantee to the Contractor that he will be required to carry out all the quantities of work indicated under any one particular item or group of items in the Bill of Quantities. The basis of payment shall be the Contractor’s rates and the quantities of work actually done in fulfillment of his obligation under the Contract.

d) The prices and rates inserted in the Bills of Quantities will be used for valuing work executed, and the Engineer will measure the whole of the works executed in accordance with this Contract.

e) A price or rate shall be entered in ink against every item in the Bill of Quantities with the exception of items, which already have provisional sums, affixed thereto. The Tenderers are reminded that no “nil” or “included” rates or “lump-sum” discounts will be accepted. The rates for various items should include discounts if any. Tenderers who fail to comply will be disqualified.

f) Provisional sums (including Dayworks) in the Bill of Quantities shall be expended in whole or in part at the discretion of the Engineer. The price and rates entered in the Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional plant to be used, labour, insurance,

g) supervision, compliance, testing, materials, erection, maintenance of works, overheads and profits, taxes including input

and output VAT and duties together with all general risks, liabilities and obligations set out or implied in the Contract, transport, electricity and telephones, water, use and replenishment of all consumables, including those required under the Contract by the Engineer and his staff.

h) Errors will be corrected by the Employer for any arithmetic errors in computation or summation as follows:

(a) Where there is a discrepancy between amount in words and figures, the amount in words will govern; and

(b) Where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer, there is an obviously gross misplacement of the decimal point in the unit price, in which event the total amount as quoted will govern and the unit rate will be corrected.

(c) If a Tenderer does not accept the correction of errors as outlined above, his Tender will be rejected.

i) The Bills of Quantities, unless otherwise expressly stated therein, shall be deemed to have been prepared in accordance with the principles of the latest edition of the Civil Engineering Standard Method of Measurement (CESMM).
j) “Authorized” “Directed” or “Approved” shall mean the authority, direction or approval of the Engineer.

k) Unless otherwise stated, all measurements shall be net taken on the finished work carried out in accordance with the details shown on the drawings or instructed, with no allowance for extra cuts or fills, waste or additional thickness necessary to obtain the minimum finished thickness or dimensions required in this Contract. Any work performed in excess or the requirements of the plans and specifications will not be paid for, unless ordered in writing by the Engineer.

l) (a) Hard material, in this Contract, shall be defined as the material which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a dozer tractor of at least 150 brake horse power (112 kilowatt) with a single, rear-mounted, hydraulic ripper. Boulders of more than 0.2m³ occurring in soft material shall be classified as hard material

(b) Soft material shall be all material other than hard material.
**BILL OF QUANTITIES**

**Bill No 1 Drilling of 1No borehole at SOS Children Villages, Eldoret.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Qty</th>
<th>Rate</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mobilization transportation and demobilization of machinery to the site</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Erecting and dismantling of drilling equipment and other machinery on site</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Drilling of borehole of minimum diameter 205m through all types of strata including disposal of excavated materials, taking any remedial measures to overcome caving in, or over drilling to accommodate sloughed material and keeping drilling records as specified between ground level and 180m below ground level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Drilling from 0-10m depth</td>
<td>M</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Drilling from 10-100m depth</td>
<td>M</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Drilling beyond 100m depth</td>
<td>M</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Supply and install 152mm internal diameter plain steel casing in the borehole</td>
<td>M</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Ditto but 152mm diameter steel slotted casing</td>
<td>M</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Allow for taking samples of drill cuttings at 2m intervals</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Allow for Electrical Conductivity measurements during drilling at 2m intervals. To ensure EC is within acceptable levels</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Supply and insert gravel pack (round 2 – 4mm diameter)</td>
<td>Tons</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Grout between the borehole and casing for the top 5m</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Physical development of the borehole including inserting and removal of development equipment</td>
<td>Hrs</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Chemical development of the borehole including inserting and removal of development equipment</td>
<td>Hrs</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Undertake constant discharge as specified (24hrs for actual test pumping and 8 hrs for recovery measurement)</td>
<td>Hrs</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Carry borehole sterilization</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>Install well head, well cap serial number and borehole chamber of dimensions 1mby1mby1m with a heavy gauge borehole chamber cover around the well head as approved by supervising</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Bill No1 Solar equipping

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit</th>
<th>Qty</th>
<th>Price</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><strong>Borehole solar pump equipping</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 2.1| Provisional sum for supply, installation, testing and commissioning of a submersible solar pump capable of pumping expected yield against a head to be identified, complete with solar system, solar pumping control unit, installation sundries and all accessories including cables and pipe fittings  
**NB: Design for pump and solar must be approved by the supervising Engineer, the pump to deliver a head of 200m and 5m/hr.** | PS   | 1   |       |               |
| 2.2| Supply and install 4m steel support structure for the solar modules, use 50mm x 50mm SHS square steel tubes as pillars, design to be approved by Supervising Engineer | LS   | 1   |       |               |
|    | **Sub total**                                                               |      |     |       |               |

### Bill No 1 Rising Main

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Unit</th>
<th>Qty</th>
<th>Price</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td><strong>Pipe work 200m for pumping/rising main</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Excavate pipe trench commencing from ground level to minimum depth of 600mm, rate to include clearing, laying the pipes and backfilling the trench</td>
<td>M</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>50mm Dia. PPR pipes</td>
<td>M</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>Supply and install pipe fittings</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Sub-total – pipe work</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NB: Equipping and civil works for the mentioned borehole is depended on the yield of the borehole, dry borehole implies the client cannot proceed with the sub sequent works**
### Bill No 1 summery

<table>
<thead>
<tr>
<th>S/No</th>
<th>Summery</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Borehole drilling</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Borehole equipping</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Pipework for rising main</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total bill No 1 carried to the summery</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Bill No 2 Drilling and equipping of 1No borehole at Munyaka Primary school, Eldoret.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Qty</th>
<th>Rate</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mobilization transportation and demobilization of machinery to the site</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Erecting and dismantling of drilling equipment and other machinery on site</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Drilling of borehole of minimum diameter 205m through all types of strata including disposal of excavated materials, taking any remedial measures to overcome caving in, or over drilling to accommodate sloughed material and keeping drilling records as specified between ground level and 180m below ground level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Drilling from 0-10m depth</td>
<td>M</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Drilling from 10 -100m depth</td>
<td>M</td>
<td>90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Drilling beyond 100m depth</td>
<td>M</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Supply and install 152mm internal diameter plain steel casing in the borehole</td>
<td>M</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Ditto but 152mm diameter steel slotted casing</td>
<td>M</td>
<td>70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Allow for taking samples of drill cuttings at 2m intervals</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Allow for Electrical Conductivity measurements during drilling at 2m intervals. To ensure EC is within acceptable levels</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Supply and insert gravel pack (round 2 – 4mm diameter)</td>
<td>Tons</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Grout between the borehole and casing for the top 5m</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Physical development of the borehole including inserting and removal of development equipment</td>
<td>Hrs</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>Chemical development of the borehole including inserting and removal of development equipment</td>
<td>Hrs</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Undertake constant discharge as specified (24hrs for actual test pumping and 8 hrs for recovery measurement)</td>
<td>Hrs</td>
<td>32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Q Carry borehole sterilization  LS 1  
R Install well head, well cap serial number and borehole chamber of dimensions 1m by 1m by 1m with a heavy gauge borehole chamber cover around the well head as approved by supervising engineer  LS 1  
S Supply drilling fluids for drilling operations and field camp  LS 1  
T Take water sample for laboratory analysis for chemical, physical and bacteriological.  LS 1  
U Allow for site reinstatement of the borehole location to satisfaction  LS 1  
W Allow for signboard as per the law.  LS 1  
Total carried to summery  

Bill No 2 Construction of water kiosk with reinforced concrete platform for tank.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Unit</th>
<th>Qty</th>
<th>Rate</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Excavate to remove top soil to average depth of 150mm deep, wheel and deposit on site n.e 100 away in permanent spoil heaps</td>
<td>SM</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Ditto but to depth of 300mm</td>
<td>CM</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Excavate for pad foundation and strip footing n.e 1000mm deep</td>
<td>CM</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Disposal: cart away excess excavated material to spoil</td>
<td>CM</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Hardcore: 250mm thick filling, deposit, spread and level and compact to receive blinding</td>
<td>CM</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>50mm murram blinding to surface of hardcore</td>
<td>SM</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Anti-Termite treatment: chemical anti-termite treatment approved by Supervising engineer executed applied to surfaces and floor</td>
<td>SM</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td><strong>Damp proof membrane</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>500mm Gauge polythene damp-proof Membrane laid on the blinded hardcore with 100mm folded side and end laps (measured net – allow for laps)</td>
<td>SM</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td><strong>Plain concrete 1:4:8 mix in:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50mm blinding bed under strip footing</td>
<td>CM</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Reinforced concrete 1:2:4 20mm gauge mix in:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>150mm floor slab</td>
<td>SM</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>300mm thick strip footing</td>
<td>CM</td>
<td>2.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>600mm x 150mm thick pavement round the perimeter walling</td>
<td>SM</td>
<td>1.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td><strong>Reinforcement: high tensile steel reinforcement to BS 4483</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y 12</td>
<td>Nr 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y 10</td>
<td>Nr 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y 8</td>
<td>Nr 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th><strong>Mesh fabric reinforcement to BS 4483</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesh reinforcement A 142 weighing 2.22kg per square meter laid in bed with 300mm side and end laps</td>
<td>SM 17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>O</th>
<th><strong>Masonry</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium quarry dressed stone walling in cement and sand (1:3) mortar, 20 gauge x 25mm wide hoop iron reinforcement and column walled ties in every alternate course to 200mm walling to foundation</td>
<td>SM 15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P</th>
<th><strong>Hessian based bituminous felt damp proof course to BS 743 type 4A and setting in cement and sand mortar ; under 200mm wall</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>M 10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q</th>
<th><strong>Concrete work and walling</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforced concrete 1:2:4 20mm gauge mix n; Ring beams 450 x 200 150 roof slab and fetching bay</td>
<td>CM 0.9 CM 1.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R</th>
<th><strong>Sawn formwork to</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sides and soffits of beams Ditto but for sides and columns</td>
<td>SM 9.7 SM 19.7</td>
</tr>
<tr>
<td>Ditto but including props beneath the roof slab and fetching bay</td>
<td>SM 12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S</th>
<th><strong>High tensile steel for columns, ring beam and top slab reinforcement to BS 4483</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Y 16</td>
<td>Nr 12</td>
</tr>
<tr>
<td>Y 12</td>
<td>Nr 15</td>
</tr>
<tr>
<td>Y 10</td>
<td>Nr 16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T</th>
<th><strong>Walling: medium quarry dressed stone walling in cement and sand (1:3) mortar,20 gauge x 25mm wide hoop iron reinforcement wall tie in every alternate course to 200mm walling</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>SM 25</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>U</th>
<th><strong>Supply and install 10,000 litres tank with all the fittings</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>LS 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V</th>
<th><strong>Floor and wall finishes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal floor, wall and slab soffits External walls including keying</td>
<td>SM 45 SM 10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>W</th>
<th><strong>Supply and install standard single leaf steel door</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>X</th>
<th><strong>Supply and install 2000 x 1200mm double leaf steel window</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Y</th>
<th><strong>Allow for provision for painting and include branding SOS Children villages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>LS</td>
<td></td>
</tr>
</tbody>
</table>
Plumbing works: supply and fix the following

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾'' GI pipe</td>
<td>Nr 1</td>
</tr>
<tr>
<td>¾'' gate valve (peggler)</td>
<td>Nr 1</td>
</tr>
<tr>
<td>¾'' bend</td>
<td>Nr 3</td>
</tr>
<tr>
<td>¾'' elbow</td>
<td>Nr 4</td>
</tr>
<tr>
<td>¾'' tee equal</td>
<td>Nr 3</td>
</tr>
<tr>
<td>¾'' union</td>
<td>Nr 1</td>
</tr>
<tr>
<td>¾'' stop cork p(peggler)</td>
<td>Nr 3</td>
</tr>
<tr>
<td>¾'' hexagonal nipple</td>
<td>Nr 10</td>
</tr>
<tr>
<td>¾'' sockets</td>
<td>Nr 2</td>
</tr>
<tr>
<td>PVC end caps 2''</td>
<td>Nr 2</td>
</tr>
<tr>
<td>PVC end caps 11/2''</td>
<td>Nr 2</td>
</tr>
<tr>
<td>PVC Tee equal 2''</td>
<td>Nr 2</td>
</tr>
<tr>
<td>Reducing socket 2'x ¾' PVC</td>
<td>Nr 2</td>
</tr>
<tr>
<td>Ditto 11/2' x ¾'</td>
<td>Nr 2</td>
</tr>
<tr>
<td>Adaptor ¾'</td>
<td>Nr 2</td>
</tr>
</tbody>
</table>

Total to be carried to the summery

Bill No 2-equipping using solar pump

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Unit</th>
<th>Qty</th>
<th>Price</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provisional sum for supply, installation, testing and commissioning of a subsensible solar pump capable of pumping expected yield against a head to be identified, complete with solar system, solar pumping control unit, installation sundries and all accessories including cables and pipe fittings. NB: Design for pump and solar must be approved by the supervising Engineer, the pump to deliver a head of 200m at flow rate of 5cum/hr)</td>
<td>PS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sub total

Bill No 2-pipe works

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Unit</th>
<th>Qty</th>
<th>Price</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavate pipe trench commencing from ground level to minimum depth of 600mm, rate to include clearing, laying the pipes and backfilling the trench</td>
<td>M</td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50mm Dia. PPR pipes</td>
<td>M</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38mm Dia PPR pipes</td>
<td>M</td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply and install pipe fittings</td>
<td>LS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sub-total – pipe work

NB: Equipping and civil works for the mentioned borehole is depended on the yield of the borehole, dry borehole implies the client cannot proceed with the sub
sequent works

Bill No 2 summery

<table>
<thead>
<tr>
<th>S/No</th>
<th>Summery</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Borehole drilling</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Borehole equipping</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Water kiosk and elevated tank</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pipework for rising main</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total bill No 2 carried to the summery</strong></td>
<td></td>
</tr>
</tbody>
</table>

Total grand summery carried to letter of bid

<table>
<thead>
<tr>
<th>S/No</th>
<th>Summery</th>
<th>Amount (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bill No 1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Bill No 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Sub total</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Add 5% contingency</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Sub total</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Add 14% Value Added Tax</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

TENDER FORMS

LETTER OF BID

Nb: The bidder must prepare letter of bid with its letter head clearly showing complete bidders address and name

Date: _______________
Bidding No.: _______________

To:

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB).

(b) We offer to execute in conformity with the Bidding Documents the following Works:

____________________________________________________________________;

(c) The total price of our Bid, excluding any discounts offered in item (d) below is:

__________________________;

(d) The discounts offered and the methodology for their application are:

______________________;
(e) Our bid shall be valid for a period of ________ days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our bid is accepted, we commit to obtain a performance security in accordance with ITB, for the performance of the Contract;

(g) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries;

(h) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB.

(i) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB, or other alternative offers submitted in accordance with ITB.

(j) Our firm, its affiliates or subsidiaries (including any Subcontractors or Suppliers for any part of the contract), has not been declared ineligible by the Bank, or under execution of a Bid-Securing Declaration in the Employer’s country, or under the Employer’s country laws or official regulations, or by an act of compliance with a decision of the United Nations Security Council, in accordance with ITB.

(k) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed.

(l) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and

(m) If awarded the contract, the person named below shall act as Contractor’s Representative:

________________________________________________________

Name:

In the capacity of:

________________________________________________________

Signed:

Duly authorized to

sign the Bid for

and on behalf of:

________________________________________________________

Date:

________________________________________________________
Form of Bid bond security

[Bank’s Name, and Address of Issuing Branch or Office]

Beneficiary: __________________________ [Name and Address of Employer]

Date: __________________________

BID GUARANTEE No.: __________________________

We have been informed that __________________________ [name of the Bidder] (hereinafter called "the Bidder") has submitted to you its bid dated ____________

(hereinafter called "the Bid") for the execution of ________________ [name of contract] under Invitation for Bids No. ___________ (“the IFB”).

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

At the request of the Employer, we ____________________ [name of Bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ____________ [amount in figures] (____________) [amount in words]

upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or

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

This guarantee will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy your notification to the Bidder of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of the Bidder’s bid. Consequently, any demand for payment under this guarantee must be received by us at the office on or before that date.

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

____________________________

[signature(s)]
1. Individual 1.1 Constitution or legal status of Tenderer: [attach copy] Place of registration: [insert]

Principal place of business: [insert]

Power of attorney of signatory of Tender: [attach]

Registration certificate [attach] current Business License [attach]

1.2 Total annual volume of construction work performed in two years, in Kenyan shillings as specified in the Tender Data Sheet; [insert]

1.3 Work performed as prime Contractor on works of a similar nature and volume over the last two years or as specified in the Tender Data Sheet in Kenyan Shillings. Also list details of work under way or committed, including expected

<table>
<thead>
<tr>
<th>Project name and country</th>
<th>Name of client and contact</th>
<th>Contractor Participation</th>
<th>Type of work performed and year of completion</th>
<th>Value of contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.4 Major items of Contractor’s Equipment proposed for carrying out the works. List all information requested below.

<table>
<thead>
<tr>
<th>Item of equipment</th>
<th>Description, make, and age (years)</th>
<th>Condition (new, good, Poor) and number available</th>
<th>Owned, leased (from whom?) or to be purchased (from whom?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Years of experience</th>
<th>Years of experience in propose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.6 Financial report for the past three years.
1.7 Evidence of access to financial resources to meet the qualification requirement.
1.8 Proposed program (work method and schedule)
1.9 Attach the power of Attorney of the signatory (ies) of the tender authorizing signature.
EVALUATION AND QUALIFICATION CRITERIA

Equipment type and characteristics

<table>
<thead>
<tr>
<th>Equipment type</th>
<th>Minimum no required</th>
<th>Ownership status</th>
<th>Kisumu</th>
<th>Eldoret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borehole rotary drilling rig to depth &gt;200</td>
<td>1</td>
<td>Must be owned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borehole rotary drilling rig to depth &gt;300</td>
<td>1</td>
<td>Must be owned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air compressor 1000/300psi Capacity or equivalent</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generator 15KVA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 ton lorry</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.75cum concrete mixer with vibrator</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Required personnel with experience in works of equivalent and/or similar volume

<table>
<thead>
<tr>
<th>Position</th>
<th>General experience (Years)</th>
<th>Specific experience (Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project director</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>One site agent (registered Civil, Mechanical or related engineer)</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Driller (Diploma in Water engineering)</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Foreman (certificate in building construction)</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Electrician (diploma in electrical engineering)</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Plumber</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Eligibility and Qualification requirements

Evaluation Criteria:

PRELIMINARY EVALUATION

i. Bidders has submitted by email provided financial and technical proposal in one email separate pdf files and indicated the tender number and name on the email subject (Required)

ii. Legal binding documents: Attach Copy of Current Valid Tax Compliance Certificate, Business Permit and Certificate of Incorporation. (Mandatory)

iii. Duly completed, signed, stamped and witnessed Letter of bid. (Required)

iv. BOQ duly completed (Mandatory)

v. Duly filled form of bid bond security (required)

vi. Confidential Business Questionnaire duly filled (required)

vii. Audited financial accounts for the Last 3 years. (Mandatory)

viii. Submit a written Power of Attorney on bidder’s letterhead for the authorized person to sign the tender on behalf of the bidder. (required)

ix. Attach work methodology and work plan. (required)

x. Submit a Certificate of registration as a driller with the Ministry of Water and Irrigation (or equivalent) – Mandatory

xi. Submit a Certificate of Registration with NCA as water works contractor in Category 7 or above. (Mandatory)

xii. Offered Eligibility statement on bidders’ letterhead indicating that the bidder is eligible for the assignment and has not been debarred for any procurement within the last five years. (required)

A firm lacking any of the mandatory of the above details shall be dropped at this stage and shall not be progressed to the Technical Evaluation stage.

TECHNICAL EVALUATION

a) Minimum Annual cash flow requirement of Kshs. 25,000,000 (or equivalence amount in freely convertible currency)
b) The minimum required annual Turnover for the successful Tenderer in any of the last 4 years shall be: **Kes. 50 million.**

c) Evidence of experience as prime contractor in the drilling and equipping of at least three boreholes project each of minimum contract value **Kes. 5 Million**, within the last 5 years in Kenya with 2 of the projects done in the last 3 years. Works cited should be at least 70 percent complete and should be proven by duly signed and stamped LPOs, service contracts or completion certificates. The bidder should provide at least 3 client reference letters (on client letter head) on previous relevant experience (for works done within last 4 years). The firm should have been in existence for at least 5 years.

d) The essential equipment to be made available for the Contract by the successful Tenderer (proposals for timely acquisition or own, lease, hire, etc) as in indicated in the table above. Attach proof of ownership of the equipment or lease agreements.

e) The essential personnel to be made available for the Contract by the successful Tenderer as indicated above. Attach the following documents Curriculum vitae (CVs) of the proposed staff duly signed by the proposed individual and copies of certificates and testimonials of the proposed key staff.

**FINANCIAL EVALUATION:**

The lowest price technically acceptable bid will be considered for the award upon passing due diligence.

**Summary Evaluation guidelines**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rationale and ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Preliminary /eligibility evaluation</td>
<td>All Mandatory requirements met (only those that pass ALL the mandatory eligibility requirements proceed for technical evaluation)</td>
</tr>
<tr>
<td>2. Technical evaluation</td>
<td>All specifications and requirements met as regards:</td>
</tr>
<tr>
<td></td>
<td>a) Minimum annual cash flows</td>
</tr>
<tr>
<td></td>
<td>b) Minimum Annual turnover</td>
</tr>
<tr>
<td></td>
<td>c) Experience as prime contractor.</td>
</tr>
<tr>
<td></td>
<td>d) Essential equipment</td>
</tr>
<tr>
<td></td>
<td>e) Essential personnel</td>
</tr>
<tr>
<td></td>
<td>Only those that pass ALL technical criteria proceed to the final stage i.e. financial evaluation</td>
</tr>
<tr>
<td>3. Financial evaluation</td>
<td>Lowest price technically acceptable to be considered for award after successful due diligence</td>
</tr>
</tbody>
</table>