KNYSNA MUNICIPALITY
REQUEST FOR QUOTATION 474/2017/18
KNYSNA BOREHOLE E8 – MOTOR CONTROL KIOSK

<table>
<thead>
<tr>
<th>EMPLOYER</th>
<th>EMPLOYER’S AGENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>P O Box 21</td>
<td>P O Box 434</td>
</tr>
<tr>
<td>Knysna</td>
<td>George</td>
</tr>
<tr>
<td>6570</td>
<td>6530</td>
</tr>
</tbody>
</table>

**SUMMARY FOR QUOTATION OPENING PURPOSES**
(In the event of any conflict between the Summary and that given in the Quotation, the latter shall apply)

<table>
<thead>
<tr>
<th>NAME OF BIDDER:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TELEPHONE NUMBER:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FAX NUMBER:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E-MAIL:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIME FOR COMPLETION :</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QUOTATION CLOSES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>12H00 ON 12 JUNE 2018</td>
</tr>
</tbody>
</table>
## CONTACT DETAILS OF TENDERER

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knysna Municipality Supplier number</td>
<td></td>
</tr>
<tr>
<td>CSD Supplier number</td>
<td></td>
</tr>
<tr>
<td>CSD Unique Registration Reference Number</td>
<td></td>
</tr>
<tr>
<td>The name of the Tenderer</td>
<td></td>
</tr>
<tr>
<td>The name of the contact person</td>
<td></td>
</tr>
<tr>
<td>The address of the Tenderer</td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td></td>
</tr>
<tr>
<td>Facsimile</td>
<td></td>
</tr>
<tr>
<td>E-mail</td>
<td></td>
</tr>
<tr>
<td>Address (physical)</td>
<td></td>
</tr>
<tr>
<td>Address (postal)</td>
<td></td>
</tr>
<tr>
<td>Signature</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

SECTION Q: PROCEDURES AND RETURNABLE DOCUMENTS .................................................. 1
Q1 QUOTATION PROCEDURES .................................................................................................. 3
Q1.1 NOTICE AND INVITATION TO QUOTE .......................................................................... 3
Q1.2 QUOTATION DATA ............................................................................................................ 5
Q1.2.1 EVALUATION .................................................................................................................. 5
Q2 RETURNABLE DOCUMENTS ............................................................................................... 6
Q2.1 LIST OF RETURNABLE DOCUMENTS .............................................................................. 6
Q2.2.1 RETURNABLE SCHEDULES AND FORMS ................................................................. 6

SECTION C: CONTRACT ........................................................................................................... 17
C1 AGREEMENTS AND CONTRACT DATA ............................................................................... 19
C1.1 FORM OF OFFER AND ACCEPTANCE ............................................................................. 19
C1.2 CONTRACT DATA ............................................................................................................. 23
C1.2 Contract Data ................................................................................................................... 24
C2 PRICING DATA .................................................................................................................. 26
C2.1 PRICING INSTRUCTIONS ............................................................................................... 26
C2.1.1 GENERAL ..................................................................................................................... 26
C2.1.2 DESCRIPTION OF ITEMS IN THE SCHEDULE .......................................................... 26
C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE ...................................................... 26
C2.1.4 PROVISIONAL SUMS ................................................................................................... 26
C2.1.5 PRICING OF THE BILL OF QUANTITIES ............................................................... 26
C2.1.6 CORRECTION OF ENTRIES ...................................................................................... 27
C2.1.7 ARITHMETICAL ERRORS .......................................................................................... 27
C2.1.8 MONTHLY PAYMENTS .............................................................................................. 27
C2.1.9 UNITS OF MEASUREMENT ....................................................................................... 28
C2.2 BILL OF QUANTITIES ..................................................................................................... 29
C3 SCOPE OF WORK ................................................................................................................ 34
C3.1 DESCRIPTION OF THE WORKS ...................................................................................... 34
C3.1.1 EMPLOYERS OBJECTIVES ......................................................................................... 34
C3.1.2 SCOPE OF CONTRACT ............................................................................................... 34
C3.1.3 LOCATION OF THE WORKS ...................................................................................... 34
C3.1.4 TEMPORARY WORKS ................................................................................................ 34
C3.2 ENGINEERING .............................................................................................................. 35
C3.2.1 EMPLOYER’S DESIGN ............................................................................................... 35
C3.2.2 DESIGN BRIEF .......................................................................................................... 35
C3.2.3 DRAWINGS ................................................................................................................. 35
C3.3 CONSTRUCTION ............................................................................................................ 36
C3.3.1 WORKS SPECIFICATIONS ....................................................................................... 36
C3.3.2 DETAILED SPECIFICATIONS ................................................................................. 36
C3.4 FACILITIES .................................................................................................................... 52
C3.4.1 PLANT AND MATERIALS SUPPLIED BY THE EMPLOYER ..................................... 52
C3.4.2 EQUIPMENT SUPPLIED BY THE EMPLOYER ....................................................... 52
C3.4.3 SITE ESTABLISHMENT ............................................................................................. 52
C3.4.4 SITE USAGE ............................................................................................................... 53
C3.5 MANAGEMENT ................................................................................................................ 54
C3.5.1 MANAGEMENT OF THE WORKS .............................................................................. 54
C3.5.2 HEALTH AND SAFETY ............................................................................................. 55
C3.6 SPECIFICATIONS ........................................................................................................... 56
C3.6.1 PREFACE ON INTERIM SITUATION ......................................................................... 56
C3.6.2 LIST OF PROJECT SPECIFICATIONS ....................................................................... 56
C3.6.3 VARIATIONS AND ADDITIONS TO THE STANDARDIZED SPECIFICATIONS FOR THIS CONTRACT, AND PARTICULAR SPECIFICATIONS .................................................. 57
C4 SITE INFORMATION .......................................................................................................... 73
C4.1 LOCATION OF THE WORKS ................................................................. 73
C4.2 ACCESS TO THE WORKS............................................................... 73
C4.3 CLIMATE...................................................................................... 73
C4.4 GEOTECHNICAL INFORMATION.................................................... 73
C4.5 DRAWINGS.................................................................................. 74
<table>
<thead>
<tr>
<th>Q1</th>
<th>Quote Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2</td>
<td>Returnable Documents</td>
</tr>
</tbody>
</table>
Page Intentionally Blank
**RFQ 474/2017/18: KNYSNA BHE8 - MOTOR CONTROL KIOSK**

**Q1** QUOTATION PROCEDURES

**Q1.1** NOTICE AND INVITATION TO QUOTE

(For publication on the Knysna Municipality website & notice boards)

<table>
<thead>
<tr>
<th>ADVERTISEMENT DATE:</th>
<th>05 June 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFQ NUMBER:</td>
<td>RFQ 474/2017/18</td>
</tr>
<tr>
<td>DESCRIPTION OF GOODS/SERVICES:</td>
<td>KNYSNA BHE8 - MOTOR CONTROL KIOSK</td>
</tr>
</tbody>
</table>
| RFQ DOCUMENTS ARE OBTAINABLE FROM: | Supply Chain Management Section  
Knysna  
or  
Knysna Municipality website: www.knysna.gov.za (Council adverts >Quotations) |
| CLOSING DATE:       | 12 JUNE 2018 |
| TIME:               | 12:00 |
| SUBMISSIONS:        | Sealed quotations clearly marked, “RFQ 474/2017/18: KNYSNA BHE8 - MOTOR CONTROL KIOSK”, can be submitted: |
|                     | By hand to: Supply Chain Management Section  
Knysna Municipality  
Clyde Street  
Knysna  
By fax to: 086 650 1415  
By email to: procurement@knysna.gov.za |
|                     | Contact person: Sandra Fourie (Tel: 044 302 6328)  
Electronic bid documents must reach the Supply Chain Management Section before the closing time. |
| COMPULSORY REQUIREMENTS: | Minimum functionality score, and MBD 6.1 and MDB 4 forms must be completed. |
| TECHNICAL ENQUIRIES: | Department : Technical Services  
Contact Person : Rhoydon Parry  
Email : rparry@knysna.gov.za  
Tel : 044 302 6300  
Employer’sAgent: Royal HaskoningDHV  
Contact Person : Keith Turner  
Email : keith.turner@rhdhv.com  
Tel : 082 491 1562 |

The following conditions will apply:
- Price(s) quoted must be firm and must be inclusive of VAT when applicable.
- Attached MBD 6.1 must be completed to qualify for B-BBEE Status Level of Contribution.
- Tax Clearance Certificate or Sufficient Evidence that Tax matters are raised with SARS must be attached.
- An original or certified copy of B-BBEE Certificate must be attached to qualify for points.
- Price must include all related expenses, i.e. transport, accommodation etc.
- Attached MBD 4 document must be completed.
- Status of Municipal accounts must be submitted (attached MBD 15 form).
- More than 1 supplier could be appointed.
- Invoices must be submitted to jcordier@knysnagov.za and will be paid within 30 days of delivering the service.
- Only an Official order and appointment letter will bind the Council.

**MUNICIPAL MANAGER**

KAM CHETTY
Q1.2 QUOTATION DATA

Q1.2.1 EVALUATION

All bids will be evaluated by a panel on basis of Functionality and Price using the 80/20 system.

The points scored for Functionality will not be carried over to price, but will be used as a functionality gateway to reach the next stage of evaluation.

The final evaluation will be done in terms of the Council's Preferential Procurement Policy which states 80 points for price and the remaining 20 points for B-BBEE level.

Point's allocation for Functionality

1. Company experience on similar works with references to previous experiences. (9 points)
2. Experience of key staff. One page maximum CV to be submitted per key staff. (6 points)
3. List of contactable references of similar municipal services previously provided. (5 points)

EVALUATION SCHEDULE

NOTE: Your pricing schedule will not be considered if this table is not completed

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Scoring criteria</th>
<th>Points Claimed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide company profile, history, years of experience.</td>
<td>Years (points)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 – 2 (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 – 4 (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 + (9)</td>
<td></td>
</tr>
<tr>
<td>Experience of key staff:</td>
<td>Years (points per key staff)</td>
<td></td>
</tr>
<tr>
<td>Contracts manager (CM)</td>
<td>3 – 4 (1)</td>
<td></td>
</tr>
<tr>
<td>Site agent (SA)</td>
<td>5 + (2)</td>
<td></td>
</tr>
<tr>
<td>Foreman (FM)</td>
<td>(Max. 6 points)</td>
<td></td>
</tr>
<tr>
<td>Provide a list of contactable references of similar municipal services previously provided</td>
<td>1 ref (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 refs (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 refs (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 refs (4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 refs (5)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

Tenderers must achieve a **minimum of 13 points** in order to qualify for further evaluation on price and preference points
Q2 RETURNABLE DOCUMENTS

Q2.1 LIST OF RETURNABLE DOCUMENTS

The following is a list of the Returnable Documents:

1. All the forms and agreements in the Contract data in C1.2, where some of the forms (agreements) need to be completed only by successful Bidder;


Q2.2.1 RETURNABLE SCHEDULES AND FORMS

A  Experience of Bidder
B  Experience of Key Staff
MBD 4  Declaration of Interest
MBD 6.1  Preferential Procurement Schedule and Affidavit
MBD 15  Certificate of Payment of Municipal Services

The Bidder is required to complete all schedules and forms listed above to the best of his ability as the evaluation of tenders and the eventual contract will be based on the information provided by the Bidder. Failure of a Bidder to complete the schedules and forms to the satisfaction of the Employer will prejudice the tender and may lead to rejection on the grounds that the tender is not responsive.
A. **Experience of Bidder**

The following is a statement of work of similar nature in the past 5 years successfully executed by myself/ourselves:

<table>
<thead>
<tr>
<th>Employer: Contact Person and Telephone Number</th>
<th>Consulting Engineer: Contact Person and Telephone Number</th>
<th>Nature of Work</th>
<th>Value of Work (Incl VAT)</th>
<th>Completion Date or Expected Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SIGNATURE: ..............................................………...……... 

DATE: .............................................. 

(of person authorised to sign on behalf of the Bidder)
### B. Experience of Key Staff

The following is a list of our proposed staff (NB: attach one page CV for each key staff member):

<table>
<thead>
<tr>
<th>Name</th>
<th>Highest Qualification</th>
<th>Relevant Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SIGNATURE: ..............................................**
**DATE: ........................................**

(of person authorised to sign on behalf of the Bidder)
## MBD 4
### DECLARATION OF INTEREST

1. **No bid will be accepted from persons in the service of the state¹.**

2. **Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.**

3. **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Full Name of bidder or his or her representative:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.2 Identity Number:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3 Position occupied in the Company (director, trustee, shareholder²):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 Company Registration Number:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5 Tax Reference Number:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.6 VAT Registration Number:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.8 Are you presently in the service of the state?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.8.1 If yes, furnish particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.9 Have you been in the service of the state for the past twelve months?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.9.1 If yes, furnish particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved the evaluation and or adjudication of this bid?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.10.1 If yes, furnish particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.11.1 If yes, furnish particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.12 Are any of the company’s directors, trustees, managers, principle shareholders or stakeholders in service of the state?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.12.1 If yes, furnish particulars:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3.13
Are any spouse, child or parent of the company’s directors, trustees, managers, principle shareholders or stakeholders in service of the state?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

**3.13.1** If yes, furnish particulars:

________________________________________________________________________________

________________________________________________________________________________

### 3.14
Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

**3.14.1** If yes, furnish particulars:

________________________________________________________________________________

________________________________________________________________________________
This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution.

NB:
BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS
1.1 The following preference point systems are applicable to all bids:
- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).
1.2 The value of this bid is estimated not to exceed R200 000 (all applicable taxes included) and therefore the 80/20 system shall be applicable.
1.3 Preference points for this bid shall be awarded for:
(a) Price; and
(b) B-BBEE Status Level of Contribution.
1.3.1 The maximum points for this bid are allocated as follows:

<table>
<thead>
<tr>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
</tr>
<tr>
<td>B-BBEE status level of contribution</td>
</tr>
<tr>
<td>Total points for Price and B-BBEE must not exceed</td>
</tr>
</tbody>
</table>
1.4 Failure on the part of a bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or an Accounting Officer as contemplated in the Close Corporation Act (CCA) together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.
1.5. The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS
2.1 “all applicable taxes” includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;
2.2 “B-BBEE” means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;
2.3 “B-BBEE status level of contributor” means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;
2.4 “bid” means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;
2.5 “Broad-Based Black Economic Empowerment Act” means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);
2.6 “comparative price” means the price after the factors of a non-firm price and all unconditional discounts that can be utilized have been taken into consideration;
2.7 “consortium or joint venture” means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract;  

2.8 “contract” means the agreement that results from the acceptance of a bid by an organ of state;  

2.9 “EME” means any enterprise with an annual total revenue of R5 million or less;  

2.10 “Firm price” means the price that is only subject to adjustments in accordance with the actual increase or decrease resulting from the change, imposition, or abolition of customs or excise duty and any other duty, levy, or tax, which, in terms of the law or regulation, is binding on the contractor and demonstrably has an influence on the price of any supplies, or the rendering costs of any service, for the execution of the contract;  

2.11 “functionality” means the measurement according to predetermined norms, as set out in the bid documents, of a service or commodity that is designed to be practical and useful, working or operating, taking into account, among other factors, the quality, reliability, viability and durability of a service and the technical capacity and ability of a bidder;  

2.12 “non-firm prices” means all prices other than “firm” prices;  

2.13 “person” includes a juristic person;  

2.14 “rand value” means the total estimated value of a contract in South African currency, calculated at the time of bid invitations, and includes all applicable taxes and excise duties;  

2.15 “total revenue” bears the same meaning assigned to this expression in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act and promulgated in the Government Gazette on 9 February 2007;  

2.16 “trust” means the arrangement through which the property of one person is made over or bequeathed to a trustee to administer such property for the benefit of another person; and  

2.17 “trustee” means any person, including the founder of a trust, to whom property is bequeathed in order for such property to be administered for the benefit of another person.

3. ADJUDICATION USING A POINT SYSTEM  

3.1 The bidder obtaining the highest number of total points will be awarded the contract.  

3.2 Preference points shall be calculated after prices have been brought to a comparative basis taking into account all factors of non-firm prices and all unconditional discounts;  

3.3 Points scored must be rounded off to the nearest 2 decimal places.  

3.4 In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of preference points for B-BBEE.  

3.5 However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for B-BBEE, the successful bid must be the one scoring the highest score for functionality.  

3.6 Should two or more bids be equal in all respects, the award shall be decided by the drawing of lots.

4. POINTS AWARDED FOR PRICE  

4.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS  

A maximum of 80 or 90 points is allocated for price on the following basis:

\[
Ps = 80 \left(1 - \frac{Pt - P_{\text{min}}}{P_{\text{min}}}\right) \quad \text{or} \quad Ps = 90 \left(1 - \frac{Pt - P_{\text{min}}}{P_{\text{min}}}\right)
\]

Where  

Ps = Points scored for comparative price of bid under consideration  

Pt = Comparative price of bid under consideration  

P_{\text{min}} = Comparative price of lowest acceptable bid
5. **POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION**

5.1 In terms of Regulation 5 (2) and 6 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

<table>
<thead>
<tr>
<th>B-BBEE Status Level of Contributor</th>
<th>Number of points (90/10 system)</th>
<th>Number of points (80/20 system)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Non-compliant contributor</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

5.2 Bidders who qualify as EMEs in terms of the B-BBEE Act must submit a certificate issued by an Accounting Officer as contemplated in the CCA or a Verification Agency accredited by SANAS or a Registered Auditor. Registered auditors do not need to meet the prerequisite for IRBA's approval for the purpose of conducting verification and issuing EMEs with B-BBEE Status Level Certificates.

5.3 Bidders other than EMEs must submit their original and valid B-BBEE status level verification certificate or a certified copy thereof, substantiating their B-BBEE rating issued by a Registered Auditor approved by IRBA or a Verification Agency accredited by SANAS.

5.4 A trust, consortium or joint venture, will qualify for points for their B-BBEE status level as a legal entity, provided that the entity submits their B-BBEE status level certificate.

5.5 A trust, consortium or joint venture will qualify for points for their B-BBEE status level as an unincorporated entity, provided that the entity submits their consolidated B-BBEE scorecard as if they were a group structure and that such a consolidated B-BBEE scorecard is prepared for every separate bid.

5.6 Tertiary institutions and public entities will be required to submit their B-BBEE status level certificates in terms of the specialized scorecard contained in the B-BBEE Codes of Good Practice.

6. **BID DECLARATION**

6.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

<table>
<thead>
<tr>
<th>6.1.2  B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 1.3.1.2 AND 5.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.2.1 B-BBEE Status Level of Contribution as reflected on the B-BBEE Certificate</td>
</tr>
<tr>
<td>6.1.2.2 Points claimed in respect of Level of Contribution (maximum of 10 or 20 points)</td>
</tr>
</tbody>
</table>

Points claimed in respect of paragraph 6.1 must be in accordance with the table reflected in paragraph 5.1 and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or an Accounting Officer as contemplated in the CCA.
### 7. SUB-CONTRACTING

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1. Will any portion of the contract be sub-contracted? <em>(Tick applicable box)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1.1. If yes, indicate:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1.1.1. what percentage of the contract will be subcontracted?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1.1.2. the name of the sub-contractor?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1.1.3. the B-BBEE status level of the sub-contractor?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1.1.4. whether the sub-contractor is an EME? <em>(Tick applicable box)</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 8. DECLARATION WITH REGARD TO COMPANY/FIRM

<table>
<thead>
<tr>
<th>Question</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Name of Company / Firm</td>
<td></td>
</tr>
<tr>
<td>8.2 VAT Registration number</td>
<td></td>
</tr>
<tr>
<td>8.3 Company Registration number</td>
<td></td>
</tr>
<tr>
<td>8.4 Type of Company / Firm <em>(Tick Applicable Box)</em></td>
<td>Partnership/Joint Venture / Consortium</td>
</tr>
<tr>
<td></td>
<td>One person business/sole propriety</td>
</tr>
<tr>
<td></td>
<td>Close corporation</td>
</tr>
<tr>
<td></td>
<td>Company</td>
</tr>
<tr>
<td></td>
<td>(Pty) Limited</td>
</tr>
<tr>
<td>8.5 Describe Principal Business Activities</td>
<td></td>
</tr>
<tr>
<td>8.6 Company Classification <em>(Tick Applicable Box)</em></td>
<td>Manufacturer</td>
</tr>
<tr>
<td></td>
<td>Supplier</td>
</tr>
<tr>
<td></td>
<td>Professional Service Provider</td>
</tr>
<tr>
<td></td>
<td>Other service providers, eg transporter</td>
</tr>
<tr>
<td>8.7 TOTAL NUMBER OF YEARS THE ENTERPRISE HAS BEEN IN BUSINESS</td>
<td></td>
</tr>
</tbody>
</table>
## 9. DECLARATION

I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contribution indicated in paragraph 7 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

(i) The information furnished is true and correct;
(ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form.
(iii) In the event of a contract being awarded as a result of points claimed as shown in paragraph 7, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;
(iv) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
   (a) disqualify the person from the bidding process;
   (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
   (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation
   (d) restrict the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
   (e) forward the matter for criminal prosecution

<table>
<thead>
<tr>
<th>NAME OF BIDDER</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNATURE</td>
<td></td>
</tr>
<tr>
<td>WITNESS 1</td>
<td>WITNESS 2</td>
</tr>
<tr>
<td>WITNESS 1</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>DATE</td>
</tr>
</tbody>
</table>
NAME OF THE BIDDER: __________________________________________________________

FURTHER DETAILS OF THE BIDDER’S; Director / Shareholder / Partners, etc:

<table>
<thead>
<tr>
<th>Director / Shareholder / partner</th>
<th>Physical address of the Business</th>
<th>Municipal Account number(s)</th>
<th>Physical residential address of the Director / shareholder / partner</th>
<th>Municipal Account number(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NB: Please attach certified copy (ies) of ID document(s)

I, ___________________________________________________________, certify that the information furnished on this declaration form is correct and that I / we have no undisputed commitments for municipal services towards a municipality in respect of which payment is overdue for more than 90 days.

If the value of the transaction is expected to exceed R10 million (VAT included) I certify that the bidder has no undisputed commitments for municipal services towards a Municipality in respect of which payment is overdue for more than 30 days;

THUS DONE AND SIGNED for and on behalf of the Bidder, at ____________________________, on the ___________ ___________ day of __________________________ 20______.

Number of sheets appended by the tenderer to this schedule (If nil, enter NIL)

SIGNATURE: ____________________________  NAME (PRINT): ____________________________

CAPACITY: ____________________________  NAME OF FIRM: ____________________________

For office use (comments): ____________________________________________________________
KNYSNA MUNICIPALITY
RFQ 474/2017/18
KNYSNA BHE8 - MOTOR CONTROL KIOSK

SECTION C: CONTRACT

<table>
<thead>
<tr>
<th>C1</th>
<th>Agreement and Contract Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>Pricing Data</td>
</tr>
<tr>
<td>C3</td>
<td>Scope of Works</td>
</tr>
<tr>
<td>C4</td>
<td>Site Information</td>
</tr>
</tbody>
</table>
A. OFFER

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the KNYSNA BHE8 – MOTOR CONTROL KIOSK.

The Bidder, identified in the offer signature block below, has examined the documents listed in the tender data and addenda thereto as listed in the returnable schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the Bidder, deemed to be duly authorised, signing this part of this form of offer and acceptance, the Bidder offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract identified in the Contract Data. The offered total of the prices inclusive of Value Added Tax is:

R................................... (In words.................................................................)

........................................................................................................................................

This offer may be accepted by the Employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the Bidder before the end of the period of validity stated in the Tender Data, whereupon the Bidder becomes the party named as the Contractor in the Conditions of Contract identified in the contract data.

Signature: (of person authorised to sign the tender):.................................................................

Name: (of signatory in capitals): ...............................................................................................

Capacity: (of Signatory): ........................................................................................................

Name of Bidder: (organisation):...............................................................................................
B. ACCEPTANCE

By signing this part of the form of offer and acceptance, the Employer identified below accepts the Bidder’s Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the Conditions of Contract identified in the Contract Data. Acceptance of the Bidder’s Offer shall form an agreement between the Employer and the Bidder upon the terms and conditions contained in this agreement and in the contract that is the subject of this Agreement.

The terms of the contract are contained in
Part 1 Agreement, and Contract Data, (which include this Agreement),
Part 2 Pricing Data,
Part 3 Scope of Work,
Part 4 Site Information,
and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 above.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto listed in the tender schedules as well as any changes to the terms of the Offer agreed by the Bidder and the Employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this Agreement. No amendments to or deviations from said documents are valid unless contained in this schedule, which must be duly signed by the authorised representatives of both parties.

The Bidder shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the Employer’s agent (whose details are given in the Contract Data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the Conditions of Contract identified in the Contract Data, at, or just after, the date this Agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this Agreement.

Notwithstanding anything contained herein, this Agreement comes into effect on the date when the Bidder receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the Bidder (now Contractor) within five days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this Agreement shall constitute a binding contract between the parties.

Signature: ..........................................................................................................

Name: (in capitals) ..........................................................................................................

Capacity: ..........................................................................................................

Name of Employer: (organisation) ..................................................................................

Address: ..........................................................................................................

Witness:
Signature: ..........................................................................................................

Name: (in capitals): .......................................................... Date: ..............................
C. SCHEDULE OF DEVIATIONS

Notes:
1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Tender Data and the Conditions of Tender,
2. A Bidder’s covering letter will not necessarily be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of offer and acceptance, the outcome of such agreement shall be recorded here,
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the parties becomes an obligation of the contract shall also be recorded here,
4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract,

1. Subject: ........................................................................................................................................
   Details: ........................................................................................................................................
   ........................................................................................................................................

2. Subject: ........................................................................................................................................
   Details: ........................................................................................................................................
   ........................................................................................................................................

3. Subject: ........................................................................................................................................
   Details: ........................................................................................................................................
   ........................................................................................................................................

4. Subject: ........................................................................................................................................
   Details: ........................................................................................................................................
   ........................................................................................................................................

By the duly authorised representatives signing this Schedule of Deviations, the Employer and the Bidder agree to and accept the foregoing Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, as well as any confirmation, clarification or change to the terms of the offer agreed by the Bidder and the Employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the Bidder of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this Agreement.
FOR THE BIDDER
Signature: 
Name: 
Capacity: 
Bidder (name and address of organisation): 
Witness: 

FOR THE EMPLOYER
Signature: 
Name: 
Capacity: 
Bidder (name and address of organisation): 
Witness:

Signature: 
Name: 
Date:
C.1.2 CONTRACT DATA

Part 1: Contract Data Provided by the Employer

The Conditions of Contract are the General Conditions of Contract for Construction Works (GCC 2015). Copies of these conditions of contract may be obtained from the South African Institution of Civil Engineering (tel 011 805 5947) or the South African Association of Consulting Engineers (tel 011 463 2022). A copy of the above-mentioned General Conditions of Contract may be inspected at the offices of the Employer’s Agent. Bidders shall however obtain copies for their own use.

**CONTRACT-SPECIFIC DATA**

The following contract-specific data, referring to the General Conditions of Contract, are applicable to this Contract:

**Compulsory Data:**

<table>
<thead>
<tr>
<th>Clause</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1.13</td>
<td>The Defects Liability Period is 180 days</td>
</tr>
<tr>
<td>1.1.1.14</td>
<td>The time for achieving Practical Completion is 2 weeks from the Commencement Date.</td>
</tr>
<tr>
<td>1.1.1.15</td>
<td>The name of the Employer is Knysna Municipality</td>
</tr>
<tr>
<td>1.1.1.26</td>
<td>The Pricing Strategy of a Bill of Quantities shall apply</td>
</tr>
<tr>
<td>1.2.1.2</td>
<td>The address of the Employer is:</td>
</tr>
</tbody>
</table>
| | Physical address: 5 Church Street  
| | Knysna  
| | 6570  
| | Postal address: P O Box 21  
| | Knysna  
| | 6570  
| | e-mail address: sfourie@knysna.gov.za  
| | Contact numbers: Corporate: +27 (0) 44 302 6300  
| | Direct: +27 (0) 44 302 6328 |
| 1.1.1.16 | The name of the Engineer is: Royal HaskoningDHV |
| 1.2.1.2 | The address of the Engineer is: |
| | Physical address: Suite 101, Bloemhof Building  
| | 65 York Street  
| | George  
| | 6530  
| | Postal address: P O Box 434  
| | George  
| | 6530  
| | e-mail address: george@rhdhv.co.za  
| | Contact numbers: Direct: +27 (0) 44 802 0600 |
| 6.10.1.5 | The percentage advance on materials not yet built into the Permanent Works is 80%. |
| 6.10.3 | The limit of retention money is 10%. |
C.1.2 CONTRACT DATA

Part 2: Data provided by the Contractor

THE CONTRACTOR IS ADVISED TO READ THE GENERAL CONDITIONS OF CONTRACT, AS SPECIFIED IN PART 1, IN ORDER TO UNDERSTAND THE IMPLICATIONS OF THIS DATA WHICH IS REQUIRED TO BE COMPLETED.

Each item of data given below is cross-referenced to the clause in the Conditions of Contract to which it mainly applies.

<table>
<thead>
<tr>
<th>Clause</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.1.9</td>
<td>The Name of the Contractor is ..........................................................</td>
</tr>
<tr>
<td>1.2.1.2</td>
<td>The address of the Contractor is:</td>
</tr>
<tr>
<td></td>
<td>Physical address: ..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>Postal address: ..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>..........................................................</td>
</tr>
<tr>
<td></td>
<td>e-mail address: ..........................................................</td>
</tr>
<tr>
<td></td>
<td>Contact numbers: Corporate: ..........................................................</td>
</tr>
<tr>
<td></td>
<td>Direct: ..........................................................</td>
</tr>
<tr>
<td></td>
<td>Mobile: ..........................................................</td>
</tr>
<tr>
<td>6.2.1</td>
<td>The security to be provided by the Contractor shall be one of the following:</td>
</tr>
<tr>
<td></td>
<td>Type of security (with Value Added Tax excluded from the Contract Sum and from the value of the Works for calculating the percentages)</td>
</tr>
<tr>
<td></td>
<td>Retention of 10% of the value of the Works.</td>
</tr>
<tr>
<td>6.8.2</td>
<td>Contract price adjustment will NOT apply to this contract</td>
</tr>
</tbody>
</table>
The variation in cost of special materials is

<table>
<thead>
<tr>
<th>Type of special material</th>
<th>Unit</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C2 PRICING DATA

C2.1 PRICING INSTRUCTIONS

C2.1.1 GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents, which include the Tender Data, Contract Data, the Scope of Work (including the Project and Particular Specification) and the Drawings.

C2.1.2 DESCRIPTION OF ITEMS IN THE SCHEDULE

The Bill of Quantities has been drawn up generally in accordance with Civil Engineering Quantities 1990 issued by the SA Institution of Civil Engineers.

The short descriptions of the items in the Bill of Quantities are for identification purposes only and the measurement and payment clause of the Standardised Specifications and the Particular Specifications, read together with the relevant clauses of the Project Specification and directives on the drawings, set out what ancillary or associated work and activities are included in the rates for the operations specified.

C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE

All quantities given in the Bill of Quantities are provisional whether so marked as such or not, and are subject to re-measurement during the execution of the work. The Contractor shall obtain the Engineer's detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Specifications and Project Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

C2.1.4 PROVISIONAL SUMS

Where Provisional sums or Prime Cost sums are provided for items in the Bill of Quantities, payment for the work done under such items will be made in accordance with Clause 6.6 of the General Conditions of Contract 2015. The Employer reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract.

The Tenderer shall not under any circumstances whatsoever delete or amend any of the sums inserted in the "Amount" column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorised in writing by the Employer before the closing of tenders. Any unauthorised changes made by the Tenderer to provisional items in the schedule, or to the provisional percentages and sums in the Summary of the Bill of Quantities, will be treated as arithmetical errors.

C2.1.5 PRICING OF THE BILL OF QUANTITIES

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and shown on the drawings, the construction of temporary works as and when required as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.
Although the Tenderer is at liberty to insert a rate of his own choosing for each item in the Bill of Quantities, his attention is drawn to the fact that the Contractor has the right, under various circumstances, to payment for additional works carried out and that the Engineer is obliged to base his assessment of the payment to be paid for such additional work on the rates inserted in the Bill by the Contractor.

Each item shall be priced and extended to the "Total" column by the Tenderer, with the exception of the items for which only rates are required, or items which already have Prime Cost or Provisional Sums affixed thereto. If the Contractor omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

The Tenderer shall fill in rates for all items where the words "rate only" appear in the "Total" column. "Rate Only" items have been included where:

(a) an alternative item or material is contemplated;
(b) variations of specified components in the make-up of a pay item may be expected; and
(c) no work under the item is foreseen at tender stage but the possibility that such work may be required is not excluded.

For “Rate Only” items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

All rates and amounts quoted in the Bill of Quantities shall be in rands and cents and shall include all levies and taxes (other than VAT). VAT will be added in the summary of the Bill of Quantities.

A price or rate is to be entered, in NON ERASABLE BLACK INK, against each item in the Bill of Quantities.

C2.1.6 CORRECTION OF ENTRIES

Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialled by the Tenderer.

C2.1.7 ARITHMETICAL ERRORS

Arithmetical errors found in the Bill of Quantities as a result of faulty multiplication or addition, will be corrected by the Engineer at the tender evaluation stage, as set out in the Tender Data.

C2.1.8 MONTHLY PAYMENTS

Unless otherwise specified in the Specifications and Project Specifications, progress payments in Interim Certificates, referred to in Clause 6.10 of the General Conditions of Contract 2015, in respect of "sum" items in the Bill of Quantities shall be by means of interim progress instalments assessed by the Engineer and based on the measure in which the work actually carried out relates to the extent of the work to be done by the Contractor.
C2.1.9 UNITS OF MEASUREMENT

The units of measurement described in the Bill of Quantities are metric units for which the standard international abbreviations are used. Non-standard abbreviations, which may appear in the Bill of Quantities, are as follows:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>asbestos-cement</td>
</tr>
<tr>
<td>b</td>
<td>barrel</td>
</tr>
<tr>
<td>Br</td>
<td>branch</td>
</tr>
<tr>
<td>BSP</td>
<td>British standard pipe</td>
</tr>
<tr>
<td>c</td>
<td>centre</td>
</tr>
<tr>
<td>c/f</td>
<td>centre to face</td>
</tr>
<tr>
<td>CI</td>
<td>cast iron</td>
</tr>
<tr>
<td>CID</td>
<td>constant internal diameter</td>
</tr>
<tr>
<td>CISC</td>
<td>cast iron short collar</td>
</tr>
<tr>
<td>COD</td>
<td>constant outer diameter</td>
</tr>
<tr>
<td>FBE</td>
<td>flanged both ends</td>
</tr>
<tr>
<td>dia</td>
<td>diameter</td>
</tr>
<tr>
<td>DN</td>
<td>nominal diameter</td>
</tr>
<tr>
<td>EO</td>
<td>extra over</td>
</tr>
<tr>
<td>FA</td>
<td>flange adaptor</td>
</tr>
<tr>
<td>FC</td>
<td>fibre cement</td>
</tr>
<tr>
<td>FBE</td>
<td>flanged both ends</td>
</tr>
<tr>
<td>FOE</td>
<td>flanged one end</td>
</tr>
<tr>
<td>f/f</td>
<td>face to face</td>
</tr>
<tr>
<td>fl</td>
<td>flange or flanged face</td>
</tr>
<tr>
<td>FTB</td>
<td>factory tested pressure</td>
</tr>
<tr>
<td>GMS</td>
<td>galvanised mild steel</td>
</tr>
<tr>
<td>GRP</td>
<td>glass reinforced polyester</td>
</tr>
<tr>
<td>hdg</td>
<td>heavy duty galvanised</td>
</tr>
<tr>
<td>HDPE</td>
<td>high density polyethylene</td>
</tr>
<tr>
<td>ID</td>
<td>internal diameter</td>
</tr>
<tr>
<td>Incl</td>
<td>inclusive</td>
</tr>
<tr>
<td>Incl</td>
<td>inclusive</td>
</tr>
<tr>
<td>kPa</td>
<td>kilopascal</td>
</tr>
<tr>
<td>mod</td>
<td>modified</td>
</tr>
<tr>
<td>MS</td>
<td>mild steel</td>
</tr>
<tr>
<td>No.</td>
<td>number</td>
</tr>
<tr>
<td>nom</td>
<td>nominal bore</td>
</tr>
<tr>
<td>OD</td>
<td>outside diameter</td>
</tr>
<tr>
<td>%</td>
<td>percent</td>
</tr>
<tr>
<td>PC sum</td>
<td>prime cost sum</td>
</tr>
<tr>
<td>pe</td>
<td>plain-ended to suit joint</td>
</tr>
<tr>
<td>pe/fl</td>
<td>plain-ended and flanged</td>
</tr>
<tr>
<td>PVC</td>
<td>poly-vinyl chloride</td>
</tr>
<tr>
<td>RC</td>
<td>reinforced concrete</td>
</tr>
<tr>
<td>RO</td>
<td>rate only</td>
</tr>
<tr>
<td>scj</td>
<td>short collar joint</td>
</tr>
<tr>
<td>S/S</td>
<td>stainless steel grade 304</td>
</tr>
<tr>
<td>Sum</td>
<td>lump sum</td>
</tr>
<tr>
<td>thk</td>
<td>thick</td>
</tr>
<tr>
<td>uPVC</td>
<td>Unplasticised poly-vinyl</td>
</tr>
<tr>
<td>wt</td>
<td>wall thickness</td>
</tr>
<tr>
<td>VJ</td>
<td>Viking-Johnson type</td>
</tr>
<tr>
<td>wt</td>
<td>wall thickness</td>
</tr>
</tbody>
</table>
### C.2.2 BILL OF QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PAY. REF</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1200 A</td>
<td>SECTION 1 : PRELIMINARY AND GENERAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.3</td>
<td>FIXED-CHARGE ITEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>8.3.1</td>
<td>Contractual Requirements</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>8.3.2</td>
<td>Establish Facilities on the Site:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a) Facilities for Engineer (None)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Facilities for Contractor</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>8.3.3</td>
<td>Other fixed-charge obligations</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>8.3.4</td>
<td>Remove all Site establishment on completion</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.4</td>
<td>TIME-RELATED ITEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>8.4.1</td>
<td>Contractual Requirements</td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>8.4.2</td>
<td>Operate and maintain facilities on the Site:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>a) Facilities for Engineer for duration of construction (telephone)</td>
<td>Prov. Sum</td>
<td>1</td>
<td>1 000</td>
<td>1 000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b) Facilities for Contractor for duration of construction, except where otherwise stated</td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>8.4.3</td>
<td>Supervision</td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>8.4.4</td>
<td>Company and head office overhead costs</td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td></td>
<td>Other time-related obligations (provide details):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9.1</td>
<td></td>
<td></td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9.2</td>
<td></td>
<td></td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9.3</td>
<td></td>
<td></td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9.4</td>
<td></td>
<td></td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9.5</td>
<td></td>
<td></td>
<td>Month</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.8</td>
<td></td>
<td>TEMPORARY WORKS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>8.8.4</td>
<td>Excavate by hand in soft material to expose existing services in a careful manner</td>
<td>m³</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(c)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>OTHER ITEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>A5.3</td>
<td>Operation and Maintenance manuals, including all equipment details, diagrams, cable routes and</td>
<td>Sum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.11</td>
<td>A5.4</td>
<td>On-site training</td>
<td>Days</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION 1 TOTAL CARRIED FORWARD TO SUMMARY
<table>
<thead>
<tr>
<th>ITEM</th>
<th>PAY. REF</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>RATE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>D3</td>
<td><strong>Arrangements with local authority</strong>&lt;br&gt;Arrangements for the electrical connection to the bulk supply including all fees and meters required.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td></td>
<td>15kW - 25A 3Phase</td>
<td>No.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
<td>Not used</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A6</td>
<td><strong>Testing, Certification and Record Drawings</strong>&lt;br&gt;Testing, Certification and Record Drawings as per statutory regulations, local authority and client specification per pumpset installation</td>
<td>No.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>A9</td>
<td><strong>Pump Control Kiosk</strong>&lt;br&gt;Complete including all distribution, control and supply equipment with wiring as per MD1870-E-201, and specifications</td>
<td>No.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td></td>
<td>15kW</td>
<td>No.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td><strong>Pump Protection Equipment</strong>&lt;br&gt;No-Flow Switch</td>
<td>No.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>A9.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Pressure Switch</td>
<td>No.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Control Cable: 600/1000V 1mm² 3Core flexible cord</td>
<td>m</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Cable Termination for control cable</td>
<td>No.</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>IP65 Outdoor 2 Way junction box with glands, terminals and mounting bracket</td>
<td>No.</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Cable: 600/1000V CU/PVC/PVC/SWA/PVC 1.5mm² x 4Core</td>
<td>m</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Cable Termination with Gland: 600/1000V CU/PVC/PVC/SWA/PVC 1.5mm² x 4Core</td>
<td>No.</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td><strong>Pump Control</strong>&lt;br&gt;Spectrum wireless radio control and monitoring, including 4x DI and 4x DO for interface to the pump Soft Starter.&lt;br&gt;Software integration of the BHE8 system to the existing Knysna Water Works network.&lt;br&gt;On Site Commissioning of the wireless radio system.</td>
<td>No.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.12</td>
<td>A9.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**AMOUNT CARRIED FORWARD**
<table>
<thead>
<tr>
<th>AMOUNT BROUGHT FORWARD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A10</strong> 600/1000V Cables: CU/PVC/PVC/SWA/PVC</td>
</tr>
<tr>
<td><strong>2.15</strong> 25mm² x 4 Core</td>
</tr>
<tr>
<td><strong>A10</strong> SWA Cable Terminations Including Glands</td>
</tr>
<tr>
<td><strong>2.16</strong> 25mm² x 4 Core</td>
</tr>
<tr>
<td><strong>Submersible cable Terminations</strong> Including Glands</td>
</tr>
<tr>
<td><strong>2.17</strong> A10 16mm² x 4 Core</td>
</tr>
<tr>
<td><strong>A11</strong> Excavations for Cables</td>
</tr>
<tr>
<td><strong>2.18</strong> Excavation in Hard Material</td>
</tr>
<tr>
<td><strong>2.19</strong> Excavation in Intermediate Material</td>
</tr>
<tr>
<td><strong>2.20</strong> Excavation in Soft Material</td>
</tr>
<tr>
<td><strong>2.21</strong> Bedding and backfill</td>
</tr>
<tr>
<td><strong>2.22</strong> Plastic Warning/Danger Tape</td>
</tr>
<tr>
<td><strong>A12</strong> Copper Earth Conductors installed with SWA Cables</td>
</tr>
<tr>
<td><strong>2.23</strong> 4mm² (Terminations &amp; Glands Included)</td>
</tr>
<tr>
<td><strong>A12</strong> Earthing of Control Kiosk</td>
</tr>
<tr>
<td><strong>2.24</strong> 1 x 2m earth rods installed vertically 300mm below ground level at the front corners of the kiosk. 16mm² BCEW is then to be attached by means of clamps to the end of the rods, and connected to the Kiosk Earth Bar.</td>
</tr>
<tr>
<td><strong>Provisional Sums</strong></td>
</tr>
<tr>
<td><strong>2.25</strong> Allow provisional sum for alterations to civil works</td>
</tr>
<tr>
<td><strong>Additional items deemed necessary by the contractor (provide details)</strong></td>
</tr>
<tr>
<td><strong>2.26</strong></td>
</tr>
<tr>
<td><strong>2.27</strong></td>
</tr>
</tbody>
</table>

SECTION 2 TOTAL CARRIED FORWARD TO SUMMARY
### SUMMARY OF BILL OF QUANTITIES

<table>
<thead>
<tr>
<th>SECTION</th>
<th>DESCRIPTION</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PRELIMINARY AND GENERAL</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>ELECTRICAL AND CONTROL EQUIPMENT</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL OF SCHEDULE OF QUANTITIES**

<table>
<thead>
<tr>
<th>CONTINGENCIES</th>
<th>10%</th>
</tr>
</thead>
</table>

**TOTAL (Excluding VAT)**

<table>
<thead>
<tr>
<th>ADD VAT</th>
<th>14%</th>
</tr>
</thead>
</table>

**TOTAL (Including VAT)**

**CARRIED FORWARD TO OFFER AND FRONT PAGE**
C3  SCOPE OF WORK
C3.1  DESCRIPTION OF THE WORKS
C3.1.1  EMPLOYERS OBJECTIVES

C3.1.1.1  BACKGROUND
As part of the short term water augmentation project, the Knysna Local Municipality (KLM) plans to abstract water from various water sources, including groundwater and springs.

This contract is for the electrical motor control kiosk required for the borehole (BHE8) part of the project, which consists of a new pump installed at an existing borehole, the associated power supply, and pipework and rising main pipeline to deliver the water.

C3.1.1.2  CONTRACT STRUCTURE
This enquiry calls for a contract with pricing data that allows for the electrical works for the new borehole BHE8 project.

The Contractor will be required to liaise, and to co-ordinate activities on site, with other contractors (civil and mechanical) where necessary.

The scope of works is as described in this document and the attached schedule of quantities, with reference to the specifications that follow.

C3.1.2  SCOPE OF CONTRACT
The scope of the contract includes, but is not limited to the following work at the KNYSNA BHE8:

- Supply and installation of new low voltage (400V) motor control kiosk for the submersible pump;
- Connection to the new bulk power supply, including liaison with the municipality and the bulk power supply contractor;
- Low Voltage power cables, and cable support systems;
- Cable trenching, cable ducts, earthing, bonding and associated work;
- Testing, commissioning, and training, and supply of operation and maintenance manuals;

Further details are provided in the Detailed Electrical specification.

C3.1.3  LOCATION OF THE WORKS
The location of the KNYSNA BHE8 is indicated on the attached locality plan, MD1870-C-100. Works will be at the KNYSNA BHE8.

C3.1.4  TEMPORARY WORKS
The Contractor shall provide all the necessary temporary works.
C3.2 ENGINEERING

C3.2.1 EMPLOYER’S DESIGN

The Engineer is responsible for the conceptual design of the Works as set out on the attached drawings, specifications and bill/s of quantities.

C3.2.2 DESIGN BRIEF

The Contractor shall be responsible for the detailed design of the electrical and control equipment, and all temporary works, i.e. access if required by the Contractor to suit his construction equipment, temporary fencing, etc.

C3.2.3 DRAWINGS

The drawing and information issued to tenderers as part of the enquiry documents must be regarded as provisional and preliminary for the tenderer’s benefit to generally assess the scope of work.

The work shall be carried out in accordance with the latest information issued for construction.

Drawings issued separately are listed hereafter.

<table>
<thead>
<tr>
<th>Drawing No.</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD1870-C-100</td>
<td>BHE8 AND RISING MAIN LAYOUT</td>
</tr>
<tr>
<td>MD1870-E-201</td>
<td>BHE8 SINGLE LINE DIAGRAM</td>
</tr>
<tr>
<td>MD1870-E-002</td>
<td>TYPICAL KIOSK INSTALLATION LOCATION</td>
</tr>
<tr>
<td>MD1870-E-003</td>
<td>TYPICAL KIOSK DESIGN &amp; LAYOUT</td>
</tr>
<tr>
<td>MD1870-E-004</td>
<td>TYPICAL TRENCH DETAIL</td>
</tr>
</tbody>
</table>
C3.3 CONSTRUCTION
C3.3.1 WORKS SPECIFICATIONS

C3.3.1.1 APPLICABLE STANDARDS

The electrical portion of the Works shall comply with the Standard Specification for Electrical Installations available on request, but as varied by the Detailed Electrical Specification provided below. References in the Standard Specifications to "Project Specification" shall be read as referring to this Detailed Electrical Specification.

For an electronic copy of the Standard Specification, please contact the Engineer / Employer’s Agent.

C3.3.1.2 CERTIFICATION BY RECOGNISED BODIES

Wherever possible items and materials for construction of the works shall comply with the relevant South African Bureau of Standards Specifications and with the British Standards where these are applicable in the absence of local standards.

The Contractor, when using materials conforming to a Standard Specification shall if called upon furnish the Engineer with certificates of tests showing that the materials do so conform.

C3.3.2 DETAILED SPECIFICATIONS

PART A : ELECTRICAL SPECIFICATIONS: DETAILED
PART A : ELECTRICAL SPECIFICATIONS: DETAILED

A1. SCOPE OF WORKS

The scope of works for the electrical installation is the design, supply, delivery, installation, testing, commissioning and upholding during the trial operation period and the defects notification period of the following equipment and materials:

a) A new low voltage (400V) motor control kiosk for the new submersible pump at the KNYSNA BHE8;

b) Connection to the new bulk power supply, including liaison with the bulk electrical contractor;

c) Low Voltage power cables;

d) Cable support systems;

e) Ground cable trenching (including danger tape and backfilling);

f) Sealing of cable ducts after all cables have been installed;

g) Earthing continuity and bonding conductors and associated equipment;

h) Testing and commissioning of all electrical equipment;

i) Training of local operator/municipal staff members in the operational and maintenance of the new electrical equipment;

j) Operation and maintenance manuals

The electrical portion of the Works shall comply with the Standard Specification for Electrical Installations available on request, but as varied by this Detailed Electrical Specification. References in the Standard Specifications to "Project Specification" shall be read as referring to this Detailed Electrical Specification.

The Contractor shall also liaise with the mechanical and civil work contractors where necessary.

A2. PROGRAMME

It shall be noted that the installation of the new electrical equipment shall happen in parallel with the bulk power supply, the mechanical and the civil works. A detailed project programme showing designs and documentation submissions, delivery periods, factory testing/inspections and planned installation for all electrical equipment shall be submitted to the Engineer after the contract has been awarded. This will be used as the baseline programme.

A3. ELECTRICITY SUPPLY

There is a new bulk supply to be installed, from the existing Glebe Dam powerline, to the BHE8 site. The new 400V, 3 phase, 50 Hz 80A bulk power supply will terminate at the borehole site, and is be connected to the kiosk supplied under this (BHE8 motor control kiosk) contract. The kiosk is to be connected to the new 15kW submersible borehole pump. The Contractor is to liaise with the bulk electrical supply contractor to check interface and termination details, as well as with the mechanical work contractor where necessary.

A4. BUILDER'S WORK
The contract includes all ground trenching associated with the installation of new cables and other electrical equipment. The Contractor shall seal all used and spare cable ducts with expanding foam upon completion of his cabling work to prevent water and vermin ingress.

The contract also includes a provisional sum for alterations to civil works where additional penetrations or concrete works that may be required.

### A5. DRAWINGS, MANUALS, TRAINING, SPARES AND TOOLS

#### A5.1 Design Data Pack

The Contractor shall produce and submit an Electrical Design data pack for approval by the Engineer within one (1) week after award of contract and before procurement of any equipment. The data pack shall include more details about the equipment to be supplied and installed than what has been provided in the Technical Data during tender stage.

The Contractor shall also submit the following design documents/drawings as part of the contractual deliverables. All documents and drawings must be approved by the Engineer prior to ordering of any equipment:

- Kiosk starter schematics shall be submitted for approval before the final sets of schematics are produced.
- Cable schedules for all cables (LV power, control stations) for each kiosk, switchboard etc.
- Site trenching route that indicates the details of the cables that will be installed in the various sections of the ground trenching.
- Manufacturing drawings of all equipment including final equipment layouts showing how equipment will be installed.

Please note that the items in the Bill are an allowance only and that the final ordering of materials shall only be done after the schedules/drawings have been approved by the Engineer.

#### A5.2 Drawings

The following lists the Engineer's drawings that form part of the Specification and the drawings that must be submitted by the Contractor.

<table>
<thead>
<tr>
<th>DRAWING NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD1870-C-100</td>
<td>BHE8 AND RISING MAIN LAYOUT</td>
</tr>
<tr>
<td>MD1870-E-201</td>
<td>BHE8 SINGLE LINE DIAGRAM</td>
</tr>
<tr>
<td>MD1870-E-002</td>
<td>TYPICAL KIOSK INSTALLATION LOCATION</td>
</tr>
<tr>
<td>MD1870-E-003</td>
<td>TYPICAL KIOSK DESIGN &amp; LAYOUT</td>
</tr>
<tr>
<td>MD1870-E-004</td>
<td>TYPICAL TRENCH DETAIL</td>
</tr>
</tbody>
</table>

The Contractor shall submit manufacturing drawings to the Engineer for approval for all equipment. For all manufacturing drawings the following information shall be shown:

- Project Name and Contract Number
Part C3: Scope of Work

The Contractor shall also submit electrical drawings for all equipment. These schematic drawings for switchboards (MCCs, DBs, field control stations, standby generators etc.), the following information shall be shown:

- Project Name and Contract Number
- Manufacturer/Supplier
- Consulting Engineer and contact person
- Client details
- Drawing Number and Revision
- Drawing to be Signed
- Revision details to be listed
- Drawing Page Number
- Drawing to be Signed

The Contractor shall also submit electrical drawings for all equipment. These schematic drawings for switchboards (MCCs, DBs, field control stations, standby generators etc.), the following information shall be shown:

- Project Name and Contract Number
- Manufacturer/Supplier
- Consulting Engineer and contact person
- Client details
- Drawing Number and Revision
- Drawing to be Signed
- Revision details to be listed
- Drawing Page Number
- Drawing to be Signed
• Reference Grid required on each schematic page
• Source of Supply – transformer name etc.
• Fault level (kA and time rating)
• Voltages for all circuit to be clearly indicated
• All devices to have reference number i.e. relays
• Equipment ratings to be given i.e. motor ratings
• All indication lamps to be labelled including required lamp colour
• Legend to be provided

It shall be noted that the Engineer requires a minimum of 7 working days for the review of drawings and documentation. In the case of the complete electrical design data pack the engineer requires at least 14 working days for the review of the complete design data pack. The contractor shall use these review durations in the programme for the engineer’s approval process.

A5.3 Operation and Maintenance Manual

Two copies of the O & M Manual shall be issued to the Engineer prior to commissioning of the Works, and the Trial Operation Period shall not commence until the manual has been issued. Before the Taking-over Certificate is issued (after the successful completion of the Trial Operational Period) three copies of the final approved version of the O & M Manual shall be issued to the Engineer.

The manual shall be of a standard acceptable to the Engineer and shall be subject to his approval. A detailed index shall be provided by the Engineer which shall then be populated by the Contractor. Binders with hard plastic covers and four-ring spring clip holders shall be used. Binders shall not be over-filled to allow use without damage to the contents. A spare binder shall be provided for every three used, marked with the contract information.

Title labels which include contract number, title, location, Contractor's name as well as the plant or process description together with volume number and contents shall be fixed on the front as well as the spine of the binders.

Manuals shall be in English only, with sections of equipment arranged by labelled dividing separator sheets. Where standard literature is obtained from suppliers or manufacturers, this shall be neatly photocopied in A4 size, with the applicable sections clearly marked, omitting duplicate sections in languages other than English.

At least one (or one set) shall contain original documents.

In addition comprehensive indexes shall be included, with separate sections (with their own index) where required, as follows:

• Details of the electrical equipment supplied including the name and address of the supplier, and descriptive and technical literature, giving performance and service information.
• Full details of control and protection systems including logic sequence charts, logic controller programs, trip settings, etc.
• Circuit diagrams.
• Dimensioned panel layout drawings.
• Cable schedules for power and instrumentation cables. This shall include the cable type, start and finish points, route length, duty load, size, voltage drop, number of cores, number of cores
used and gland size.

- Record (as-built) drawings referenced to the above. As-built drawings shall be provided by the contractor. Cable routes to be surveyed on layout drawings.
- A list of spares, tools and testing equipment supplied under this contract. The spares list shall be split into commissioning spares, critical spares and maintenance spares. The spares lists shall also include base date costs and contact details of the suppliers where the spares can be procured from.
- A comprehensive schedule of routine maintenance by time period for the system as installed.
- All completed factory and site test certificates/commissioning sheets for the works. This shall include a commissioning sheet for every starter (a template shall be provided by the Engineer).

A5.4 Training

The Contractor shall provide on-site training for up to three nominated local operator/Municipal technical staff in the operation and maintenance of the equipment provided under this Contract.

The training shall be provided by way of formal training sessions by the equipment suppliers, who shall certify that the training has been completed satisfactorily.

During the commissioning of the works the Contractor shall train the Municipal operating staff responsible for running the works in the operation of the works. The Contractor shall check the knowledge/competence of the operating staff whom have been trained by way of practical tests.

Training shall at least cover the following items:

- Operation of the pumping equipment and process.
- Basic operation & settings of the Soft Starter.
- Field instruments

A5.5 Spares and Tools

Spares and tools shall be provided as called for in the particular equipment specifications in this Specification.

In addition to any spares specifically called for in this Specification, the Tenderer shall recommend any additional spares which he considers the Municipality should hold. The prices of these spares must not be included in the tender price. Prices for these spares shall be submitted prior to commissioning and shall include delivery to and off loading at the site. Items may be ordered in full or in part before the end of the maintenance period.

A6. INSPECTIONS, TESTS AND COMMISSIONING

For equipment being manufactured in South Africa, the Engineer and a Municipal representative will have the opportunity to attend one factory inspection. It is the responsibility of the contractor to complete the quality control procedure at the panel manufacturers premises. This QCP document along with detailed photos is to be sent to the Engineer and the Municipal representative prior to the request for the factory inspection being sent to the Engineer and the Municipal representative. The Engineer and/or the Municipal representative shall have the opportunity to attend the factory inspection.
For all the inspections and tests the Contractor shall notify the Engineer in writing at least 2 weeks in advance, when his presence will be required for inspections or witnessing of tests. This time is required for the Engineer and the Municipal representative to make the required travel arrangements and for them to plan accordingly. In the event that tests fail, the Contractor shall be required to affect all corrections and perform such tests again. Should these tests require the Engineer to be present again, the Engineer's cost for time, travel and disbursements shall be recovered from the Contractor at rates as set out by the Engineering Council of South Africa.

A6.1 Inspections

(a) All items shall be inspected by means of detailed design drawings and equipment schedules that are submitted to the Engineer for approval. No items shall be procured/ordered prior to the Engineer’s approval of the selected equipment and design drawings. If any equipment does not meet the specifications the Contractor shall change the equipment to comply with the specification at no additional cost to the Municipality.

(b) The Contractor shall submit a quality control plan and procedures document for all main equipment. These documents shall include baseline delivery dates for checking by the Engineer.

(c) For all inspections the Contractor shall notify the Engineer in writing at least 2 weeks in advance, when his presence will be required for inspections or witnessing of tests.

(d) All cable trenches shall be inspected by the Engineer’s representative prior to cables being laid, and after cables have been laid, prior to backfilling.

(e) For all equipment being manufactured in South Africa the Engineer or a Municipal representative will attend one factory inspection. This will include physical inspections and all functional testing of Kiosk, distribution boards etc. The cost for this shall be included in the FAT price in the Bill. If test fail the Contract shall be responsible for all remedial actions to make good the failure at his own cost and should the Engineer be required to re-inspect and or re-witness such re-testing, the Engineer’s time and travel costs shall be for the Contractor’s account.

(f) All switchboards and control panels shall be subject to inspection by the Engineer during manufacture at the following holding points prior to delivery to Site:
   - Switchboard designs (review of drawings and schedules)
   - Optional Factory Acceptance Test – depending on QCP documents issued by the contractor. Approval / written consent shall be required from the Engineer prior to the Kiosk leaving the manufacturers premisis.

A6.2 Tests

The Contractor shall carry out quality control tests in his factory and on site which will be recorded, all records shall be issued to the Engineer and a Municipal representative. A request for the Engineer and the Municipal representative is to be sent 2 weeks prior to the inspections being conducted.

Factory and site testing shall be carried out in accordance with the particular equipment and material specifications in this Specification as well as the Contractor’s manufacturing Quality Assurance system. Copies of and test certificates and quality assurance records shall be submitted to the Engineer.

The cost of all factory routine and type tests (where existing certification is not available) shall be included in the supply prices for the equipment.
The tests listed below shall be carried out in the factory (FAT) and on site (SAT) by the Contractor and witnessed by the Engineer and a representative of the Employer.

In addition to the routine testing the following test shall be conducted:

A6.2.1  **LV Cables**
- insulation resistance test (after jointing and termination)
- phase rotation test (after jointing and termination)

A6.2.2  **Earthing**
- earth electrode resistance measurements
- bonding conductor continuity tests

A6.2.3  **LV Kiosk’s and Distribution Boards**
- Visual checks (including paintwork)
- Impedance measurements
- Insulation resistance measurement
- Proving of protection scheme and settings
- Circuit breaker operational tests
- Control scheme tests
- Load testing (site only)

A7.  **MATERIALS, FINISHING AND PAINTING OF MATERIALS AND EQUIPMENT**

A7.1  **Materials**
The following materials shall be used as tabulated below.

<table>
<thead>
<tr>
<th>MCCs/ Distribution boards &amp; Kiosks</th>
<th>3CR12, powder coated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Busbars/ Earth Bars</td>
<td>Copper</td>
</tr>
<tr>
<td>Cable supports/ Unistrut</td>
<td>316L Stainless steel</td>
</tr>
<tr>
<td>Fixings, nuts and bolts</td>
<td>316L Stainless steel</td>
</tr>
</tbody>
</table>

Please note that where a specific material is specified for the manufacturing of an item it means that all components of the equipment must be manufactured from the specified material. An example is the Kiosk. The Kiosk shall fully be manufactured from 3CR12; this includes all gland plates, plinths etc. No galvanised material will be allowed in the Kiosk.

The cutting and drilling of gland plates and other steelworks shall be done in the factory. No cutting and drilling shall be on site without the approval of the Engineer.

Hot-dip galvanized material is allowable only where specifically stated in this Detailed Electrical Specification. No zinc or electroplated material will be allowed.

Glass fibre switchboards or switchboards manufactured of other composite materials will not be accepted.

A7.2  **Finishing and Painting**
All material shall be degreased, with any sheared edges, welds or surfaces subjected to any form of heat treatment pickled and passivated. If there is any mill scale on the material, the 3CR12 shall be non-metallic blast cleaned to SA2½, prior to degreasing.

A primer coat of Strontium Chromate Epoxy Primer or approved alternative shall be applied to a minimum dry film thickness (DFT) of 30 µm. A final coat of Epoxy / Polyester powder coating shall be applied by electrostatic spray and baked in accordance with the manufacturer’s specification.

This final coat shall be in the colour as specified, with a minimum DFT of 50 µm, but not more than 100 µm.

The suppliers or manufacturers shall furnish paint thickness test certificates for all materials that are epoxy powder coated.

All galvanizing shall be hot-dip zinc galvanized coating done in accordance with SANS 121.

The hot-dip galvanizers shall be permit holders in terms of the SABS Mark Scheme.

The MCC shall be painted as follows:

<table>
<thead>
<tr>
<th>Kiosk Assembly frames</th>
<th>Avocado Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kiosk Inside assembly cubicles</td>
<td>White</td>
</tr>
<tr>
<td>Kiosk Cubicle backplates</td>
<td>White</td>
</tr>
<tr>
<td>Kiosk Assembly plinth</td>
<td>Black</td>
</tr>
</tbody>
</table>

A8. FIXING OF MATERIALS

All fasteners shall be 316 stainless steel. No galvanised, electro-plated, brass or zinc plated fasteners will be allowed.

Fixing to structures and concrete shall be effected by 316 stainless steel bolts and nuts, or 316 stainless steel threaded rod used in conjunction with an approved chemical anchor.

Where there is a possibility of electro-galvanic reaction (e.g. between stainless steel and galvanizing) the Contractor shall make use of suitable insulating washers of rubber, teflon or similar material. Insulating paint will not be acceptable.

The pricing of all equipment (such as cable supports) shall include the necessary fixing bolts/ nuts etc. No additional funds will be approved for fixing materials.

A9. LV MOTOR CONTROL KIOSK

A9.1 General

The Kiosk included in this contract is detailed in this section, the switchboard matrix and on the drawings as listed in section A5. The following Kiosk shall be manufactured as part of this contract

- BHE8 Pump Kiosk;

The requirements for the above-mentioned Kiosk are shown in the Single Line Diagram and Typical Kiosk Design & Layout.
A9.2 Standard Specifications

The Kiosk shall comply with SANS 61439-1/2, SANS 1973-1/3 and the following Standard Specifications (available on request) as varied by this Detailed Electrical Specification:

- E204 : Enclosures for MCC
- E205 : LV switchgear and controlgear
- E206 : Busbars
- E207 : Current transformers
- E208 : LV motor protection
- E209 : Wiring in MCC
- E210 : Wiring and cable terminations
- E211 : Glands and gland plates
- E213 : Switchboard accessories
- E214 : Nameplates and labels
- E215 : Metering and indication equipment
- E218 : Circuitry
- E234 : Variable speed drives (VSDs)

A9.3 Kiosk's Construction

The Kiosk shall be constructed as per the design & layout drawing and the construction details below.

(a) The Kiosk is to be mounted outdoors and is to have a double door arrangement, where the outer door is to act as a weather barrier for the internal panel door and components within the Kiosk.

(b) The Kiosk shall be fabricated from 3CR12 sheet metal. The outer panels of the Kiosk enclosure shall have a minimum thickness of 2.0 mm and the internal separations shall have a minimum thickness of 1.6 mm.

(c) The Kiosk shall be flush fronted, i.e. the chassis of the enclosure shall be flush with the panel door.

(d) All cables will be bottom entry for the Kiosk. The Kiosk shall be equipped with a robust 3CR12 gland plate (at least 2.0 mm thick), sealing off the Kiosk at the bottom.

(e) The Kiosk shall be front access. The Kiosk internal compartments shall be equipped with hinged doors with the drive indication equipment mounted on it, secured with square key driven latches.

(f) An interlocking device shall be provided so that the inner door of a compartment cannot be opened unless the circuit breaker / isolator is in the off position, and so that the circuit breaker / isolator cannot be switched on unless the door or cover is locked.

(g) The Kiosk shall have an ingress protection rating as follows:

- IP65 with all doors closed
- IP44 with front door open
- IP2x between compartments

(h) Accessible PVC trunking shall be provided on all routes for conductors between the various components inside the cubicle as well as for bus wiring between panels. Internal wiring shall be kept separated from external wiring and as far as possible the internal serving of PVC-PVC-CPVC-SWAPVVC cables entering the switchboard/Kiosk shall be left around the conductors until the cable enters the compartment to which it is to be connected.
Soft Starters installed into the Kiosk shall be ventilated as per the OEM requirements. The Contractor shall provide details to the Engineer of how each of the Soft Starters ventilation requirements are achieved by means of extraction ventilation calculations. It is to be noted that the panel must maintain its IP65 rating.

A9.4 Switchgear and Controlgear

(a) The motor ratings given on the single line diagram are the Engineer’s estimates, which have been used for systems design purposes. Should the ratings of motors offered in the Tender differ from the Engineer’s estimates, then the switchgear and controlgear shall be suitably sized accordingly. No additional funds will be made available for varied motor sizes after the Tender stage and the Tenderer shall be responsible for sizing and pricing the suitable switchgear. Where motors in the mechanical offer have additional forced cooling motors, these shall be allowed for by the Contractor (switchgear and steelwork) as part of the Tender price submission. The Contractors shall ensure that the electrical offer fully matches the mechanical offer.

(b) The contractor is to make use of a soft starter the same or similar to that of the WEG Soft Starters, as used in previous projects.

(c) All equipment shall be approved by the Engineer in writing before acceptance for use on the project, and shall bear the SABS/SANS mark where applicable. A detailed component list for the MCC shall be provided to the Engineer for approval. Where alternatives are offered to the preferred make or manufacture, these shall be equal to the specified items, and shall be approved by the Engineer in writing before acceptance for use on the project. Should the alternative item as offered not be approved, the Subcontractor shall supply and install the specified item with no cost implication.

(d) Moulded Case Circuit Breakers (MCCBs) shall be used for all main circuit breaker ≥60A and <800A.

(e) All motor starter breakers shall be lockable in the "off" position (have a door interlocked handle that is lockable). Motor starter circuit breakers shall be of the magnetic motor curve type.

(f) Class II type surge arrestors are required on all incomer panels and distribution boards where shown on the drawings. These surge arrestors shall be protected with fuses, rated to OEM requirements.

(g) All contactors shall be rated for the duty to which they will be subjected. For all motor loads an AC-3 category shall be applicable.

(h) Fuses and fuse holders shall comply with SANS 172 and shall be adequately rated for the circuit currents. All fuses shall be positioned so as to be accessible from the front of the board.

(i) The contactors shall operate from a 230VAC control supply system.

A9.5 Wiring and Cable Terminations

(a) Power cables shall be terminated directly onto circuit breakers, Soft Starters or contactors (as applicable) and shall not be connected up via separate terminal strips.

(b) All wiring inside the Kiosk shall of the silicone rubber insulated type with high conductivity tinned stranded flexible conductors, with a minimum size of 1mm².

(c) Power cables shall be labelled externally to the Kiosk to indicate the equipment being fed. Incoming supply cables shall also be labelled to indicate the source of supply. A labelling schedule shall be submitted to the Engineer for approval prior to manufacturing.
(d) The colour of the wiring shall be in accordance with the SANS Standards.

A9.6 Glands and Gland Plates

(a) All cable glands shall be of the nickel-plated brass type and fitted with waterproof neoprene shrouds. All glands in “wet” areas where there is a possibility of moisture ingress shall be rated a minimum of IP65.

(b) Gland plates shall be provided for cable entry from below.

(c) Gland plates shall be mounted at 200mm above finished floor level and shall be bolted to robust brackets welded to the framework of the Kiosk.

(d) Gland plates shall be manufactured from unpainted 3CR12 sheets with a minimum thickness of 2mm. Where single core cables are terminated, the gland plates shall be manufactured from non-ferrous material of adequate thickness to support the single core cable sizes selected.

A9.7 Switchboard Accessories

A9.7.1 Indicator Lights

(a) Motor control compartments shall be equipped with running, ready and fault indicator lights:

- The Soft Starter is to have a display that is to be visible when the front door is open, it is to be mounted on the internal door. The display is to indicate; at a minimum - any faults, the running amps and status of the drive.

A9.7.2 Name Plates and Labels

The requirements of SANS 1973-1 relating to name plates and labels shall take precedence over the Standard Specification.

A9.7.3 Metering and Indication Instruments

(a) Metering and indication instruments shall be provided in accordance with the single-line diagram for the Kiosks.

(b) The Kiosks shall be equipped with a door mounted power (kVA) meter on the door of the drive section of the MCC. This meter shall measure instantaneous values and maximum demand values for all kVA, Alarms, Currents, Voltages and Energy values. The meter shall be capable of recording consumption data. The Schneider PM 2000 meter is preferred. Where alternatives are offered they shall be submitted to the Engineer for approval. If the proposed meter does not have the same functionality as the preferred meter then the Contractor shall supply the preferred meter without any additional costs to the Client.

(c) No analogue meters shall be required for the main metering. The power meter shall be protected by two sets of fuses.

(d) The incomer circuit shall also have a CT per phase.

(e) The Soft Starter shall be used to measure running hours. Where this is not possible separate run hours meters shall be installed per motor starter. Runhour meters shall be provided for all motor starter compartments to match the ammeters and voltmeters in size. The runhour meter shall count to 99 999.9 before returning to zero, and it shall not be possible to reset the meter.

(f) Relays used for indication purposes shall be general purpose plug-in relays with octal or 11 pin bases. Soldered connections to bases will not be accepted. Each relay shall be tightly sealed with a clear plastic cover. Relay coils shall operate on a 230VAC, 50 Hz supply with 24V
potential free DC contacts for output from the future Radio Control System.

A9.7.4 Pump Protection Equipment
(a) The borehole pump is to be equipped with a no-flow and pressure switch. These switches shall alarm the controller that there is insufficient water at the pumping extraction point. The Pump is to be stopped and then reset after a 15 minute period. During the alarm conditions an indication light on the front of the panel is to be used to show the operator that there is an issue.

A9.7.5 Pump Control
(a) The pump is to be controlled in two modes, Automatic and manual. Automatic mode shall be implemented during a future project. Manual mode shall have start and stop push buttons on the inner kiosk door.

A9.7.6 Kiosk power supplies
(a) Kiosks are to be equipped with an internal dedicated 16A 3 pin switch socket outlet and an external dedicated IP65 3 phase Welding plug socket. The proposed welding socket is to be approved by the Engineer prior to purchase. The contractor is to provide the municipality with the male connector.

A9.8 Installation, Testing and Commissioning
The Kiosk shall only be released for site installation after the Factory Acceptance Testing has been completed to the satisfactory of the Engineer.

The Kiosk shall be installed in the space provided. This space is indicated in drawing MD1870-E-002. The Contractor shall ensure that they fully understand the rigging requirements for the installation, all of this is to be covered as part of the installation price. The Kiosk will be positioned over penetrations to allow for cable access to the underside of the Kiosk.

An indicative position of the Kiosk has been indicated on the equipment layout drawings. The final position of the Kiosk shall be determined on site with the Engineer.

The Kiosk shall be fully tested and commissioned on site by the Contractor. The Contractor shall produce a full site commission checklist with a total Kiosk commissioning schedule including the incomer, starters etc. The Kiosk shall be fully dry and wet commissioned and the Engineer and the Client shall witness the final commissioning and operation.

A9.9 Measurement and Payment
(a) The Kiosk installation price shall include for the delivery, rigging and all fixings as required.
(b) Minor Civil works required for mounting of Kiosk and/or cable routing.
(c) The price for the supply of the Kiosk shall include all Soft Starters, control circuit breakers and ancillary equipment.
(d) The FAT pricing shall include for testing as detailed in section A6.

A10. LOW-VOLTAGE POWER CABLES
A10.1 General
(a) LV power cables shall be provided as indicated on the single-line diagrams. However, should the ratings of motors offered in the tender differ from the Engineer’s estimates, then the motor supply cables shall be sized to suit the motors offered by the tenderer in the tender. The voltage
drop from the Kiosk to the motor terminals shall not exceed 3% of motor rated voltage at motor rated current. Allowances shall also be made for the de-rating of cables in accordance with SANS 10142-1 and SANS 10198.

(b) All multicore LV cables shall be PVC insulated, PVC bedded, steel wire armoured, PVC sheathed, 600/1000V cables manufactured to SANS 1507-3. Single core cables shall be unarmoured. All power cabling to motors up to 120mm² shall be 4 core cables using one of the cores as an earth. Above 120mm² all power cables to motors shall be 3 cores with a separate earth cable as shown on the single line diagrams.

(c) Motor cables to borehole and submersible pumps are to be 4 core 600/1000V Cu Submersible cable SABS approved.

(d) Single-core cables shall be 600 / 1000V XLPE/PVC and unarmoured. All single core cables are to be housed within PVC conduit or strapped to cable ladder.

(e) The minimum size of a motor supply cable, based on the cross sectional area of its phase conductors, shall be 2.5 mm². Where a four core motor supply cable is used, the fourth core can be used as an earthing conductor.

(f) The Contractor shall produce detailed cable schedules and calculations per site. These cable schedules and calculations shall be submitted to the Engineer for checking and approval. The Contractor shall also produce a cable routing drawing that needs to be submitted to the Engineer for approval.

(g) All cable glands shall be of the nickel-plated brass type and fitted with waterproof neoprene shrouds. The proposed glands datasheet shall be submitted to the Engineer for approval prior to procurement of the glands. It shall also be noted that where glands are installed in wet areas (mostly around the inlet works) the Contractor shall supply IP65 glands. A glanding schedule shall be included as part cable schedule that needs to be approved by the Engineer.

A10.2 Installation

(a) All cable routes indicated on the Engineer’s drawings are provisional and the final routes shall be confirmed with the Engineer on site before cables are installed. Cable lengths given in the Bill of Quantities are provisional and subject to re-measurement on site. Unit prices shall allow for wastage, as only the net length will be measured for payment purposes. The Contractor shall produce a final cable schedule that will be checked and approved by the Engineer prior to the ordering of any cables.

(b) Prices for cable trench excavations and the laying of cables shall be determined per meter cubed. The prices includes for all backfill materials and cable marking danger tape.

(c) Cables shall be clearly marked with metal strap cable markers. The Contractor shall propose a final circuit naming convention and issue this proposal to the Engineer and Municipal staff for approval.

(d) Upon installation the contractor shall provide as-built drawings of cable routes and provide surveyed co-ordinate points at every change in direction and on straight runs every 100 metres. A final installed cable schedule will also be provided in segments (for ease of measurement) in order for the Engineer to verify installed cable lengths.

A10.3 Measurement and Payment

(e) Prices for the installation of cables in the ground shall include for cable marking tape.

(f) Prices for the termination of cables shall include for all material required for the termination.
(g) Cable lengths given in the Bill of Quantities are provisional and subject to re-measurement on site. Unit prices shall allow for wastage, as only the next length will be measured for payment purposes. The Engineers will verify installed cables at the end of the Contract.

A11. CABLE TRENCHES AND EXCAVATIONS

Cable trenches shall be as per drawing E-004 and all trenches will be inspected by the Engineer prior to backfilling.

The trench bottom shall be cleared of all sharp or protruding objects / stones. Soft material shall be installed into the bottom of the trench before laying of the cables. The soft sand may be backfill material sifted through a 3mm mesh grid. Sifted backfill shall cover the cables from the trench bottom. PVC danger tape shall be added and then the remaining area shall be backfilled using insitu backfill.

The rate for trenching shall include for all backfilling and danger tape. An allowance has been made for imported soil in the bill of quantities in case this is required for backfilling. This imported soil shall not be used unless approved in writing by the Engineer.

Where cables are drawn into sleeves, they shall be drawn according to the manufacturer’s recommendations.

Cable routes shall be so planned that the minimum number of crossovers occurs in a cable trench and where signal or control cables are installed in the same trench a minimum clearance distance of 300 mm (between power and communication cables) shall be adhered to.

For the purpose of this Contract, three classes of material are considered and all excavated material shall be classified according to the following:

<table>
<thead>
<tr>
<th>TYPE OF EXCAVATION</th>
<th>GENERAL DESCRIPTION</th>
<th>FORMAL CLASSIFICATION TO SABS 1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft excavation</td>
<td>Excavation by pick and shovel in soft soil</td>
<td>Soft Excavation</td>
</tr>
<tr>
<td>Intermediate excavation</td>
<td>Possible by use of pneumatic tools and equipment</td>
<td>Intermediate excavation: Boulder excavation Class A Boulder excavation Class B</td>
</tr>
<tr>
<td>Hard rock excavation</td>
<td>Removal of material by blasting</td>
<td>Hard Rock excavation</td>
</tr>
</tbody>
</table>

A12. BONDING

All cable ladders / trays forming part of this contract shall be properly bonded to earth and joints in the cable support system shall be fitted with a bonding conductor across each joint. Bonding shall be done in accordance with SANS 10142-1.

A13. EARTHING

A13.1 General

The Kiosk shall be supplied with a dedicated earth bar as detailed in the various sections. The equipment shall be connected to the earthing system as per the earthing diagram.

All earthing conductors shall be continuous lengths without joints between terminations.

All electrical and electronic equipment, metallic and mechanical structures shall be bonded together to form a holistic earthing system using earthing continuity conductors .

A13.2 Earth Electrodes
At the laydown point of the Kiosk, a 2 m long copper rod is to be installed 300mm below ground level. It shall be installed vertically in the ground. A 16mm² BCEW is then to be bonded to the copper rod on one end and then earth bar of the Kiosk.
C3.4 FACILITIES
C3.4.1 PLANT AND MATERIALS SUPPLIED BY THE EMPLOYER

Not applicable.

C3.4.2 EQUIPMENT SUPPLIED BY THE EMPLOYER

No equipment supply will take place by the employer.

C3.4.3 SITE ESTABLISHMENT

C3.4.3.1 SERVICES AND FACILITIES PROVIDED BY THE EMPLOYER

No services and facilities will be provided by the Employer.

C3.4.3.2 FACILITIES PROVIDED BY THE CONTRACTOR

Location of Camp and Depot: The Contractor shall make his own arrangements for his offices, storage facilities, workshops & latrines. No offices or equipment thereto are required for the Engineers or Engineer’s Representative’s use.

Temporary buildings and fencing are to be neat and presentable and the surrounding areas must at all times be kept in a neat, clean and orderly condition. The Contractor must not cut down or damage any trees nor make any excavation without the written permission of the Engineer and will be required to restore the site to its original condition on completion of the works.

C3.4.3.3 STORAGE AND LABORATORY FACILITIES

No storage and laboratories are required other than that which the Contractor may require for the execution of the Works.

C3.4.3.4 AREA FOR CONTRACTOR’S SITE ESTABLISHMENT

The Contractor shall be solely responsible for identifying and making arrangements for an area for his site offices, workshops, stores and other facilities required for the execution of the Contract.

C3.4.3.5 OTHER SERVICES AND FACILITIES

Disposal of refuse

The Contractor shall be responsible for disposal of refuse and waste generated by his staff on a daily basis. The entire site is to be kept clean, neat and tidy, to the Employer’s satisfaction.

Telephone facilities

The Contractor is to provide his own telephone facilities on site.

Rail facilities

The nearest goods handling station is George.

Survey Equipment and Facilities

The Contractor is to provide his own survey equipment and facilities.
C3.4.4 SITE USAGE

C3.4.4.1 HOUSING FACILITIES

No accommodation of the Contractor’s employees will be permitted on site

C3.4.4.2 CONSTRUCTION AREA FINISHING, TIDYING AND ENVIRONMENTAL REINSTATEMENT

Progressive and systematic finishing and tidying will form an essential part of this contract. On no account shall spoil, rubble, materials, equipment or unfinished operations be allowed to accumulate in such a manner as to unnecessarily impede the activities of others or give rise to complaints from the Engineer, Municipal officials or members of the public. In the event of this occurring the Employer shall have the right to withhold payment for as long as may be necessary in respect of the relevant works in the areas concerned without thereby prejudicing the rights of others to institute claims against the Contractor on the grounds of unnecessary obstruction.

All finishing and tidying shall be carried out to the best advantage of the project as a whole and in the closest co-operation with others that may be operating on the site.

No indiscriminate spoiling of material will be allowed. All surplus or unsuitable material shall be spoiled at the Knysna Municipal dumping site, (within 20km from the site), or as otherwise directed by the Engineer.

C3.4.4.3 CARE, DAMAGE AND PROTECTION

The Contractor shall at his own cost make full provision for all watching and lighting necessary for the protection of all persons, animals, vehicles, etc., from injury by reason of the Works. He shall provide ample warning signs, guard rails, etc., around open excavations, stacks of materials, excavated material, debris or the like, and he shall be held liable for all claims made upon himself or upon the Employer by reason of his neglect of all such precautions and provisions. If at any time the Contractor fails to take proper or adequate precautions in this respect, the Employer may take such steps as he deems necessary and recover the cost thereof from the Contractor.

C3.4.4.4 PERMITS AND WAYLEAVES

The Employer is to obtain the necessary approvals and wayleaves from inter alia, land owners, Provincial Roads Department, Eden District Council, Telkom and Eskom.

The Contractor is to confirm that permission has been granted before commencing work.

C3.4.4.5 INSPECTION OF ADJOINING PROPERTIES

As most of the construction activities will be on privately owned land, the Contractor shall abide by the conditions agreed with the individual property owners.

A photo or video record shall be kept of the condition of the properties by the Employers Agent, before, during and after the construction.

C3.4.4.6 EXISTING SERVICES

The Contractor shall at all times exercise the utmost care when working in the vicinity of existing services and shall take all necessary steps to protect any existing services whatsoever against damage which may arise as a result of his operations on site. The Contractor shall bear the cost of the repair of damage to any service the possible existence of which could reasonably have been ascertained by him in good time. All cables and pipes shall be considered “live” unless confirmed otherwise by the relevant service authority.
C3.5 MANAGEMENT

C3.5.1 MANAGEMENT OF THE WORKS

C3.5.1.1 APPLICABLE SANS 1921 STANDARDS

The following SANS 1921 Construction and Management requirements for works standards and associated specification data are applicable:


C3.5.1.2 ENVIRONMENT

The Western Cape Department of Environmental Affairs Standard Construction Phase Environmental Management Plan (EMP) is included in the specifications. The requirements of this plan are to be strictly adhered to during all activities involved in the execution of this Contract.

The Contractor will be responsible for environmental control on site during construction and the maintenance period. The construction activities will be monitored by an independent environmental specialist and audited against the EMP.

The Contractor shall restrict his operations to the limits of the Site and any approved access route/s thereto.

The Contractor shall, for the duration of the contract, take appropriate measures to control the water, soil, and dust movement which may arise due to his operations and shall at all times ensure that his operations do not endanger any member of the public.

An item has been included in the Bill of Quantities for implementing and adhering to the EMP.

C3.5.1.3 RECORDING OF WEATHER

Measuring the rainfall is not required and the records from the Knysna water treatment works (WTW) will be used if such records are required.

C3.5.1.4 LOCAL LABOUR

It is intended that the contractor must make the maximum possible use of the local labour force which is at present under-employed. To this end the Contractor shall limit the use of non-local staff to key personnel only and is to employ local labour on this Contract. The Contractor will be required to submit weekly labour returns indicating the numbers of workers in the various categories of workers and wages paid, in a format as approved by the Engineer.

C3.5.1.5 MANAGEMENT MEETINGS

The Contractor and such other persons as may be nominated by the Engineer shall be required to attend periodic site meetings, the date and place for which will be set by the Engineer in consultation with the Employer and Contractor.

A main purpose of the site meetings will be to review and discuss progress and programme. All persons attending the site meetings must be empowered to act on behalf of the firms they represent.

C3.5.1.6 DAILY RECORDS

The Contractor is to provide a site diary, which is to be kept on site, for the purpose of keeping daily records in respect of work performed on the site.
C3.5.2 HEALTH AND SAFETY

The Contractor shall prepare a Health and Safety Plan in terms of the Occupational Health and Safety Act No 85 of 1993 and the Construction Regulations issued in terms of Section 43 of the Act. The employers’ pre-construction health and safety specification is attached to this Document as specification PZ.

An item is provided in the Bill of Quantities for the preparation of, and adherence to, this plan.
C3.6  SPECIFICATIONS

C3.6.1  PREFACE ON INTERIM SITUATION

(until full suite of SANS Series Specifications are available.)

The Bill of Quantities is based on the SABS 1200 system of specifications and measurement. Where SANS specifications are available, these have been incorporated into the “Contract” section of this document.

Where overlapping specifications from the SANS 1200 series of specifications occur the appropriate SABS 1200 specifications have been incorporated into the Project Specifications.

In such cases, the following shall be observed:

(i) the requirements of the SANS specification(s) shall prevail over the requirements of the SABS 1200 specifications.

(ii) The payment clauses in the Bill of Quantities are based on the SABS 1200 series of specifications for consistency and the Tenderer is required to ensure that he has priced all of the requirements pertaining to the SANS specifications.

C3.6.2  LIST OF PROJECT SPECIFICATIONS

The following project specifications are applicable:

SABS 1200 A (1986): General

ROYAL HASKONINGDHV: Standard Specification for Electrical Installations (available on request)

The following particular specifications shall apply:

PZ: Health and Safety

PE: Environmental specifications

The variations and additions to the standardised specifications as well as the particular specifications listed above are included in the Annexures to this Scope of Works. The variations, are prefixed PS, and take precedence over the SABS Standardised Specification.
C3.6.3 VARIATIONS AND ADDITIONS TO THE STANDARDIZED SPECIFICATIONS FOR THIS CONTRACT, AND PARTICULAR SPECIFICATIONS

PZ PRE-CONSTRUCTION HEALTH AND SAFETY SPECIFICATION

PE ENVIRONMENTAL SPECIFICATION
PZ  PRE-CONSTRUCTION HEALTH AND SAFETY SPECIFICATION

PZ 1  INTRODUCTION AND BACKGROUND

PZ1.1  BACKGROUND

The Construction Regulations, 2014 place the onus on the Employer (defined as the Client in terms of the Construction Regulations) to prepare a pre-construction health & safety (H&S) specification, highlighting all risks not successfully eliminated during design.

PZ1.2  PURPOSE OF THE PRE-CONSTRUCTION HEALTH AND SAFETY (H&S) SPECIFICATION

The purpose of the pre-construction H&S specification is to assist with the achievement of compliance with the OHS Act, and in particular with the Construction Regulations, so as to reduce incidents and injuries on the project. The pre-construction specification enables Tenderers to make adequate financial provisions in their tenders to cover the H&S requirements of the project and thereafter, for the Contractor and its sub-contractors to use as the basis for the preparation of the construction phase H&S plan.

The pre-construction specification sets out the basic requirements to be met by the Contractor and all subcontractors so that the H&S of all persons potentially at risk may receive a priority at least equal to the other facets of the project such as the standard of workmanship, costs, programme, environment, etc.

PZ1.3  STATUS OF THE PRE-CONSTRUCTION HEALTH AND SAFETY SPECIFICATION

The Client’s H&S specification will form an integral part of the contract, and Tenderers are required to use it during the tender phase for pricing the preparation a project-specific construction phase H&S plan prior to commencing any work and for pricing the costs of ensuring compliance thereto during the entire construction phase. Tenderers shall forward a copy of the H&S specification to all other persons or organisations who may be preparing to submit prices to the Tenderer during their bidding phase so that they can also price for preparing their own H&S plans relating to their individual operations and for complying with the H&S requirements during the construction phase.

Notwithstanding the fact that the Client’s pre-tender H&S specification does not identify all of the H&S risks that may be encountered on the project, Tenderers are required to take cognisance of all potential H&S risks that may be evident from the tender documents namely the conditions of contract, tender drawings, technical specifications and schedules of quantities, and to make the requisite provisions in their tenders for dealing with all of them.

PZ2  HEALTH AND SAFETY SPECIFICATION

PZ2.1  SCOPE

This health and safety (H&S) specification is the Client’s H&S specification prepared in accordance with Clause 4(a) of the Construction Regulations. It covers the requirements for eliminating and mitigating incidents and injuries during the construction phase of the project. The specification addresses legal compliance, hazard identification and risk assessment, risk control, and promoting a health and safety culture amongst those working on the project. The specification also makes provision for the protection of those persons other than employees of the Principal Contractor and Contractors.

PZ2.2  INTERPRETATIONS

PZ2.2.1 Application

This specification is a compliance document drawn up in terms of South African legislation and will therefore be binding on the Contractor. It must be read in conjunction with all of the other contract documentation and also with all the relevant statutory documents. This specification is not intended to over-ride, or in any way to amend, the statutory/regulatory documents and, in the event of there being any conflict, the legislation will take precedence.
PZ2.2.2 Definitions

The definitions as listed in the Occupational Health & Safety Act 85/1993 and Construction Regulations, (2014 shall apply to this H&S specification. More specifically, where used in this H&S specification, “Principal Contractor” means the Contractor, “Contractor” means sub-contractors to the Principal Contractor, and “Client” means the Employer or his/her duly appointed Agent.

PZ2.3 MINIMUM ADMINISTRATIVE REQUIREMENTS

PZ2.3.1 Notification of Intention to Commence Construction Work

On receipt of the Client’s notification of award of the contract and, in any event before any construction work commences, the Principal Contractor shall notify the Provincial Director of the Department of Labour in writing of the intention to undertake construction work. Annexure A to the Construction Regulations must be used for that purpose and a copy of that form is attached as Annex A to this specification. A copy of the completed notification must be forwarded to the Client and to the Engineer and a copy shall be attached to the H&S plan. The addresses of the nine Provincial Directors of the Department of Labour are given in Clause 1 of the General Administrative Regulations to the OHS Act.

PZ2.3.2 Assignment of the CEOs’ Responsibility For Health and Safety on Site

In terms of Section 16 of the Act, the Chief Executive Officers (CEOs) of the Client, the Engineer, the Principal Contractor and all other Contractors shall make the requisite assignments of their responsibilities in writing prior to commencement of work on site. It is noted that, in a large organisation, the CEO may decide to assign his responsibilities to a line manager who may in turn assign his responsibilities to another line manager and so on. Annexure B to this specification comprises forms which may be used for these assignments. Copies of the completed forms shall be attached to the H&S plan.

PZ2.3.3 Appointment of the Construction Supervisor

The Principal Contractor’s CEO (or his duly assigned employee) shall appoint (in writing) a full time competent person to supervise the construction work. One or more competent persons may also be appointed (in writing) to assist the appointed construction supervisor should the Principal Contractor deem it necessary or desirable. The Principal Contractor’s and the Contractors’ competent persons for the various roles shall fulfil the criteria as defined the Construction Regulations. Copies of these appointments, together with proof of competence of the individuals concerned, shall be attached to the H&S plan. Proof of competencies shall take cognisance of the definition of a “competent person” as set out in the Construction Regulations and may comprise CV’s and written motivations/recommendations by the persons’ direct report.

PZ2.3.4 Compensation of Occupational Injuries and Diseases Act 130 of 1993

The Principal Contractor shall, prior to commencing work on site, submit a letter of good standing with its Compensation Insurer to the Client and to the Engineer as proof of registration. All other Contractors shall submit their proof of registration to the Principal Contractor before they commence work on site. Copies of these documents shall be attached to the H&S plan.

PZ2.3.5 Occupational Health and Safety Policy

The Principal Contractor and all other Contractors shall submit to the Client and to the Engineer, a copy of their organisation’s H&S Policy signed by their Chief Executive Officer. Each policy must include a description of the organisation and state the H&S objectives and how they will be achieved and implemented by the organisation. Copies of these policies shall be attached to the H&S plan.

PZ2.3.6 Health and Safety Organogram

The Principal Contractor shall submit an organogram, outlining the H&S site management structure including those of all other Contractors. In cases where appointments have not been made, the organogram shall reflect the intended positions, and the names shall be filled in as and when the appointments are made. The
organogram shall be updated whenever there are any changes in the site management structure and/or personnel. A copy shall be attached to the H&S plan.

PZ2.3.7 Health and Safety Representative(s)

The Principal Contractor and all other Contractors shall, after due consultation with the parties concerned, ensure that an H&S Representative is appointed in writing as soon as there are 20 persons employed on a site. Additional H&S Representatives are required once the workforce exceeds 50 persons. Annexure C may be used for this purpose and copies of the appointments are to be attached to the H&S plan. Each H&S Representative(s) is to be trained to carry out their respective functions and must carry out regular inspections, keep records, and report all findings to the responsible person forthwith, and also at the next H&S meeting. Copies of these documents are to be kept in the Project H&S File.

PZ2.3.8 Health and Safety Committees

Provided that two or more Safety Representatives have been designated, the Principal Contractor shall ensure that one or more Safety Committees are established and that H&S committee meetings are held at least monthly and that minutes are kept on record. Meetings must be convened and chaired by the Principal Contractor’s Construction Supervisor. All of the Principal Contractor’s and other Contractors’ responsible persons and H&S Representatives shall attend the monthly H&S meetings. Contractors shall also have their own internal H&S committees as required in terms of the OHS Act and copies of their agendas and minutes of their meetings shall be forwarded to the Principal Contractor on a monthly basis. Copies of all H&S committees’ agendas and minutes are to be kept in the Project H&S File.

PZ2.3.9 Health & Safety Audits, Monitoring and Reporting

The Client shall conduct monthly H&S audits of the construction work operations including a full audit of physical site activities as well as an audit of the administration of H&S. The Principal Contractor is obligated to conduct similar audits on all Contractors that they have appointed. Detailed reports of the audit findings shall be reported on at all levels of project management meetings/forums. Copies of all audit reports shall be kept in the Project H&S File.

PZ2.3.10 Emergency Procedures

The Principal Contractor shall prepare a detailed emergency procedure prior to commencement of work on site and it shall be included in, and form part of, the H&S plan. The procedure shall be updated whenever changes occur and it shall detail the emergency response plans. The emergency procedures shall not be limited to, but shall include, the following key elements:

- List of key competent personnel on site;
- Details of the nearest emergency services, including their physical addresses and phone numbers;
- Actions or steps to be taken in the event of each specific type of emergency;
- Information on hazardous materials/situations that may be encountered on site.

Emergency procedures shall include, but shall not be limited to, fire, spills, accidents to employees, use of hazardous substances, bomb threats, major incidents/accidents.

A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc) must be maintained and be readily available to site personnel at all times that there are persons on site i.e. it must not be located in an area which may be inaccessible outside of normal working hours.

The Principal Contractor shall advise the Client and the Engineer in writing forthwith, and thereafter at the project and H&S meetings, of any emergencies that occurred, together with a record of the action taken. Copies of all reports on emergencies shall be kept in the Project H&S File.
PZ2.3.11 Accident / Incident Reporting and Investigation

Each Injury that occurs is to be categorised into first aid, medical, disabling, or fatal and must be reported on the prescribed form (refer Annexure D). The Principal Contractor must document in its construction phase H&S plan how it will handle each of these categories of injury. When reporting injuries to the Client, these aforementioned categories shall be used. All injuries shall be investigated by the Principal Contractor, with a report being forwarded to the Client forthwith. All Contractors have to report on the four categories of injuries to the Principal Contractor at least monthly. The Principal Contractor must report all injuries to the Client in the form of a detailed injury report at least monthly and copies of these reports shall be kept in the Project H&S File.

PZ2.3.12 General Record Keeping

The Principal Contractor and all Contractors shall keep and maintain H&S records to demonstrate compliance with this specification, the approved H&S plan, the OHS Act, and the Regulations. The Principal Contractor shall ensure that all records of incidents/accidents, training, inspections, audits, etc. are kept in the Project H&S File stored in a suitable place on site. The Principal Contractor must ensure that every Contractor opens its own H&S file, maintains the file, makes it available to the Principal Contractor and other authorised persons on request and sends copies of the relevant documentation to the Principal Contractor.

The Principal Contractor shall maintain an up to date register of each Contractor engaged in construction work on site giving the Contractors’ name and the Responsible Persons’ contact details and the number of employees on site. As these details may be subject to frequent change, the register must be updated at least weekly. The register is to be available for inspection.

PZ2.3.13 Project H&S File

The Principal Contractor shall prepare, and update on at least a monthly basis, a properly indexed H&S file for the project. This file will evolve during the construction phase and is to be handed over to the Client on completion of the construction work on site. The Project H&S File shall contain:

- The names and addresses and contact details of the Principal Contractor
- The names and addresses of all other Contractors that worked on the project, copies of their agreements with the Principal Contractor and the type of work that each one is carrying/has carried out.
- The original and all subsequent versions/revisions of the H&S plan and the Annexures and Appendices thereto.
- All information specifically called for in the OHS Act and the Construction Regulations and this specification and any other pertinent information relating to H&S on the project that is considered relevant.
- The safe work procedures developed by the Principal Contractor and all other Contractors.
- Details of any special or unusual materials forming part of the completed works.
- All relevant information concerning the completed works. This information shall comprise the record/“as built” drawings prepared by the Engineer, copies of which will be issued to the Principal Contractor for inclusion in the File, and the operating and maintenance instructions and all relevant information relating to any unusual or special features of the completed works that could affect H&S of the end users. When compiling this data, consideration must be given to all information that may be relevant to possible future alterations and/or demolition of all or part of the works.

PZ2.4 HEALTH AND SAFETY INDUCTION, TRAINING AND EQUIPMENT

PZ2.4.1 H&S Induction, Awareness and Competency

Induction of Site Personnel

The Principal Contractor shall ensure that all site personnel, including those of all other Contractors, undergo risk-specific H&S induction training before starting work. A record of attendance at every induction session shall be kept in the Project H&S File. A suitable venue must be made available by the Principal Contractor to accommodate this training.
Awareness of Site Personnel

The Principal Contractor shall ensure that periodic ‘toolbox talks’ take place on site. These talks should deal with risks relevant to the construction work at hand. All Contractors shall conduct ‘toolbox’ talks at least once per week with their own employees. A record of attendance at each ‘toolbox talk’ shall be kept in the Project H&S File.

Competency of Site Personnel

All competent persons shall have the knowledge, experience, training, and qualifications specific to the work they have been appointed to supervise, control and/or carry out. This will have to be assessed on a regular basis by, for example, periodic H&S audits, progress meetings, etc. The Principal Contractor will be responsible for ensuring that only competent Contractors are appointed to carry out construction work.

PZ2.5 Preliminary Hazard Identification and Risk Assessment and Progress Hazard Identification and Risk Assessment

The Principal Contractor and all other Contractors shall cause a hazard identification to be performed by a competent person(s) before commencement of their respective construction work, and the assessed risks shall be documented in the construction phase H&S plan to be submitted for discussion with, and subsequent approval by, the Client. The risk assessments must include:

- A list of all hazards identified as well as potentially hazardous tasks to be carried out;
- A documented risk assessment based on the list of hazards and tasks;
- A set of safe working procedures (method statements) to eliminate, reduce and/or control the risks assessed;
- Details of the PPE and clothing to be worn;
- A monitoring and review procedure of the risk assessments to be carried out on a monthly basis, whenever variation orders are issued or changes made, and whenever the risks change.

The Principal Contractor shall ensure that all other Contractors are informed, instructed and trained, by a competent person regarding all hazards, risks, and the related safe work procedures before any work commences and thereafter at regular intervals if the risks change and/or if new risks are identified.

The Principal Contractor shall be responsible for ensuring that all persons who could be negatively affected by its operations are informed and trained according to the hazards and risks and are conversant with the safe work procedures, control measures, and other related rules such as the ‘tool box talk’ strategy that is to be implemented.

The Principal Contractor shall immediately notify all other Contractors as well as the Client of any hazardous or potentially hazardous situations that may arise during performance of construction activities.

The Principal Contractor shall keep records as per Clause 9 of the Hazardous Chemical Substances Regulations.

All of the above are to be documented in the H&S plan.

PZ2.6 PERMITS

Permits may be required for certain activities and these are not limited to but may include the following:

- Use of explosives and blasting
- Work for which a fall prevention plan is required
- Removal of asbestos materials.
- Disposal of (old type) fire detectors with radio active elements.
- Decanting/handling of ammonia.
If and where applicable, the Employer will issue to the Principal Contractor, permits and log books (which log books shall thereafter be kept up to date by the Principal Contractor), for the following installations:

- Boilers
- Medium voltage (MV) switchgear and chambers/rooms
- MV switchgear outdoor yards
- Lifts

All of the above are to be documented in the H&S plan.

PZ2.7 SPECIFIC PROJECT REQUIREMENTS

PZ2.7.1 Trench Excavation

Trench depths may in places be in excess of 2 m deep. Adequate protection shall be provided to workers in the trench at all time. The sides of the trenches shall be battered or shoring shall be installed to prevent side wall collapse. The Contractor shall appoint a competent person in writing to inspect all trenches where work is being carried out on a daily basis.

PZ2.7.2 High Voltage Cables

High voltage and street light cables are present on the Site.

PZ2.7.3 Construction Vehicles and Mobile Plant

The Principal Contractor shall ensure that all persons in its employ, all Contractors, and all those that are visiting the site are aware and comply with the site speed restriction(s). Separate vehicle and pedestrian access routes shall be provided, maintained, controlled, and enforced.

The Principal Contractor and all relevant Contractors shall inspect and keep records of inspections of the construction plant used on site. Only authorised/competent persons are to use machinery under proper supervision.

The Principal Contractor shall ensure that all hired plant and machinery used on site is safe for use. The Principal Contractor shall ensure that operators hired with machinery are competent and that certificates are kept on site in the health & safety file. All relevant Contractors must ensure the same.

PZ2.7.4 Warning signs

The Principal Contractor shall erect and maintain the necessary signs, notices and barricades at strategic points on the boundaries to inform people of the dangers of the construction site.

PZ2.7.5 Construction Welfare Facilities

The Principal Contractor shall supply hand washing facilities, soap, toilet paper, and hand drying material. Waste bins must be strategically placed and emptied regularly. Safe, clean storage areas must be provided for workers to store personal belongings and personal protective equipment. Workers shall not be exposed to hazardous materials/substances while eating.

PZ2.7.6 General Machinery

The Principal Contractor and relevant Contractors shall ensure compliance with the Driven Machinery Regulations, which include inspecting machinery regularly, appointing a competent person to inspect and ensure maintenance, issuing PPE or clothing, and training those who use machinery.

PZ2.7.7 Transport of Workers

The Principal Contractor and other Contractors shall not:
RFQ 474/2017/18: KNYSNA BHE8 - MOTOR CONTROL KIOSK

- Transport persons together with goods or tools unless there is an appropriate area or section to store them;
- Transport persons in a non-enclosed vehicle, e.g. truck; there must be a proper canopy (properly covering the back and top) with suitable sitting area. Workers shall not be permitted to stand or sit at the edge of the transporting vehicle.
- Transport workers in bakkies unless they are closed/covered and have the correct number of seats for the passengers.

PZ2.8 FINANCIAL PROVISION FOR HEALTH AND SAFETY

Tenderers (including those sub-contractors and/or suppliers who are preparing prices/quotations for submission to the main Tenderer) must ensure that they make adequate financial provision in their tenders for full compliance with the OHS Act, the Regulations thereto and this H&S specification. Financial provision shall therefore be made by each Tenderer for, inter alia, the following:

- Carrying out and documenting risk assessments of all work to be carried out under the contract.
- Preparation of safe work procedures for all work to be carried out under the contract.
- Preparation of an H&S plan, discussing it with the Client, and then amending it as agreed.
- Preparation for and conducting “toolbox talks” with relevant employees.
- Induction and training as and where required.
- Preparation of a Project H&S File.
- Regular updating of all of the foregoing.
- Provision of PPE and protective clothing for employees
- Complying with all H&S requirements for the duration of the contract.

To enable the Client to be appraised of the allowances that Tenderers have made for H&S in their tenders, so that he/she can fulfil his/her obligations in terms of Clause 4 (h) of the Construction Regulations, the following H&S items have been included in the Schedules of Quantities and must be individually priced:

- Fixed Charge Item for the preparation of risk assessments, safe work procedures, the project H&S File, the H&S plan, the provision of PPE and protective clothing, and any other H&S matters that the contractor deems necessary.
- Fixed Charge Item for completing and checking the Project H&S File and handing over to the Client on completion of the works.
- Time Related Item for updating and amending the risk assessments, safe work procedures, the project H&S File, the H&S plan, the provision of PPE and protective clothing and any other H&S matters that the contractor deems necessary.
- Time Related Item for full compliance with all H&S matters during the construction of the works under the contract.
PE ENVIRONMENTAL SPECIFICATION

WESTERN CAPE PROVINCIAL
DEPARTMENT OF ENVIRONMENTAL AND CULTURAL AFFAIRS AND SPORT

FOR IMPLEMENTATION ON SMALL OR LOW IMPACT DEVELOPMENTS APPROVED
UNDER THE ENVIRONMENT CONSERVATION ACT (ACT 73 OF 1989).

1 TERMS AND ABBREVIATIONS

Audit - regular inspection and verification of construction activities for implementation of the Bund - enclosure under / around a storage facility to contain any spillage.

Batch plant - a concrete or plaster mixing facility and associated equipment and materials.

Contractor - the principal persons / company undertaking the construction of the development

Developer - The developer is the same person as the applicant.

Development site - boundary and extent of development works and infrastructure.

Engineer - A person who represents the client and is responsible for the technical and contractual aspects of the Contract.

ECO - Environmental Control Officer: - Designation is reserved for suitably qualified independent site environmental managers or authorities officer mainly associated with large and complex developments.

ESA - Environmental Site Agent: - Person responsible to applicant tasked with implementing and controlling the environmental requirements during construction. This title is reserved for implementation on small or low impact developments approved by an exemption under the Environment Conservation Act.

2 MANAGEMENT PLAN CONTEXT

2.1 INTRODUCTION

This document describes mitigation measures and is partly prescriptive, identifying specific people to undertake specific tasks, in order to ensure that impacts on the environment are minimised during the construction phase.

This Environmental Management Plan (EMP) serves as a basic standard guideline document for use on small or low impact construction development sites to prevent unnecessary environmental impacts. Expansion or adaptation of this management plan may be required in specific circumstances.

2.2 ENVIRONMENTAL SITE AGENT

The environmental site agent (ESA) is the person involved with the development project who is responsible for the implementation of the environmental management plan. This person is, therefore responsible for the environmental issues involved with the construction phase of the project.

At large developments an independent, qualified Environmental Control Officer is normally appointed. For the implementation of this management plan, the appointment of an ESA is required. This person may be someone involved with the project acting on behalf of the applicant (e.g. a farm manager) or may be the applicant. It must, however, be a person with adequate environmental knowledge to understand and implement this management plan. The ESA may not be someone appointed by the contractor, engineer or other party involved with the project. The ESA must report to the applicant only.

The ESA has the authority to stop works if in his opinion there is a serious threat to or impact on the environment caused directly from the construction operations. This authority is to be limited to emergency
situations where consultation with the engineer or applicant is not immediately available. In all such work stoppage situations the ESA is to inform the engineer and applicant of the reasons for the stoppage as soon as possible.

Upon failure by the contractor or his employee to show adequate consideration to the environmental aspects of this contract, the ESA may recommend to the engineer to have the contractor’s representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor.

2.3 ENVIRONMENTAL AWARENESS TRAINING FOR SITE PERSONNEL

All contractor teams involved in work on the development are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMP prior to work commencing. The briefing will usually take the form of an on-site talk and demonstration by the ESA. The education / awareness programme should be aimed at all levels of management within the contractor team. (see “Do's & Don'ts” summery sheet, appendix 1)

2.4 COMMUNICATION PROCEDURES ON SITE

2.4.1 Site instruction entries

The Site Instruction book entries will be used for the recording of general site instructions as they relate to the works on site. It will also be used for the issuing of stop work orders for the purposes of immediately halting any particular activities of the contractor in lieu of the environmental risk that they may pose.

2.4.2 ESA diary entries

The purpose of these entries will be to record the comments of the ESA as they relate to activities on the site. Each of these books must be available in duplicate, with copies for the Engineer and ESA. These books should be available to the authorities for inspection or on request. Contractors meeting minutes must reflect environmental queries, agreed actions and dates of eventual compliance. These minutes form part of the official environmental record.

2.4.3 Method statements

Method statements from the Contractor will be required for specific sensitive actions on request of the authorities or ESA. A method statement forms the base line information on which sensitive area work takes place and is a “live document” in that modifications are negotiated between the Contractor and ESA / Engineer, as circumstances unfold. All method statements will form part of the EMP documentation and are subject to all terms and conditions contained within the EMP main document. (see standard Method statement sheet).

A method statement describes the scope of the intended work in a step by step description in order for the ESA and Engineer to understand the Contractors intentions. This will enable them to assist in devising any mitigation measures, which would minimise environmental impact during these tasks. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ESA, the format should clearly indicate the following:

- **What** - a brief description of the work to be undertaken;

- **How** - a detailed description of the process of work, methods and materials;

- **Where** - a description/sketch map of the locality of work (if applicable); and

- **When** - the sequencing of actions with due commencement dates and completion date estimates.

The Contractor must submit the method statement before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ESA.
2.5 RECORD KEEPING

All records related to the implementation of this management plan (e.g. site instruction book, ESA diary, method statements) must be kept together in an office where it is safe and can be retrieved easily. These records should be kept for two years and should at any time be available for scrutiny by any relevant authorities.

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with other records related to this EMP.

2.6 ENVIRONMENTAL COMPLETION STATEMENT

An Environmental Completion Statement is a report by the ESA to the relevant authorities stating completion of the project and compliance with the EMP and conditions. This statement replaces the final audit that is normally required for large development projects.

3 STANDARD MANAGEMENT PROGRAMME

3.1 Fauna and flora

Indigenous plants or wild animals (including reptiles, amphibians or birds etc.) may not be damaged or harmed. Vegetation removals as part of the development requirements are excluded. All incidents of harm to any animal or natural vegetation (apart from the agreed areas) must be reported to the ESA.

3.2 Services

Care and due cognisance must be taken of existing services, new service routes and service construction methods and restrictions. This aspect is often overlooked causing unnecessary environmental impact and costs.

3.3 Appropriate use of machinery

Contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage.

3.4 Demarcating and fencing

In the event that sensitive features are threatened by construction activities, the temporary fencing off of these areas (for individual areas such as trees or rocks) or the construction area (when working in a mainly natural environment) is recommended. A two-strand barbed wire fence of approximately 1m high is considered adequate. All fencing and fence placement / positioning must be approved by the ESA on site.

Where the construction area is fenced, all activities including stockpiling must occur within this fenced area. The contractor should be fined and must pay for reinstatement or rehabilitation of damaged areas and features.

Work areas and access routes must be clearly demarcated to minimise environmental impact. Demarcation can take the form of colour coded pegs at least 1 m high. Danger tape may also be used for this purpose. All pegs and tape must be maintained.

3.5 Anti-erosion measures

The Contractor shall take appropriate and active measures to prevent erosion resulting from his own works, operations and activities as well as stormwater control measures to the satisfaction of the ESA / Engineer. Restoration costs are likely to be for the contractor's account, should these measures not be reasonably implemented. Aspects normally covered in construction contracts in terms of "protection of works" are standard and are not to be billed or confused with any details covered under environmental requirements.

During construction the Contractor shall protect areas susceptible to erosion by installing all the necessary temporary and permanent drainage works as soon as possible. Other measures as may be necessary shall
be taken to prevent the surface water from being concentrated in streams and from scouring the slopes, banks or other areas. All such measures must be discussed with and approved by the ESA / Engineer. Measures can include cut off trenches, straw stabilising, brush packing etc.

A method statement is required from the Contractor prior to site clearing.

3.6 Fuel and service areas

Fuels and flammable materials are to be stored in suitably equipped storage areas. These areas shall comply with general fire safety requirements. Impervious materials are to be used in these storage areas to prevent contamination of the ground in the event of spillages or leaks. Quantities of fuels and hazardous materials stored on site should be appropriate to the requirement for these substances on site.

All vehicles, equipment, fuel and petroleum services and tanks must be maintained in a good condition that prevents leakage and possible contamination of soil or water supplies. The following recommendations should be implemented.

Refuelling areas should be bunded and lined to prevent spilled fuels and oils from contaminating the area. It is suggested that as a minimum that sandbags surround the bulk fuel supply tank, the floor of the area is to be lined with plastic and a layer of sand of approximately 50mm is placed on top of the plastic.

The park and service area should be treated with a suitable hydrocarbon absorption or remediation product. Absorbent spill mop-up products need to be on hand - Drizzit and products from Enretech should be investigated for these purposes.

All servicing must have a drip tray present to prevent accidental spillage of oils and fuels. A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be established. Fuels and oils must be safely located out of harms way from the elements and safety and fire prevention must be strictly adhered to. No fuel may be stored within the 1:50 year flood line level. No fuel / oil containers may be left unattended within drainage areas. All spills are to be recorded in the ESA diary.

3.7 Concrete works

Cement powder has a high alkalinity pH rating, which can contaminate and effect both soil and water pH dramatically. A shift in pH can have serious consequences on the functioning of soil and water organisms and plants. The following recommendations must be implemented to minimise impact.

Cement contaminated water may not enter a natural or man-made (e.g. trench / sloot or dam) water system. Preventative measures include establishing sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.

Mixing areas to be carefully placed in consultation with the Engineer / ESA. If possible/appropriate ready mix concrete should be used. Cement bags are to be stored securely out of harms way from the elements (wind and rain). Excess or spilled concrete should be confined within the works area and then removed to a waste site.

3.8 Blasting / drilling

In the event that blasting or rock drilling is required, the following recommendations should be implemented.

The Contractor shall take all necessary precautions to prevent damage to special features and the general environment, which includes the removal of flyrock. Environmental damage caused by blasting / drilling shall be repaired at the Contractors expense to the satisfaction of the ESA and Engineer.

No blasting may be done on Sundays. Adequate warning must be provided prior to all blasting to all site staff and neighbours. All clear signals must also be clearly given. The Engineer and ESA must be given 24-hour notice before blasting events.

3.9 Fires
No fires may be allowed outside the construction area and adequate fire fighting equipment according to the fire hazard during the construction period must be available on site in good working order (at least one type ABC (all purpose) 12.5 kg extinguisher). Welding, gas cutting or cutting of metal will only be permitted inside the working areas.

The Contractor shall pay the costs incurred to organisations called to put out any fires started by him. The Contractor shall also pay any costs incurred to reinstate burnt areas as deemed necessary by the Engineer.

3.10 Refuse

The Contractor shall be responsible for the establishment of a refuse control system that is acceptable to the ESA. The Contractor shall ensure that waste and surplus food, food packaging and organic waste are not deposited by his employees anywhere on the site except in refuse bins for removal on a daily basis by the Contractor. Refuse bins shall be weather and animal-proof.

The Contractor must transport refuse collected from the working areas from site at least once a week. Refuse must be disposed of at a site approved by the ESA/Engineer.

For the purposes of this document refuse includes discarded construction materials such as steel reinforcing, wooden shuttering and timbers, cement bags, piping etc.

3.11 Toilets

The Contractor shall provide suitable sanitary arrangements near his offices and construction sites for his staff. A minimum of one toilet shall be provided per 15 persons at each working area or as stipulated by local authority or other relevant legislation.

Toilets shall be of a neat construction and shall be provided with doors and locks and shall be secured to prevent them blowing over. Sanitation provision and servicing shall be to the satisfaction of the Engineer. The Contractor shall ensure that toilets are emptied before any builders’ holidays.

3.12 Dust control

The Contractor is to take appropriate measures to minimise the generation of dust as a result of construction works, to the satisfaction of the ESA. On sandy or very dusty sites, mulched indigenous vegetation which is to be removed from the site and is suitable, can be used as a method of stabilisation and dust control on any cleared or exposed sections of the site. Alternatively, straw stabilisation or watering can be used. Seed bearing invasive vegetation should not be used for this purpose.

3.13 Top material removal and stockpiling

Prior to construction or earthworks commencing on site, top material should be stripped from work sites and separately stockpiled for later use in rehabilitating damaged areas or for landscaping purposes.

3.14 Preparation of building material

All building materials are to be prepared at the batching plant, to enable the effects of cement and other substances, and the resulting effluent to be more easily managed.

3.15 Discharge of construction water

All cement effluent from mixer washings, and run-off from batching areas and other work areas shall be contained in suitable sedimentation ponds. Sedimentation ponds shall be allowed to dry out on a regular basis to allow for solid material to be removed. This material must be disposed of in a suitable manner, depending on the nature of the material, and to the discretion of the ESA, in consultation with the local authority.

Care must be taken to ensure that no water from the construction site enters the agricultural land adjacent to the site, or the natural watercourses.
3.16 Site clean up and rehabilitation

The Contractor must ensure that all structures, equipment, materials and facilities used or created on site for or during construction activities are removed once the project has been completed. The construction site shall be cleared, and cleaned to the satisfaction of the ESA.
APPENDIX 2

METHOD STATEMENT SHEET

ENVIRONMENTAL METHOD STATEMENT

(If the space provided is insufficient then attach additional sheets)

<table>
<thead>
<tr>
<th>WHAT: Subject of Method Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO: Site foreman/contact person:</td>
</tr>
<tr>
<td>Submitted to (e.g. ESA):</td>
</tr>
<tr>
<td>Approved by:</td>
</tr>
<tr>
<td>Date Submitted on:</td>
</tr>
<tr>
<td>Date approved:</td>
</tr>
<tr>
<td>WHEN: Date works start</td>
</tr>
<tr>
<td>Date works complete</td>
</tr>
<tr>
<td>Rehabilitation period:</td>
</tr>
<tr>
<td>Programme restrictions (critical path, season restrictions etc.)</td>
</tr>
<tr>
<td>Split work phasing:</td>
</tr>
<tr>
<td>Item</td>
</tr>
<tr>
<td>Start date</td>
</tr>
<tr>
<td>End date</td>
</tr>
<tr>
<td>Phase 1</td>
</tr>
<tr>
<td>WHERE: Area of works – submit plan or sketch if appropriate – stockpile, detention ponds, boundaries / restriction of works, special features or mitigation works landscape specials etc:</td>
</tr>
<tr>
<td>HOW: Route/site layout pegged:</td>
</tr>
<tr>
<td>Date available to inspect</td>
</tr>
<tr>
<td>Inspection persons required:</td>
</tr>
<tr>
<td>Landscape concerns: (Specify items not covered in EMP. Refer to EMP items if required.)</td>
</tr>
<tr>
<td>Existing features &amp; services affected (e.g. paths, curbing, irrigation etc.)</td>
</tr>
<tr>
<td>Trees (protection or removal methods).</td>
</tr>
<tr>
<td>Special vegetation</td>
</tr>
<tr>
<td>Reinstatement methods</td>
</tr>
<tr>
<td>Maintenance</td>
</tr>
<tr>
<td>Restricted areas</td>
</tr>
<tr>
<td>HOW</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
C4 SITE INFORMATION

C4.1 LOCATION OF THE WORKS

The location of the KNYSNA BHE8 is indicated on the attached locality plan; MD1870-C-200.

List of Co-ordinates:

<table>
<thead>
<tr>
<th>Work item location</th>
<th>Co-ordinate</th>
<th>Co-ordinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNYSNA BHE8</td>
<td>34° 0'50.03&quot;S</td>
<td>23° 6'23.57&quot;E</td>
</tr>
</tbody>
</table>

C4.2 ACCESS TO THE WORKS

The Sites are accessible from normal suburban roads. Access to properties and any community related issues is to be undertaken in consultation with the Engineer’s Representative, Client and Landowner if necessary.

C4.3 CLIMATE

Knysna experiences a moderate coastal climate with an all year rainfall. The average monthly rainfall is as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Monthly Rainfall (mm)</th>
<th>Month</th>
<th>Average Monthly Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>68</td>
<td>July</td>
<td>67</td>
</tr>
<tr>
<td>February</td>
<td>62</td>
<td>August</td>
<td>95</td>
</tr>
<tr>
<td>March</td>
<td>73</td>
<td>September</td>
<td>75</td>
</tr>
<tr>
<td>April</td>
<td>78</td>
<td>October</td>
<td>90</td>
</tr>
<tr>
<td>May</td>
<td>71</td>
<td>November</td>
<td>74</td>
</tr>
<tr>
<td>June</td>
<td>69</td>
<td>December</td>
<td>65</td>
</tr>
</tbody>
</table>

C4.4 GEOTECHNICAL INFORMATION

Not applicable.
C4.5 DRAWINGS