SAIAB
SOUTH AFRICAN INSTITUTE FOR AQUATIC BIODIVERSITY

TENDER DOCUMENT
VOLUME 1 OF 3:
TENDERING PROCEDURES
for

COMPLETION OF THE FIRST FLOOR COLLECTION FACILITY AT THE SOUTH AFRICAN INSTITUTE FOR AQUATIC BIODIVERSITY

ELECTRICAL INSTALLATION

TENDER REFERENCE: NRF/SAIAB/2016-021
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# T1 : TENDERING PROCEDURES

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T1.1 : BACKGROUND TO THE NATIONAL RESEARCH FOUNDATION AND THE SOUTH AFRICAN INSTITUTE FOR AQUATIC BIODIVERSITY

The National Research Foundation (NRF) is a juristic person established in terms of section 2 of the National Research Foundation Act, Act 23 of 1998 and a schedule 3A public entity in terms of the Public Finance Management Act. The NRF is the government’s national agency responsible for promoting and supporting research and human capital development through funding, the provision of National Research Facilities and science outreach platforms and programs to the broader community in all fields of science and technology, including natural science, engineering, social science and humanities.

The South African Institute for Aquatic Biodiversity (SAIAB), based in Grahamstown, is a National Research Facility of the National Research Foundation. SAIAB is an internationally recognised centre for the study of aquatic biodiversity.

The SAIAB Collections Building was constructed adjacent to the existing Administration building in 2007 for the purpose of housing the extensive collection of aquatic biological specimens curated by SAIAB as a research platform for scientists, researchers and students. The new building addressed the pressing need for additional space for offices and laboratories in the Administration building as well as the separation of the operational and storage areas. This is essential in order to mitigate health and safety risks inherent in managing an alcohol-based collection. The Collection building was designed and built specifically for this purpose, with specialised systems for air control, ventilation and fire prevention. The Collection building was constructed with two floors, with the upper level left unfitted for future development. This tender is for the completion of the interior of the first floor.
T1.2 : TENDER NOTICE AND INVITATION TO TENDER

PROJECT NAME : SOUTH AFRICAN INSTITUTE FOR AQUATIC BIODIVERSITY (SAIAB) : GRAHAMSTOWN - COLLECTION CENTRE : ELECTRICAL INSTALLATION
TENDER No. NRF/SAIAB/2016-021

Tenders are hereby invited for the completion of the second floor of the SAIAB Collection building from suitably experienced and skilled Subcontractors.

Note: A compulsory clarification meeting will be held at SAIAB on Tuesday 26 July 2016 at 10:00. Tenderers are to meet at SAIAB Somerset Street, Grahamstown at the Main Entrance gate to the SAIAB Collection Centre, whereafter they will be taken to the site. Prospective tenderers are required to attend this meeting, failure to attend this meeting will result in the tender not being considered.

Tender documents will be available as from 11 July 2016 during office hours (08:00-17:00) at the offices of the Clinkscales Maughan-Brown, 41 Parliament Street, Central, Port Elizabeth, 6001 on payment of a compulsory cash non-refundable levy of R500.00 per document. No cheques will be accepted. Documents are to be collected prior to the compulsory clarification meeting. No documents will be issued at the compulsory clarification meeting.

One original copy of the completed tender document in a sealed envelope endorsed: “NRF/SAIAB/2016-021 ELECTRICAL INSTALLATION” must be deposited in the Tender Box, in the Reception Area of SAIAB not later than 11:00 on 10 August 2016 when tenders will be opened in public.

Tenderers shall take note of the following conditions:

- Electronic or faxed tenders will not be considered.
- The lowest or any tenders need not necessarily be accepted.
- Late tenders will not be accepted.
- Failure to complete all supplementary information and the RETURNABLE SCHEDULES will result in the tender being deemed null and void (eliminated).
- Tender Forms that are incomplete or incorrectly completed will result in the disqualification of that tender.
- Tenders may only be submitted on the tender documentation issued.
- The Employer reserves the right to request additional information over and above that which is provided by the Tenderer should he deem it necessary to complete his evaluation of the Tenderer.

Tender Evaluation

Tenders will be in assessed in four stages, namely:

- Stage 1 : Eligibility
- Stage 2 : Responsiveness
- Stage 3 : Functionality
Stage 1: Eligibility

A Tenderer will not be eligible to submit a Tender if:

(a) the Contractor submitting the Tender is under restrictions or has principals who are under restriction to participate in the Employer’s procurement due to corrupt or fraudulent practices.

(b) The Contractor submitting the Tender is insolvent, in receivership, bankrupt or being wound up, has his affairs administered by a court or a judicial officer, has suspended his business activities, or is subject to legal proceedings in respect of the foregoing;

(c) The Contractor submitting the Tender, or any of its directors, are listed on the Register of Tender Defaulters as a person prohibited from doing business with the public sector.

(d) The Contractor submitting the Tender tenders an unduly high or unduly low price (offers of either 10 % below or 10 % above the Professional Quantity Surveyors estimate) will not be considered..

A Tenderer will be eligible to submit a Tender if they are registered with the CIDB and they are:

(a) contractors who have a contractor grading designation equal to or higher than 3EB determined in accordance with Regulation 25 (1B) or 25(7A) of the Construction Industry Development Regulations; and

(b) Joint ventures where every member of the joint venture is registered with the CIDB and each member has a contractor grading designation equal to or higher than 3EB.

Stage 2: Responsiveness

Over and above the test for responsiveness as described under F3.8 of the Standard Conditions of Tender, failure of the Tenderer to submit the following will result in immediate disqualification:

(i) Proof of attendance of Tender briefing and visit to the site – Form T2.2.1. Signing of the Attendance Register will be regarded as sufficient proof that the Tenderer has attended the Tender briefing. However, the Tenderer must sign Form T2.2.1 regardless of whether the employer’s representative has counter signed same.

(ii) Certificate of authority for signatory (Schedule T2.2.2)

(iii) Certified copies of Company/CC/Trust/Partnership registration certificates as well as signed agreements and power of attorney for Joint Venture/Consortium if applicable, Identity Documents (Refer to Schedule T2.2.3)

(iv) Joint Venture Agreement or Joint Venture/Consortium Disclosure Form (Schedule T2.2.4) and Power of attorney in case of Joint Ventures.

(v) Valid original Tax Clearance Certificate or Declaration by the South African Revenue Services that tax matters of the Tendering company/association or Joint Venture parties are in order. Refer Schedule T2.2.5.
(vi) Proof of CIDB contractor grading designation equal to or higher than 3EB – refer F2.1 of the Tender Data and Schedule T2.1.2. CRS number also to be provided.

(vii) Proof of Workmen’s Compensation Registration (or proof of payment of contributions in terms of the Compensation for Occupational Injuries and Diseases Act No 130 of 1993) (Form T2.2.7) and signing of the Health and Safety Declaration (Form T2.5.2).

(viii) Declaration of Interest (Form T2.2.8).

(ix) Declaration of Tenderers Past Supply Chain Management Practices (Form T2.2.9).

(x) Certificate of Independent Tender Determination (Form T2.2.10).

(xi) Related Experience of Tenderer (Form T2.2.11)

(xii) List of Key Personnel (Form T2.2.12)

(xiii) Curriculum Vitae Contracts Manager (Form T2.2.13)

(xiv) Curriculum Vitae Site Agent (Form T2.2.14)

(xv) Curriculum Vitae Foreman (Form T2.2.15)

Stage 3: Functionality

Functionality of responsive Tenders submitted is evaluated according to the predetermined criteria described below, taking into account, among other factors, the quality, reliability and the technical capacity and ability of a Tenderer.

A Tender will be disqualified if it fails to meet the minimum threshold for functionality which has been set at 70% for this project.

Tenderers will be evaluated on the following factors, with points weighting as shown:

Project References : 65 points
Number of Years in Operation : 10 points
Comparable Project Nature : 10 Points

In order for the evaluation reports to be prepared by the Professional Team, the Tenderer is obliged to provide comprehensive information on forms T2.2.11 to T2.2.14 in the tender documents. Failure to provide the said forms will cause the tender to be declared non-responsive and removed from any further consideration. The Employer reserves the right to request additional information over and above that which is provided by the Tenderer on said forms. The information must be provided by the Tenderer within the stipulated time as determined by the Principal Agent, failing which the tender offer will mutatis mutandis be declared nonresponsive.

Project References
The Tenderer must provide references from the Employer or Principal Agent for at least five different projects, which must be of a similar nature and have a project value of at least R650 000 each. The references must be from five different Employers or Principal Agents. The information must be completed on forms T2.3.1 to T2.3.5 included in these tender documents.

Each Employer or Principal Agent of the projects referred to will be required to evaluate the Tenderers performance on the following criteria:

Criterion 1: Project performance/ time management/ programming
Criterion 2: Quality of workmanship
Criterion 3: Resources: Personnel
Criterion 4: Co-ordination with other services
Criterion 5: Financial management/ payment of suppliers/ cash flow etc.
Criterion 6 : Occupational Health & Safety : Compliance

The Employer or Principal Agent on each project referred to will score each of the above criterion on the following basis:

Very poor = 1
Poor = 2
Fair = 3
Good = 4
Excellent = 5

Any tenderer not achieving a minimum score of three or more for each criterion will be declared non-responsive and removed from further evaluation as the tenderer would present an unacceptable risk to the Employer.

Number of Years in Operation
The Tenderer must provide additional information with respect to Years in Operation and Local Office. This information must be completed on form T2.3.6 included in these tender documents.

Each of the above criterion will be scored on the following basis:

0 – 4 Years in Operation = 0
4 – 5 Years in Operation = 1
5 – 6 Years in Operation = 2
6 – 7 Years in Operation = 3
7 – 8 Years in Operation = 4
9 – 10 Years in Operation = 5
10 plus Years in Operation = 10

Comparable Project Nature
The Tenderer must provide additional information with respect to Comparable Project Experience on a successfully completed project. This information must be completed on form T2.3.7 included in these tender documents.

This criteria will be scored on 10 points and will be evaluated on the basis of the Tenderer’s ability to show experience on a similar project. Failure to do so will result in 0 points been scored.
Stage 4: Financial Offer and Preference Evaluation

All responsive Tenders that qualify by meeting the minimum thresholds for functionality are then evaluated on the basis of price and preference in accordance with the Preferential Procurement Regulations 2011 (Government Gazette No. 34350 dated 8 June 2011). The points scored for functionality are not carried over or considered in the calculation of the Financial and Preference evaluation.

All responsive Tenders that have achieved the minimum qualification score for functionality shall be evaluated further in terms of the preference point system prescribed in regulation 5 and 6 of the Preferential Procurement Regulations 2011 (Government Gazette No. 34350 dated 8 June 2011) i.e.:

For Tenders with a Rand Value below R1,0 million (80/20)

(1) The following formula must be used to calculate the points for price in respect of Tenders with a Rand value above R1 000 000 (all applicable taxes included):

\[ P_s = 80 \left( 1 - \frac{P_t - P_{min}}{P_{min}} \right) \]

Where

- \( P \) = Points scored for comparative price of Tender or offer under consideration;
- \( P_t \) = Comparative price of Tender or offer under consideration; and
- \( P_{min} \) = Comparative price of lowest acceptable Tender or offer.

(2) Subject to sub-regulation (3) below, points must be awarded to a Tenderer for attaining their B-BBEE status level of contributor in accordance with the table below:

<table>
<thead>
<tr>
<th>B-BBEE STATUS LEVEL OF CONTRIBUTOR</th>
<th>NUMBER OF POINTS</th>
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<td>7</td>
<td>4</td>
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<tr>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Non-compliant contributor</td>
<td>0</td>
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</tbody>
</table>
A maximum of 20 points may be allocated in accordance with sub-regulation (2) above.

The points scored by a Tenderer in respect of the level of B-BBEE contribution contemplated in sub-regulation (2) above shall be added to the points scored for price as calculated in accordance with sub-regulation (1) above.

The contract shall be awarded to the Tenderer who scores the highest total number of points.

Stage 4: Risk Analysis

In addition to the evaluation of Responsiveness and Functionality, a risk analysis will be performed on the Tenderers having the highest ranking / number of points to ascertain if any of the following, as relevant, present an unacceptable commercial risk to the employer in terms of:

a) Clause F.3.13 of the Standard Conditions of Tender below;
b) Unduly high or unduly low Tendered prices in the Tender offer;
c) Contract data provided by the contractor; and

d) The contents of the Tender returnables which are to be included in the contract.

Technical Enquiries can be addressed to:  Bidding Procedure Enquiries can be addressed to
Mr Malcom Wait  Ms Wendy Sweetman
Tel: 041-585 9731  Tel: 046 603 5820 / 083 313 5954
E-mail: mw@cmbpe.co.za  E-mail: W.Sweetman@saiab.ac.za

COMPILED BY:

<table>
<thead>
<tr>
<th>Peter May</th>
</tr>
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<td>KWMH Quantity Surveyors</td>
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Volume 1
T1.3 : TENDER DATA

GENERAL

The Conditions of Tender applicable to this contract are the Standard Conditions of Tender as contained in Annexure F of the CIDB Standard for Uniformity in Construction Procurement (28 May 2010) as published in Government Gazette No. 33239, Board Notice 86 of 2010.

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this Tender. Data shall have preference in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender.

Each item of Tender Data given below is cross-referenced to the relevant clause in the Standard Conditions of Tender to which it mainly applies.

All references to the terms : “Tender” and “Tenders” and/or “Tenderer” and “Tenderers” in these documents and the Conditions of Tender shall have the same meaning as each other and shall be of equal force.

F.1.1 Actions

The Employer for this Contract is the South African Institute for Aquatic Biodiversity – hereafter SAIAB.

F.1.2 Tender Documents

(a) The Tender Document issued by the Employer comprises of the following:

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<td>T2.4</td>
<td>Forms, Certificates and Schedules required for Tender Evaluation Purposes : Stage 4 : Financial Offer and Preference Evaluation</td>
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<td>T2.6</td>
<td>Other Forms, Certificates and Schedules that will be Incorporated into the Contract Documentation</td>
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<td>Drawings</td>
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The Tender Document and the drawings shall be obtained from the Employer or his authorised representative at the physical address stated in the Tender Notice, upon payment of the amount stated in the Tender Notice.

The following documents are relevant to this Tender and Tenderers are advised to obtain their own copies thereof:

(a) “JBCC Series 2000 N/S Subcontract Agreement (March 2005)” issued by the Joint Building Contracts Committee Inc. (including amendments).

(b) “Code of Practice for the Wiring of Premises” SANS 10142 Part 1.

(c) “Code of Practice for the application of the National Building Regulations” SABS 0400-1990


(e) In addition, Tenderers are advised, in their own interest, to obtain their own copies of the following acts, regulations and standards referred to in the this document as they are essential for the Tenderer to get acquainted with the basics of construction management, the implementation of preferential construction procurement policies and participation of targeted enterprise and labour.


F.1.4 Employer’s Agent

The Employer’s agent is : Clinkscales Maughan-Brown
Address : 41 Parliament Street
Central
PORT ELIZABETH
6001

Contact Number : 041 – 585 9731
E-Mail : cmb@cmbpe.co.za
**F.2.7 Site visit and clarification meeting**
See Notice and Invitation to Tender T1.1

**F.2.12 Alternative Tender offers**
No alternative offers will be considered.

**F.2.13 Submitting a Tender Offer**
Tender offers shall be submitted as an original copy of the compulsory returnable schedules.

**F.2.13.5 Delivery of Tender**
The Employer’s address for delivery of Tender offers and identification details to be shown on each Tender offer package are as per the Notice and Invitation to Tender T1.1.

**F.2.13.6 Two Envelope System**
A two envelope system will be followed.

**F.2.15 Closing time**
The closing time for submission of Tender Offers is as per the Notice and Invitation to Tender T1.1.

**F.2.16 Tender offer validity**
The Tender offer validity period is 90 days from the closing time for submission of Tenders.

**F.2.19 Inspections, tests and analyses**
Access shall be provided for inspections and testing by personnel acting on behalf of the Employer.

**F.2.23 Certificates**
All required documents and certificates expressly requested must be provided with the Tender:

**F.3.4 Opening of Tender Submissions**
Time and location for opening of the tender offers are as per the Notice and Invitation to Tender T1.1.
F.3.11 Evaluation of Tender Offers
The procedure for the evaluation of responsive tenders is method 2 of the CIDB Standard Tender Evaluation Method.

F3.17 Copies of contract
The number of paper copies of the signed contract to be provided by the Employer is **ONE.**
LIST OF RETURNABLE DOCUMENTS

Tenderers to complete this checklist to ensure that all information in the Tender Document is completed included and read by the Tenderer.

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<td>N/S Contract Variables : Pre-Tender Information</td>
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<td></td>
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<td><strong>Other Forms, Certificates and Schedules that will be Incorporated into the Contract</strong></td>
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<td>81</td>
<td>T2.6.1</td>
<td>Record of Addenda to Tender Documents</td>
<td></td>
</tr>
<tr>
<td>82</td>
<td>T2.6.2</td>
<td>Schedule of Departures from Specification</td>
<td></td>
</tr>
</tbody>
</table>
# T2.1 : RETURNABLE DOCUMENTS

**Notes :**
The Tender Document must be submitted as a whole. All forms must be properly completed as required and the document shall not be taken apart or altered in any way whatsoever.

All forms must be duly completed in **black ink** as required.

The list of returnable documents, which consists of forms and schedules to be completed and company specific certificates and information pages to be attached, comprise the following:

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<th>Description</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
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<td>T2.4</td>
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</tr>
<tr>
<td>T2.5</td>
<td>Forms, Certificates and Schedules required for Tender evaluation purposes</td>
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</tr>
<tr>
<td>T2.6</td>
<td>Other Forms, Certificates and Schedules that will be Incorporated into the Contract</td>
<td>80-82</td>
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</table>
T2.1 : FORMS, CERTIFICATES AND SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES: STAGE 1 : ELIGIBILITY

T2.1.1 FORM OF TENDER in terms of a:

Principal Contract Agreement
N/S Subcontract Agreement  X
Minor Works Agreement

Principal Agent or Agent  KWMH Quantity Surveyors
Street Address  4 Lawrence St Central PE
Tel No  041-585 8374
Employer  South African Institute for Aquatic Biodiversity (SAIAB)
(N/S tender only) Contractor
Tenderer
Postal Address
Tel No.  Fax  Email
Code

Project  Completion of 1st floor Collections Facility
Works  Electrical Installation

1.0 CONDITIONS OF TENDER

1.1 PRINCIPAL, NOMINATED / SELECTED AND MINOR WORKS AGREEMENTS

1.1.1 The successful tenderer will be appointed in terms of the JBCC Principal Building Agreement, JBCC N/S Subcontract Agreement of JBCC Minor Works Agreement.

1.1.2 Additions and alterations to such agreement are clearly detailed in the schedule of the agreement.

1.1.3 All pre-tender information is set out in the Schedule. Variables requiring selection by the Tenderer are to be clearly marked for later inclusion in the Schedule.

1.1.4 Any conditions or qualifications that are appended by the tenderer, which are at variance with the conditions in this or the tender enquiry document, may invalidate the submitted tender.

1.1.5 Details of the amount of item 2.4.2 of tender sum are to be clearly designated in the tender documentation provided by the principal agent or agent.

1.1.6 This tender is to be submitted to the principal agent or agent at the street address stated above before the tender closing date and time stated on the cover hereof.

1.1.7 Tenders will be opened in public directly after the stated closing time. Only the total tender sum as stated in 2.4.5 of each tender will be announced.

1.1.8 The lowest or any tender will not necessarily be accepted.

1.2 NOMINATED/SELECTED SUBCONTRACT AGREEMENT ONLY

1.2.1 The Contractor has been or will be appointed in terms of the JBCC Principal Building Agreement.

1.2.2 Where the Tenderer is advised of the appointment of the Contractor after submission of this tender, the Tenderer shall be entitled to reasonable objection to being appointed by the contractor.
1.2.3 This tender is submitted to the Principal agent or agent who is authorised in terms of the Principal Building Agreement to instruct the contractor to appoint the successful tenderer as a nominated/selected subcontractor.

2.0 THE TENDER

2.1 By the submission of this tender to the employer the tenderer offers and agrees to contract for, execute and complete the works/subcontract works for the tender sum as stated below.

2.2 This tender shall remain in full legal force for sixty (60) calendar days from the tender closing date in the case of Principal or Nominated/Selected Contracts. The tenderer accepts liability for damages as may be suffered by the employer should the tender validity period not be honoured.

2.3 The tender takes into account the documents listed hereunder or as per the attached addendum by the principal agent or agent for the purpose of preparing and submitting this tender.

| Document list or addendum identification |

2.4 TENDER SUM COMPILATION

2.4.1 Tenderer’s work including Prime Cost and provisional Amounts

2.4.2 Budgetary Allowances
(amount stated by the principal agent or agent)  
R 60 000.00

2.4.3 Sub Total

2.4.4 Add tax on 2.4.3

2.4.5 TOTAL TENDER SUM inclusive of tax

Tender sum in words

2.5 TENDERER’S SELECTIONS (Fill in Yes / No / Nil etc as appropriate)

<table>
<thead>
<tr>
<th>Selection Item</th>
<th>PBA</th>
<th>N/S</th>
<th>Minor</th>
<th>Addendum</th>
<th>No/s</th>
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<tr>
<td>Preliminaries</td>
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<td>Payment</td>
<td>Alternative A</td>
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<tr>
<td>Adjustment</td>
<td>Alternative A</td>
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<td>Security</td>
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<td>Cash deposit</td>
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<td>Variable construction guarantee</td>
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<td>Fixed construction guarantee</td>
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<td>Retention (Payment reduction)</td>
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<td>Advance payment guarantee</td>
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<tr>
<td>Payment guarantee required</td>
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</table>

Tender sum in words

Thus done and signed at ___________________________ on ___________________________.

Name of signatory ___________________________ Capacity of authorised signatory ___________________________.

As Witness ___________________________ for and on behalf of the Tenderer who by Signature hereof warrants authorisation hereto ___________________________.
T2.1.2 : PROOF OF REGISTRATION WITH CIDB

The Tenderer shall attach hereto the Contractors proof of valid registration certificate with CIDB. CRS number(s) also to be provided.

In the case of Consortium/Joint Venture Tenders, each partner shall provide their own valid CIDB registration certificate.
T2.1.3 : PROOF OF REGISTRATION WITH CSD

In order for a service provider / supplier to do business with the South African Institute for Aquatic Biodiversity they must be registered on the National Treasury Central Supplier Database (CSD) and provide the South African Aquatic Biodiversity with their Supplier Unique No. and an Access Reference No.
### T2.2 : FORMS, CERTIFICATES AND SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES : STAGE 2: RESPONSIVENESS

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<td>T2.2.13</td>
<td>Curriculum Vitae Master Electrician</td>
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</table>
T2.2.1 : TENDER BRIEFING / SITE INSPECTION ATTENDANCE CERTIFICATE

This is to certify that
(Tenderer)…………………………………………………………………………………………...of
Address……………………………………………………………………………………………………
Telephone number……………………………………………………………………………………
Fax number……………………………………………………………………………………………..
E-mail address…………………………………………………………………………………………

was represented by the person(s) named below at the compulsory meeting held for all Tenderers at SAIAB Collection Centre, on 26 July 2016 starting at 10:00.

I/We hereby acknowledge that I/We visited the site and acquainted ourselves with the conditions likely to influence the work and all aspects that could influence either the cost or the construction of the services prior to determining our rates and prices.

I/We further certify that I/we are satisfied with the description of the work and explanations given at the meeting and that I/We understand adequately the work to be done, as specified and implied, in the documentation and information provided.

TENDERER’S REPRESENTATIVE(S):

Name : ................................................ Signature .................................
Capacity ……………………………………………………………………………………………

Name : ................................................ Signature .................................
Capacity ……………………………………………………………………………………………

EMPLOYER’S REPRESENTATIVE:

Name : ................................................ Signature .................................
Capacity …................................................ Date……………………………………..
T2.2.2 : CERTIFICATE OF AUTHORITY FOR SIGNATORY

Indicate the status of the Tenderer by ticking the appropriate box hereunder. The Tenderer must complete the certificate set out below for the relevant category.

<table>
<thead>
<tr>
<th>(I) COMPANY</th>
<th>(II) CLOSE CORPORATION</th>
<th>(III) PARTNERSHIP</th>
<th>(IV) JOINT VENTURE</th>
<th>(V) SOLE PROPRIETOR</th>
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Signatories for Companies, Close Corporations, Partnerships, Joint Ventures or Sole Proprietors must establish their authority thereto by attaching a copy of the relevant resolution of their Board of Directors, Members or Partners duly signed and dated. Examples are shown below.

(I) CERTIFICATE FOR COMPANY

I, ...................................................., chairperson of the Board of Directors of .............................................................., hereby confirm that by resolution of the Board (copy attached) taken on .................... 20...., Mr/Ms ................................, acting in the capacity of .............................................................., was authorized to sign all documents in connection with the Tender for Tender No. ____________ and any contract resulting from it, on behalf of the company.

Chairman: .................................................................

As Witness: 1. .............................................................

2. .................................................................

Date: .................................................................

(II) CERTIFICATE FOR CLOSE CORPORATION

We, the undersigned, being the key members in the business trading as .............................................................., hereby authorize Mr/Ms .............................................................., acting in the capacity of .............................................................., to sign all documents in connection with the Tender for Tender No. ____________ and any contract resulting from it, on our behalf.

<table>
<thead>
<tr>
<th>NAME</th>
<th>ADDRESS</th>
<th>SIGNATURE</th>
<th>DATE</th>
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---------------------------------------------------------
Note: this certificate is to be completed and signed by all of the key members upon whom rests the directions of the affairs of the Close Corporation as a whole.
(III) CERTIFICATE FOR PARTNERSHIP

We, the undersigned, being the key partners in the business trading as, 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**NAME OF FIRM** | **ADDRESS** | **DULY AUTHOURISED SIGNATORY**
---|---|---
Lead Partner | | Signature
CIDB Registration No. | | Designation

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Lead Partner | | Signature
CIDB Registration No. | | Designation

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Lead Partner | | Signature
CIDB Registration No. | | Designation

**Note:** *This certificate is to be completed and signed by all of the key partners upon whom rests the direction of the affairs of the Partnership as a whole.*

(V) **CERTIFICATE FOR SOLE PROPRIETOR**

I, .................................................................................. hereby confirm that I am the sole owner of the business trading as ...........................................................................................................

**Signature** of Sole Owner : ..................................................

As Witnesses:
1. ..............................................................
2. ..............................................................

Date : ...........................................................................
T2.2.3 : REGISTRATION CERTIFICATES/AGREEMENTS / IDENTITY DOCUMENTS

Attach hereto certified copies of Registration Certificates for Companies and Closed Corporations and certified copies of Identity Documents for Partnerships and Sole proprietors as well as signed Agreements and Powers of Attorney for Joint Venture / Consortium if applicable.
T2.2.4 : JOINT VENTURE/CONSORTIUM DISCLOSURE FORM

TO BE COMPLETED ONLY IF TENDER IS SUBMITTED IN A
JOINT VENTURE OR CONSORTIUM

GENERAL

i) All the information requested must be filled in the spaces provided. If additional space is required, additional sheets may be used and attached to the original documents.

ii) A copy of the joint venture agreement must be attached to this form, in order to demonstrate the Affirmable, Joint Venture Partner’s share in the ownership, control, management responsibilities, risks and profits of the joint venture, the proposed joint venture agreement must include specific details relating to:
   a) the contributions of capital and equipment
   b) work items to be performed by the Affirmable Joint Venture Partner’s own forces
   c) work items to be performed under the supervision of the Affirmable Joint Venture Partner.

iii) Copies of all written agreements between partners concerning the contract must be attached to this form including those, which relate to ownership options and to restrictions/limits regarding ownership and control.

iv) ABE partners must complete ABE Declaration Affidavits.

v) The joint venture must be formalised. All pages of the joint venture agreement must be signed by all the parties concerned. A letter/ notice of intention to formalise a joint venture once the contract has been awarded will not be considered.

vi) Should any of the above not be complied with, the joint venture will be deemed null and void and will be considered non-responsive.

1. JOINT VENTURE PARTICULARS

a) Name…………………………………………………………………………………………

b) Postal Address……………………………………………………………………..

   ………………………………………………………………………..


c) Physical address…………………………………………………………………..

   ……………………………………………………………………..


d) Telephone……………………………………………………………………..


e) Fax……………………………………………………………………..
2. IDENTITY OF EACH NON-AFFIRMABLE JOINT VENTURE PARTNER

2.1(a) Name of Firm .................................................................
Postal Address .................................................................
Physical Address ...............................................................
Telephone .................................................................
Fax ..............................................................................
Contact person for matters pertaining to Joint Venture Participation Goal requirements
...........................................................................................

2.2(a) Name of Firm .................................................................
Postal Address .................................................................
Physical Address ...............................................................
Telephone .................................................................
Fax ..............................................................................
Contact person for matters pertaining to Joint Venture Participation Goal requirements
...........................................................................................

(Continue as required for further non-Affirmable Joint Venture Partners)

3. IDENTITY OF EACH AFFIRMABLE JOINT VENTURE PARTNER

3.1(a) Name of Firm .................................................................
Postal Address .................................................................
Physical Address ...............................................................
Telephone .................................................................
Fax ..............................................................................
Contact person for matters pertaining to Joint Venture Participation Goal requirements
...........................................................................................

3.2(a) Name of Firm .................................................................
Postal Address .................................................................
Physical Address ...............................................................
Telephone .................................................................
Fax ..............................................................................
Contact person for matters pertaining to Joint Venture Participation Goal requirements

3.3(a) Name of Firm .................................................................
Postal Address .................................................................
Physical Address ...............................................................
...........................................................................................
4. BRIEF DESCRIPTION OF THE ROLES OF THE AFFIRMABLE JOINT VENTURE PARTNERS IN THE JOINT VENTURE

5. OWNERSHIP OF THE JOINT VENTURE
   a) Affirmable Joint Venture Partner ownership percentage(s) ............... %
   b) Non-Affirmable Joint Venture Partner ownership percentage(s) ........... %
   c) Affirmable Joint Venture Partner percentages in respect of: *
      (i) Profit and loss sharing.................................................................
      (ii) Initial capital contribution in Rands.........................................
           .................................................................................................
      (*Brief descriptions and further particulars should be provided to clarify percentages).
      (iii) Anticipated on-going capital contributions in Rands .................
           .................................................................................................
      (iv) Contributions of equipment (specify types, quality, and quantities of equipment) to be provided by each partner.
           .................................................................................................

6. RECENT CONTRACTS EXECUTED BY PARTNERS IN THEIR OWN RIGHT AS PRIME CONTRACTORS OR AS PARTNERS IN OTHER JOINT VENTURES

| NON-AFFIRMABLE JOINT VENTURE | PARTNER NAME |
7. **CONTROL AND PARTICIPATION IN THE JOINT VENTURE**

(Identify by name and firm those individuals who are, or will be, responsible for, and have authority to engage in the relevant management functions and policy and decision making, indicating any limitations in their authority e.g. co-signature requirements and Rand limits).

(a) **Joint Venture cheque signing**

........................................................................................................................................
........................................................................................................................................
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(b) **Authority to enter into contracts on behalf of the Joint Venture**

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(c) **Signing, co-signing and/or collateralising of loans**

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8. MANAGEMENT OF CONTRACT PERFORMANCE
(Fill in the name and firm of the responsible person).

(a) Supervision of field operations
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(b) Major purchasing
...................................................................................................................
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(c) Estimating
....................................................................................................................
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(d) Technical management
.....................................................................................................................
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9. MANAGEMENT AND CONTROL OF JOINT VENTURE

(a) Identify the “managing partner”, if any,
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(b) What authority does each partner have to commit or obligate the other to financial institutions, insurance companies, suppliers, subcontractors and/or other parties participating in the execution of the contemplated works?
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(c) **Describe the management structure for the Joint Venture’s work under the contract**

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<th>MANAGEMENT FUNCTION / DESIGNATION</th>
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* Fill in “ex Affirmable Joint Venture Partner” or “ex non-Affirmable Joint Venture Partner”.

10. **PERSONNEL**

(a) State the approximate number of operative personnel (by trade/function/discipline) needed to perform the Joint Venture work under the Contract.

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<th>TRADE/FUNCTION/ DISCIPLINE</th>
<th>NUMBER EX AFFIRMABLE JOINT VENTURE PARTNERS</th>
<th>NUMBER EX NON-AFFIRMABLE JOINT VENTURE PARTNERS</th>
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(Fill in “ex Affirmable Joint Venture Partner” or “ex non-Affirmable Joint Venture Partner”).

(b) Number of operative personnel to be employed on the Contract who are currently in the employ of partners.
(i) Number currently employed by Affirmable Joint Venture Partners
..........................................................................................................................

(ii) Number currently employed by the Joint Venture
..........................................................................................................................

(c) Number of operative personnel who are not currently in the employ of the respective partner and will be engaged on the project by the Joint Venture
..........................................................................................................................

(d) Name of individual(s) who will be responsible for hiring Joint Venture employees
..........................................................................................................................
..........................................................................................................................
..........................................................................................................................

(e) Name of partner who will be responsible for the preparation of Joint Venture payrolls
..........................................................................................................................
..........................................................................................................................
..........................................................................................................................

11. CONTROL AND STRUCTURE OF THE JOINT VENTURE

Briefly describe the manner in which the Joint Venture is structured and controlled.
..........................................................................................................................
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The undersigned warrants that he/she is duly authorised to sign this Joint Venture Disclosure Form and affirms that the foregoing statements are true and correct and include all material information necessary to identify and explain the terms and operations of the Joint Venture and the intended participation of each partner in the undertaking.

The undersigned further covenants and agrees to provide the Employer with complete and accurate information regarding actual Joint Venture work and the payment therefore, and any proposed changes in any provisions of the Joint Venture agreement, and to permit the audit and examination of the books, records and files of the Joint Venture, or those of each partner relevant to the Joint Venture, by duly authorised representatives of the Employer.

Signature .................................................................................................................................
Duly authorised to sign on behalf of...........................................................................................
Name ........................................................................................................................................
Address ....................................................................................................................................
Telephone ...................................................................................................................................
Date ..........................................................................................................................................
Signature

Duly authorised to sign on behalf of

Name

Address

Telephone

Date

Signature

Duly authorised to sign on behalf of

Name

Address

Telephone

Date

Signature

Duly authorised to sign on behalf of

Name

Address

Telephone

Date

Signature

Duly authorised to sign on behalf of

Name

Address

Telephone

Date
T2.2.5 : TAX CLEARANCE CERTIFICATE

It is a condition of Tender that the taxes of the successful Tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the Tenderer’s tax obligations.

Tenderers’ original valid tax clearance certificate to be attached hereto.

IMPORTANT NOTES:

1. The following is an abstract from the Preferential Procurement Regulations 2011 promulgated with the Preferential Policy Framework Act No 5 of 2000:

   “Tax clearance”

   Section 14. No Tender may be awarded to any person whose tax matters have not been declared by the South African Revenue Service to be in order.”

2. The TCC001 “Application for Tax Clearance Certificate” form is available from any SARS branch office nationally or on the website www.sars.gov.za.

   Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register for this service with SARS through the website www.sarsefiling.co.za.

   SARS will then furnish the Tenderer with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.

3. In the case of Joint Venture/Consortium Tenders, each party must submit a separate Tax Clearance Certificate of Declaration by SARS that tax matters are in order.

4. Failure of Tenderer to comply with the above will result in the invalidation of the Tender.

5. The company VAT number should also be quoted on the Tax Clearance Certificate.
T2.2.6 : PROOF OF WORKMEN’S COMPENSATION REGISTRATION

The Tenderer shall attach hereto valid proof of workmen’s compensation registration or proof of payment of contributions in terms of the compensation of occupational injuries and diseases (Act No. 4 of 2002). (Letter of Good Standing)
T2.2.7 : DECLARATION OF INTEREST

TENDERERS WHO FAIL TO DECLARE ACCURATELY AND HONESTLY SHALL BE DISQUALIFIED AND THEIR NAMES AND COMPANY DETAILS WILL BE SUBMITTED TO NATIONAL TREASURY AND PROVINCIAL TREASURY TO BE BLACK LISTED. SHOULD YOUR INTEREST BE DISCOVERED AFTER THE AWARD OF THE CONTRACT THE EMPLOYER SHALL TERMINATE YOUR CONTRACT ON THE BASIS OF THE ABOVE

1. Any legal person, including persons employed by SAIAB or the state, or persons having a kinship with persons employed by SAIAB or the state, including a blood relationship, may make an offer or offers in terms of this invitation to tender (includes a price quotation, advertised competitive Tender, limited Tender or proposal). In view of possible allegations of favouritism, should the resulting Tender, or part thereof, be awarded to persons employed by the state, or to persons connected with or related to them, it is required that the Tenderer or his/her authorised representative declare his/her position in relation to the evaluating/adjudicating authority where-
   - the Tenderer is employed by SAIAB or the state; and/or
   - the legal person on whose behalf the Tendering document is signed, has a relationship with persons/a person who are/is involved in the design, evaluation and or adjudication of the Tender(s), or where it is known that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the design, evaluation and or adjudication of the Tender.

2. In order to give effect to the above, the following questionnaire must be completed and submitted with the Tender.

2.1. Full Name of Tenderer or his or her representative:
............................................................................................................................

2.2. Identity Number: ...............................................................................................................

2.3. Position occupied in the Company (director, trustee, shareholder):
...........................................................................................................................................

1. “State” means –
   (a) any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);
   (b) any municipality or municipal entity;
   (c) Provincial legislature;
   (d) National Assembly or the National Council of Provinces; or
   (e) Parliament

2. “Shareholder” means – a person who owns shares in the company and is actively involved in the management of the enterprise or business and exercises control over the enterprise.

2.4. Company Registration Number:
............................................................................................................................

2.5. Tax Reference Number: ...........................................................................................................
2.6. VAT Registration Number: ..............................................................................................

2.7. The names of all directors / trustees / shareholders / members, their individual identity numbers, tax reference numbers and, if applicable, employee /PERSAL numbers must be indicated in paragraph 3 below.

2.8. Are you or any person connected with the Tenderer presently employed by SAIAB or the state?  

YES / NO

2.8.1. If so, furnish the following particulars:

Name of person / director / trustee / shareholder/ member

Name of state institution at which you or the person connected to the Tenderer is employed:

Position occupied in the state institution:

2.8.2. Any other particulars:

2.8.3. If you are presently employed by SAIAB or the state, did you obtain the appropriate authority to undertake remunerative work outside employment in the public sector?  

YES / NO

2.8.3.1. If yes, did you attached proof of such authority to the Tender document?  

YES / NO

(Note: Failure to submit proof of such authority, where applicable, shall result in the disqualification of the Tender.

2.8.3.2. If no, furnish reasons for non-submission of such proof:

2.9. Did you or your spouse, or any of the company’s directors / trustees / shareholders / members or their spouses conduct business with SAIAB or the state in the previous twelve months?  

YES / NO

2.9.1. If so, furnish particulars:

28
2.10. Do you, or any person connected with the Tenderer, have any relationship (family, friend, other) with a person employed by SAIAB or the state and who may be involved with the design, evaluation and or adjudication of this Tender?

YES / NO

2.10.1. If so, furnish particulars.

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

2.11. Are you, or any person connected with the Tenderer, aware of any relationship (family, friend, other) between any other Tenderer and any person employed by SAIAB or the state who may be involved with the evaluation and or adjudication of this Tender?

YES/NO

2.11.1. If so, furnish particulars.

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

2.12. Do you or any of the directors / trustees / shareholders / members of the company have any interest in any other related companies whether or not they are Tendering for this contract?

YES/NO

2.12.1. If so, furnish particulars:

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
### 3. FULL DETAILS OF DIRECTORS / TRUSTEES / MEMBERS / SHAREHOLDERS

<table>
<thead>
<tr>
<th>FULL NAME</th>
<th>IDENTITY NUMBER</th>
<th>PERSONAL TAX REFERENCE NUMBER</th>
<th>STATE EMPLOYEE NUMBER / PERUSAL NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### 4. DECLARATION

I, THE UNDERSIGNED (NAME) .................................................................

CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 2 and 3 ABOVE IS CORRECT. I ACCEPT THAT THE STATE WILL REJECT THE TENDER OR DEEM ME TO BE IN DEFAULT OF THE CONTRACT SHOULD THIS DECLARATION PROVE TO BE FALSE.

................................................................. .................................................................
Signature Date

................................................................. .................................................................
Position (Print) Name of Tenderer

FAILURE TO SIGN THE DOCUMENT WILL LEAD TO DISQUALIFICATION
T2.2.8 : DECLARATION OF TENDERERS PAST SUPPLY CHAIN MANAGEMENT PRACTICES

Penalty:

Upon detecting any false claim or statement hereunder will result in the Tenderers de-registration and the Tenderer will be prevented from participation in future contracts for a period of three (3) years.

1. This Standard Tendering Document must form part of all Tenders invited.

2. It serves as a declaration to be used by institutions in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3. The TENDER of any Tenderer may be disregarded if that Tenderer, or any of its directors have -
   a. abused the institution’s supply chain management system;
   b. committed fraud or any other improper conduct in relation to such system; or
   c. failed to perform adequately on any previous contract.

4. In order to give effect to the above, the following questionnaire must be completed and submitted with the Tender.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUESTION</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Is the Tenderer or any of its directors listed on the National Treasury’s database as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this database were informed in writing of this restriction by the National Treasury after the audi alteram partem rule was applied).</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4.1.1</td>
<td>If so, furnish particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>Is the Tenderer or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To access this Register enter the National Treasury’s website, <a href="http://www.treasury.gov.za">www.treasury.gov.za</a>, click on the icon “Register for Tender Defaulters” or submit your written request for a hard copy of the Register to facsimile number (012) 3265445.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4.2.1</td>
<td>If so, furnish particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td>Was the Tenderer or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4.3.1</td>
<td>If so, furnish particulars:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4</td>
<td>Was any contract between the Tenderer and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>4.4.1</td>
<td>If so, furnish particulars:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CERTIFICATION

I, THE UNDERSIGNED (FULL NAME)……………………………………………… CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS TRUE AND CORRECT.

I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

.................................................. ..................................................
Signature Date

.................................................. ..................................................
Position Name of Tenderer

I confirm that I am duly authorized to sign this contract.
1. This Standard Tendering Document (SBD) must form part of all Tenders invited.

2. Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive Tendering (or Tender rigging). Collusive Tendering is a per se prohibition meaning that it cannot be justified under any grounds.

3. Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:
   a. disregard the Tender of any Tenderer if that Tenderer, or any of its directors have abused the institution’s supply chain management system and or committed fraud or any other improper conduct in relation to such system.
   b. cancel a contract awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the Tendering process or the execution of that contract.

4. This SBD serves as a certificate of declaration that would be used by institutions to ensure that, when Tenders are considered, reasonable steps are taken to prevent any form of Tender-rigging.

5. In order to give effect to the above, the attached Certificate of Tender Determination must be completed and submitted with the Tender:

---

1. Includes price quotations, advertised competitive Tenders, limited Tenders and proposals.

2. Tender rigging (or collusive Tendering) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a Tendering process. Tender rigging is, therefore, an agreement between competitors not to compete.
CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying Tender:

CONTRACT: ____________________________________________________________________________

in response to the invitation for the Tender made by:
_____________________________________________________________________________________

(Name of Institution)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of: ________________________________________________________________ that:

(Name of Tenderer)

1. I have read and I understand the contents of this Certificate;

2. I understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect;

3. I am authorized by the Tenderer to sign this Certificate, and to submit the accompanying Tender, on behalf of the Tenderer;

4. Each person whose signature appears on the accompanying Tender has been authorized by the Tenderer to determine the terms of, and to sign the Tender, on behalf of the Tenderer;

5. For the purposes of this Certificate and the accompanying Tender, I understand that the word “competitor” shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:

   (a) has been requested to submit a Tender in response to this Tender invitation;

   (b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and

   (c) provides the same goods and services as the Tenderer and/or is in the same line of business as the Tenderer

6. The Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium will not be construed as collusive Tendering.

7. In particular, without limiting the generality of paragraph 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

   (a) prices;

   (b) geographical area where product or service will be rendered (market allocation)

   (c) methods, factors or formulas used to calculate prices;

   (d) the intention or decision to submit or not to submit, a Tender;
(e) the submission of a Tender which does not meet the specifications and conditions of the Tender; or

(f) Tendering with the intention not to win the Tender.

8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this Tender invitation relates.

9. The terms of the accompanying Tender have not been, and will not be, disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official Tender opening or of the awarding of the contract.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to Tenders and contracts, Tenders that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

3. Joint venture or Consortium 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.
11. N.B.: THIS FORM MUST BE SIGNED BY THE TENDERER AND TWO WITNESSES

.................................................. ..................................................
Signature Date
.................................................. ..................................................
Position Name of Tenderer

WITNESS (1) __________________________ NAME (PRINT) _______________________

WITNESS (2) __________________________ NAME (PRINT) _______________________

T2.2.10 : RELATED EXPERIENCE OF TENDERER

The Tenderer shall list below or in a separate schedule a statement of those works/services that are of a similar nature which they have satisfactorily completed in the past five years. The works/services should reflect a project of similar nature to this tender. Information must be provided in the format provided below. It is essential that telephone contact details of references be supplied.

**COMPARABLE PROJECT UNDERTAKEN:**

<table>
<thead>
<tr>
<th>PROJECT DESCRIPTION</th>
<th>EMPLOYER / CONTACT PERSON / TEL NO.</th>
<th>CONSULTING ENGINEER / CONTACT PERSON / TEL NO.</th>
<th>VALUE OF SUB-CONTRACT WORKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

DATE: ___________________________ SIGNATURE OF TENDERER: ___________________________
**T2.2.11 : LIST OF KEY PERSONNEL**

The Tenderer shall attach hereto a shortened CV for each key member available to work on the project in the Categories Site Foreman and Master Electrician (using the template provided).

The Tenderer shall list below the key personnel to be used on this project.

<table>
<thead>
<tr>
<th>NAME</th>
<th>JOB</th>
<th>RESPONSIBILITIES AND AVAILABILITY TO PROJECT</th>
<th>QUALIFICATIONS (ATTACHED COPY)</th>
<th>EXPERIENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SITE FOREMAN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MASTER ELECTRICIAN</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# T2.2.12: CURRICULUM VITAE SITE FOREMAN

<table>
<thead>
<tr>
<th>Responsibility or role on the project (as per table T2.3.2)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Date of birth</td>
</tr>
<tr>
<td>Profession</td>
<td>Nationality</td>
</tr>
<tr>
<td>Qualifications</td>
<td></td>
</tr>
<tr>
<td>Professional membership</td>
<td></td>
</tr>
<tr>
<td>Name of employer (firm)</td>
<td></td>
</tr>
<tr>
<td>Current position</td>
<td>Years with firm</td>
</tr>
</tbody>
</table>

**Employment record:** (List of chronological order starting with earliest work experience)

**Experience record pertinent to required service:**

**Certification:**

I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience and that I will be available to execute the work for which I have been nominated.

(Signature of Person named in schedule) \(\quad\) Date

Attach additional pages if more space is required
SUPPLEMENTARY INFORMATION SITE FOREMAN

Please attach any supporting documentation, supplementary information or Curriculum Vitae to this page.
# T2.2.13 : CURRICULUM VITAE MASTER ELECTRICIAN

<table>
<thead>
<tr>
<th>Responsibility or role on the project (as per table T2.3.2)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Name : Date of birth :</td>
<td></td>
</tr>
<tr>
<td>Profession : Nationality :</td>
<td></td>
</tr>
<tr>
<td>Qualifications :</td>
<td></td>
</tr>
<tr>
<td>Professional membership :</td>
<td></td>
</tr>
<tr>
<td>Name of employer (firm) :</td>
<td></td>
</tr>
<tr>
<td>Current position : Years with firm :</td>
<td></td>
</tr>
<tr>
<td>Employment record : (List of chronological order starting with earliest work experience)</td>
<td></td>
</tr>
<tr>
<td>Experience record pertinent to required service:</td>
<td></td>
</tr>
<tr>
<td>Certification :</td>
<td></td>
</tr>
</tbody>
</table>

I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience and that I will be available to execute the work for which I have been nominated.

(Signature of Person named in schedule) Date

Attach additional pages if more space is required
SUPPLEMENTARY INFORMATION MASTER ELECTRICIAN

Please attach any supporting documentation, supplementary information or Curriculum Vitae to this page.
## T2.3: FORMS, CERTIFICATES AND SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES: STAGE 3: FUNCTIONALITY

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.3.1</td>
<td>Project Reference Returnable 1 of 5</td>
<td>44 - 45</td>
</tr>
<tr>
<td>T2.3.2</td>
<td>Project Reference Returnable 2 of 5</td>
<td>46 - 47</td>
</tr>
<tr>
<td>T2.3.3</td>
<td>Project Reference Returnable 3 of 5</td>
<td>48 - 49</td>
</tr>
<tr>
<td>T2.3.4</td>
<td>Project Reference Returnable 4 of 5</td>
<td>40 - 51</td>
</tr>
<tr>
<td>T2.3.5</td>
<td>Project Reference Returnable 5 of 5</td>
<td>52 - 53</td>
</tr>
<tr>
<td>T2.3.6</td>
<td>Form of Required Information</td>
<td>54</td>
</tr>
<tr>
<td>T2.3.7</td>
<td>Related Experience of Tenderer</td>
<td>55</td>
</tr>
</tbody>
</table>
T2.3.1 : PROJECT REFERENCE RETURNABLE 1 OF 5

NOTE: This returnable document must be completed by the person who was the Employer, Principal Agent, OR Consulting Engineer of a project of at least R650 000 including VAT that was completed successfully by the tenderer.

I, __________________________________________ (name and surname) of __________________________________________ (company name) declare

That I was the Employer/ Principal Agent/ Consulting Engineer on the following project successfully executed by __________________________________________ (name of tenderer):

Project name: __________________________________________

Project location: __________________________________________

Construction period: _____________________ Completion date: ___________________

Subcontract value: _____________________

A. Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting “Yes” in the relevant box below:

<table>
<thead>
<tr>
<th></th>
<th>Very Poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project performance / time management / Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Quality of workmanship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Resources: Personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Co-ordination with other services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Financial management / payment of suppliers/ cash flow, etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Occupational Health &amp; Safety : Compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. Would you consider / recommend this tenderer again:

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

C. Any other comments:
____________________________________________________________________________________________________________________________________________________
____________________________________________________________________________________________________________________________________________________

D. My contact details are:

Telephone: ________________  Cellphone: ________________  Fax: ________________
E-mail: ____________________________

Thus signed at ______________________ on this ______ day of __________ 2015

Signature of Referee

NOTE:
If reference cannot be verified due to the inability to contact the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points.

____________________________________________________________________________________________________________________________________________________
Name of Tenderer

____________________________________________________________________________________________________________________________________________________
Signature of Tenderer  Date
T2.3.2: PROJECT REFERENCE RETURNABLE 2 OF 5

NOTE: This returnable document must be completed by the person who was the Employer, Principal Agent, OR Consulting Engineer of a project of at least R650 000 including VAT that was completed successfully by the tenderer.

I, ___________________________ (name and surname) of ___________________________ (company name) declare

That I was the Employer/ Principal Agent/ Consulting Engineer on the following project successfully executed by ________________________________________________ (name of tenderer):

Project name: ____________________________________________________________

Project location: __________________________________________________________

Construction period: _____________________ Completion date: ___________________

Subcontract value: _____________________________

B. Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting “Yes” in the relevant box below:

<table>
<thead>
<tr>
<th></th>
<th>Very Poor 1</th>
<th>Poor 2</th>
<th>Fair 3</th>
<th>Good 4</th>
<th>Excellent 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project performance / time management / Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Quality of workmanship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Resources: Personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Co-ordination with other services</td>
<td></td>
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<td></td>
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<tr>
<td>6. Occupational Health &amp; Safety : Compliance</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
B. Would you consider / recommend this tenderer again:

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

C. Any other comments:

________________________________________________________________________
________________________________________________________________________

D. My contact details are:

Telephone: _______________  Cellphone: _______________  Fax: __________

E-mail: ________________________________

Thus signed at ______________________ on this _______ day of __________ 2015

_______________________________________________________________________

Signature of Referee

COMPANY STAMP

NOTE:

If reference cannot be verified due to the inability to contact the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points.

_______________________________________________________________________

Name of Tenderer

_______________________________________________________________________

Signature of Tenderer  Date
T2.3.3 : PROJECT REFERENCE RETURNABLE 3 OF 5

NOTE: This returnable document must be completed by the person who was the Employer, Principal Agent, OR Consulting Engineer of a project of at least R650 000 including VAT that was completed successfully by the tenderer.

I, __________________________ (name and surname) of __________________________________________ (company name) declare

That I was the Employer/ Principal Agent/ Consulting Engineer on the following project successfully executed by ________________________________ (name of tenderer):

Project name: __________________________________________________________

Project location: _________________________________________________________

Construction period: ___________________ Completion date: ___________________

Subcontract value: __________________________

C. Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting “Yes” in the relevant box below:

<table>
<thead>
<tr>
<th></th>
<th>Very Poor 1</th>
<th>Poor 2</th>
<th>Fair 3</th>
<th>Good 4</th>
<th>Excellent 5</th>
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<tr>
<td>1. Project performance / time management / Programming</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Quality of workmanship</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>4. Co-ordination with other services</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Financial management / payment of suppliers/ cash flow, etc</td>
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<td></td>
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</tr>
<tr>
<td>6. Occupational Health &amp; Safety : Compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. Would you consider / recommend this tenderer again:

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

C. Any other comments:

________________________________________________________________________
________________________________________________________________________

D. My contact details are:

Telephone: _______________   Cellphone: _______________   Fax: _______________
E-mail: _______________

Thus signed at __________________ on this _______ day of ___________ 2015

_______________________________
Signature of Referee

COMPANY STAMP

NOTE:

If reference cannot be verified due to the inability to contact the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points.

__________________________________________
Name of Tenderer

__________________________________________
Signature of Tenderer   Date
T2.3.4 : PROJECT REFERENCE RETURNABLE 4 OF 5

NOTE: This returnable document must be completed by the person who was the Employer, Principal Agent, OR Consulting Engineer of a project of at least R650 000 including VAT that was completed successfully by the tenderer.

I, ________________________________ (name and surname) of ________________________________ (company name) declare

That I was the Employer/ Principal Agent/ Consulting Engineer on the following project successfully executed by ________________________________ (name of tenderer):

Project name: __________________________________________________________

Project location: _______________________________________________________

Construction period: _____________________ Completion date: ________________

Subcontract value: ____________________________

D. Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting “Yes” in the relevant box below:

<table>
<thead>
<tr>
<th></th>
<th>Very Poor 1</th>
<th>Poor 2</th>
<th>Fair 3</th>
<th>Good 4</th>
<th>Excellent 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project performance / time management / Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Quality of workmanship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Resources: Personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Co-ordination with other services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Financial management / payment of suppliers/ cash flow, etc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Occupational Health &amp; Safety : Compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. Would you consider / recommend this tenderer again:

YES  NO

C. Any other comments:
________________________________________________________________________
________________________________________________________________________

D. My contact details are:

Telephone: _______________  Cellphone: _______________  Fax: __________
E-mail: ______________________________

Thus signed at __________________ on this _______ day of __________ 201

___________________________________________  COMPANY STAMP
Signature of Referee

NOTE:

If reference cannot be verified due to the inability to contact the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points.

___________________________________________
Name of Tenderer

___________________________________________  _________________________
Signature of Tenderer  Date
NOTE: This returnable document must be completed by the person who was the Employer, Principal Agent, OR Consulting Engineer of a project of at least R650 000 including VAT that was completed successfully by the tenderer.

I, ______________________________________________ (name and surname) of

________________________________________________________ (company name) declare

That I was the Employer/ Principal Agent/ Consulting Engineer on the following project successfully executed by ______________________________________________ (name of tenderer):

Project name: ____________________________________________________________

Project location: __________________________________________________________

Construction period: _____________________ Completion date: ___________________

Subcontract value: ____________________

E. Please evaluate the performance of the Tenderer on the abovementioned project, on which you were the principal agent, by inserting “Yes” in the relevant box below:

<table>
<thead>
<tr>
<th></th>
<th>Very Poor</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project performance / time management / Programming</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. Quality of workmanship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Resources: Personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Co-ordination with other services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Occupational Health &amp; Safety : Compliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
B. Would you consider / recommend this tenderer again:

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

C. Any other comments:
________________________________________________________________________
________________________________________________________________________

D. My contact details are:

Telephone: _______________  Cellphone: _______________  Fax: ___________
E-mail: __________________________

Thus signed at __________________ on this _______ day of ______________ 2015

_________________________________________
Signature of Referee

NOTE:

If reference cannot be verified due to the inability to contact the referee or failure on his/her part to respond to a written request to do so, that reference will not score any points.

_________________________________________
Name of Tenderer

_________________________________________
Signature of Tenderer   Date

Volume 2
T2.3.6 ; FORM OF REQUIRED INFORMATION

THE FOLLOWING PARTICULARS MUST BE FURNISHED

NAME OF TENDERER ....................................................................................................................

LOCAL OFFICE INFORMATION: ....................................................................................................

DATE OF COMMENCING OPERATIONS: ...........................................................................................

POSTAL ADDRESS ...........................................................................................................................

STREET ADDRESS ..........................................................................................................................

TELEPHONE NUMBER CODE ....... NUMBER ...........................................................

CELLPHONE NUMBER ..................................................................................................................

FACSIMILE NUMBER CODE ....... NUMBER ............................................................

SIGNATURE OF TENDERER: ...........................................................................................................

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

CAPACITY IN WHICH THIS TENDER IS SIGNED: .............................................................................

T2.3.7 : RELATED EXPERIENCE OF TENDERER

The Tenderer shall list below or in a separate schedule a statement of those works/services that are of a similar nature which they have satisfactorily completed in the past five years. The works/services should reflect a project of similar nature to this tender. It is essential that telephone contact details of references be supplied.

**COMPARABLE PROJECT UNDERTAKEN:**

<table>
<thead>
<tr>
<th>PROJECT DESCRIPTION</th>
<th>EMPLOYER / CONTACT PERSON / TEL NO.</th>
<th>CONSULTING ENGINEER / CONTACT PERSON / TEL NO.</th>
<th>VALUE OF SUB-CONTRACT WORKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DATE: ___________________ SIGNATURE OF TENDERER: ___________________
T2.4 : FORMS, CERTIFICATES AND SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES : STAGE 3 : FINANCIAL OFFER AND PREFERENCE EVALUATION

T2.4.1  Broad-based Black Economic Empowerment Status Level Certificate

Page No.

57
T2.4.1 : BROAD-BASED BLACK ECONOMIC EMPOWERMENT STATUS LEVEL CERTIFICATE

Tenderer to attach hereto the Broad-Based Black Economic Empowerment Status Level Certificate of the Tendering Company and/or Joint Venture Partners.

a) Exempted Micro Enterprises (EME’s) with an annual total revenue of R10,000,000 or less may submit a sworn affidavit or Certificate issued by the Companies and Intellectual Properties Commission (CIPC).

b) Qualifying Small Enterprises (QSE’s) with an annual total revenue of R50,000,000 or less may submit a sworn affidavit or Certificate issued by the Companies and Intellectual Properties Commission (CIPC).

c) All other measured entities are required to submit their original and valid BBBEE status level verification certificate or a certified copy thereof, substantiating their BBBEE rating.

i) as issued prior to 17 February 2016 in accordance with the Construction and Chartered Accounting (CA) Sector Codes

ii) as issued post 17 February 2016 in accordance with the Generic Codes of Good Practice

iii) only BBBEE status level certificates issued by the following are valid:

- Verification Agencies accredited by the South African National Accreditation System (SANAS);

- Registered Auditors approved by the Independent Regulatory Board of Auditors (IRBA) in accordance with the approval granted by the Department of Trade and Industry.

d) The submission of such certificates must comply with the requirements of instructions and guidelines issued by the National Treasury and be in accordance with notices published by the Department of Trade and Industry in the Government Gazette.

e) The BBBEE status level attained by the Tenderer must be used to determine the number of points contemplated in regulations 5 (2) and 6 (2).”
**T2.5 : FORMS, CERTIFICATES AND SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES**

<table>
<thead>
<tr>
<th>T2.5.1</th>
<th>Final Summary</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.5.2</td>
<td>Form Concerning Fulfilment of the Construction Regulations</td>
<td>60 - 62</td>
</tr>
<tr>
<td>T2.5.3</td>
<td>N/S Subcontract Variables : Pre-tender information</td>
<td>63 - 66</td>
</tr>
<tr>
<td>T2.5.4</td>
<td>N/S Subcontract Variables : Post-tender information</td>
<td>67 - 69</td>
</tr>
<tr>
<td>T2.5.5</td>
<td>Pro-Forma Construction Guarantee</td>
<td>70 - 73</td>
</tr>
<tr>
<td>T2.5.6</td>
<td>Form of Intent to provide a Performance Guarantee</td>
<td>74</td>
</tr>
<tr>
<td>T2.5.7</td>
<td>Audited Financial Statements for the last three years</td>
<td>75</td>
</tr>
<tr>
<td>T2.5.8</td>
<td>Letter of Good Standing from Tenderers Banker</td>
<td>76</td>
</tr>
<tr>
<td>T2.5.9</td>
<td>Schedule of Proposed Sub Contractors</td>
<td>77</td>
</tr>
<tr>
<td>T2.5.10</td>
<td>Schedule of Equipment Offered</td>
<td>78 - 79</td>
</tr>
</tbody>
</table>
**T2.5.1 : FINAL SUMMARY**

**PRICE SUMMARY**

The following Schedule of Prices must be completed by the Tenderer. The Employer reserves the right to accept or reject any tender and the lowest price tender need not necessarily be accepted.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
</table>
| 1.   | Price for the supply and installation, commissioning of the complete electrical installation as specified as per the Bills of Quantities and as detailed on the layout drawings. | R……………..
| 2.   | **PROVISIONAL AMOUNTS**                                                    |           |
| 2.1  | Re-testing of the existing dedicated earth mat                             | R 2 000-00 |
| 2.2  | Re-testing of the existing Lightning Protection System                     | R 2 000-00 |
| 2.3  | Work in Genetics laboratory                                                | R12 000-00 |

*Total Carried forward to 'Form of Tender' PART T2.1 R__________*

**DATE:** ____________________ **SIGNATURE OF TENDERER** ____________________

**NAME (IN BLOCK LETTERS)** ____________________________

**ADDRESS** ________________________________________

**TELEPHONE NUMBER** ________________________________

**FAX NUMBER** ________________________________
T2.5.2 : FORM CONCERNING FULFILMENT OF THE CONSTRUCTION REGULATIONS, 2003

In terms of regulation 4(3) of the Construction Regulations, 2003 (hereinafter referred to as the Regulations), promulgated on 18 July 2003 in terms of Section 43 of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) the Employer shall not appoint a contractor to perform construction work unless the Contractor can satisfy the Employer that his/her firm has the necessary competencies and resources to carry out the work safely and has allowed adequately in his/her Tender for the due fulfilment of all the applicable requirements of the Act and the Regulations.

1. I confirm that I am fully conversant with the Regulations and that my company has (or will acquire/procure) the necessary competencies and resources to timeously, safely and successfully comply with all of the requirements of the Regulations.

   (Tick)

2. Proposed approach to achieve compliance with the Regulations

   (Tick)

   | Own resources, competent in terms of the Regulations (refer to 3 below) |
   | Own resources, still to be hired and/or trained (until competency is achieved) |
   | Specialist sub-contract resources (competent) - specify: |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |
   | ............................................................................................................................ |

   YES  NO
3. Provide details of proposed key persons, competent in terms of the Regulations, who will form part of the Contract team as specified in the Regulations (CV’s to be attached).

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

4. Provide details of proposed training (if any) that will be undergone:
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................

5. Potential key risks identified and measures for addressing risks:
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................
..................................................................................................................................................

6. I have fully included in my Tendered rates and prices (in the appropriate payment items provided in the Schedule of Quantities) for all resources, actions, training and any other costs required for the due fulfilment of the Regulations for the duration of the construction and defects repair period.

(Tick)

SIGNATURE OF PERSON(S) AUTHORISED TO SIGN THIS TENDER:

1. .................................................... Date ....................................................

2. .................................................... Date ....................................................

YES

NO
T2.5.3 : N/S SUBCONTRACT VARIABLES : PRE-TENDER INFORMATION

N/S CONTRACT VARIABLES

THE N/S SCHEDULE

This n/s schedule contains all variables referred to in this document and is divided into pre-tender and post-tender categories. The pre-tender category must be completed in full and included in the tender documents. Both the pre-tender and post-tender categories form part of this n/s agreement.

Spaces requiring information must be filled in, shown as 'not applicable' or deleted and not left blank. Where choices are offered, the non-applicable items are to be deleted. Where insufficient space is provided the information should be annexed hereto and cross referenced to the applicable clause of the n/s schedule. Key cross reference clauses are italicised in [ ] brackets.

42.0 PRE-TENDER INFORMATION

42.1 N/S CONTRACTING AND OTHER PARTIES

42.1.1 Employer

South African Institute for Aquatic Biodiversity (SAIAB)

Postal address
Private Bag 1015
Grahamstown
Code 6140
Tel 046 – 603 5820 Fax 046 – 622 2403 E-mail

42.1.2 Principal Agent

KWMH Quantity Surveyors

Postal address
P O Box 12496
Centrahil, Port Elizabeth
Code 6006
Tel 041 – 585 8374 Fax 041 – 585 9046 E-mail

42.1.3 Agent (1)

Moors Milne Kievit Architects

Agent’s service
Architects
Postal address
P O Box 12019
Centrahil, Port Elizabeth
Code 6006
Tel 041 – 585 1575 Fax 041 – 585 7797 E-mail

42.1.4 Agent (2)

Botha Shelver cc t/a KWMH Quantity Surveyors

Postal address
P O Box 12496
Centrahil, Port Elizabeth
Code 6006
Tel 041 – 585 8374 Fax 041 – 585 9046 E-mail
Agent (3) Clinkscales Maughan-Brown
Agent’s service Mechanical and Electrical Consulting Engineers
Postal address P O Box 12615
Centrahil, Port Elizabeth Code 6006
Tel 041 – 585 9731 Fax 041 – 585 5733 E-mail cmb@cmbpe.co.za

Agent (4)
Agent’s service
Postal address

N/S CONTRACT DETAILS

42.2.1 Works description Refer to T3.3 Scope of Work

42.2.2 Site description Refer to T3.3 Scope of Work

42.2.3 N/S works description Electrical Installation

42.2.4 Specific options that are applicable to a State organ only

Where so:
(1) Legislation applicable to the rate

Section 80(1)(b) PFMA

(2) Lateral support insurance to be affected by the contractor

No

(3) Payment will be made for materials

Yes

(4) Dispute resolution by litigation in terms of the principle agreement

No

(5) Extended defects liability period applicable to the following elements:

Electrical and Mechanical : 12 months

42.2.5 Commencement period of the n/s cons

Volume 2
42.2.6 The subcontractor shall be responsible for the design of the n/s works (yes/no) No

Principal Agreement

42.2.7 For the works as a whole: im completion n/s work

<table>
<thead>
<tr>
<th>Date</th>
<th>Penalty / day Works Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Practical Completion works Date

42.2.9 The law applicable to this agreement shall be that of (country)

41.3 INSURANCES

42.3.1 Contract works insurance effected by the Employer for the sum of (amount) n + 20%

8.4, 10.1, 12.1

With a deductible of (amount)

42.3.2 Supplementary insurance required [10.1, 12.1] yes/no

42.3.3 Public liability insurance to be effected by the subcontractor (contractor)

[11.1] (amount) 5 000

With a deductible of (amount) N/A

42.4 DOCUMENTS

42.4.1 Waiver of the contractor’s lien or right of continuing possess required in terms of the principal agreement (yes/no)

42.4.2 Construction document copies to be supplied [3.7] to the subcontractor free of charge (No of) 3

42.4.3 N/s bills of quantities / n/s lump sum document schedule of rates drawn up in accordance with (state measuring system) N/A

42.4.4 On acceptance of the tender the detailed bill of quantities / n/s lump document is to be submitted within working days (No of) 5

42.4.5 JBCC Engineering General Conditions are to be included [3.4] in the n/s contract documents (yes/no) Yes

42.4.6 The n/s contract value is to be adjusted using CPAP indices [31.5.3] (yes/no) No
Where **JBCC CPAP** is to be used

(base month) 

Alternative indices *(if applicable)* ____________________________
42.4.7 Details of changes made to the provisions of JBCC standard documentation

Refer to Principal Contract Preliminaries

42.4.8 Express amendments to the provisions of this document

Refer to Principal Contract Preliminaries

JBCC Series 2000 Edition 4.1 Code 2102 @ March 2005
T2.5.4 : N/S SUBCONTRACT VARIABLES : POST-TENDER INFORMATION

N/S CONTRACT VARIABLES

THE N/S SCHEDULE

This n/s schedule contains all variables referred to in this document and is divided into pre-tender and post-tender categories. The pre-tender category must be completed in full and included in the tender documents. Both the pre-tender and post-tender categories form part of this n/s agreement.

Spaces requiring information must be filled in, shown as ‘not applicable’ or deleted and not left blank. Where choices are offered, the non-applicable items are to be deleted. Where insufficient space is provided the information should be annexed hereto and cross referenced to the applicable clause of the n/s schedule. Key cross reference clauses are italicised in [ ] brackets.

42.0 POST – TENDER INFORMATION

Note: All information for this category requires consultation with the subcontractor

42.5 N/S CONTRACT DETAILS

42.5.1 Subcontractor ____________________________

Postal address ____________________________ Code ____________________________

Tel __________ Fax __________ E-mail __________

Tax / VAT registration No [1.2]

Physical address ____________________________

42.5.2 The accepted n/s contract sum inclusive of tax is (amount)

[1.1] (in words)

42.5.3 The latest day of the month for the issue of an interim payment certificate (day of)

[31.3]

42.5.4 The preliminaries amounts shall be paid in terms of (Alternative A or B)

[32.12]

42.5.5 The preliminaries amounts shall be adjusted in terms of (Alternative A or B)

[32.12]

42.5.6 The payment guarantee to be effected by the contractor for the sum of (Amount)

[3.1]
42.5.7 The security selected by the subcontractor is:

[14.1] (1) Variable n/s construction guarantee (yes/no) 
(2) Fixed n/s construction guarantee (yes/no) 

[14.5] (3) Advance payment guarantee (yes/no) 

42.5.8 The annual building holiday period after the commencement of the construction period (dates) 

42.6 DOCUMENTS

42.6.1 N/s contract documents marked and annexed hereto:

Priced n/s bills of quantities (yes/no) (marked) 
N/s lump sum document (yes/no) (marked) 
Guarantees (yes/no) (marked) 
N/s contract drawings (yes/no) (marked) 
Other documents (yes/no) (marked) 

42.6.2 Signed set of n/s contract documents originals held by contractor

[3.4] (1) Variable n/s construction guarantee (yes/no) 

If “No” held by ________________________________ 

Postal address ________________________________ Code _____________ 

Tel ____________ Fax ____________ E-mail _____________________ 

42.7 DISPUTE RESOLUTION

42.7.1 The default dispute resolution process is adjudication 

[40.2.1#] (insert arbitration only where adjudication is not to apply) 

Note: It is considered good practice to name the person to be appointed or the body to make such appointment

42.7.2 Where adjudication is elected:

(1) Adjudicator ________________________________ 

Postal address ________________________________ Code _____________ 

Tel ____________ Fax ____________ E-mail _____________________ 

or

(2) Adjudicator to be appointed by: (name) 

body ________________________________ 

42.7.3 Where arbitration is elected or required in terms of 40.5:
(1) **Arbitrator**

N/A

Postal address ____________________________

__________________________ Code ____________

Tel ______________ Fax __________ E-mail ____________________________

or

(2) **Arbitrator** to be appointed by: (name __________ body) ________

42.7.4 Where mediation is elected in terms of 40.6:

(1) **Mediator**

__________________________

Postal address ____________________________

__________________________ Code ____________

Tel ______________ Fax __________ E-mail ____________________________

or

(2) **Mediator** to be appointed by: (name __________ body) ________

42.8 **SIGNATURES OF THE N/S CONTRACTING PARTIES**

Thus done and signed at __________________________ on __________________________

__________________________________________

Name of signatory Capacity of signatory

__________________________________________

as Witness for and on behalf of the **subcontractor** who by signature hereof warrants authorisation hereto

__________________________

JBCC Series 2000
T2.5.5 : CONSTRUCTION GUARANTEE

GUARANTOR DETAILS AND DEFINITIONS

Guarantor means ____________________________
Physical address ____________________________
Guarantor's signatory 1 ____________________________ Capacity __________________
Guarantor's signatory 2 ____________________________ Capacity __________________
Contractor means ____________________________
Subcontractor means ____________________________
Employer means ____________________________
N/S Works means ____________________________
Site means ____________________________
Agreement means The JBCC Series 2000 Nominated/Selected Subcontract Agreement

Subcontract Sum means ____________________________
Amount in words ____________________________
Guaranteed Sum means The maximum aggregate amount of ____________________________
Amount in words ____________________________

N/S Construction Guarantee
(Insert Variable or Fixed) ____________________________
(Insert expiry date) ____________________________

AGREEMENT DETAILS

Sections: Total sections (No or n/a) ____________________________ Last section (No / Identification or n/a) ____________________________

Contract issues: Interim payment advices, Final payment advice
Principal Agent issues: Interim payment certificates, Final payment certificate, Practical completion certificate/s and Final completion certificate/s
### 1.0 VARIABLE N/S CONSTRUCTION GUARANTEE

#### 1.1 Where a variable N/S Construction Guarantee in terms of the Agreement has been selected this 1.0 with 3.0 to 13.0 shall apply. The Guarantor’s liability shall be limited to the diminishing amounts of the Guaranteed Sum as follows:

<table>
<thead>
<tr>
<th>GUARANTOR’S LIABILITY</th>
<th>PERIOD OF LIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1.1</strong> Maximum Guaranteed Sum (not exceeding 10.0% of the subcontract sum) in the amount of:</td>
<td>From and including the date of issue of this N/S Construction guarantee and up to and including the date of the interim payment advice certifying in excess of 50% of the subcontract sum</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount in words:</td>
<td></td>
</tr>
</tbody>
</table>

| **1.1.2** Reducing to the Guaranteed Sum (not exceeding 6.0% of the subcontract sum) in the amount of: | From and including the date of aforesaid interim payment advice and up to and including the date of the only practical completion certificate where there are sections |
| | |
| Amount in words: |

| **1.1.3** Reducing to the Guaranteed Sum (not exceeding 4.0% of the subcontract sum) in the amount of: | From and including the day after the date of the applicable practical completion certificate and up to and including the only or last final completion certificate |
| | |
| Amount in words: |

| **1.1.4** Reducing to the Guaranteed Sum (not exceeding 2.0% of the subcontract sum) in the amount of: | From and including the date of the applicable final completion certificate and up to and including the date of the final payment advice where payment is due to the subcontractor, whereupon this N/S Construction Guarantee shall expire. Where the final payment advice reflects payment due to the Contractor, this N/S Construction guarantee shall expire upon payment of the full amount certified |
| | |
| Amount in words: |

#### 1.2 For avoidance of doubt the Guarantor’s liability limits set out in 1.1.1 to 1.1.4 shall apply in respect of any claim received by the Guarantor during the period in question.
2.0 **FIXED N/S CONSTRUCTION GUARANTEE**

2.1 Where a fixed N/S Construction Guarantee in terms of the Agreement has been selected this 2.0 with 3.0 to 13.0 shall apply. The Guarantor’s liability shall be limited to the amount of the Guaranteed Sum as follows:

**GUARANTOR’S LIABILITY**

<table>
<thead>
<tr>
<th>PERIOD OF LIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.1 Maximum Guaranteed Sum (not exceeding 5.0% of the subcontract sum) in the amount of:</td>
</tr>
<tr>
<td>From and including the date of issue of this N/S Construction Guarantee and up to and including the date of the last practical completion certificate and up to and including the only practical completion certificate or last practical completion certificate where there are sections upon which this N/S Construction Guarantee shall expire.</td>
</tr>
</tbody>
</table>

Amount in words: ____________________________

3.0 The Guarantor hereby acknowledges that:

3.1 Any reference in this Guarantee to the Agreement is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship.

3.2 Its obligation under this Guarantee is restricted to the payment of money.

4.0 Subject to the Guarantor’s maximum liability referred to in 1.0 or 2.0, the Guarantor hereby undertakes to pay the Contractor the sum certified upon receipt of the documents identified in 4.1 to 4.3 below:

4.1 A copy of a first written demand issued by the Contractor to the Subcontractor stating that payment of a sum certified by the Contractor in an interim or final payment advice has not been made in terms of the Agreement and failing such payment within seven (7) calendar days, the Contractor intends to call upon the Guarantor to make payment in terms of 4.2.

4.2 A first written demand issued by the Contractor to the Guarantor at the Guarantor’s physical address with a copy to the Subcontractor stating that a period of seven (7) calendar days has elapsed since the first written demand in terms of 4.1 and that the sum certified has still not been paid therefore the Contractor calls up this N/S Construction guarantee and demands payment of the sum certified from the Guarantor.

4.3 A copy of the said payment advice which entitles the Contractor to receive payment in terms of the Agreement of the sum certified in 4.0.

5.0 Subject to the Guarantor’s maximum liability referred to in 1.0 or 2.0, the Guarantor undertakes to pay the Contractor the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Contractor to the Guarantor at the Guarantor’s physical address calling up this N/S Construction Guarantee stating that:

5.1 The Agreement has been cancelled due to the Subcontractor’s default and that the N/S Construction guarantee is called up in terms of 5.0. The demand shall enclose a copy of the notice of cancellation; or
5.2 A provisional sequestration or liquidation court order has been granted against the Subcontractor and that the N/S Construction guarantee is called up in terms of 5.0. The demand shall enclose a copy of the court order.

6.0 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4.0 and 5.0 shall not exceed the guarantor’s maximum liability in terms of 1.0 or 2.0.

7.0 Where the Guarantor is a registered insurer in terms of the Short-Term Insurance Act No 53 of 1998 and has made payment in terms of 5.0, the Contractor shall upon the date of issue of the final payment certificate submit an expense account to the Guarantor showing how all monies received in terms of the N/S Construction guarantee have been expended and shall refund to the guarantor any resulting surplus. All monies refunded to the guarantor in terms of this N/S Construction guarantee shall bear interest at the prime overdraft rate of the Contractor’s bank compounded monthly and calculated from the date payment was made by the guarantor to the Contractor until the date of refund.

8.0 Payment by the guarantor in terms of 4.0 or 5.0 shall be made within seven (7) calendar days upon receipt of the first written demand to the guarantor.

9.0 The Contractor shall have the absolute right to arrange his affairs with the Subcontractor in any manner which the Contractor deems fit and the Guarantor shall not have the right to claim his release from this N/S Construction Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.

10.0 The Guarantor chooses the physical address as stated above for all purposes in connection herewith.

11.0 This N/S Construction Guarantee is neither negotiable nor transferable and shall expire in terms of either 1.1.4 or 2.1, or payment in full of the Guaranteed Sum or on the Guarantee expiry date, whichever is the earlier, where after no claims will be considered by the Guarantor. The original of this N/S Construction Guarantee shall be returned to the Guarantor after it has expired.

12.0 This N/S Construction Guarantee, with the required demand notices in terms of 4.0 or 5.0, shall be regarded as a liquid document for the purpose of obtaining a court order.

13.0 Where this Construction Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate’s Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate’s Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate’s Court.

Signed at ___________________________ Date ___________________________

Guarantor’s
Signatory 1 ___________________________ Guarantor’s
Signatory 2 ___________________________

Witness ___________________________ Witness ___________________________

Guarantor’s seal or stamp
T2.5.6: FORM OF INTENT TO PROVIDE A PERFORMANCE GUARANTEE

The Tenderer must attach hereto a letter from the bank or institution with whom he has made the necessary arrangements, to the effect that the said bank or institution will be prepared to provide the required performance guarantee when asked to do so.
T2.5.7 : AUDITED FINANCIAL STATEMENTS FOR THE LAST THREE YEARS

Tenderers are to attach Audited Financial Statements for the last three financial years.
T2.5.8 : LETTER OF GOOD STANDING FROM TENDERERS BANKER

Letter to be provided by Tenderers banker regarding the tenders financial status.
### T2.5.9 : SCHEDULE OF PROPOSED SUB-CONTRACTORS

In terms of Clause 4.4 of the Conditions of Contract for Construction, the Tenderer shall enter below the names of sub-contractors he intends to employ for work on this contract, as well as the portion and value of the work to be executed by such sub-contractors.

Based on the definition of SMME provided below the Tenderer should indicate in which category, i.e. Medium, Small, Very Small or Micro, the intended sub-contractor is categorized if applicable.

<table>
<thead>
<tr>
<th>DESCRIPTION OF PORTION OF WORK</th>
<th>APPROX. VALUE (EXCL. VAT)</th>
<th>NAME, ADDRESS AND TELEPHONE NUMBER OF SUB-CONTRACTOR/SMME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

DATE: ___________________________ SIGNATURE OF TENDERER: _____________________

(Authorised Person)
T2.5.10 : SCHEDULE OF EQUIPMENT OFFERED

The Tenderer is required to complete the following schedule, stating where appropriate, the size or capacity of equipment, Type or Catalogue No., Country of Origin and any other details he considers necessary. Failure to complete this schedule in full may invalidate the tender.

1. **CABLES**
   - Make of surfix cables
   - Make of surfix cable glands

2. **SUB-DISTRIBUTION BOARDS**
   - Make, type and kA rating of m.c.b.’s
   - Make and sensitivity of earth leakage units
   - Make of contactors

3. **CONDUIT AND WIRING**
   - Make of PVC conduit and fittings
   - Make of galvanised conduit and fittings
   - Make of PVC wiring

4. **ACCESSORIES**
   - Make and Type
     - 16 Amp flush switches
     - 16 Amp Zone 2 switches
     - 16 Amp flush S.S.O.’s

5. **MISCELLANEOUS**
   - Make and Type / Catalogue No
     - Cable trays
     - Welded mesh type cable trays
     - Wiring trunkings
     - Powerskirting 2 Tier
## LIGHT FITTINGS

6.1 Is tender based on light fitting types as specified?  

YES / NO

6.2 The following table must be completed in respect of any light fittings which the Tenderer wishes the Engineer to consider as alternatives:

<table>
<thead>
<tr>
<th>Code</th>
<th>Installed cost of specified fitting</th>
<th>Make &amp; Catalogue No. of alternative fitting</th>
<th>Installed cost of alternative fitting</th>
<th>Benefit to Client of Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.3 Have full details, including photometric data, been furnished with this tender in respect of all the above alternative light fittings?  

YES / NO

DATE: ___________________ SIGNATURE: ___________________  

(For the Tenderer)
### T2.6 : OTHER FORMS, CERTIFICATES AND SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

<table>
<thead>
<tr>
<th>T2.6.1</th>
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<th>81</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2.6.2</td>
<td>Schedule of Departures from Specification</td>
<td>82</td>
</tr>
</tbody>
</table>
**T2.6.1 : RECORD OF ADDENDA TO TENDER DOCUMENTS**

I/We confirm that the following communications amending the Tender documents, received from the Employer or his representative before the closing date of submission of this Tender offer, have been taken into account in this Tender offer.

<table>
<thead>
<tr>
<th>ADD NO.</th>
<th>DATE</th>
<th>TITLE OR DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

SIGNATURE: _______________________________ DATE: ______________

(of Authorised Person)
## T2.6.2 : SCHEDULE OF DEPARTURES FROM SPECIFICATION

<table>
<thead>
<tr>
<th>Part No</th>
<th>Reference</th>
<th>Clause No</th>
<th>Departure</th>
</tr>
</thead>
</table>

**N.B.** The Tenderer is required to give full details of any departure from the Specification and shall then sign this page officially. If there are no departures, the Tenderer must state NIL on this page and sign it. The Tender shall then be held to comply in all respect with the Specification.

Should there be insufficient space, the Tenderer may include separate sheets arranged in the same manner as above. Mere reference to a covering letter will not be regarded as compliance with this requirement.

DATE: _____________________ SIGNATURE: _____________________

(For The Tenderer)
# T3 : THE TENDER

## TABLE OF CONTENTS

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<th>Section</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
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<td>AGREEMENT AND CONTRACT DATA</td>
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<td>T3.1.1</td>
<td>Conditions of Subcontract</td>
<td>2</td>
</tr>
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<td>Main Contract Preliminary &amp; General Information</td>
<td>3</td>
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<td>7 - 18</td>
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<td><strong>T3.3</strong></td>
<td>SCOPE OF WORK</td>
<td></td>
</tr>
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<td>19</td>
</tr>
<tr>
<td>T3.3.1.1</td>
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<td>Technical Specification applying to this Installation</td>
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<tr>
<td>T3.3.2</td>
<td>OHS Specification</td>
<td>58 - 75</td>
</tr>
<tr>
<td><strong>T3.4</strong></td>
<td>ANNEXURES</td>
<td></td>
</tr>
<tr>
<td>T3.4.1</td>
<td>Drawings</td>
<td>76</td>
</tr>
<tr>
<td>T3.4.2</td>
<td>Extract from Main Contract Bills</td>
<td>77 (22 pages)</td>
</tr>
</tbody>
</table>
T3.1 : AGREEMENT AND CONTRACT DATA

T3.1.1 : CONDITIONS OF SUBCONTRACT

The Conditions of Subcontract are the JBCC Series 2000 N/S Subcontract Agreement (March 2005) published by the Joint Building Contracts Committee.

Copies of these conditions of contract may be obtained from the Association of South African Quantity Surveyors (011-3154140), Master Builders Association (011-205-9000; 057-3526269) South African Association of Consulting Engineers (011-4632022) or South African Institute of Architects (051-4474909; 011-4860684; 053-8312003;)

The JBCC N/S Subcontract Agreement makes several references to the Contract Variables for specific data, which together with these conditions collectively describe the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract. The Contract Variables shall have precedence in the interpretation of any ambiguity or inconsistency between it and the JBCC N/S Subcontract Agreement.
T3.1.2 : MAIN CONTRACT PRELIMINARY & GENERAL INFORMATION

Refer to Annexure T3.4.2 for an extract from the Main Contract Bills
T3.2 : PRICING DATA

T3.2.1 : PRICING INSTRUCTIONS

1.0 This Schedule of Quantities forms part of, and must be read in conjunction with the Specification. The Price Summary is to reflect the total price carried forward from the Schedule of Quantities, which itself need not be submitted with the tender documents.

2.0 The tender price must be based on the Schedule of Quantities. Any Tenderer requested to submit his priced Schedule of Quantities shall do so within 48 hours of such request.

3.0 No alteration, erasure or addition is to be made in the text of the Schedule of Quantities. Should any erasure or addition be made it will not be recognised but the original wording of the Schedule of Quantities will be adhered to.

4.0 The quantities in the Schedule are not to be considered as limiting or extending the amount of work to be done and materials to be supplied.

5.0 Only major Items have been scheduled but the Tenderer shall nevertheless include for all things he considers necessary whether specified in detail or not to complete the work to specification.

No extra price will be considered for the provision of material or labour which should have been allowed for in order to provide the completed works unless set out in detail and submitted separately by the Tenderer with his tender.

6.0 The completed Schedule of Quantities shall detail the unit rate and total amount for material and labour respectively for each Item. Tenderers are advised to check their Item extensions and total additions since no claim for mathematical errors will be considered.

7.0 All Items are deemed to include supply, delivery, installation and connection where appropriate, unless specifically stated otherwise. The unit rate must include for all things necessary, whether specified in detail or not, including all components, small installation materials, allowance for off-cuts, wastage, etc. erection and fixings to complete the Item to Specification in a satisfactory and workmanlike manner in order to provide a complete and working system.

"Material Rate" shall include the supply and delivery of all items of material and equipment (plant) to the site including all incidentals necessary for the completion of each Item, plus the profit but shall exclude VAT which shall be added as a separate item in the Price Summary.
8.2

"Labour Rate" shall include the cost of all labour, both skilled and unskilled, including supervision and profit required to complete the installation of all material covered by each Item but shall exclude VAT which shall be added as a separate item in the Price Summary.

8.0

The Engineer will check the completed Schedule of Quantities and reserves the right to adjust any individual price and to rectify any discrepancy whilst the total tender price as quoted remains unaltered. Individual rates inconsistent with the pricing structure of the majority of the rates may be changed on the basis of the average ruling prices as determined by the Engineer for similar work in the industry in the area in which the work is situated. The method by which the average ruling prices are determined will be at the sole discretion of the Engineer.

9.0

Unless stated to the contrary in the Particular Specification, quantities, with the exception of cable, cable joints, trenches, bedding and cover sand, cable slabs, cable and joint markers and pole holes, will not be measured on site in which case the successful Tenderer shall, within 60 days of notification of acceptance of his tender, notify the Engineer in writing of any discrepancies between the drawings, Specification and the quantities of any Item in the Schedule of Quantities, listing each such discrepancy in detail. Where it is agreed by the Engineer that any such claims are valid, the contract price will be adjusted accordingly. No further claim will be entertained except where the Employer changes the requirements of the Contract, in which case such variations will be based on unit prices quoted, where applicable. Escalation costs will, where necessary, be made on the basis of unit rates.

10.0

Where alternative prices for equipment of different manufacture are offered, the lowest alternative price for equipment to specification must be included, against the relevant Item in the Schedule of Quantities. The remaining alternative prices must be furnished separately.

Where such equipment is found not to comply with the Specification, the Contractor will be required to provide equipment which does comply, without adjustment to the price in the Schedule of Quantities.

11.0

In certain instances prices are requested for Items which may be required during the progress of the work, but which are not included in the known quantities of material required. These Items are indicated by the designation "R/O" (rate only) in the "Quantity" column, and the price is to be noted in the "Rate" columns only and must not be carried forward.
DAYWORK RATES

The following rates are for work not covered by rates in the Schedule of Quantities. All rates are to be exclusive of VAT.

LABOUR RATES, NORMAL TIME, PER HOUR

Installation Electrician and Labourer  R .................
Artisan Electrician and Labourer  R .................
Labourer  R .................

LABOUR RATES, NORMAL OVERTIME, PER HOUR

Installation Electrician and Labourer  R....................
Artisan Electrician and Labourer  R....................
Labourer  R....................

LABOUR RATES, SUNDAYS AND PUBLIC HOLIDAYS, PER HOUR

Installation Electrician and Labourer  R....................
Artisan Electrician and Labourer  R....................
Labourer  R....................

MATERIALS

Percentage mark up on nett cost of materials  ...................%

TRANSPORT

Private car or light delivery vehicle  .......... cents/km
3 tonne truck  .......... cents/km
5 tonne truck  .......... cents/km
10 tonne truck  .......... cents/km

DATE: ____________________  SIGNATURE: ____________________
(For the Tenderer)
# T3.2.2 : BILL OF QUANTITIES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>FIXED AMOUNT</th>
<th>ADJUSTABLE WITH CONTRACT AMOUNT</th>
<th>ADJUSTABLE WITH CONTRACT PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R  C</td>
<td>R  C</td>
<td>R  C</td>
</tr>
<tr>
<td>01</td>
<td>Allow for costs incurred for provision of Surety or Letter of Guarantee to cover 10% of the Contract Amount</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Allow for premium costs incurred for insurances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Allow for accommodation and/or living out expenses.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Allow for transport charges.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Allow for travelling charges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Allow for testing the installation as detailed in the Documents, and inspection fees, if any.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>Allow for record drawings and operating instructions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>Allow for Maintenance, if specified.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Allow for submission of drawings to the Engineer for approval</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Allow for costs incurred for site establishment, ablution facilities, off-loading and storage and removal of site establishment on completion of contract.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Allow for cost for supply and use of electricity, water, telephone and, if applicable, radio communication system.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Allow for guarantee in terms of the documents.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Allow for lifting gear, cranes etc. that may be required for moving plant &amp; equipment into position.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Allow for costs incurred for provision of Surety to cover payment for unfixed materials on site per Part B.1.3 hereof</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Allow for costs incurred in provision of Certificate of Compliance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL TO COLLECTION SHEET
### COLLECTION SHEET

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>FIXED</th>
<th>ADJUSTABLE WITH CONTRACT AMOUNT</th>
<th>ADJUSTABLE WITH CONTRACT PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>C</td>
<td>R</td>
</tr>
<tr>
<td>1</td>
<td>Total of Page 7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lump sum allowance for any items not included in this Section of the Schedule of Quantities necessary to complete the installation in accordance with the Conditions of Contract, Specification and Drawings. Claims against this item must be detailed below.

**TOTALS TO BE CARRIED FORWARD TO PRICE SUMMARY ITEM 1**
## MAIN LV RETICULATION

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>QTY</th>
<th>MATERIAL RATE</th>
<th>TOTAL</th>
<th>LABOUR RATE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SWITCHGEAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Supply and install in prefitted SDB</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1</td>
<td>100 Amp, TP, QF3(B) circuit breaker</td>
<td>No</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.2</td>
<td>60 Amp, TP, QF3(13) circuit breaker</td>
<td>No</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.3</td>
<td>30 Amp, TP QF3 (13) circuit breaker</td>
<td>No</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>LV CABLES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Supply and install PVCSWA copper cables on cable trays, measured elsewhere</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1.1</td>
<td>25mm² x 4 core</td>
<td>m</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1.2</td>
<td>10mm² x 4c</td>
<td>m</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Cable Terminations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.1</td>
<td>50mm² x 4 core</td>
<td>No</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.2</td>
<td>10mm² x 4c</td>
<td>No</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Earth Wire</td>
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<td></td>
</tr>
<tr>
<td>2.3.1</td>
<td>16mm²</td>
<td>m</td>
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<td>2.3.2</td>
<td>10mm²</td>
<td>m</td>
<td>30</td>
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<td>2.4</td>
<td>Earth wire Connections</td>
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<td></td>
</tr>
<tr>
<td>2.4.1</td>
<td>35mm²</td>
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<td>EARTH SPIKES</td>
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<td>3</td>
<td>WIRING TRAYS</td>
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<tr>
<td>3.1</td>
<td>Supply and install medium duty wire mesh basket as specified, rates to include for splicers, bolts, nuts, washers etc.</td>
<td></td>
<td></td>
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<tr>
<td>3.1.1</td>
<td>150mm wide</td>
<td>m</td>
<td>10</td>
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<td>3.2</td>
<td>Suspension Brackets</td>
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<td>3.2.1</td>
<td>Supply and install canti-lever arms fitted to existing brickwork for wire mesh basket measured elsewhere, include for bolts, nuts, washers, etc.</td>
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**Totals to collection:**

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**Volume 3**
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<td>Total of Page 9</td>
<td>..........</td>
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<td>2</td>
<td>Total of Page 10</td>
<td>..........</td>
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Lump sum allowance for any items not included in this Section of the Schedule of Quantities necessary to complete the installation in accordance with the requirements of the Conditions of Sub-Contract, Specification and Drawings. Claims against this Item must be detailed below.

| Totals to be carried forward to Price Summary Item 2 | .......... | .......... |
### BILL NO 3
### SAIAB – NEW WET COLLECTION FACILITY
### SMALL POWER AND LIGHTING

<table>
<thead>
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<td>1</td>
<td>SUB-DISTRIBUTION BOARD</td>
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<td>RATE</td>
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<tr>
<td>1.1</td>
<td>Supply and Install surface mounted sub-distribution board with hinged lockable doors, complete with switchgear and equipment as detailed on Drawings 8599/E/002.</td>
<td></td>
<td></td>
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<tr>
<td>1.1.1</td>
<td>Construction, including busbars rated at 100 amp for non essential and 60 amp for essential section.</td>
<td>No</td>
<td>1</td>
<td></td>
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<tr>
<td>1.2</td>
<td>Supply and install wiring trays with hinged lids</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1.2.1</td>
<td>450mm x 450mm x 100mm deep</td>
<td>No</td>
<td>2</td>
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</tr>
<tr>
<td>2</td>
<td>CABLE TRAYS</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Supply and install perforated medium duty galvanised trays as specified, rates to include for nuts, bolts, washers, etc.</td>
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</tr>
<tr>
<td>2.1.1</td>
<td>150mm wide</td>
<td>m</td>
<td>12</td>
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<tr>
<td>2.1.2</td>
<td>100mm wide</td>
<td>m</td>
<td>80</td>
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<td>2.1.3</td>
<td>50mm wide</td>
<td>m</td>
<td>12</td>
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<tr>
<td>2.2</td>
<td>Horizontal bends 90° for perforated medium duty galvanised trays as specified</td>
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<tr>
<td>2.2.1</td>
<td>150mm wide</td>
<td>No</td>
<td>2</td>
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<tr>
<td>2.2.2</td>
<td>100mm wide</td>
<td>No</td>
<td>4</td>
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<td>2.2.3</td>
<td>50mm wide</td>
<td>No</td>
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<tr>
<td>2.3</td>
<td>Fixing brackets, consisting of a section of P4000 trunking fixed to brickwork to which the cable tray is to be fixed, included for fixings, bolts, nuts, washers, etc.</td>
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<td></td>
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<tr>
<td>2.3.1</td>
<td>150mm wide</td>
<td>No</td>
<td>12</td>
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<td>2.3.2</td>
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<td>2.3.3</td>
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**Totals to collection:**
**BILL NO 3**
SAIAB – NEW WET COLLECTION FACILITY

**SAIAB – NEW WET COLLECTION FACILITY**

**SMALL POWER AND LIGHTING**

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<th>LABOUR RATE</th>
<th>TOTAL</th>
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<td><strong>CONDUIT WORK</strong></td>
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<tr>
<td></td>
<td>Supply and install conduit, U-PVC and galvanised, fixed on surface, chased into brickwork and cast into concrete.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>3.1</td>
<td><strong>Fixed on Surface</strong> (including saddles)</td>
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<td>3.1.1</td>
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<td>300</td>
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<td>m</td>
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<td>3.2</td>
<td><strong>Chased into Brickwork</strong> (including chase)</td>
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<td>3.2.1</td>
<td>20mm dia. galvanised</td>
<td>m</td>
<td>100</td>
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<td>m</td>
<td>50</td>
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<td>3.3</td>
<td><strong>Cast into Concrete</strong></td>
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<td>3.3.4</td>
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<td>3.4</td>
<td>Standard conduit boxes, installed on surface, built into brickwork cast into concrete</td>
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<td>3.4.1</td>
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<td>25mm Through box</td>
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<td>3.4.5</td>
<td>100mm x 50mm ko boxes</td>
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<td>3.4.6</td>
<td>100mm x 100mm ko boxes</td>
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<td>4.1</td>
<td>PVC wiring, single core with copper conductors drawn into conduitwork elsewhere measured</td>
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<td>4.1.1</td>
<td>1.5mm²</td>
<td>m</td>
<td>200</td>
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<td>4.1.2</td>
<td>2.5mm²</td>
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**Totals to collection:**

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**Volume 3**
### BILL NO 3
SAIAB – NEW WET COLLECTION FACILITY

#### SMALL POWER AND LIGHTING

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<th>LABOUR</th>
<th>TOTAL</th>
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<tr>
<td>4.2</td>
<td>Earth wire, green PVC with copper conductors, drawn in with PVC wiring elsewhere measured</td>
<td>m</td>
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<td>4.2.1</td>
<td>1,5mm²</td>
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<td>2,5mm²</td>
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<td>4.2.3</td>
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#### LV CABLES

| 5.1  | LV Cables, supply and install PVCSWA cables with copper conductors on cable trays or drawn through galvanised conduit, measured elsewhere | m    | 200 |      |       |        |       |
| 5.1.1| 1,5mm² x 4c |      | 200 |      |       |        |       |
| 5.1.2| 2,5mm² x 3c |      | 500 |      |       |        |       |
| 5.1.3| 2,5mm² x 7c |      | 30  |      |       |        |       |
| 5.1.4| 4mm² x 4c   |      | 20  |      |       |        |       |
| 5.1.5| 25mm² x 4c  |      | 60  |      |       |        |       |

#### Cable Terminations

| 5.2  | Cable terminations and connections, for copper cables measured elsewhere, including glands shrouds, lugs, etc | No  | 6   |      |       |        |       |
| 5.2.1| 1,5mm² x 4c | No  | 6   |      |       |        |       |
| 5.2.2| 2,5mm² x 3c | No  | 4   |      |       |        |       |
| 5.2.3| 2,5mm² x 7c | No  | 3   |      |       |        |       |
| 5.2.4| 25mm² x 4c  | No  | 6   |      |       |        |       |

*For Zone 2 classified areas, similar or equal to Stahl type "FGA" and for use with wire armoured cables*

| 5.2.5| 1,5mm² x 4c | No  | 6   |      |       |        |       |
| 5.2.6| 2,5mm² x 3c | No  | 140 |      |       |        |       |
| 5.2.7| 2,5mm² x 7c | No  | 3   |      |       |        |       |
| 5.2.8| 4mm² x 4c   | No  | 2   |      |       |        |       |

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### SMALL POWER AND LIGHTING

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<td>Supply and install fixed on surface as specified, complete with lamps, include bolts, nuts, washers, etc.</td>
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<td>Type FP2</td>
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<td>Type F1</td>
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<td>7.1</td>
<td>Supply and install switches and socket outlets as specified include for bolts, nuts, washers, etc</td>
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<td>7.1.1</td>
<td>Standard Type</td>
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<td>7.1.2</td>
<td>1 Lever, 1 Way with PVC cover plate</td>
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<td>4</td>
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<td>7.1.3</td>
<td>16 Amp, 3-Pin, flush mounted plug with PVC cover plate</td>
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<td>Presence Detector</td>
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<td>7.1.5</td>
<td>Stahl II, 2G EEX ed II T6, Zone 1/2 polyester resin enclosure type 8146/4091-3A and fitted with 8 off ON/OFF 2 pos, 2 pole, 16A, 200VAC selector switches and handles</td>
<td>No</td>
<td>1</td>
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<td>7.1.6</td>
<td>8 off red 12-220V AC/DC LED indicating lamps</td>
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<td>7.1.7</td>
<td>34 off WDU 2,5 terminals</td>
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<td>7.1.8</td>
<td>3 20mm dia. cable entries</td>
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<td>7.1.9</td>
<td>Stahl, Series 8030, Rotary Handle 1 way switch</td>
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<td>7.1.10</td>
<td>Stahl II, 2G, EEX ed T6 Zone 1/2 polyester resin enclosure control switch with stop/start push buttons, green 12-220V AC/DC LED indicating lamp and cable entry</td>
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<td>5 Amp, switch socket outlet with cover plate</td>
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<td>32 Amp, double pole, weatherproof isolator</td>
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<td>8</td>
<td>OUTLET BOXES FOR LOW VOLTAGE SERVICES</td>
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<td>8.1</td>
<td>Supply and install wiring trays and boxes as specified including all fixings, bolts, nuts, washers, etc.</td>
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<td>8.1.1</td>
<td>450mm x 450mm x 150mm deep Telkom Telephone and data wiring tray with central division and wood backing board in each section</td>
<td>No</td>
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</tr>
<tr>
<td>8.1.2</td>
<td>450mm x 450mm x 150mm deep wiring tray with hinged cover and wood backing board.</td>
<td>No</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>POWERSKIRTING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td>Supply and install two compartment powerskirtings, similar or equal to 'Jupiter' PVC - 801 Series</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1.1</td>
<td>Two compartment powerskirting including cover plates</td>
<td>m</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1.2</td>
<td>Internal Bends</td>
<td>No</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1.3</td>
<td>End Caps</td>
<td>No</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1.4</td>
<td>16 amp plugs to suit powerskirting</td>
<td>No</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.1.5</td>
<td>ON/OFF switches to suit powerskirting</td>
<td>No</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>TESTING AND INSPECTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.1</td>
<td>Test, inspect and commission the installation as specified</td>
<td>Item</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.2</td>
<td>Maintenance as specified</td>
<td>Item</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>EARTHING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.1</td>
<td>Earthing of the complete installation as specified in clauses 1 - 10 above</td>
<td>Item</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.2</td>
<td>PC Item for earth of exposed mechanical equipment</td>
<td>Item</td>
<td></td>
<td>2 000.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.3</td>
<td>PC Item for repair of existing earth mat and lightning protection systems</td>
<td></td>
<td></td>
<td>3 000.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Totals to collection:
## COLLECTION SHEET

BILL NO 3  
SAIAB – NEW WET COLLECTION FACILITY  
SAIAB – NEW WET COLLECTION FACILITY  
SMALL POWER AND LIGHTING

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>MATERIAL</th>
<th>LABOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>c</td>
</tr>
<tr>
<td>1</td>
<td>Total of Page 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Total of Page 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Total of Page 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Total of Page 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Total of Page 16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lump sum allowance for any items not included in this Section of the Schedule of Quantities necessary to complete the installation in accordance with the requirements of the Conditions of Sub-Contract, Specification and Drawings. Claims against this Item must be detailed below.

<table>
<thead>
<tr>
<th>Totals to be carried forward to Price Summary Item 3</th>
<th></th>
</tr>
</thead>
</table>

Volume 3
PRICE SUMMARY

The following Schedule of Prices must be completed by the Tenderer. The Employer reserves the right to accept or reject any tender and the lowest price tender need not necessarily be accepted.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total of Page 8 (Fixed, Time &amp; Value combined)</td>
<td>R____</td>
</tr>
<tr>
<td>2.</td>
<td>Total of Page 11 (Material &amp; Labour combined)</td>
<td>R____</td>
</tr>
<tr>
<td>3.</td>
<td>Total of Page 17 (Material &amp; Labour combined)</td>
<td>R____</td>
</tr>
</tbody>
</table>

4. **PROVISIONAL AMOUNTS**

4.1 Re-testing of the existing dedicated earth mat  R 2 000-00
4.2 Re-testing of the existing Lightning Protection System R 2 000-00
4.3 Work in Genetics laboratory                  R12 000-00

Total Carried forward to 'Form of Tender' T 2.1 R____

DATE: ___________________ SIGNATURE OF TENDERER ____________________

NAME (IN BLOCK LETTERS) ____________________________________________

ADDRESS _________________________________________________________

TELEPHONE NUMBER ________________________

FAX NUMBER ____________________________
T3.3 : SCOPE OF WORK

T3.3.1 DESCRIPTION OF THE WORKS

T3.3.1.1 PRELIMINARY AND GENERAL INFORMATION

1. PREAMBLE

This Part of the Tender Document deals with general requirements to be met and standards for plant and workmanship which shall be observed in the execution of the subcontract covered by this Tender Document. "Plant" is defined as machinery, apparatus, materials, articles and things of all kinds to be provided under the subcontract other than Construction Equipment.

When the requirements of this Part are at variance with any detailed requirement of any other Part hereof, or the Drawings, such other detailed requirements shall take precedence. All items of plant which are specified in this Tender Document or by nature of the installation are required, shall comply with this Part, unless stated otherwise elsewhere in this Tender Document. In the event of ambiguity the Engineer shall be asked for his clarification prior to submission of the Tender.

Any reference herein to "elsewhere in this Tender Document" shall be deemed to mean in any of the other Parts of this Tender Document or on the Drawings.

This Tender Document covers major items required for this installation but shall not limit the Subcontractor's responsibility to provide everything necessary to complete the subcontract. The works shall be carried out with best quality items of plant and to a high class of workmanship. All items of plant shall be the best of their respective kinds, and the subcontractor shall, upon request of the Engineer, furnish him with proof to his satisfaction that they so comply.

This Tender Document and accompanying Drawings are copyright and are the property of the Engineer and must be returned to him whether a bona-fide tender is submitted or not.

For the purposes of this Part of the Tender Document the term “Engineer” is used to describe the Agent, named elsewhere in this Tender Document, who will deal with the Subcontract Works covered by this Tender Document.

2. ALTERNATIVE OFFERS

Tenderers must tender in accordance with the Tender Document.

While Tenderers may offer alternative materials, makes of equipment, construction techniques, etc. which they believe will be advantageous, it is to be clearly understood that the main tender is to be in full compliance with this Tender Document. The total tender price entered on the Form of Tender, all prices entered in any Schedule of Quantities and the prices detailed in the Price Summary, must reflect the price to provide the plant and everything which is or may be necessary for the completion of the Subcontract Works in complete accordance with this Tender Document, irrespective of any alternatives that may be offered.
Where alternative offers are submitted, these shall comply in principle with all requirements of this Tender Document. Tenderers should note that should any accepted alternative subsequently be found not to meet this condition, the Subcontractor will be liable for all costs incurred in making the necessary alterations.

Should tenderers wish to offer alternative makes and types of equipment to those specified herein, the alternatives are to be listed separately in detail, complete with make, type No., price etc, in the Schedule of Proposed Amendments and Qualifications, Part T2.6.2 of this Tender Document. In cases where a Schedule of Quantities is applicable, the alternative price for each noted item must be submitted.

The Engineer shall have the right to accept any or all of the alternative offers as he thinks appropriate and must give his written acceptance of these prior to orders being placed.

Failure to comply with the foregoing may result in the Subcontractor being compelled to meet the requirements of this Tender Document in full at the tendered price.

3. SPARE PARTS

Tenderers shall state in the Schedule of Equipment Offered, the names of the accredited South African Agents from whom spare parts for all items of plant offered are obtainable and the place nearest to the Works from which such spare parts are available. Submission of a tender will be construed as confirmation that spare parts for all equipment offered are readily available, and the subcontractor will be held responsible for any costs involved if this should prove to be otherwise.

4. DELIVERY TIMES OF MANUFACTURED ITEMS

The Tenderer shall, if required in the Schedule of Equipment Offered, state the times quoted by suppliers for both dispatch and delivery of major items of plant which may contribute to an extension of the time for completion.

The subcontractor shall, during the continuance of the subcontract, keep the Engineer well and sufficiently informed regarding the placing of all orders for materials and the progress of manufacture of any plant so as to ensure that no extension of the time for completion may be occasioned because of non-delivery of plant within the time specified for delivery of same. A delivery status report on each major item of plant shall be submitted by the 7th of every second month.

The subcontractor shall at all times remain fully and solely responsible for the timeous delivery to site of all plant, equipment and materials in terms of this subcontract.

5. PACKING AND DELIVERY

Plant shall be carefully packed and protected to avoid mechanical or other damage during transport and off-loading. The subcontractor will be held responsible for any damage occurring prior to its acceptance in writing by the Employer.

Every item of plant is to be clearly labelled with its description and with the subcontract number.
All consignments shall be addressed to the subcontractor on site and he/she shall make prior arrangements for receipt and storage upon arrival. The employer and/or contractor will not accept delivery of items of plant for the subcontractor unless the subcontractor has made prior arrangements to this effect with the contractor and/or the employer. The subcontractor will be required to make all arrangements for off-loading since no equipment for this will be available on site unless specifically stated to the contrary elsewhere herein.

6. **LAYOUT OF INSTALLATION**

The layouts shown on the Engineer's Drawings shall be strictly adhered to in principle, only alterations to suit specific plant being provided being acceptable. The Engineer's Drawings show general arrangements of layout but the subcontractor is required to prepare detailed Drawings of pipework, fabricated plant, machine and plant rooms, ductwork, switchboards, transformers, substations, etc. The position of services detailed by the Engineer shall not be altered.

All architectural and structural dimensions shown on the drawings are approximate and must be verified by the subcontractor on Site. All measurements specially marked on the drawings in connection with engineering services shall be strictly adhered to.

If Tenderers require alterations to structure these must be described at the time of tendering. Minor structural alterations which may facilitate the work can be arranged with the Engineer and/or Principal Agent as the work progresses, but no claims will be entertained for alteration of any part of the subcontract works constructed before the necessary dimensions and details have been verified.

Before work on any particular section is commenced, the position of all control equipment and plant shall be approved by the Engineer.

7. **DRAWINGS, CERTIFICATES AND OPERATING INSTRUCTIONS**

7.1 Tenderers shall submit with their tender, outline drawings and pamphlets showing principal dimensions of the plant offered together with a general description of its operation.

7.2 In instances where, for any reason, the subcontractor is required to prepare and/or submit detailed drawings of any portion of the subcontract works, the subcontractor shall, within one month of the date of acceptance of the subcontract tender, or on such other date as may be agreed with the contractor and/or the Engineer to suit the contract programme, submit duplicate copies of such subcontractor’s detailed drawings to the Engineer for approval. A further two copies of the finally approved drawings shall subsequently be supplied to the Engineer. The following drawings shall be submitted, as appropriate:

- General arrangement details of all items of plant.
- Schematic and wiring diagrams of all switchboards and control systems.
- Detailed layout drawings of all pipework, ducting, cable racking etc.
- Detailed layouts, sections and elevations of all plant rooms.
- Rating plate details of all plant including inter alia: max.: kW rating, speed, temperature limitations, no-load voltage, full load current, percentage impedance, etc.
- Cable termination arrangements of all transformers, motors etc.: Detailed drawings of all plinths, foundations or bases.
Failure to comply with this requirement may result in the Engineer instructing the subcontractor to place the order for the specific item of plant with another Manufacturer. Where failure of the Contractor to ensure that the proposed Manufacturer complies with this requirement necessitates the above action being taken, no increase in price will be considered.

7.3 The subcontractor shall, within one month of acceptance of the subcontract tender, or on such other date as may be agreed with the contractor and/or the Engineer to suit the contract programme, submit triplicate copies of type test certificates issued by an authorised inspection authority or other approved testing agency in respect of all items of plant for which such certificates are required by the Engineer.

7.4 After completion of manufacture, all test certificates called for elsewhere in this Part shall be provided in duplicate.

7.5 Prior to the issue of the Practical Completion Certificate the following documents shall be provided, as appropriate, in duplicate, bound in a durable folder bearing the contract title and number:

- Test certificates relating to tests done after completion of the installation as called for elsewhere in this Part.
- Catalogue extracts of all major items of plant with performance curves marked to show operating duties.
- List of spare part numbers and local Agents for these parts.
- "As built" drawings, including layouts, sections, wiring and control diagrams and plant schematic diagrams. These are to show in detail the positions of poles, stays, cables, joints, sleeves, ducts, heating and cooling coils, dampers, pipes, control and regulating valves, air release valves, expansion joints, fixed equipment and all other pertinent items of plant. In the case of buried services, the route of such services and location of all cables, pipes, joints, valves, tees, access manholes, etc. are to be dimensioned relative to permanent and fixed objects, and the GPS coordinates must be provided. These drawings must depict the complete installation as finally commissioned.
- Detailed instruction manuals covering the operation, maintenance and servicing of each item of major plant provided under this subcontract and, where the complete plant has been supplied under this subcontract, the operation of the plant as a whole.

In addition, one complete set of Engineer’s Drawings clearly marked up to indicate all alterations made to the original drawings must be provided.

The subcontractor shall note that the Practical Completion Certificate may be withheld until the above has been complied with.

8. **STANDARDS AND CODES OF PRACTICE**

The installation shall comply with the following and all amendments thereto, as appropriate:-

- The Occupational Health and Safety Act and Regulations
- SABS 0142 Code of Practice for the Wiring or Premises, as appropriate (referred to herein as the Wiring Regulations).
- The Post Office Act.
The SAIEE Code of Practice for Overhead Power Lines.

The Local Authorities : Standard Electricity Supply By-Law and appropriate Additional By-Law or Regulations.

Any further Specification, Regulation or Code of Practice stated elsewhere in this Specification.

All items of plant supplied and/or installed, whether expressly specified herein or not, shall conform in respect of quality, manufacture, tests and performance with the requirements of the appropriate South African National Standards (SANS) Specifications and addenda thereto, or, if no such Specification exists covering any one or more of these requirements, with the relevant requirements of the appropriate British Standard Specifications and addenda thereto, except where elsewhere required by this Specification or approved by the Engineer. Where the South African Bureau of Standards has issued a licence for the use of its Mark on products complying with any of its Specifications, only such products which carry the Mark shall be supplied.

Preference will be given to plant manufactured in South Africa.

9. WORKMANSHIP

All work shall be carried out by qualified artisans or registered apprentices or, only where appropriate, labourers, under the constant supervision of a qualified artisan. At no stage during the construction programme shall any work be carried out without adequately qualified and experienced installation personnel being on site. If the subcontractor fails to comply with this requirement, the Engineer has the right to instruct the subcontractor to suspend the subcontract work. All costs incurred in so doing shall be for the account of the subcontractor.

10. CO-ORDINATION OF SERVICES ON SITE

The subcontractor will be required to work in close co-operation with the contractor and other specialist direct contractors and subcontractors to ensure that no conflict arises between the various services, and to plan the progress of the various aspects of his work. It is imperative that such close liaison continues throughout the duration of the contract.

11. INTERRUPTION OF EXISTING SERVICES

No interruption of existing services will be permitted without the express permission of the contractor, and/or the Engineer and/or the Employer or his representative, given as a result of written notification by the subcontractor of the date, time and duration of such interruption. Any costs arising from the interruption of any service without such permission shall be for the subcontractor’s account.

12. BUILDER’S WORK

All builders’ work as detailed in other Parts of this Tender Document has been allowed for in the contract and must not be allowed for in this subcontract. The onus shall be on the subcontractor to ensure that all work carried out by the contractor in this respect, is to the subcontractor’s satisfaction.
The subcontractor shall notify the contractor prior to building work being commenced of the positions where holes, cuts and recesses will be required and shall ensure that each is correctly located and that heavy-gauge draw-wires are supplied and installed in all sleeves.

13. **APPROVAL OF DRAWINGS**

All Drawings, circuit or schematic diagrams prepared by or on behalf of the subcontractor for submission to the Engineer in terms of the requirements of this Tender Document shall have been thoroughly checked, corrected where necessary and signed as approved by the subcontractor, prior to such submission.

14. **OPERATING, MAINTENANCE AND SERVICING PROCEDURES**

The subcontractor shall, by agreement with the contractor and the Engineer, instruct the Employer's appointed Representative in routine operating, maintenance and servicing procedures of all items of plant supplied under this subcontract, and shall ensure that the Employer or his/her Representative, fully understands the documents provided in terms of Clause 7.5 hereof.

15. **MAINTENANCE**

During the defects liability period, up until issue of the Final Completion Certificate, the subcontractor shall, in addition to attending to any lists of work to be completed which may be issued by the Engineer, carry out full maintenance and servicing operations specifically recommended by the suppliers of any item of plant used in the subcontract works to maintain it in full and correct operation. Such maintenance shall include all attention necessary to comply with the suppliers' recommendations and shall include the provision of all necessary consumable items. The subcontractor will also be required to make any adjustments necessary during this period to ensure the satisfactory operation of the plant.

On completion of each such maintenance visit the subcontractor shall submit to the Engineer a schedule detailing the work done, which schedule shall have been countersigned by the Employer's representative, whereupon a certificate will be issued for moneys due, in respect of the particular maintenance service, as included in the original tender price.

Notwithstanding any maintenance and servicing which may be carried out during the defects liability period, the subcontractor shall carry out a full maintenance and servicing operation at the end of the defects liability period and before the Final Completion Certificate will be issued.

Allowance for all costs in relation to the above must be made in the tender price. It shall be noted that the Engineer reserves the right to omit partly or wholly the prices submitted for the maintenance of the subcontract works, should the installation not be adequately maintained within the stipulated maintenance period.

The Employer may request the subcontractor to enter into a Service/Maintenance Agreement for the subcontractor to continue to maintain and service the subcontract works, or a portion thereof, beyond the date of issue of the Final Completion Certificate. The terms and duration of such an Agreement shall be subject to mutual agreement between the Employer and Subcontractor, and shall be concluded before the issue of the Final Completion Certificate.

Mutually agreeable conditions will be negotiated by the Engineer with the subcontractor should the subcontract works not be put into operation immediately on issue of the Practical Completion Certificate.
T3.3.1.2 STANDARD ELECTRICAL SPECIFICATION

SECTION 1 – REGULATIONS

The following Regulations shall apply as applicable:

Electricity Act, 1987 (as amended)
Occupational Health & Safety Act, 1993 (as amended)
Post Office, Act 1958 (as amended)

SECTION 2 – STANDARDS

With the exception of Clause 1.0, all clauses hereafter will first contain a list of the SANS, NRS, BS, CKS, etc. Standards, and thereafter the Clinkscales Maughan-Brown Standards, whilst the latter Standards shall take precedence over the afore-mentioned Standards.

The Project Technical Specification contained elsewhere in this document shall, however, take precedence over all Standards contained in this Section.

1.0 DEFINITION

In this Part, the term “Contractor” means the person, firm or company whose tender has been accepted for the work specified in the document of which it forms a part.

High Voltage (HV): Voltage in excess of 33 000 Volt
Medium Voltage (MV): Voltage of 6 600 to 33 000 Volt
Low Voltage (LV): Voltage up to 1 000 Volt

2.0 ELECTRICAL SUPPLY AND PHASE ROTATION

SANS 1019 Standard voltages, currents and insulation levels for electricity supply
SANS 1816 Electricity supply - Quality of supply: Power quality instruments
NRS 048 Quality of supply

CMB Standards

2.1 Electrical power supply details relative to fault levels, voltage and phase rotation are given elsewhere in this Document.

2.2 Phase rotation specified shall be maintained on all overhead lines, cables, transformers, switchgear and distribution equipment.

2.3 Where existing connections are to be reconnected to a new system, phase rotation is to be checked before disconnection and reconnection made to maintain the same phase rotation.
3.0 SWITCHING OF HV, MV AND LV POWER SUPPLIES

3.1 Switching of existing power supplies shall be pre-arranged with the appropriate Authority.

3.2 All possible preparation shall be made in advance, to minimize the time required for re-energising the system.

3.3 All such switching shall be carried out by the “responsible person” unless such authority is given to the Contractor by that person in writing.

4.0 EARTHING AND BONDING

SANS 10142 The wiring of premises (Part 1) Low voltage installations

SANS 10200 Neutral earthing in medium voltage industrial power systems

SANS 10292 Earthing of low-voltage (LV) distribution systems

NRS 076 Earthing of distribution substations with nominal voltages up to and including 132 kV.

CMB Standards

4.1 General Earth Systems:

4.1.1 Earth systems for distribution transformers, minisubs shall comprise two earth electrodes with 1,5m long earth spikes located 6,0m apart, linked with 80mm² bare conductor. Spikes are to be located adjacent to pole structures or ends of plinths in case of minisubs and shall be located at least 1,0m therefrom.

4.1.2 In case of transformer earthing, if neutral earth system resistance is not 1,0 ohm or less, two systems as above are to be installed, one for the LV neutral and the other for the tank and associated equipment, in which case they are to be kept at least 6,0m apart and at opposite sides of the transformer position.

4.1.3 Earth system is to be connected with 80mm² insulated earth conductor to the earth bar or transformer tank earth stud as appropriate.

4.1.4 Common leg of secondaries of CT’s, other than secondaries of summation transformers, shall be effectively earthed to main earth system.

4.7 Earth Spikes:

4.7.1 Top of earth spikes and interconnecting conductors are to be 1,0m below finished ground level.

4.7.2 Connections to earth spikes shall be by means of at least two suitable mechanical clamps of an approved type for this duty. Clamps shall not be attached to the rod but must be installed so that the bolt face is in contact with the rod. Brazing will not be accepted. Connection must be wrapped with two layers of "Denzo" tape.

4.7.3 Cable marker as described elsewhere in this Part shall be installed above each spike and shall be labelled "Earth Spike".

4.8 Earth Continuity Conductors:

4.8.1 Earth conductors shall be hard drawn bare copper wire or bi-coloured green/yellow or black PVC covered as specified elsewhere in the Specification, the PVC being UV stabilised. Sizes of earth wire are depicted on the drawings.

4.8.2 Bare earth continuity conductors shall be run with all cables constituting a low voltage distribution system except in cases where an earth system as described in the Sub-Clause “Reticulation Feeder Neutral Earthing” above shall be installed.
4.8.3 Uninsulated earth conductors shall not be less than 500mm below ground level. Above this level all earth conductors shall be green insulated carried in a PVC conduit sleeve.

4.8.4 Terminal lug shall be crimped onto the end of the main earth conductor for bolting to the main earth bar of a substation or minisub or other outdoor equipment. Two mechanical clamps shall be used for connection onto cradles or other equipment, as appropriate.

4.8.5 Earth connections must not be carried through metal conduits or sleeves.

4.8.6 Earth connections shall be so made that in event of any connections being removed the earth connection to the rest of the equipment will not be affected.

4.9 Bonding Generally:
4.9.1 All metallic parts of an installation are to be bonded to the earth system as required by the appropriate Standards.

4.10 Bonding of Equipment:
4.10.1 All earth bars shall be run in one continuous length as far as possible, and shall not be bent or formed in any way that requires hammering or severe distortion.

4.10.2 Any joints shall be lapped with at least two bolts with nuts and washers of suitable size. Lapped ends shall be pre-tinned.

4.10.3 If multiple straps are used, they shall be bolted and fixed together at not more than 750mm intervals.

4.10.4 All connections shall be made using brass or stainless steel bolts, nuts and washers, together with a star lock washer, on all kiosks, fused feeder panels, miniature substations and outdoor equipment. Connections to indoor equipment may be made with cadmium plated steel bolts, nuts and washers, with a steel spring washer.

4.10.5 All steelwork on a pole is to be bonded using 20mm² solid copper conductor. Requirement applies to cross-arms, all insulator supports and any other hardware.

4.10.6 Where equipment is also mounted on the pole, bonded metal is to be earthed to an earth spike as elsewhere specified herein, using a 40mm² bare copper conductor.

4.11 Supplementary Requirements for Building Services:
4.11.1 Main earth system is to comply with the Supply Authority's requirements.

4.11.2 Earth spikes, mats and conductors shall be installed as early as possible in building programme, and onus is on Contractor to arrange this with Building Contractor so as to avoid later disturbance of completed construction.

4.11.3 Ends of earth conductors shall be terminated in lugs securely bolted to switchboard frames or trays.

4.11.4 Earth conductors run outside flexible tubing, where this has been permitted, shall be run neatly along tubing and shall be held in place by approved cable ties. Such conductors shall not be wound around the tubing.
5.0 **LV MCB MAIN AND SUB-DISTRIBUTION BOARDS AND CONTROL PANELS**

These are defined as boards controlling the main supplies, normally coming from a LV Main Distribution Switch Board, and outgoing supplies with moulded case circuit breakers.

- **SANS 10142** The wiring of premises
- **SANS 1195** Busbars
- **SANS 1274** Coatings applied by the powder-coating process
- **SANS 60529/IEC 60529** Degrees of protection provided by enclosures (IP Code)

**CMB Standards:**

5.1 **Construction:**

5.1.1 Construction material and colour specified elsewhere in Project Technical Specification.

5.1.2 Larger MCB panel distribution boards and motor control panels shall be floor standing.

5.1.3 Suitable to accommodate all equipment specified elsewhere in Project Technical Specification.

5.1.4 Where single phase breakers are used in three phase boards, these must be arranged in three vertical rows, one for breakers in each phase.

5.1.5 All structural elements of main and sub-distribution boards and complete construction of motor control panels shall be of minimum 2,0mm thick material.

5.1.6 Non-structural elements shall be of 1,6mm material. Minor bonding trays shall be of 1,2mm material and all bonding trays shall be galvanised.

5.1.7 All boards to be mounted outside or specified as being weatherproof shall be constructed of 2,0mm 3CR12 sheet, epoxy powder coated to a thickness of 70 microns.

5.1.8 Cognisance must be taken of the heat dissipated by equipment and adequate ventilation be provided.

5.1.9 Panels shall be either hinged or removable as specified elsewhere in Project Technical Specification.

5.1.10 Securing of fixed panels shall be by means of square key latches with vertical locating pins.

5.1.11 Boards shall be at least 115mm in depth unless otherwise approved.

5.1.12 A maximum of two rows of conduit shall enter horizontal edges of boards and width of board must be sufficient to accommodate all conduits entering.

5.1.13 All control panel doors shall be fitted with dust and damp proof seals

5.1.14 Flush boards in walls shall be provided with a separately attached metal frame and door which is adjustable so that it may be set plumb.

5.1.15 Boards with a width of 600mm or greater shall be fitted with double doors. Surface and flush boards shall be provided with doors.

5.1.16 Hinges shall be as specified elsewhere in Project Technical Specification.

5.1.17 Hot dipped galvanising shall comply with Clause “Hot Dip Galvanising” elsewhere in this Part.

5.1.18 All metal surfaces of boards shall be epoxy powder coated.

5.1.19 Cabling arrangements shall be such that outgoing feeder ends can be made off with board live at all times.

5.1.20 Gland plates shall be bonded to earth bar by means of a 70mm² bare copper conductor fixed with min. 10mm cadmium plated bolts and nuts.
5.1.21 Where single phase breakers are used in three phase boards, these must be arranged in three vertical rows, one for breakers in each phase.

5.1.22 Interior of boards shall be arranged for easy access to all wiring and components.

5.1.23 Where boards are installed in 115mm walls, they shall be provided with expanded metal fixed to entire back of board.

5.1.24 Underside of board shall be rendered vermin proof by means of similar plates to gland plates above.

5.2 Contents and Equipment:

5.2.1 Unless made specifically to clip in from front, blanking plates shall be fixed with short cadmium plated bolts and nuts.

5.2.2 All openings for future equipment shall be covered with blanking plates fixed on inside of opening.

5.2.3 Copper busbars are to be provided for each phase and are to be mounted on suitable insulators or fixed to terminals of miniature circuit breakers, and be of sufficient length to accommodate future breakers as specified elsewhere in Project Technical Specification.

5.2.4 Busbar and other connections shall be made using cadmium plated steel (or brass in coastal areas) bolts, nuts, flat and spring washers.

5.2.5 Main neutral feed to busbar shall be connected by a lug bolted to bar, as described above.

5.2.6 Neutral busbars shall be solid brass with two per-way pinching screws and sufficient ways for feed and all circuits connected, including spare ways to same number as spare circuits.

5.2.7 All equipment shall be mounted behind removable fascia plates, only switch toggles, etc., protruding.

5.2.8 Isolating device for all motors situated remote from control panel shall be lockable in the "OFF" position.

5.2.9 Fascia panels shall have moulded knobs for ease of removal of the panel.

5.2.10 Transformers for low voltage supplies and all low voltage wiring shall be separated by metal barriers from medium voltage circuits.

5.2.11 Positions of transformers are to be indicated by labels attached to face of board.

5.2.12 All equipment on boards shall be back-connected and no wire or cable shall be visible from front.

5.2.13 PVC insulated wiring shall be used throughout, current rating being not less than rating of circuit breaker or aggregate rating of bank of circuit breakers which it connects.

5.2.14 In case of MCB Main Boards cabling arrangements shall be such that outgoing feeder ends can be made off with board live at all times.

5.2.15 In case of MCM Main Boards all gland plates shall be bonded to earth bar by means of a 70mm² bare copper conductor fixed with min. 10mm cadmium plated bolts and nuts.

5.2.16 Wiring of boards shall comply generally with Clause “Control Equipment and Wiring” elsewhere in this Part.

5.2.17 Main circuit breakers shall comply with Clause “LV Circuit Breakers” elsewhere in this Part.

5.2.18 Labelling shall comply with Clause “Labels and Notices” elsewhere in this Part.

5.2.19 A spare set of HRC fuses for each switch-fuse unit or set of fuse holders installed shall be supplied and value included in tender price, except that a maximum of 6 spare fuses of any one size is required.

5.2.20 All spares shall be handed to Employer’s representative at time of handover inspection.
5.2.21 All instruments, meters, pilot lights, etc., and main isolator must be operable with the doors closed unless otherwise specified.

5.2.22 Heat anti-condensation heaters are to be so constructed and fitted that they cannot be inadvertently touched.

5.2.23 Transformers for low voltage supplies and all low voltage wiring shall be separated by metal barriers from medium voltage circuits.

5.2.24 Positions of transformers are to be indicated by labels attached to face of board.

5.2.25 Equipment on boards shall be back-connected and no wire or cable shall be visible from front.

5.2.26 PVC insulated wiring shall be used throughout, current rating being not less than rating of circuit breaker or aggregate rating of bank of circuit breakers which it connects.

5.3 Installation:

5.3.1 Floor standing boards shall be bolted in position.

5.3.2 No board shall exceed 2,4m in height nor shall any operating handle, button or switch be mounted higher than 1,8m or lower than 0,6m.

5.3.3 No part of any equipment shall be mounted closer than 300mm to floor.

5.3.4 Minor types of main and sub-distribution boards and control panels shall consist of sheet metal trays, suitably built in or secured on surface.

5.3.5 Where boards are installed in 115mm walls, they shall be provided with expanded metal fixed to entire back of board.

5.3.6 Trays of flush boards shall be built in or suitably secured to brickwork in specified places. Each shall be mounted with upper edge at a height of 2,0m above floor level, unless otherwise specified.

5.3.7 Unless otherwise specified elsewhere in this Specification, boards contained in cupboards shall be surface mounted and all conduit shall drop into them neatly, vertically and evenly spaced, in a single row, if possible.

6.0 LV CIRCUIT BREAKERS

**SANS 156**  Moulded-case circuit-breakers

**SANS 767**  Earth leakage protection units

**SANS 1473**  Low-voltage switchgear and control gear assemblies

**SANS 1765**  Low-voltage switchgear and control gear assemblies (distribution boards) with a rated short-circuit withstand strength up to and including 10 kA

**SANS 60439**  Low-voltage switchgear and control gear assemblies

**SANS 60934**  Circuit-breakers for equipment

**SANS 61008**  Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)

**BS EN 60947**  Specification for switchgear and control gear for voltages up to and including 1000 V A.C. and 1200 V d.c. Circuit-breakers
CMB Standards

6.1 General:

6.1.1 Supply voltage, normal current, fault capacity and type, as well as any special characteristics required for circuit breakers, shall be as stated elsewhere in Project Technical Specification.

6.1.2 Main circuit breakers are to be of one make throughout installation.

6.1.3 Main circuit breakers inside LV main distribution switchboards shall be equipped with adjustable instantaneous magnetic and inverse time delay thermal overload releases on each phase and shall be arranged for flush mounting. Shall be connected to busbars with solid copper connections of adequate section to resist short circuit stresses that may be imposed by faults up to maximum rupturing capacity of breaker.

6.1.4 Where circuit breakers are used to control supply taken directly from Supply Authority, they shall be of a make approved by that Authority, and shall be set to trip within specified limits laid down by that Authority.

6.1.5 Rack-out type air circuit breakers shall have interlocking to ensure that racking in or out can take place only with circuit breaker open.

6.1.6 Moulded case circuit breakers shall have a time delay tripping on low overloads and high speed tripping on short circuit.

6.1.7 Three phase MCB’s shall be fitted with suitable phase barriers.

6.1.8 Where MCB's are required to be connected to cables larger than 70mm², terminals shall be of stub busbar or rear connecting stud types. For all other cables, box type terminals shall be provided.

6.2 Installation

6.2.1 Connecting device between incoming cable and air circuit breaker, and between said breaker and outgoing bars shall be fitted with shutters which are automatically closed and locked by the action of racking out.

6.2.2 MCB's shall be fitted with purpose made terminal shrouds where no fascia plate is provided.

7.0 INSTRUMENTS, METERS AND PROTECTION RELAYS

SANS 473 / NRS 071 Automated meter reading for large power users
SANS 474 / NRS 057:2005 Code of practice for electricity metering
SANS 1524 Electricity payment systems
SANS 1799 Watt-hour meters - AC electronic meters for active energy
SANS 1966 / IEC 60211 Maximum demand indicators, Class I.0
SANS 60044 / IEC 60044 Instrument transformers
SANS 62052 / IEC 62052 Electricity metering equipment (A.C.) - General requirements, tests and test conditions
SANS 62053 / IEC 62053 Electricity metering equipment (A.C.) - Particular requirements
NRS 068  Electricity distribution - cable earth fault indicator
NRS 072  Overhead line fault path indicators
BS EN 60044, BS EN 60044  Specification for voltage transformers

CMB Standards:

7.1  General:
7.1.1  Indicating instruments and meters shall have HRC fuse protection on all voltage connections as specified elsewhere on the drawings.
7.1.2  Meters and instruments shall have labels fitted below, stating in which circuit they are installed.
7.1.3  Cases of all meters shall afford complete protection from dust and damp and shall be suitable for attachment of seals.
7.1.4  Selector switches shall be rated at 16A shall be provided with an "OFF" position.
7.1.5  Tenderer shall submit full details of meters, instruments and control switches offered in the tender, including connection diagrams for all equipment.

7.2  Potential Indicators:
7.2.1  Potential indicators shall comprise three neon indicating lamps each energised from a capacitor bushing connected to indicate that incoming cable or busbars are alive, unless specified elsewhere in the Project Technical Specification.

7.3  Protection Relays:
7.3.1  Protection relays are specified elsewhere in the specification.

7.4  Current Transformers:
7.4.1  Current transformers are specified elsewhere in Project Technical Specification.

7.5  Voltage Transformers:
7.5.1  Voltage transformers shall be three phase and of the type specified in the Project Technical Specification.
7.5.2  Output shall be 50VA per phase at 110V phase to phase.
7.5.3  Fuse protection shall be provided on both primary and secondary.
7.5.4  Transformers shall not be affected by single-phasing on the MV side.

7.6  Indicating instruments:
7.7  All instruments shall be as specified elsewhere in the Project Technical Specification.

7.8  Ammeters:
7.8.1  Ammeters, including whole current ammeters, unless specified otherwise in the Project Technical Specification, shall be calibrated to 120% of rated current. Overload capability shall be 10 x rated current for 1,0 second. Those reading in excess of 100A shall be CT operated with 5A full scale deflection.
7.8.2  One instantaneous reading ammeter, unless specified otherwise in the Project Technical Specification, shall be provided and connected via a phase selector switch with "OFF" position.
7.8.3  Maximum demand reading ammeters, unless specified otherwise in the Project Technical Specification, shall be of combined maximum demand and instantaneous type, one meter being supplied per phase.
7.8.4  Shall comprise a thermal maximum demand ammeter with drag pointer combined with a moving iron instantaneous pointer. The drag pointer reset knob shall be sealable.
Where dual ratio CT's are specified, ammeter scale plates are to be engraved on both sides to suit these ratios, the plate for the lower ratio being outermost.

Voltmeters:

One instrument shall be provided in each instance connected via a selector switch to read line to line voltages and also line to neutral voltages.

Voltmeters for MV use shall be suitable for operation on the 110V side of the voltage transformer, while LV voltmeters shall operate off a nominal line to line voltage of 400V. Scales between 90% and 110% of nominal voltage shall be graduated in 1.25% divisions.

Consumption Meters:

KWh meters shall be of the type specified in the Project Technical Specification.

Full details of programme facilities and operating instructions shall be supplied with these meters.

Allowance must be made in the tender price for Metval testing and the programming of the bulk meters.

Supply Monitors / Power Analysers:

Power analyser module shall display the voltage and currents of all three phases as well as the record the peak, i.e. maximum values of same. The instantaneous power consumed, power factor and total harmonic distortion (THD) of all three phases shall also be accesses via a scrollable menu interface.

Medium Voltage Metering Units:

Shall comprise of a free standing panel mounted on a concrete plinth.

When used in conjunction with extensible switchgear, metering unit shall form an integral part of the switchboard. In such cases it shall be specifically designed to match the associated switchgear and to be connected to the busbars of the extensible switches from which the complete switchboard is assembled.

When mounted adjacent to non-extensible switchgear or within an extensible switchboard it shall share a common plinth with switchgear.

Voltage transformer, current transformers, and consumption metering equipment shall comply with the relevant requirements detailed elsewhere in this part and in the Project Technical Specification.

Operating voltages, CT and VT ratios, and metering requirements are detailed in the Project Technical Specification.

Voltage transformer shall not be affected by single phasing on the medium voltage side.

Cable boxes shall be suitable for the cable sizes and types specified in the particular specification or on the drawings.

Exposed metal work shall be hot dip galvanized or zinc metal sprayed and painted to match adjacent or associated MV switchgear. Where such switchgear is remote from the metering unit, the unit shall be painted as specified in Project Technical Specification.

Exposed bolts, nuts and hinges shall be galvanized or fabricated from a suitable grade of stainless steel designed to resist corrosion or discolouration in service.
8.0 CONTROL EQUIPMENT AND WIRING

SANS 767 Earth leakage protection units
SANS 1091 National colour standard
BS EN 60947 Specification for motor starters for voltages up to and including 1000 V A.C. and 1200 V D.C. Direct-on-line (full voltage) A.C. starters

CMB Standards:

8.1 Time Switches:
8.1.1 Time switches shall be mounted in an accessible position for ease of adjustment.
8.1.2 Shall be provided with re-chargeable batteries to provide up to 48 hours of operation should a power failure occur.
8.1.3 Shall be fully programmable as specified in the Project Technical Specification.
8.1.4 Shortest switching interval shall be 1,0 minute for motor control and 30 minutes for general purposes.
8.1.5 Units shall include a manual override facility and be suitable for wall or DIN-rail mounting.
8.1.6 Protection shall be at least to IP42 and the units shall operate satisfactorily in the temperature range - 5°C to + 55°C.

8.2 Low Voltage Transformers:
8.2.1 Bell and other low voltage transformers shall be of the double wound type.
8.2.2 Shall have an adequate capacity for the duty required but not less than 50VA on short-time rating.
8.2.3 Transformers shall have one end or the centre point of the low voltage winding earthed.

8.3 Contactors:
8.3.1 Contactors shall, unless otherwise specified, comply with the standards for current making and breaking Category AC1 for non-inductive loads and Category AC3 for inductive loads.

8.4 Earth Leakage Protection Units:
8.4.1 Earth leakage protection units shall have a sensitivity of 30mA, unless stated to the contrary elsewhere in this Specification, or on the drawings.
8.4.2 Unit shall actuate a shunt trip isolator or MCB as specified.

8.5 Units shall carry the SABS Mark.

8.6 Motor Starters:
8.6.1 All Starters are to be of the same make.
8.6.2 Star-Delta starters are to be provided with both electrical and mechanical interlocks.
8.6.3 Starters are to be protected by moulded case circuit breakers as specified in Sub-Clause "Moulded Case Circuit Breakers" elsewhere in this Part.
8.6.4 Starters are to be so selected that they are not subjected to a higher fault current than that for which they are designed.
8.6.5 MCB's and isolators are to be lockable in "OFF" position where motors are situated remote from control panel.
8.6.6 Starters for all motors shall comprise magnetically operated contactors, shall be of robust design, operate without undue noise and vibration.

8.6.7 Unless otherwise stated, they shall be of continuous rating, current making and breaking Category AC3.

8.6.8 Contactors shall be of the hold-in type capable of operating satisfactorily without overheating for a period of 10 minutes if the supply voltage falls to two thirds nominal.

8.6.9 Contactors shall not chatter when opened at two thirds voltage, or at a frequency 10% below nominal.

8.6.10 Low voltage release is to be inherent in the operating coil.

8.6.11 Starters are to be equipped with a voltage free auxiliary change-over contact to provide a "RUN" signal during operating.

8.6.12 No motor control gear shall have a continuous rating of less than 10A at Category of duty AC3.

8.6.13 Contactors shall be capable of making and breaking the starting current of the motor and of carrying this current without damage for a period of one minute.

8.6.14 Contactors shall also be capable of withstanding, without damage, the passage of the maximum fault MVA of the circuit until such time as the fault can be cleared by the operation of the back-up protection.

8.6.15 Where anti-condensation heaters are fitted, these must be disconnected by the starter main switch.

8.6.16 Overloads of the thermal type shall be matched to the motor ratings and are to be manually reset.

8.6.17 Overloads are to be so set that the motor will trip within 30 seconds of a single phase condition arising when the motor is hot and operating at 80% of full load current. If the starter is not capable of this, then single phase protection devices are to be fitted for all motors of 10kW and over.

8.6.18 All overload devices must be fitted with a voltage free auxiliary changeover contact to provide a "tripped" signal. If this facility is not available on the overload offered, an interposing relay is to be provided to perform the same function. Such a relay must be energised upon an overload trip occurring.

8.6.19 The following shall be included as standard features:

- Overload protection; Phase imbalance and single phase protection; Locked rotor and excessive re-starts protection; Thermal memory; Auxiliary supply dip-proofing; Fail-safe operation on main trip relay; Analogue or LED indication of percentage motor load and thermal memory.

8.6.20 Optional features which may be specified elsewhere in this Specification are:

- Earth fault protection; Short circuit protection, etc.

8.6.21 In the case of dual-speed motors, protection shall be provided by a dual-operation relay separately configured to provide full protection at each speed.

8.7 **Pilot Lights:**

8.7.1 Pilot lights are to be either cluster LED, neon, transformer or resistor reduced wattage type.

8.7.2 Lights shall be easily seen when operating in normal daylight.

8.7.3 Where pilot lights are connected to remote equipment by multi-core control cables neon lamps shall not be used because of the inductive effect of the control cores.

8.7.4 100% spare lamps are to be provided for all pilot lights.

8.7.5 Lamp test facilities via a lamp test push button wired to all indicator lights must be provided.
8.7.6 Pilot lights are to be of the colours indicated below, unless elsewhere specified.

- Power on: Amber
- Fault: Red
- Run: Green

8.7.7 Pilot lights indicating "STARTER CLOSED" and "OVERLOAD TRIP" shall be fitted to all motor circuits.

8.8 Main and Control Circuits:

8.8.1 Control equipment shall be mounted in a separate hinged panel fitted with square key latches to permit ease of access to terminals, etc., at the rear of the panel.

8.8.2 Where busbars are located directly behind such panels, a separate removable insulated panel shall screen them.

8.8.3 Wiring shall be carried out using suitably rated, colour coded insulated wire.

8.8.4 Main terminals are to be connected in strict phase rotation.

8.8.5 Wires shall not be joined between terminal points and no terminal shall have more than two wires connected to it unless they are lugged connections.

8.8.6 Spare terminals are to be provided to accommodate all spare control cable cores.

8.8.7 Terminals for wires smaller than 16mm² shall have pressure plates.

8.8.8 Terminations for the connection of external control wiring shall be of the "disconnect" type.

8.8.9 Terminations shall be fitted with numbered ferrules, the numbers corresponding to those on the appropriate wiring diagrams to be prepared by the board Manufacturer. All terminal strips are to be similarly numbered.

8.8.10 Generally, wiring shall be enclosed in strategically placed plastic wireways. Small numbers of wires to remote positions may be neatly strapped, using plastic buckle clips or hard plastic "loom formers". Where wiring is run to equipment mounted on hinged doors, wiring shall be carried in a plastic "loom former" which is so installed that the wiring is not strained with the door fully open.

8.8.11 Colour of all panel wiring shall comply with the following:

<table>
<thead>
<tr>
<th>Colour of Wire</th>
<th>Circuit Particulars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red, White and Blue</td>
<td>Phase connections in current and voltage transformer circuits and in all three phase circuits.</td>
</tr>
<tr>
<td>Green/Yellow bi-colour</td>
<td>Insulated earth wires.</td>
</tr>
<tr>
<td>Black</td>
<td>Neutral connections.</td>
</tr>
<tr>
<td>Grey</td>
<td>Control connections.</td>
</tr>
<tr>
<td>White</td>
<td>Connections in DC alarm circuits.</td>
</tr>
</tbody>
</table>

All control circuits shall have 5A HRC fuse protection.

8.9 Labelling:

8.9.1 Control equipment both within the panel as well as all projecting items, are to be labelled in accordance with Clause "Labels and Notices" elsewhere in this Part.

8.9.2 Any device which can be unplugged is to be labelled at the base and on the device.
9.0 CABLE TRAYS

CMB Standards:

9.1 Type, i.e. perforated and folded or wire mesh comprising Light, Medium and Heavy Duty, shall be specified in Project Technical Specification.

9.2 Tray, incl. hardware, support brackets, etc. shall be hot dip galvanised after manufacture.

9.3 Maximum spacing between supports shall be as per Manufacturer’s recommendations.

9.4 Splicing pieces, bends and tee pieces shall be provided to suit cable tray system. These shall be of an approved make conforming to width and quality specification of the particular cable tray being used.

9.5 Trays are to be installed in accordance with Manufacturer's recommendations, supported in such a way that they are carried on cross members cantilevered from a vertical support so that cables do not have to be threaded between the supports.

9.6 Trays on walls are either to be carried horizontally on right-angled brackets or fixed vertically to wall.

9.7 Support brackets shall be spaced so that a sag of 1/200 is not exceeded with tray fully loaded.

9.8 Where trays are likely to be damaged because of their proximity to a working area and could therefore be stepped on or similarly abused, they are, if at all possible, to be installed out of way of such abuse. Where this is not possible, only heavy duty tray is to be used and additional longitudinal support in way of angle iron of suitable size is to be installed.

9.9 Where width of cable trays is unspecified elsewhere in this Specification, they shall be sized to accommodate 20% more cables than number presently to be installed on basis that future cables will be of the same average size.

9.10 All cables over 16mm² are to be spaced at least 12mm apart. Where cables are laid flat on trays, fixing is required for all cables larger than 16mm² using heavy duty nylon cable ties. Where fixed in vertical plane, all cables are to be strapped to trays using stainless steel strapping applied with an approved tool. This also applies to single cables fixed to trusses or other parts of structure and to all cables fixed to cable trays in a physically vulnerable situation.

10.0 MV AND LV CABLE JOINTS AND TERMINATIONS

SANS 808 Cable glands for use on flameproof enclosures (Ex d)

SANS 10198-9 The selection, handling and installation of electric power cables of rating not exceeding 33 kV.

SANS 1213 Mechanical cable glands

SANS 1803 Lugs and ferrules for insulated electric cables

NRS 053 Accessories for medium-voltage power cables (3,8/6,6 kV to 19/33 kV)

CMB Standards:

10.1 General:

10.1.1 Cable jointing and termination shall be carried out by a qualified cable jointer using only approved standard methods for particular type of cable. Proof of his training may be required.

10.1.2 Joints in all cables shall only be made at full drum length intervals, but where necessary and when approved by Engineer cable through joints may be used in other approved positions.
10.1.3 Where a cable has steel wire armouring all strands of armouring shall be through jointed.

10.2 Connections:

10.2.1 Cable connections shall be made by means of crimped or sweated lugs, firmly bolted, one plain and one lock washer being placed under nut, so that plain washer is against lug and there shall be no washer between lug and terminal. A plain washer is also required under the bolt head. Alternatively, sweated systems fitting into clamp connections will be acceptable.

10.2.2 Crimped lugs shall be fitted using manual tools up to 70mm² and hydraulic tools from this size upwards. Approved tools are to be used in both cases. An hydraulic tool is to be used on all sizes of aluminium cable. Where a single point hydraulic crimping tool is used, lug shall be cramped in three places. Where a hexagonal die is used, this shall extend full length of lug.

10.2.3 Where aluminium cored cables are to be connected to circuit breakers, aluminium cable lug shall be bolted to a copper tag or tail, which is to be connected to circuit breaker. Ensure that sufficient Densal paste is installed on faces of lugs.

10.2.4 Where an aluminium cable is to connect to copper, lug shall be a bi-metal type lug with a copper spade and an aluminium ferrule friction welded to the spade.

10.2.5 Cable connections shall be made using brass bolts, nuts and washers, together with a star lock washer, on all kiosks, fused feeder panels and minisubs and with cadmium plated steel bolts and nuts on all indoor equipment.

10.2.6 All bolted joints shall be taped with self-vulcanising (not adhesive) tape, unless otherwise specified elsewhere in Specification.

10.2.7 Where cable connections are required to the MV and LV terminals of transformers, these shall be made off as follows:-

10.2.8 Red Phase to Terminal A

10.2.9 White Phase to Terminal B

10.2.10 Blue Phase to Terminal C

10.2.11 All transformer connections shall be kept in strict phase rotation and where two or more units are to operate in parallel, respective connections are to be checked for phase rotation and polarity. In case of cable terminations to transformer bushings cable itself shall be clamped substantially to a post adjacent to transformer, connections to bushings being puttied and taped.

10.2.12 All connections are to be colour coded.

10.3 LV Cable Terminations:

10.3.1 PVCAS cables shall be made off using adjustable mechanical glands.

10.3.2 Care shall be taken to ensure that armour wires are correctly seated in gland and that all parts are properly tightened.

10.3.3 Outdoors, in damp situations and in all minisubs and kiosks, neoprene waterproofing shrouds are to be fitted over all glands.

10.3.4 Wherever PVCAS cables are terminated to overhead lines a suitable moulded heat shrinkable glove to affect a watertight seal at crotch shall be used, in accordance with Manufacturer's instructions. Alternatively, a PVC cable cap may be used.

10.4 Service Cable Ends:

10.4.1 Service cable ends are to be located in positions indicated on drawings.

10.4.2 In general case, ends are to be located 1,0m from each of the front and lateral boundaries. Where they cross road in sleeves they are to be located 1,0m into erf directly opposite the sleeve.

10.4.3 No service cables are to be laid to erven directly behind kiosks or at pole positions.
10.4.4 Cables are to be left sealed with a heat shrink cap at a depth of 500mm, unless specified elsewhere in the Specification and drawings.

10.4.5 Before sealing, each cable is to be checked by Contractor, in Engineer's presence if he so decides, to ensure that it is correctly located and labelled at respective kiosk or pole.

10.4.6 After checking and sealing and while end of connection is still exposed, marker posts shall be installed at end of connection and vertically above it as detailed on drawings.

11.0 **LIGHTNING PROTECTION**

SANS 10313 The protection of structures against lightning

SANS 62305/IEC 62305 Protection against lightning

12.0 **LV WIRING AND CONDUIT FOR LV WIRING**

SANS 950 Unplasticized polyvinyl chloride rigid conduit and fittings for use in electrical installations

SANS 1507 Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V)

SANS 1574 Electric flexible cores, cords and cables with solid extruded dielectric insulation

SANS 10142-1 The wiring of premises Part 1: Low-voltage installations

SANS 60614 Conduits for electrical installations

SANS 61035 Specification for conduit fittings for electrical installations

**CMB Standards:**

12.1 Size of conductor as per Project Technical Specification.

12.2 Loop-in system is to be adopted throughout any conduit installation.

12.3 Circuit wiring for different services, e.g. lighting and power, shall be run in separate conduits.

12.4 Where switches fed from different phases are mounted adjacent, they must be mounted in separate boxes or a single box with a fixed metal barrier between each switch.

12.5 Metal conduit shall be heavy gauge solid lap welded steel, screwed or plain-end galvanised, both as specified in Project Technical Specification.

12.6 All metallic conduit shall be manufactured from mild-steel with a minimum thickness of 1.6mm in respect of screwed and 0.9mm for plain-end conduit except that when used in concrete slabs, plain-end conduit shall have a minimum wall thickness of 1.2mm and when laid in screed on top of concrete slabs, 1.6mm.

12.7 Only plastic saddles and compatible fittings shall be used with non-metallic conduit.

12.8 Earth wires shall be installed with all non-metallic conduits.

12.9 All conduit fittings for steel conduit shall be malleable iron or pressed steel except for brass bushes.

12.10 Use of inspection tees or elbow pieces and internally screwed solid bends will not be permitted.
12.11 All conduit shall, wherever possible, be concealed by being cast in concrete slabs, chased in, built in or run in roof spaces.

12.12 When run in surface beds conduit is to be galvanised and is to be laid in concrete on surface bed so that it is completely covered.

12.13 Conduit cast in concrete shall be fixed at intervals to the formwork.

12.14 Where hollow tile type slabs are being used in structure, back entry conduit boxes shall be used.

12.15 All outlet boxes for lighting points shall be of long spout, deep type.

12.16 Where structural expansion joints occur, conduits shall, as far as possible, be laid to avoid crossing joint.

12.17 When crossings are unavoidable, the following arrangement shall be made. From a drawbox, or the nearest outlet within 4.0m of the joint, conduit of one size larger than necessary for the wire sizes, shall be run straight, and at right angles to the joint, finishing at the joint. Conduit of the required size shall then be passed into this from the other side of the joint, bushed inside the draw-box, but not mechanically connected otherwise. Care shall be taken to prevent concrete from entering the end of the larger conduit. The Conduits approaching from both sides of the expansion joint shall be wrapped with two layers of corrugated cardboard from a point 1.0m from the joint. A bare earth wire of the same size as the wiring in the conduit shall be run from the drawbox to the next outlet, connecting firmly and solidly to each box. Care shall be taken to exclude the ingress of dirt or moisture to partially completed runs, and all open ends shall be plugged temporarily while work is not actually in progress. Plug may consist of a conduit socket with brass ET plug or conduit fishtail, or purpose made tightly fitting plastic sealing caps. Wooden or paper plugs will not be acceptable.

12.18 Conduit in false ceiling spaces shall be run surface.

12.19 In roof spaces all conduit runs shall be parallel or at right angles to trusses and joists.

12.20 Where conduits run along trusses and joists they shall not be run or fixed on top but on side.

12.21 Conduit shall lead into and out of back entry conduit boxes at all fitting positions. All such boxes shall be finished flush with the underside of ceiling and lighting fittings shall be screwed directly onto box.

12.22 At ceiling positions where conduit runs do not have to continue to next truss (e.g. last point in a row), conduit shall be extended beyond box to next truss. This conduit extension shall be plugged.

12.23 Where conduit is run on surface, it shall be fixed with stand-off saddles, multiple spacer saddles being used for conduits run together.

12.24 Maximum distance between saddles shall not exceed 1.5m.

12.25 Conduit box lighting fitting shall be fixed within 100mm on either side of box.

12.26 Where conduits have to run adjacent to gas or cold water pipes, communication or data circuits, they shall be prevented by spacing or other means from coming into contact with these other services under any condition.

12.27 Under canopies, outlets for future signs, etc., which have been terminated in round conduit boxes, are to be blanked off with 75mm dia galvanised cover plates finished with a zinc plumbate primer. These are to be fitted prior to painting and are to be fixed using cheese headed brass machine screws.

12.28 Where conduit enters boards, trays, etc., locknuts shall be used inside and outside, with female bushes inside. Same arrangement shall be used wherever possible for entry into switch boxes, control gear, etc., provided with clearance holes. Where this arrangement does not allow sufficient wiring space, however, couplings and hexagonal male bushes may be used, but must be very tightly screwed up. In case of multiple back entries into a conduit box, male bushes and couplings are to be used.
12.29 Care must be exercised when laying conduit in vicinity of distribution boards of any type to ensure that conduits radiate from these points in order. Under no circumstances are more than two conduits to cross at any point where cast in concrete and a space of at least 20mm must be left between all conduits both vertically and horizontally after emerging from distribution point.

12.30 Drops to switch and other high level outlets shall be from ceiling while conduit to low level outlets shall be run in floor. In basements and ground floor areas which are below natural ground level, all conduits to any type of outlet shall drop from ceiling level.

12.31 No draw boxes which are not, in themselves, outlets shall be permitted. Notwithstanding Wiring Code, if it proves necessary to draw conductors round more than two 90° bends, or equivalent, or on very long straight runs, draw boxes are required. Maximum length of straight runs between draw boxes shall not exceed 20m. Such draw boxes shall be provided with oversize flat covers fitted flush with ceiling, fixed with cheese-headed screws.

12.32 Contractor is responsible for checking with Building Contractor by reference to drawings on site, of positions where panelling, tiling, tile edging or dados, etc., may affect exact positioning of outlets.

12.33 All setting of conduit shall be done with approved tools. No kinks will be accepted. Where necessary, boxes with special configurations shall be used to avoid necessity for too many sets in conduitwork.

12.34 Conduit shall be run or erected in straight or symmetrical lines, with easy sets or bends. Care shall be taken when installing conduit that cut ends are completely free from burrs and sharp edges which might damage conductors. All open ends shall be fitted with brass bushes. Composition bushes will not be accepted. All bushes are to be fitted prior to wiring. All running joints shall be fitted with lock-nuts, and lock-nuts shall be provided wherever necessary to ensure that all conduit joints in installation are tight.

12.35 Where conduit only is required, draw-wires shall be left in each such conduit, irrespective of service for which it is required. Draw-wires shall be minimum 1.6mm dia hot dipped galvanised steel.

12.36 Conduit run on surface within ducts shall be painted an approved colour under this Contract. Conduit in false ceilings and roof spaces is not to be painted.

12.37 Contractor must ensure that, prior to final completion, all openings left at conduit exit from switchrooms or between floors in rising ducts, are made good.

13.0 **LV WIRING TRUNKING**

**SANS 60570** Electrical supply track systems for luminaires

**CMB Standards:**

Trunking shall be used where indicated in the Project Technical Specification and shall be of type specified.

13.1 Where trunking is to be fabricated of sheet metal, this shall be of 1.0mm minimum thickness. Each length shall be so constructed that it matches identically with the other lengths and the lengths shall be joined by splicing sections inside the trunking.
13.2 Trunking shall be finished by degreasing, suitably primed and painted with two coats of high quality enamel, unless otherwise specified. Where galvanising is specified, this shall mean fabrication from pre-galvanised plate unless hot-dip galvanising is specifically called for. Electro-galvanising will not be accepted.

13.3 Trunking shall be installed straight and level and shall incorporate all recommended fixings when of proprietary makes. Plastic clips shall be installed at not more than 1200mm centres to hold wiring in place when covers are removed.

13.4 Earth wires shall be run in all wiring trunking and these shall be bonded to all equipment fed by wiring carried in the trunking and to the trunking lengths themselves.

13.5 When trunking is cast into structures it shall be taped to prevent the ingress of slurry and it will be the Contractor's responsibility to ensure that the trunking runs true. Where trunking is fitted to pre-formed slots in the structure or built into brickwork, the trunking shall be adequately braced to prevent deformation of the sides during plastering, resulting in the bowing of the cover when finally fitted.

13.6 Where light fittings cross ceiling trunking, the cover strip shall be cut square to abut the fittings, and the raw edges, if of metal, shall be painted to match the applied finish.

13.7 Skirting trunking shall be as specified elsewhere in this Specification, the general remarks above being deemed to apply.

14.0 LV BUSBAR TRUNKING

SANS 784 Design for access and mobility – Tactile indicators

SANS 10142-1 The wiring of premises Part 1: Low-voltage installations

CMB Standards:

14.1 Busbar trunking for LV systems shall consist of metal-enclosed copper or aluminium busbars intended for use indoors at voltages not greater than 1000V.

14.2 Busbars shall be spaced apart and held in position by robust insulating material and shall be sufficiently strong to withstand the rated fault level without failure.

14.3 Metal enclosure around the busbars shall be sheet metal of sufficient thickness so as to provide adequate rigidity and strength under fault conditions. Metal enclosure shall be treated adequately against corrosion by means of hot dip galvanizing or enamel coatings. Ventilation openings shall comply with IP 30 and with the vermin proofing requirements set out in the Project Technical Specification.

14.4 Busbar trunking systems shall be installed strictly in accordance with the Manufacturer's instructions.

14.5 No protective devices shall be provided within the busbar trunking system (except as described in the standards) and outgoing circuits or tee-offs shall be adequately protected from overcurrent by fuses or circuit breakers.

14.6 Expansion joints shall be purpose made and shall be installed at such intervals as recommended by the Manufacturer.

14.7 Fire-resistant units shall be purpose made and shall be installed where busbar trunking passes through walls and floors and shall be installed strictly in accordance with the Manufacturer's instructions. The opening through the wall/floor around the fire resistant unit shall be fire stopped with non-combustible/fire-retardant foam in compliance with the National Building Regulations.
15.0 **LV SWITCHES, SOCKET OUTLETS, PLUGS AND BOXES**

**SANS 164**  
Plug and socket-outlet systems for household and similar purposes for use in South Africa

**SANS 1085**  
Wall outlet boxes for the enclosure of electrical accessories

**SANS 1239**  
Plugs, socket-outlets and couplers for industrial purposes

**SANS 10142-1**  
The wiring of premises Part 1: Low-voltage installations

**SANS 10400**  
The applications of the National Building Regulations

**SANS 60309**  
Plugs, socket-outlets and couplers for industrial purposes

**SANS 60669**  
Switches for household and similar fixed-electrical installations

**SANS 60670**  
Boxes and enclosures for electrical accessories for household and similar fixed electrical installations

**SANS 60884**  
Plugs and socket-outlets for household and similar purposes

**SANS 60906**  
IEC system of plugs and socket-outlets for household and similar

**CMB Standards:**

15.1 Type, size, finishing and IP rating (in case of weatherproof) plugs and switches will be specified in Project Technical Specification.

15.2 Samples of all switches and socket outlets shall be approved by Engineer before installation.

15.3 Weatherproof and watertight switches and socket outlets are to be semi-recessed in a manner to be discussed with Engineer to ensure their acceptable mounting, especially in case of facebrick walls.

15.4 Contractor is to ensure that the Plasterer covers right to edge of various boxes since gaps between plates and plaster will not be accepted, and it is deemed the Contractor’s responsibility to ensure that no such gaps are visible.

15.5 Switches and socket outlets shall be mounted at dimensions as indicated in the Project Technical Specification or depicted on drawings.
16.0 **LIGHT FITTINGS**

- **SANS 56** Incandescent lamps.
- **SANS 475** Luminaires for interior lighting, streetlighting and floodlighting - Performance requirements
- **SANS 890** Ballasts for fluorescent lamps
- **SANS 1012** Electric light dimmers (Metric units)
- **SANS 1777** Photoelectric control units for lighting (PECUs)
- **SANS 10114** Interior lighting
- **SANS 10400** The applications of the National Building Regulations
- **SANS 60238** Edison Screw Lamp holders
- **SANS 60598** Luminaires
- **SANS 60921** Ballasts for tubular fluorescent lamps - Performance requirements
- **SANS 61184** Bayonet Lamp holders
- **SANS 61347** Lamp control gear
- **VC 8043** Incandescent Lamps

**CMB Standards:**

16.1 Allowance shall be made for light fittings as specified in Project Technical Specification.

16.2 Fittings to be installed at each point are detailed on drawings according to code types set out in Project Technical Specification.

**Fittings shall be directly fixed to ceiling or structure in addition to being fixed to the conduit box.**

17.0 **TELEPHONES**

**CMB Standards:**

17.1 Telephone outlets and distribution boards, etc., shall be located as shown on drawings.

17.2 Telephones will be supplied and installed by others, unless advise otherwise.

17.3 Distribution boards shall comprise galvanised metal bonding trays of sizes indicated, mounted flush, unless otherwise specified, in position shown. Doors shall be carried on a separately mounted and adjustable architrave and construction shall comply generally with Clause "LV MCB Main and Sub-Distribution Boards and Control Panels" elsewhere in this Part. All such boards shall be provided with a 16mm thick timber backing board.

17.4 Internal arrangement, size, and specific requirements of Main Telkom Board shall comply with the Project Technical Specification and drawings detailed elsewhere.
17.5 Contractor responsible to supply and install conduit and boxes of sizes shown, and in positions indicated on drawings, from point of entry to building to distribution points and individual outlets and skirting ducts. Where no outlet sizes are shown, 100mm x 100mm x 50mm flush boxes shall be provided. When mounted adjacent to socket outlets, plates shall be in line and 25mm apart, unless advised otherwise.

17.6 Conduit shall conform to particulars laid down elsewhere in this Part, all bends being large radius. No draw-in boxes on telephone circuits will be permitted in roof spaces. 1,6mm min. diameter galvanised draw-wires are to be left in all conduit. All draw boxes are to be labelled.

17.7 Contractor shall be responsible for supply and installation of blank cover plates to all boxes. Plates shall be of exactly matching finish to cover plates specified for switches and socket outlets.

17.8 Distribution boards shall be appropriately labelled in accordance with Clause "Labels and Notices" elsewhere in this Part.

17.9 Sleeves shall be laid 500mm, unless detailed elsewhere, below ground. Galvanised 1,6mm draw wires are to be left in all such sleeves. Joints are to be made using exterior couplings.

18.0 **HOT DIP GALVANISING**

**General Hot Dip Galvanizing Standards:**

- **SANS 32**  
  Hot-dip (galvanized) zinc coatings (other than on continuously zinc-coated and sheet wire)

- **SANS 121**  
  Hot-dip (galvanized) coatings on fabricated iron and steel articles

- **SANS 10094**  
  The use of high strength friction grip bolts

- **SANS 14713**  
  General principles of design and corrosion resistance

**Mechanical Cleaning and Zinc Thermal Spraying Standards:**

- **SANS 2063**  
  Metallic and other inorganic coatings

**Continuously Hot Dip Galvanized Sheeting Standards:**

- **SANS 4998**  
  Continues hot dip zinc coated carbon steel sheet of structural quality

- **SANS 3575**  
  Continues hot dip zinc coated carbon steel sheet of commercial, lock forming and drawing qualities

- **SANS 9364**  
  Continues hot dip aluminium / zinc coated steel sheet of commercial, drawing and structural qualities

- **SANS 14788**  
  Continues hot dip zinc / 5% aluminium alloy coated sheets
**Continuously Hot Dip Galvanized Wire Standards:**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANS 675</td>
<td>Zinc coated fencing wire</td>
</tr>
<tr>
<td>SANS 935</td>
<td>Hot dip galvanized zinc coatings on steel wire</td>
</tr>
<tr>
<td>SANS 10244</td>
<td>Steel wire and wire products</td>
</tr>
</tbody>
</table>

**CMB Standards:**

18.1 Before galvanising, all cutting, drilling, welding, etc., shall be complete.

18.2 Galvanised parts shall be stored under cover and in stacks such that no part is resting on another and there is sufficient ventilation to prevent condensation occurring. No galvanised parts shall be stored directly on ground but on pallets or similar protection.

19.0 **PAINTING**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANS 1274</td>
<td>Coatings applied by the powder-coating process</td>
</tr>
</tbody>
</table>

**CMB Standards:**

19.1 Equipment that is delivered to site painted shall, after installation, and as near as possible to handover be inspected for damaged paintwork and be touched up, if necessary, according to manufacturer’s recommendation.

19.2 Where any galvanised or zinc coated surface has been damaged or cut, this shall be touched up using an organic zinc rich epoxy primer (containing min. 90% zinc).

20.0 **LABELS AND NOTICES**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANS 1186</td>
<td>Symbolic safety signs</td>
</tr>
</tbody>
</table>

**CMB Standards:**

20.1 Contractor shall arrange for labelling of all equipment, instruments, meters, relays, cables, etc.

20.2 Where identical items of equipment can be removed from their housings, e.g. circuit breaker carriages, plug-in relays etc., both fixed and withdrawable portions are to be labelled identically.

20.3 All labels shall be ivorine or other back engraved white on black labels of sizes indicated.

20.4 Labels are to be located in purpose made holders or otherwise are to be screwed or riveted into position.

20.5 "Dymo" tape or similar labels will not be accepted nor will labels which are glued in position only.

20.6 Labels on poles shall be manufactured from a material as specified in Project Technical Specification with the designated number. Labels shall be nailed to pole 3.5m above ground level, unless otherwise specified in the Project Technical Specification. Nails shall be electro-galvanised clout nails.

20.7 Prior to any equipment being labelled, Contractor shall request Engineer to provide a complete labelling schedule for all items of equipment. Under no circumstances is equipment to be labelled in accordance with tender drawings since any description thereon is for identification purposes during construction only and is unlikely to apply to the completed Works.

20.8 Following list indicates general labelling requirements but does not limit extent of labelling required, which shall encompass full extent of equipment supplied, or in case of existing equipment, any such which is affected by this Contract.
20.8.1 50mm high lettering:-
Substation and minisub designation.
Outdoor switchgear designation. Transformer designation.
Distribution kiosk and fused feeder panel designation.

20.8.2 20mm high lettering:-
Main or sub-main board designation. Control panel designation.
Indoor switchgear designation.

20.8.3 10mm high lettering:-
Individual switches on switchgear.
Cubicles.
Sub-distribution board designation.
Poles for OH lines.

20.8.4 5mm high lettering:-
Minisub feeder breakers and isolators.
Distribution kiosk feeder breakers and isolators.
General distribution switchgear.
Meters, instruments and relays.
Multiplying factors.

20.8.5 3mm high lettering:-
This size shall be used to designate conductor size and number of cores of each cable.
In addition, all feeder cables shall be labelled to state from whence they are fed.

20.9 All substations, minisubs, kiosks, transformer rooms and switchrooms shall be provided with
notices as required by Occupational Health and Safety Act. All doors to such locations shall be
fitted with appropriate notices.

20.10 Where more than one similar item of equipment is fed from same board or control panel, item
itself shall be labelled, this being fixed in a permanent position, i.e. not attached to motors,
pumps, etc., but to bases or adjacent thereto. The lettering shall be 50mm high.

21.0 DISMANTLING

CMB Standards:

21.1 Where dismantling of existing parts of installation is called for, all components including wire,
insulators, poles, cable, switchgear, transformers, etc., are to be removed and handed to
appropriate Authority.

21.2 Under no circumstances is any material or equipment to be taken over by Contractor.

21.3 In case of reclamation of conductor, this is to be done after removing binding wires on
intermediate insulators so that full strain lengths are recovered.

21.4 All such material is to be neatly coiled, packed, etc., as appropriate.

21.5 Extreme care is to be taken in dismantling all such equipment, since it will be re-used by
Employer.

21.6 If, in opinion of Engineer, unnecessary damage is done, cost of replacing such equipment will
be debited to Contractor's account.

21.7 Receipt detailing all equipment and materials delivered in accordance with above must be
obtained and a copy submitted to Engineer.

22.0 SECURITY CAMERAS

CMB Standards:

22.1 Control Room Equipment
22.1.1 Type of equipment, i.e. server room equipment, workstations display monitors, and software configuration specified in Project Technical Specification.

22.1.2 In case where equipment is replaced same shall be compatible with existing system.

22.2 All new equipment shall be supplied complete with licensed software, operating system, etc.

22.3 Camera Equipment

22.3.1 General:

52.2.1.1 In case where new or replacement equipment is supplied and installed at an existing installation same shall be capable of seamlessly integrating with the existing system without affecting any functioning of the existing system in any way.

52.2.1.2 Camera equipment shall comply with type and minimum standards as given in Project Technical Specification.

52.2.1.3 Cameras to be from same manufacturer.

52.2.2 Communication:

52.2.2.1 Type of communication and communication equipment between cameras specified in Project Technical Specification.

52.2.2.2 Equipment offered shall be compatible with existing equipment without affecting existing communication links or functioning of existing communication systems.

52.2.2.3 All equipment offered shall be of a type approved by ICASA and a certified copy shall be submitted on request.

52.2.2.4 Equipment offered shall be fully capable of handling all data traffic required and it shall be the Contractor’s responsibility to audit a site to determine exact communication paths necessary to achieve reliable communications.

52.2.3 Supporting Structures:

52.2.3.1 Supporting structure for camera equipment, specified elsewhere in Project Technical Specification.

52.2.3.2 Exact position of supporting structures to be determined prior to installation.

52.2.4 Equipment Enclosures:

52.2.4.1 Equipment enclosures for camera equipment, specified elsewhere in Project Technical Specification.

52.2.4.2 Enclosures shall be weatherproof, i.e. IP44.

52.2.4.3 Dimensions of enclosures shall be as small as possible, but still of a size to house all equipment required including spare space for future equipment / terminations as specified in Project Technical Specification, while at same time providing enough free air flow between equipment to prevent unnecessary overheating of same.

52.2.4.4 Enclosure shall be fitted with a removable wooden backboard to which all equipment and trunking shall be mounted.

52.2.4.5 Free airflow by means of natural ventilation shall be achieved by providing louvered slotted openings along side panels of enclosure.

52.2.4.6 Ventilation openings shall be vermin proof.

52.2.4.7 Forced cooling by means of extractor fans mounted against side ventilation slots shall be installed if natural ventilation proves inadequate.

52.2.4.8 All cables entering the enclosure shall be glanded off onto a gland plate in the cabinet floor.

52.2.5 Power Supply:
52.2.5.1 Power supply to all camera equipment shall incorporate a standby power supply of min 30 minutes, unless specified otherwise in Project Technical Specification.

52.3 Operation and Maintenance Manuals:

52.3.1 General:

52.3.1.1 Three complete sets of operating manuals shall be supplied by Contractor on handover.

52.3.1.2 Manuals shall be bound in suitable hardcover binders complete with all “As-Built” drawings details, datasheets, specifications, etc of all equipment and software provided.

52.3.1.3 Manuals shall be suited to both instruction and reference use by maintenance staff at technician / client level in operation, trouble shooting and repair of system.

52.3.1.4 Manuals shall be user friendly and written in laymans terms where possible.

52.3.1.5 Detailed illustrations and drawings shall be provided to aid in description of various items such as network layouts / interconnections, system architecture, etc.

52.3.1.6 Draft copies shall be submitted to Consultants for comments and prior approval prior to printing of final manuals.

52.3.1.7 Delivery of installation will not be accepted without manuals.

52.3.2 Operating Manuals:

52.3.2.1 Operating manuals shall give a clear description of purpose of installation, and shall be a step by step guide to aiding operating personnel in day to day operation of the system.

52.3.2.2 Operating manuals shall include the following as applicable:

- Detailed description of different components used in installation. Where illustrations are required to further assist in understanding of various tasks or processes (i.e. functional block diagrams, etc these shall be included.
- System set-up procedures, i.e. setting of different security levels, passwords, etc.
- First line maintenance procedures.
- Guide lines for routine-tests to be carried out by Client inclusive of periods in which tests are to be undertaken.
- Detailed instructions and trouble shooting guide for procedures to be followed in event of equipment failure or malfunction.

52.3.3 Maintenance Manuals:

52.3.3.1 Maintenance manual shall be a detailed technical instruction manual covering system maintenance and repair. Manual shall contain all technical documentation and literature required to give a clear description of the maintenance aspects of the system.

52.3.3.2 Manual shall be both comprehensive and concise, facilitating easy use by technical staff.

52.3.3.3 The following shall be included with the maintenance manuals as applicable:

- A general description of entire system and its various components including functional block diagrams of equipment, system architecture, etc.
- Schedule of all equipment, model numbers, serial numbers, optional extras, modifications, electrical power requirements, etc.
- Detailed weekly, monthly, quarterly, semi annually and annual preventative maintenance procedures.
- Manufacturers catalogues and relevant literature.
- Complete list of all configuration and calibration parameters for all equipment in use.
- List of spare parts for all equipment.
- Fault tracing procedures.

52.4 Training:
52.4.1 In the event that training for personnel is required Contractor shall undertake to train Employer’s staff in operation of the system until they are fully conversant with equipment and handling thereof.

52.4.2 Tenderers shall allow under applicable item in Bill of Quantities for a training course to be provided for number of persons indicated.

52.4.3 Training shall be in relation to the operating and maintenance of the system that is supplied under the contract and shall be conducted on the actual equipment installed inside the Control Room where possible.

52.4.4 The price in the pricing schedule will be for a one hour training session, to be increased as required for suitable training to be given, which may include such items as:

- Description of system and software / hardware system set-up procedures.
- Normal operating procedures and solutions to typical problems or issues to be encountered with the system.
- Identification and flagging for further attention and action any non-standard operation of equipment and software.
- Advanced instructions and trouble shooting guide for procedures to be followed in the event of equipment or software malfunction.

52.4.5 Contractor shall keep attendance records of the training sessions and submit copies of records to Consultant once training has been completed.

23.0 INSPECTION, TESTING AND COMMISSIONING

CMB Standards:

23.1 Engineer shall have access at all reasonable times to such parts of the Works or Contractor’s premises or premises of Manufacturer of component parts, as may be necessary for purpose of inspecting, examining and testing materials, workmanship and performance of any plant or equipment specified for Works.

23.2 Contractor shall ensure that complete project and inspection, testing and commissioning of any equipment shall be done as per the applicable SANS or BS Specification.

23.3 Contractor shall supply all equipment necessary for testing and commissioning procedures.

23.4 Contractor shall provide duplicate test certificates relating to cable tests, current injection tests of all instruments, meters and relays and results of earth mat tests.

24.0 COMPLETION OF WORKS

CMB Standards:

24.1 Completion of works will be executed as per relevant contract conditions.

25.0 CERTIFICATE OF COMPLIANCE

CMB Standards:

25.1 Contractor to complete and submit certificate of compliance as per the relevant contract conditions.

T3.3.1.3 GENERAL PARTICULARS
1. **SCOPE AND TYPE OF CONTRACT**

The Principal Contract, which is the Main Contractor's responsibility, comprises the fit out of the existing First Floor of a new Wet Collection Facility adjacent to the existing facilities in Somerset Street, Grahamstown for the South African Institute of Aquatic Biodiversity.

The Electrical Contract which will form a Nominated Sub-Contract to the Principal Contract comprises the supply, delivery to site, off-loading, storage, installation, testing, commissioning and handing over in good working order, and **twelve months guarantee and free maintenance**, of all items of materials and workmanship as further specified in this Document and on the drawings.

Tenderers are to include for all things, whether necessary or specified, to complete the installation in a satisfactory and first class workmanlike manner. The installation is to comply with all the relevant regulations and shall be to the satisfaction of the Engineer.

2. **CONDITIONS OF CONTRACT**

The contract will be let as a Nominated Sub-contract to the Main Building Contract in terms of the JBCC Series 2000 (March 2005) Selected Sub-Contract Agreement and Additional General Conditions of Contract and Addendum.

The Tenderer's attention is drawn to Part T3.1.2, of this document which contains extracts from the Preliminary and General Information forming part of the Bills of Quantities for the Main Building Contract.

3. **BUILDINGS**

The Electrical Contractor must fully acquaint himself with the type of materials, method of construction and finishes to be used prior to construction. No allowance will be made should difficulties arise during installation through lack of knowledge in this respect. A full set of Architectural and Structural drawings will be available at the offices of the Architect and Structural Engineer during the tendering period, and on site during construction and these shall be read in conjunction with the drawings covering the electrical installation.

4. **ENGINEERS DRAWINGS**

The Engineers Drawings pertaining to this installation are:

- 8599/E/1 – First floor Lighting and Power Layout
- 8599/E/2 – Schematic Diagram
5. **CONTRACT PERIOD AND PROGRAMME OF WORK**

A detailed programme will be drawn up by the Principal Contractor and the sub-contractor shall comply with any reasonable programme laid down.

6. **CONTRACT PRICE ADJUSTMENT**

Fixed price contract - no escalation.

7. **SERVICE BY OTHERS**

7.1 **Builder’s Work**

The Main Contractor will be responsible for the following items of work required for the electrical installations:

i) The provision of slots and sleeves through the concrete structure, floor slabs, etc.

ii) The cutting of holes in the ceiling tiles for the installation of diffusers etc.

The Electrical Contractor will be responsible for all further builder’s work required for the installation. These include the cutting and chasing of brick walls, as well as the provision of holes for switches and plugs where applicable. Where conduits are chased into brickwork, the Electrical Contractor will plaster these in up to the level of the brickwork.

8. **ELECTRICITY SUPPLY**

The supply will be taken at a nominal 400/231 volt, 50 Hz, 3 phase, 4 wire supply all as detailed in Part 5B below. All apparatus and equipment shall be suitable for these conditions as applicable.

9. **MATERIALS, EQUIPMENT AND WORKMANSHIP**

Materials, equipment and workmanship employed on this contract shall, wherever possible, comply with the relevant SABS Specifications and Codes of Practice as set out below.

10. **SAMPLES OF MATERIAL AND WORKMANSHIP**

If called upon to do so, the Electrical Contractor shall submit samples of materials, equipment and installation methods to the Engineer for approval prior to their installation.
11. **LIAISON**

It is the Electrical Contractors responsibility to liaise fully with the Principal Contractor and his respective Sub-Contractors on site so as to prevent clashes and to ensure that the contract is completed timeously.

12. **VALUE ADDED TAX**

The tender shall be inclusive of Value Added Tax.

13. **GUARANTEE AND MAINTENANCE**

The Electrical Contractor will be required to guarantee the complete new installation and all equipment installed by him for a period of twelve months commencing from date of acceptance of the installation or portion thereof. He shall make good any defects in material and workmanship which may arise during this period.

14. **NAME BOARD**

It is the Principal Contractor's responsibility to supply and erect a project notice board which bears the names of the Sub-Contractors. No individual notice boards of Sub-Contractors will be allowed on site.

15. **BUDGETARY ALLOWANCE AND PROVISIONAL SUMS**

Tenderers must allow in the Tender Price for these items as detailed in the Price Summary.

The above amounts will be deducted in part or in whole to the extent that they are expended in accordance with the direction of the Engineer.

No amounts shall be expended without authority of the Engineer.

16. **QUALIFICATIONS OF PERSONNEL**

The supervision, testing and inspection of the entire installation shall be carried out only by competent personnel whose training has included instructions on the various types of protection and installation practice, relevant rules and regulations and the general principles of area classification. C.O.C.’s shall be issued on completion of the entire works and signed off only by personnel in possession of the appropriate licences.
T3.3.1.4 TECHNICAL SPECIFICATION APPLYING TO THIS INSTALLATION

1. SCOPE OF WORK

This Sub-Contract includes for the following work.

1.1 Supply and install additional switchgear in the existing Distribution Board.
1.2 Supply and install small power and lighting.
1.3 Provide wireways and ducting for other services.
1.4 Earth the entire First Floor including track rails associated with storage racks.
1.5 Re-test the existing earth mat and lightning protection systems.

2. EXISTING SUB-DISTRIBUTION BOARD

The existing sub-distribution board is a surface board and is installed within the existing DB Room on the Ground Floor. All equipment contained therein has a rupturing capacity of 5000 amps.

Cable and conduit entry is from both the top and bottom of the board.

Additional equipment for the control of small power and lighting is to be installed within the existing board and as far as possible and new equipment shall match that of the existing.

3. SUB-DISTRIBUTION BOARD

The board and all the equipment contained therein shall comply fully with the requirements of Part 4 of this document. The board shall have a minimal rupturing capacity as shown on the diagram. Where no rupturing capacity is shown it shall be a minimum of 5000 amps.

The board shall be a surface mounted unit with hinged lockable doors, and finished in an electrical orange. Cable entry to the board will be from both top and bottom.

4. SUB-CIRCUIT ARRANGEMENT

Sub-circuitry throughout shall be generally carried out using PVC insulated single core conductors in U-PVC conduit. In addition sub-circuitry within the confines of the wet facility shall be carried out using multi-core cables with Zone 1 and 2 classified cable terminations. All equipment within the facility shall be suitable for Zone 1 and 2 installations as applicable.

Conduits and cables whether run vertically or horizontally shall be arranged in neat parallel rows either parallel or at right angles to the corridors.
Sub-circuitry between light fittings within the facility shall be carried out using multi-core surfix cables run in galvanised conduit, details of which can be found on drawing 8599/E/01.

All metalwork for all services such as Unistrut Channels, supports, boxes, bolts, nuts, washers, etc., shall be hot dipped galvanised. No rusted material will be accepted. If it is found that rusted material has been installed, the Electrical Contractor will be instructed to remove it at his own cost.

Powerskirting shall be provided in the positions indicated on the layout drawing, powerskirting shall be “Cabstrut” CS801 made up of 2 x 70mm high sections.

All normal electrical equipment shall comply with the relevant Clauses of Part Four, Section B, of the Standard Specification. However, all light switches are to be rated at 10 amp minimum except as otherwise indicated on the drawings.

16 Amp 3 pin switch sockets shall be used throughout. All cover plates for flush outlets shall be white plastic samples of which should be submitted for approval prior to ordering.

The Ventilation Contractor shall supply and install air conditioning units and extract fans to the extent indicated on the layout drawings. The Electrical Contractor is to supply and install power to each of the AC control panels as well as provide provisional outlets for the control of these units all as detailed on the layout drawings.

Certain circuits shall be protected by earth leakage units, these shall be installed in their respective DB’s and shall be of the core balanced type, having a sensitivity of 30mA.

If any doubt arises concerning the positions of any items, or the method to be employed in installing any equipment or materials, or the type of material or equipment to be used, the Engineers advice shall be sought before proceeding with the installation.

Earth wires shall be run with all circuit wiring and to all power and lighting circuits.

5. **LIGHT FITTINGS**

The Tenderer shall include in this tender price for the supply, installation and connection, including all lamps, etc., of all lighting fittings as specified below and as code referenced on the drawings.

The tender is to be priced using the cost of the specified fittings only.

Tenderers are at liberty to offer alternative fittings which may be of the same or different manufacture to those specified, however these alternatives will not form part of the Tender which must be priced on the specified fittings only. Full details of any alternatives, including catalogue numbers, illustrations, photometric data and price, must accompany the tender.

The Tenderer’s attention is drawn to Clause 2 of the Part ‘Preliminary and General Information’ which will be strictly applied in respect of any alternatives considered.

It shall be noted that the schedule of fittings listed is typical for the entire project and it is possible that certain makes and types may not be required in different sections of the project.
6. **LABELLING**

The Tenderer’s attention is drawn to the labelling of all outlet points which includes plug points, small power outlets, light switches and lighting fittings, this in addition to any other labelling described in Clause 23 of Part 4B of this specification.

Special attention must be given to the clause referred to Ivorine or black engraved labels as this will be strictly adhered to. “Stick On” labels will not be accepted.

7. **EARTHING**

The whole installation shall be effectively earthed in accordance with Clause 4 of Part 4B of this specification.

In addition to the entire installation being effectively earthed the Electrical Contractor is to supply and install a dedicated equipotential earthing system and connect this to the roller guides serving the mobile racking system. A separate earth wire shall be run to each of the guide details of which shall be given in due course.

A single line diagram which indicates the actual cable sizes and the positions of the earth bars has been detailed on drawing 8599/E/03. The testing of the existing dedicated earth mat has been covered by a PC amount allowed in the Price Summary.

8. **LIGHTNING PROTECTION**

A provisional sum has been allowed in the Price Summary to cover the re-testing of the existing lightning protection system for the building.

This work will be carried out by a specialist contractor that will be appointed as a nominated sub-contractor to the Electrical Contractor.

9. **FIRE DETECTION, DATA AND ACCESS CONTROL SYSTEMS**

The Electrical Contractor is to supply and install conduit work, draw wires, draw trays etc., for the Fire Detection, Data and Access Control systems as detailed on the Layout Drawings. The systems shall be installed in a similar manner as that described in Clauses 15 and 16 of Part 4B of this Specification.

All cabling and equipment for the two systems shall be carried out by a specialist contractor to be employed by the Client.
10. **BALANCING OF LOADS**

The Electrical Contractor will be required to carry out appropriate testing in an attempt to balance the load as equally as possible. These tests should only take place once the premises are occupied.

11. **TESTING AND COMPLETION**

The successful Tenderer shall arrange for the necessary Municipal Inspection of the Installation as part of this Contract, prior to testing and final inspection by the Engineer.

On completion of the entire installation or any particular section thereof, as may be decided by the Engineer, tests shall be carried out in accordance with the appropriate Rules, in the presence of the Engineer.

The Electrical Contractor shall keep pace with the programme of work laid down by the Main Contractor and reach completion at the same date.
T3.3.2 : HEALTH AND SAFETY SPECIFICATIONS

In addition to the Standardized and Project Specifications the following Particular Specifications shall apply to this contract and are bound in hereafter.

1. INTERPRETATIONS

Occupational Health and Safety Act, Act 85 of 1993 shall apply to this Contract. The Construction Regulations promulgated on 7 February 2014 published in Government Gazette 37305 apply to any person involved in construction work. These regulations are hereinafter referred to as “the Construction Regulations” and the said Act as “the Act”.

PROJECT SPECIFIC OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

1. SCOPE

This health and safety specification in respect of the Alterations and Additions to the South African Institute for Aquatic Biodiversity Lab:

- Provides the overarching framework within which the Principal Contractor is required to demonstrate compliance with certain requirements for occupational health and safety established by the Occupational Health and Safety Act 85 of 1993 during construction for the Alterations and Additions of SAIAB Lab;
- Establishes the manner in which the Principal Contractor is to manage the risk of health and safety incidents during construction; and
- Establishes the manner in which the Client’s Health and Safety Agent will interact with The Principal Contractor and Sub – Contractors.

This specification establishes general requirements to enable the Principal Contractor to satisfy aspects of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the Construction Regulations, 2014. The Principal Contractor is required to develop, implement and maintain a site specific health and safety plan. The Client is required to provide certain site specific information to the Principal Contractor or a health and safety specification for the works to enable such a plan to be formulated. Accordingly, this specification on its own cannot ensure compliance with the requirements of the aforementioned Act.

The Construction Regulations, 2014, require a Client to stop any contractor from executing construction work which is not in accordance with the contractor’s health and safety plan for the site or which poses to be a threat to the health and safety of persons.

The South African Council for the Project and Construction Management Professions has established the following specified categories of registration in terms of the Project and Construction Management Professions Act of 2000 (Act No. 48 of 2000):

- A Construction Health and Safety Agent who may be appointed by the Client to act as his agent in terms of the Occupational Health and Safety Act of 1993 and the Construction Regulations issued in terms of that Act;
- A Construction Health and Safety Manager who may be appointed by the Client to complement his professional team or by a contractor to manage company or project health and safety performance and compliance in accordance with the Occupational Health and Safety Act and Regulations; and
- A Construction Health and Safety Officers who may be appointed by an employer to mitigate the risk on a project or by a contractor to monitor and assist on-site health and safety performance and compliance in accordance with the Occupational Health and Safety Act and Regulations and services.
2. DEFINITIONS

As per the Occupational Health and Safety Act (85 of 1993) and the relevant regulations and applicable standards.

**Client:** South African Institute of Aquatic Biodiversity

### LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AIA</td>
<td>Approved Inspection Authority</td>
</tr>
<tr>
<td>BOQ</td>
<td>Bill of Quantities</td>
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<tr>
<td>CC</td>
<td>Compensation Commissioner</td>
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<tr>
<td>CHS</td>
<td>Construction Health and Safety</td>
</tr>
<tr>
<td>CHSA</td>
<td>Construction Health and Safety Agent</td>
</tr>
<tr>
<td>CHSO</td>
<td>Construction Health and Safety Officer</td>
</tr>
<tr>
<td>CR</td>
<td>Construction Regulations (Gazette 10113 of 07/02/2014)</td>
</tr>
<tr>
<td>DMR</td>
<td>Driven Machinery Regulations</td>
</tr>
<tr>
<td>DoL</td>
<td>Department of Labour</td>
</tr>
<tr>
<td>FEMA</td>
<td>Federated Employers Mutual Association</td>
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<tr>
<td>GAR</td>
<td>General Administration Regulations</td>
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<tr>
<td>GSR</td>
<td>General Safety Regulations</td>
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<tr>
<td>HCSR</td>
<td>Hazardous Chemical Substances Regulations</td>
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<tr>
<td>HIRA</td>
<td>Hazard Identification Risk Assessment</td>
</tr>
<tr>
<td>H&amp;S</td>
<td>Health and Safety</td>
</tr>
<tr>
<td>ER</td>
<td>Engineer’s Representative</td>
</tr>
<tr>
<td>LI</td>
<td>Labour Intensive</td>
</tr>
<tr>
<td>OH</td>
<td>Occupational Health</td>
</tr>
<tr>
<td>OHS</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>OHSA</td>
<td>Occupational Health and Safety Act No. 85 of 1993 (as amended)</td>
</tr>
<tr>
<td>OHSS</td>
<td>Occupational Health and Safety Specification</td>
</tr>
<tr>
<td>PA</td>
<td>Principal Agent</td>
</tr>
<tr>
<td>PSHSS</td>
<td>Project Specific Health and Safety Specification</td>
</tr>
<tr>
<td>PC</td>
<td>Principal Contractor</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>SANS</td>
<td>South African National Standards (Authority)</td>
</tr>
<tr>
<td>SDS</td>
<td>Safety Data Sheet</td>
</tr>
<tr>
<td>SMME</td>
<td>Small, Micro, Medium Enterprise</td>
</tr>
<tr>
<td>SWP</td>
<td>Safe Work Procedure</td>
</tr>
</tbody>
</table>

### KEY REFERENCES

- Occupational Health and Safety Act No. 85 of 1993 and Regulations (as amended)
- Construction Regulations 2014.
- Compensation for Injury and Occupational Diseases Act No. 100 of 1993 (as amended)
- SANS Code 10400.

3. INTERPRETATION

3.1 The Act and its associated regulations shall have precedence in the interpretation of any ambiguity or inconsistency between it and this specification.

3.2 Compliance with the requirements of this specification does not necessarily result in compliance with the provisions of the Act.
4. **Purpose of the Project Specific Health and Safety Specification (PSHSS)**

The PSHSS is a performance specification to ensure that the Client and any bodies that enter into formal agreements with the Client / Agents, Professional Service Consultants (Engineers, Quantity Surveyors and Architects), Principal Contractors and Contractors achieve an acceptable level of OHS performance. No advice, approval of any document required by the PSHSS, such as hazard identification and risk assessments, or any other form of communication from the Client shall be construed as acceptance by the Client of any obligation that absolves the Principal Contractor from achieving the required level of performance and compliance with legal requirements. Furthermore, there is no acceptance of liability by the Client, which may result from the Principal Contractor failing to comply with the PSHSS, i.e. the Principal Contractor remains responsible for achieving the required performance levels.

A Mandatory Agreement in terms of Section 37.2 of the OHSA will be signed between parties prior to any works commencing.

The PSHSS highlights the aspects to be implemented over and above the minimum requirements of current legislation. Requirements may be changed should new risks or issues are identified that could not have been foreseen during the design phase of the project, or during the construction phase. Any new legislation or standards (legislated, or determined by the Client) that are promulgated or accepted during the contract will automatically be applied.

It should be noted that this OHSS in no way relieves the Contractor of any of his responsibilities set out in the Act and Regulations.

4.1 **Implementation of the Project Specific Occupational Health and Safety Specifications (PSHSS)**

The project specific H&S specification (PSHSS) forms an integral part of the Contract, and PCs are required to make it an integral part of their Contracts with Contractors and Suppliers. A PSHSS will be available for each level of Contract and Contractor, and must be complied with.

This specification must be read in conjunction with the OHSA, Regulations (as amended) and any other standards relating to work being done, and ensure compliance thereto. The information relative to the scope of the project, the works etc. are detailed in the tender, are to be considered when developing the H&S plan and associated documentation.

The OHSA S.37.2 Mandatory Agreement must be fully completed by the PC, supplied by the Client. These documents shall be deemed to form part of the returnable Contract Documents.

No work may commence without written approval of the H&S plan by the CHS Agent, or the responsible person at SAIAB.

Should there be design changes, or change in the scope of works, an amended PSHSS may be issued. Where amended PSHSSs are issued, the PC will be required to ensure a resubmission of an amended H&S plan for approval. Further to this, the PC must ensure that similar information must be provided as it applies to the works to all their Contractors, within 5 working days following notification thereof. Such design changes.

The CHS Agent will visit the project as deemed necessary by the Designer and the CHS Agent to ensure compliance and limit risk. All activities on the site and all appropriate documentation will be monitored and reported on to the Client and the Designer.

Non-conformances will be issued and penalties or work stoppage will be issued where appropriate. Communication between the CHS Agent and the PC will be through the Designer (or Client’s responsible person) as determined at the commencement of the project.
4.2 Requirements

A project specific H&S Plan in response to this PSHSS will be subject to approval by the CHS Agent. This must include all supporting documentation as required to verify the H&S system:

- A declaration to the effect that he has the competence and necessary resources to carry out the work safely in compliance with the Occupational Health and Safety Act and its Regulations;
- A valid Letter of Good Standing.
- Incident Investigation Reports for other projects of a similar nature undertaken by the tenderer
- Claims ratio receipt from FEM or the Compensation Commissioner for the previous review period;
- Detailed technical method statements for approval by the Designer and appropriate risk assessments and safe work procedures for approval by the CHS Agent or Client:
  - Site establishment including:
    - Security Clearance and inductions.
    - Offloading of containers and equipment.
    - Exposure of services, power, telecommunication etc.;
    - Arrangements for hoarding, traffic accommodation;
  - An emergency plan indicating how and where emergencies will be handled, incorporating with the Lab’s existing plan.
  - Temporary Works.
  - Working at heights.
  - Electrical works.
  - Mechanical Installations.

Further method statements are to be submitted prior to, and during the project where changes or new work is required, and the approval of the Designer/Client is required before work on that aspect or activity can commence. The CHS Officer is to be included in production planning sessions/meetings to ensure that the appropriate risk assessments, safe work procedures and communication required are available and completed timeously. Penalties will be applied should this not be adhered to, and deemed a serious offence.

5. GENERAL REQUIREMENTS

5.1 Summary of Risks

The summary of risks provided is to point the contractor towards some risks he may not be aware of during tendering stage and while developing his formal risk assessments for the project.

The design risks and the management thereof should be included in the Principal Contractors (PC) risk assessments. Where there are other Contractors appointed to do work, the PC is to ensure that Contractors include such information in their risk assessments.

The summary is to be developed following the completion of the Design risk assessment, and to include the residual risks as they apply to the project. The items noted are for information only and must be expanded on as required by the project.

Refer to Risk Analysis

<table>
<thead>
<tr>
<th>PHASES OF THE PROJECT</th>
<th>RESIDUAL RISKS IDENTIFIED TO BE MANAGED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security Clearance</td>
<td>All personnel need to be inducted by Security</td>
</tr>
<tr>
<td>Site Establishment</td>
<td>Offloading of Containers, Plant, Equipment and Material.</td>
</tr>
<tr>
<td>Demolition work</td>
<td>breaking down of existing walls and inner structures.</td>
</tr>
<tr>
<td>Brickwork</td>
<td>Working at heights, Housekeeping, Hand tools, constructing off lift shaft.</td>
</tr>
<tr>
<td>Temporary Works</td>
<td>Building of support work, edge protection, working at heights.</td>
</tr>
<tr>
<td>Excavation</td>
<td>Excavation for the lift shaft 2.5m below ground level.</td>
</tr>
<tr>
<td>Painting</td>
<td>HCS, use of correct PPE, working at heights.</td>
</tr>
<tr>
<td>Tiling</td>
<td>Use of HCS, hand tools, housekeeping, Sharp cutting edges.</td>
</tr>
<tr>
<td>Plumbing</td>
<td>Working at heights, Hot works, vessels under pressure (soldering torch)</td>
</tr>
<tr>
<td>Electrical Work</td>
<td>Installation of electrical reticulation.</td>
</tr>
<tr>
<td>Mechanical Installations</td>
<td>Working at heights, working with lifting equipment, exposing existing services.</td>
</tr>
</tbody>
</table>
5.2 Specified Hazardous Chemical Substances

The following lists of products or substances are those which have been identified as likely to be used on the project. This list is not inclusive and other products may be considered. Where the PC is likely to supply the product as the product has not been specified, materials data sheets (MDSs) need to be considered prior to all selections.

<table>
<thead>
<tr>
<th>PRODUCTS/SUBSTANCES/RISKS</th>
<th>POTENTIAL HEALTH OR OTHER RISKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>• Hand mixing may occur, 50kg bags are an ergonomic risk from handling.</td>
</tr>
<tr>
<td></td>
<td>• Pumping of concrete may occur exposure to extensive vibration, extended hours of work, and potential eye, skin and respiratory irritant from dust exposure, chromates.</td>
</tr>
<tr>
<td>Cement/Silica dust</td>
<td>Caused by cutting, grinding, sanding of any concrete/granite/tiled surface/masonry.</td>
</tr>
<tr>
<td>Petrol/diesel/lubricants</td>
<td>Potentially fuel storage on site. Fire, spillage, fumes</td>
</tr>
<tr>
<td>Wood dusts</td>
<td>Caused by cutting, sanding, drilling wooden products treated</td>
</tr>
<tr>
<td>Adhesives</td>
<td>Possible irritation of eyes, skin damage SDS to be supplied and checked</td>
</tr>
<tr>
<td>Plaster/mortar/screeds</td>
<td>Cement dermatitis if frequent contact with cement. Dust in Lungs</td>
</tr>
<tr>
<td>Sealants/joint fillers</td>
<td>Fumes can irritate lungs and eyes. Area to be well ventilated.</td>
</tr>
<tr>
<td>Paints (PVA)</td>
<td>Possible irritation of eyes, skin damage SDS to be supplied and checked</td>
</tr>
<tr>
<td>Grouts (epoxy)</td>
<td>May be toxic area to be well ventilated. Possible irritation of eyes, skin damage SDS to be supplied and checked</td>
</tr>
<tr>
<td>PRODUCTS/SUBSTANCES/RISKS</td>
<td>POTENTIAL HEALTH OR OTHER RISKS</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>LPG Cylinders</td>
<td>Irritation of eyes, skin and lungs. Highly Flammable, Stored in Bulk</td>
</tr>
<tr>
<td>Oxygen Cylinders</td>
<td>Highly Flammable, stored under pressure, Stored in Bulk.</td>
</tr>
<tr>
<td>Solvents / cleaning detergents</td>
<td>May be toxic area to be well ventilated. Possible irritation of eyes, skin damage SDS to be supplied and checked</td>
</tr>
</tbody>
</table>

6. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

6.1 Structure and Organization of H&S Responsibilities

6.1.1 Notification of Construction Work
The Notification of Construction must be completed and signed by the Client, Client’s Agent and the Contractor. The Notification must be taken to the Regional Department of Labour Office for approval, the DOL will issue a confirmation Letter.

This must take place before a Site Handover meeting will be scheduled.
It should be noted that this OHSS in no way relieves the Contractor of any of his responsibilities set out in the Act and Regulations

7. HEALTH AND SAFETY PLAN FRAMEWORK

The H&S aspects related to the project outlined in the previous sections are to be taken into account when drawing up the H&S Plan. The PC is required to demonstrate competence by providing an H&S system that will address the requirements of the project.

The current legislative requirements, SANS codes, SANS 10400 and any other standards that may guide practice are to be taken into consideration. The following aspects must be addressed in the H&S Plan, as they have been identified in section 2, as playing a role in reducing the overall risk of a particular activity, or section of the project. The CHS Agent may from time to time request additions or systems as they relate to the works or legislative requirements at the time.

The PC is to prepare a site layout drawing to indicate at least the following:
- The positions of site offices of all Contractors, toilets, drinking water and worker rest areas;
- Indicate the positions of emergency personnel and equipment (fire, first aiders, first aid posts);
- Protection of plant and pedestrians, indicate parking, and
- Storage areas (materials and equipment, waste etc.)
- Access and egress to site for deliveries and intended temporary traffic management
- Emergency assembly point

Such layouts are to be updated regularly throughout the project.

7.1 Appointment of Competent Site Personnel
The CEO (OHSA S16.1) of the PC will take overall responsibility for the appointment of competent site staff for the duration of the project. Should the CEO not be personally involved in the project, the H&S responsibilities are to be delegated to the Site Agent (OHSA 16.2). Knowledge and training in H&S is required, and certificates indicating H&S training as well as experience to be included in CVs.
All other legal appointments are to be made with relevance to the type of work required and kept current with the project programme. The construction team is to ensure the appointed CHS Officer is kept up to date with all planned activities, to ensure all H&S requirements are met.

All construction/technical method statements are to be generated by senior site personnel, and the appropriate risk assessments developed therefrom in conjunction with the CHS Officer.

The Occupational Health and Safety Plan shall include the following, but is not limited to the following key appointments:

7.1.1 Construction Manager / Supervisors
Competent Construction Managers (CR 8.1) must be appointed to manage part or all of the works and have training and/or experience in the area of responsibility. All site supervisors must show evidence of appropriate training in H&S, and an understanding or training in areas of responsibility (i.e. risk assessments, method statements etc.). Construction Managers may be appointed where justified by the scope and complexity of the works.

Curriculum Vitae (CVs) are to be submitted for approval by the Designer, and/or Client. The Supervisor will be held responsible for the safety of working teams and subordinates, housekeeping and stacking and storage of materials.  

7.1.2 Construction Health and Safety Officer
The PC will employ at least one competent, full-time CHS Officer for the duration of the contract. The CHS Officer’s CV is to be submitted for approval by the CHS Agent or the Client, at time of tender. The PC is to ensure adequate resources are provided in order to undertake all responsibilities (i.e. mobile phone, computer and internet access, vehicle etc.) Qualifications shall include at least Grade 12 SAMTRAC/NEBOSH/Diploma in H&S qualifications or similar, with exposure to civil engineering and building that is appropriate given the level of project complexity preferably in an OHS capacity. He should also have undergone training in the Act and Regulations. In the case of a contract where contractors are employed, the CHS Officer must have a competence to evaluate the Contractors Health and Safety plans.

Proof of registration or Confirmation letter as a Construction Health and Safety Officer with SACPCMP must be supplied.

This person may not hold any other position on the site staff.

The site supervisor may not act as the CHS Officer.

The Construction Manager will be held responsible for all H&S on the project. He will be assisted by the Construction health and Safety Officer

- Senior site staff and supervision, Contractors are to follow systems, instructions etc. given by the CHS Officer at all times;
- No new workers or Contractors may commence work without approval or following the H&S plan as submitted, and
- No inductions of Contractor staff until the H&S documentation is approved by the CHS Officer.
- The CHS Officer/s may not be removed or replaced without the approval of the CHS Agent, nor may the site be left unattended for more than 1 day without adequate, competent cover.

A monthly report of all H&S activities and incidents is required by the end of the first week of each month, or at a date agreed to by the CHS Agent/Client and the CHS Officer. An example of the monthly report is attached as an Annexure C.

The CHS Officer will be responsible for collating the H&S documentation at the close out of the project in electronic format. A list of the typical aspects that should be provided is available as Annexure A to this document. The PC is to ensure that all Contractors documentation follows the same requirements and closed out H&S documentation must be completed and be available with the close out of the main contract.

Failure to do so will be considered a serious offence and penalties applied.
Traffic Safety
The CHS Officer will be responsible for ensuring that daily traffic management is adequately managed.

No worker may be transported in, or on the rear of construction vehicles (bakkies included), or with plant and materials to, on, or from site. The number of passengers in any vehicle is limited to what is stated on the license disc. Vehicles used to transport workers to, from, or on site, shall have secure seats and be covered.

Where there is an interface between the works and any public thoroughfare, typical traffic accommodation drawings will be provided.

7.2 Health and Safety Representatives and H&S meetings
H&S Representatives representing workers and Contractors are to be appointed following the startup of the project, irrespective of the number of workers on site. The appointed H&S Representatives are to be actively involved with H&S and will assist the CHS Officer and site management in meeting legislative duties.

The CHS Officer shall further ensure that H&S is discussed at all internal production or progress meetings. Issues arising from the CHS Agent audits are to be discussed, as well as all H&S related issues.

Minutes are to be kept for all H&S interventions and meetings. Failure to do so will be deemed to be a moderate offence.

7.3 Appointment of Competent Contractors
The Principal Contractor is to ensure compliance with the Client’s minimum standards and all legislative requirements. The same H&S standards required of the PC are to be applied to all Contractors. An index of all Contractors and Suppliers is to be on file and kept updated at all times. The PC is to ensure there is sufficient funding for H&S compliance by each Contractor.

The following minimum aspects are applicable to any Contractor appointed:
- The CHS Officer is to ensure a Contractor’s appointment and approval of H&S documentation at least seven (7) working days prior to commencing work.
- No Contractor may work under the PC’s Compensation registration number. If required, the PC may assist SMMEs with their registration with the Compensation Commissioner. However, such Contractors will not be able to commence work until proof of registration or Letter of Good Standing has been received.
- No work may commence without Mandatory agreements between parties in place.

The following aspects are applicable to Suppliers or short-term works (surveying, repairs, servicing, deliveries etc). Cognisance is to be taken of the level of risk involved and the CHS Officer is to ensure the level of H&S documentation is appropriate:
- Mandatory agreements in place
- Letter of Good Standing
- Method statements and risk assessments
- Available information relative to:
  - Load testing and registers for cranes or lifting devices
  - Medical certificates of fitness
  - Safety data sheets (SDSs)

Failure to provide written approval of H&S documentation will be considered a serious offense, and could result in aspects of, or all the activities being stopped and penalties implemented.
8. GENERAL RISK MANAGEMENT

8.1 Health Risks and Medical Surveillance
As some products used in the building work have not been identified, the PC is to ensure the CHS Officer and all supervision is responsible for ensuring the safe use of such products, and their inclusion into method statements and risk assessment. The appropriate SDSs are to be obtained for all products and used to develop the H&S documentation as they relate to the works.

Many of the processes may be labour intensive and ergonomic risks are to be noted. All workers (including Contractors) are to be included in the medical surveillance programme.

Workers will be exposed to noise, dust, and physical risks from extended periods of work of a repetitive nature, materials specified and the general nature of the works.

Environmental monitoring results and risk assessments are to be made available to the occupational health professionals doing the medical surveillance. The use of occupational risk exposure profiling (OREPS) and job descriptions are to be used to determine specific exposures for management.

Medical surveillance will commence at pre-employment. All workers (including Contractors) are required to be in possession of a medical certificate of fitness prior to commencing work. Annual medical surveillance is required (unless identified as being required more frequently), as well as an exit medical. Arrangements for keeping medical records for the required time are to be noted. It is preferable that the PC has a medical surveillance plan. Full medical records are not to be placed in the H&S file. A procedure for managing the medical records which require safekeeping for prescribed periods are to be addressed.

Given the potential health risks the following aspects are to be included in each medical surveillance intervention:

- Full medical, surgical and occupational history;
- Full physical examination of all systems; and
- Referral if required for the management of identified health issues that may affect the worker.

Specific testing for existing conditions and limitations relative to exposure could include, but are not limited to:

- Audiometry (hearing tests); and
- Any other tests identified as relevant from chemical or specifically identified risks of exposure
- Urine test for working at heights.

Failure to do so will be considered a serious offence.

8.1.1 General Environmental Conditions

Compliance with the Environmental Regulations (as amended), among others is required. Environmental monitoring of ventilation, lighting and dusts may be deemed to be required by the Approved Inspection Authority used to measure the environment. Copies of the relevant reports and actions taken in respect of these are to be placed in the H&S file.

8.1.2 Noise Risks

All plant from plant hire companies (suppliers) or that of the PC is to be compliant with the Noise Induced Hearing Loss Regulations. Plant identified that has not been tested and marked for noise emissions will result in having to be tested at the Contractors or PCs expense. Failure to do so within a reasonable time period will result in such plant being removed from site.

Audiometric testing of all workers is noted as required in the medical surveillance programme for all permanent workers prior to work commencing. Temporary labour working in identified noise areas will require testing if the noise levels are indicated on plant or through processes as greater than 85dB. Audiometry records are to be available in the H&S file.

Suitable SANS approved hearing protective equipment shall be issued and worn. Where several items of construction plant are in operation at or near to each other, the noise zone for the combined plant should be established and suitable hearing protective equipment used within this zone. Failure to do so will be considered a serious offence.
8.2 Emergency Procedures

An emergency plan and procedure that is appropriate to the risks is required prior to commencement on site. It is advised that the system should be simple and easy for any worker to follow. The plan may be adapted should new information or risks are identified. An appointment of a competent emergency response co-ordinator must be made.

The procedure shall detail the response plan in relation to the works, and include at least (but are not limited to) the following key elements:

- Fire;
- Public injury, Motor vehicle accidents;
- Injury to patients moving around on the premises.
- Falls from heights;
- Labour unrest;
- Serious injury to workers (medical or work-related); and
- Any other major risks identified during risk assessments.

The emergency plan is to ensure the inclusion of local service providers where possible. Such arrangements should be made with these persons prior to the commencement of the project.

Local emergency telephone numbers must be displayed and made part of the emergency procedure.

The general principals of emergency management are to be applied as it applies to the hierarchy of control and management.

The PC must consult with the Client in preparation of the emergency as buildings will be operational.

8.2.1 First Aiders and First Aid Equipment

At least 1 first aider will be trained to Level 3. First aiders shall be available and accessible on site at all times, and be able to work as a team when responding to any emergency on the project.

Contractors are expected to ensure compliance and provide/manage their own first aiders and equipment. The number of First aiders will be determined by the complexity and exposed risks of the project, not numbers of workers.

Appropriately stocked first aid kits, at least to the requirements of the Annexure to the GAR, are to be available at all times to assure continual availability and access on site.

8.2.2 Fires and Emergency Management

Attention to emergency planning and procedures is very important. The full emergency plan must form part of the supporting documentation with the H&S Plan. The CHS Agents approval of all emergency plans and procedures is required prior to commencement on site. It is advised that the system should be simple and easy for any worker to follow. The plan may be adapted should new information or risks are identified.

First aiders shall be available in each working team, and be able to work as a team when responding to any emergency on the project.

The procedure shall detail the response plan in relation to the works, and include at least (but are not limited to) the following key elements:

- Appointment of a competent emergency response co-ordinator and wardens;
- Lists of first aiders, and
- Requirement in terms of identified risks:
  - Fire;
  - Explosions;
  - Labour unrest;
  - Falls from heights, and
  - Motor vehicle accidents.

The emergency plan is to ensure the inclusion of local service providers where possible. Such arrangements should be made with these persons prior to the commencement of the project; the emergency plan is to include the risks of fire on site and related to any specific activities where gas, welding, cutting etc. occur. Hot work permits are required for any such activities.

Fire extinguishers will be appropriate for the risk and in sufficient numbers to deal with the type of fires that could occur. All mobile plant is to have appropriate, accessible fire extinguishers.

8.2.3 Incident Management and Compensation Claims
All incidents and accidents are to be investigated. All serious incidents involving any form of disabling injury or fatality are to be reported to the Designer /Client /CHS Agent immediately. This shall be confirmed in writing following the incident. Full details are to be included in each site meeting or when the Client visits site. A summary of incidents is to be included in the monthly report.

Failure to comply with emergency provisions will be considered a serious offence, and the operation or project may be stopped if deemed inadequate for the work at the time of assessment or site inspection.

8.3 Personal Protective Equipment (PPE) and Clothing
The PC is to provide a procedure as an addendum to indicate how PPE is managed within the Company.

The wearing of the identified SANS approved PPE at all times is non-negotiable. The PC shall ensure that all workers (Including Contractors) are issued with and shall wear:

- Hard hats;
- Protective footwear;
- Overalls that ensure worker visibility.
- Eye protection (if required)
- Hearing protection;
- Reflective jackets (no blibs)
- Respiratory protection (minimum of FF2), and
- Safety Harnesses with Big Hooks.
- Life Lines or cables with anchor points.
- Any other necessary PPE identified from SDSs and/or risk assessments.

Adequate quantities of PPE shall be available. This shall include necessary PPE for visitors. The procedures for managing PPE are to be in a formal procedure submitted with the H&S plan for approval.

Any person (including Client, Designers etc.) found on site without the necessary PPE will be removed from site until the PPE is supplied and worn.

Failure to comply will result in penalties being applied.

8.4 Occupational Health and Safety Signage
On-site H&S signage is required. Signage shall be posted up at fixed or temporary working areas, or other potential risk areas/operations. These signs shall be in accordance with the requirements of the General Safety Regulations or SANS requirements as amended. Signage is to be noted on the site drawings indicating where fixed/temporary signage is required.

Temporary signage is to include (but not be limited to) the following:

- Multipurpose Construction sign at the site Entrance
- ‘Report to site office’ / ‘Warning: Construction Site – Keep out’ or similar;
- ‘Site office’ (if relevant);
- ‘hard hat area’ or other PPE requirements noted;
- First aid box positions (including vehicles); and
- Fire extinguishers.
- Assembly Area

Signs shall be posted at areas of work on site indicating that a construction site is being entered and that persons should take note of H&S requirements.
Note should be taken that “omnibus” signs indicating that the entire site requires PPE should not be used. Any areas where PPE is mandatory must be separately designated.

Failure to comply will result in penalties being applied.

8.5 Induction of Employees and Visitors, General H&S Training
A simple, formal induction programme is to be submitted as an addendum for approval with the H&S plan. Inductions must be carried out for all workers and visitors (including Client, Designers) to the site.

Pre-task training is required to ensure workers are familiar with the risks and H&S measures of the work or tasks to be done. Such training is to be done at least daily. Records of inductions and pre-task training are to be kept in the H&S file.

Any person found on site without proof of induction in the H&S File will be removed from site until the proof is supplied and, and a penalty issued per non-compliance.
8.6 Management of Plant and Equipment

Close control of plant and equipment is required, including that of Contractors.

Daily monitoring of all plant and equipment is required prior to commencing work. Full lists of hired and own plant are to be available at the CHS Agent's/Client audit. All daily inspection records are to be kept in the H&S file. Plant Hire and Haulage Contractors are to comply with the requirements where plant and equipment is brought onto site. Registers are not to be more than 1 week behind.

Only competent, fit plant operators are to be used. Medical certificates of fitness are required for all operators. Any plant or slings used to lift plant or material require annual load testing by an AIA, and all certificates must have the testers LMI/E number. Operators are to be adequately trained and certified to operate mobile cranes or crane trucks. Certificates and registers are to be placed in the H&S file.

Movement of plant in closures and in confined working areas is to be closely monitored and managed by the supervisors. The blind spots of plant are to be taken into account and workers and Contractors protected accordingly.

All machinery shall have moving parts adequately guarded so that no access to these is possible when the machine is working.

Failure to do so will be considered a serious offence.

8.7 Excavations

Excavations should preferably not be open beyond what can be closed daily. Where excavations need to remain open, all excavations are to be properly protected. Adequate stakes with 1m high demarcation and berms/spoil are required to be a safe distance from the edge of the angle of repose. Candy tape may not be used to demarcate excavations. Cognisance is required of the surrounding area and increased levels of protection are required where work is in communities, near schools and clinics.

Work will be stopped and penalties applied to any work in excavations that is not compliant.

8.8 Working at heights

A Site specific fall protection plan and Rescue Plan is to be available and supplied as an addendum to the H&S plan. The fall protection plan must be appropriate for the project. Method statements, appropriate risk assessments, safe work procedures and training are to be available prior to work commencing.

Construction drawings shall be required for all temporary structures as they relate to the project. The drawings shall be accompanied by full calculations, design loads and any relevant test results as required by the SANS code, and ensure adequate allowance for the development of appropriate documentation and training. All drawings are to be checked and signed by a competent structural engineer (registered with ECSA).

The focus for working at height shall include fall restraint systems where possible except during assembling or dismantling top components or where it is not deemed safe. The relevant SANS codes are to be applied as they apply to the works and the project, such as:

- SANS 10085
- SANS 10333 (parts 1-3)
- SANS 10087-1:2008

Should part of the works be contracted out, competent Contractors are to be appointed and submit documentation according to the project requirements. The PC is to note if such work is to be contracted to specialists in the H&S Plan. The plan is to be developed and work managed by a competent person for the duration of the project. The following aspects must be included:

- Notices to be posted
- Restrictions or stoppage when weather conditions are deemed hazardous
- Permit system for working at heights
- Prevention of falling tools or equipment
- Link to emergency plan regarding rescue

All workers are to be in possession of valid certificates of fitness that extend for the duration of the works. Note the requirements in the section relating to medical surveillance.

Registers and all relevant documentation are to be placed in the H&S file.

Work will be stopped if any work at heights is not compliant.

8.9 Cranes and lifting equipment

Should any form of lifting device or crane (fixed or mobile) be used during the project for deliveries, moving of supplies or equipment, the appropriate documentation must be made available. Method statements, risk assessments, safe work procedures and training are to be available prior to work commencing. A procedure for managing loads and lifting must be made available as an addendum to the H&S Plan.
8.10 Temporary Works (Scaffolding, support work, formwork)

Temporary works must be properly designed and signed off by a competent person. In these instances, a competent person is defined as a Professional Engineer or Professional Technologist (registered with ECSA) who has sufficient experience in the design of the type of temporary work in question to be able to assess the design. The appropriate competent persons are to be appointed to manage and monitor such works to the satisfaction of the Engineer and CHS Agent. Records and registers are to be properly completed and kept in the H&S file. If temporary works are to be erected by a Contractor, this must be notified to the Designer/CHS Agent. All necessary calculations and drawings of temporary works must be kept on site and available to the PA and CHSA.

8.11 Bulk Mixing Plants

Whichever form of bulk mixing plant is used, for mixing concrete, guards and protection of nip points, emergency stops etc. are to be appropriately managed by competent supervision. Edge protection, movement of plant and dust management are required, including disposal of cement bags. The layout of the batch plant and movement of plant is to be provided on an appropriate drawing.

The added requirement of Chest X rays for workers is to be added to pre-employment and possibly exit medicals, unless the workers are already on a system of medical surveillance.

8.12 Mechanical installations

All mechanical installations are to be carried out in conformity with the manufacturer’s instructions. Method statements and risk analyses must be compiled for each type of installation. A competent person must be designated to supervise the work.

8.13 Auditing

Frequency of external auditing by the CHS Agent or Client will be as agreed with the Client and Designer but will at least conform to the requirements of the Construction Regulations. The site will be inspected and the documentation audited relative to the activities and H&S plan. The CHS Officer of the PC must accompany the Client, or the CHS Agent, on all audits and inspections. Not all audits will be, or need be announced.

The PC will ensure that all their Contractors are audited at a frequency determined by the CHS Agent. Audit frequency may be increased if Contractors are not performing adequately. Audit results will be acted upon and non-conformances and penalties issued where deemed appropriate. The Client, Designer or CHS Agent may act or require further outcomes if non-compliances are noted or unsafe acts are noted on site.

Internal audits are to include site conditions as well as ensuring H&S files are appropriate, and compliant. Comprehensive audit reports are to be made available, the format of the audit reports are to be acceptable by the CHS Agent.

The audit template will be adjusted from time to time relative to the activities on site. A similar process is to be used by the PC when auditing their Contractors on site. Compliance with legislative requirements and the systems provided by the PC to manage the H&S on site will be measured. Full compliance is required. Time limits for corrective actions will be set and must be adhered to.

Failure to address findings or non-conformances will be considered a serious offence.

8.14 Communication on Site

All H&S communication during the project between the CHS Agent and the PC will be done through the Architect/Clerk of Works/Client and be in writing, including the issue and responses to non-conformances and H&S audit results.

Failure to address issues timeously will be considered a serious offence.

8.15 Care of Workers on Site (Welfare)
Adequate toilets, clean, safe drinking water and decent shelter must be afforded workers at all times. Toilets will be within reasonable distance of workers, or placed with each working team in safe, with reasonable privacy. Hand washing facilities will be provided. Arrangements made where existing facilities are shared with existing users must be made in writing and placed in the H&S file. No substances containing Formaldehyde may be used in Chemical Toilets.

Failure to ensure compliance will be considered a serious offence.

8.16 Discipline, Alcohol and Substance Abuse

All employees (management included) are to follow instructions given in the interest of H&S. Disciplinary action is to be imposed on those who do not follow such instructions or company rules or policies.

No person is allowed to work or access site if under the influence of alcohol or other substances that could impact on their own or others safety. The PC is to have a drug and alcohol policy available to manage such instances.

These requirements are applicable to any employee of any organization providing services on site. Penalties may also be applied by the Client, OHS Agent or Engineer.

8.17 Electrical Equipment

In addition to the requirements of the Electrical Machinery Regulations and the General Machinery Regulations any electrical distribution board used for construction work shall be fitted with suitable earth leakage protection. Leads must be properly and firmly connected. Plugs and sockets shall be in good and safe condition.

All electrical apparatus, other than electrical hand tools, shall have a physical “lock out” system which will prevent any operation other than that authorized by a supervisor. A “lock out” sign shall be displayed when the apparatus is not in use.

Method statements and safe work procedures will be required for all work involving electrical apparatus.

9. HEALTH AND SAFETY FILE

The documentation submitted and approved following the awarding of the contract will be used to form the H&S file. The H&S file is required to be laid out in a logical manner, and documentation filed within the file is to be easily accessible.

The following completed information shall be included (but not be limited to) as part of the index:

- The PSHSS;
- The H&S Plan and the approval by Client;
- Appointment by Client;
- Mandatory agreement with Client;
- Notification of Construction work
- A record of all working drawings, calculations and design where applicable;
- Detailed list of Contractors and Sub-Contractors with contact details, appointments, Mandatories etc., H&S specifications issued;
- Record of Competencies (CVs) and appointments;
- Training Records;
- Permits;
- Method statements;
- Risk assessments;
- Safe work procedures;
- Emergency and injury management;
- Safety data sheets
- Medical surveillance records;
- Registers; and
- Records of audits, minutes etc.
- Plant lists
- Temporary electrical installations
- Employee records (who is on site)
10. NON-CONFORMANCES

Should, at any time, the works, or part of the works, be stopped due to unsafe acts or non-compliance with the Clients OHS Spec or PCs H&S Plan; neither the PC nor any other Contractor shall have a claim for extension of time or any other compensation.
ANNEXURE A
CLOSE OUT REQUIREMENTS

The H&S files for the Principal Contractors and all Contractors require closure and handover to the Client at the completion of the project. The following list is an example of what should be included, but is not exhaustive. The OHS Agent or the Client may require further information at the time of completion and the Principal Contractor is to ensure that all instructions are met. Documentation would include all records from the start of the project. Daily or monthly plant inspection records are not required unless they are related to an accident. All records to be in electronic format and submitted to the OHS agent for approval in adequately formatted lists and folders. Layout should be logical and in the same order as in the site files.

Health and Safety close out file requirements include:

a) Client H&S Specification
b) Principal Contractor's OHS Plan(s)
c) Organograms
d) Legal Appointments
e) List of all employees employed on a permanent or contractual basis over the duration of the contract
f) Letters of Good Standing for the Project
g) Full files for all Contractors as well as their close out reports
   • List of Contractors
   • All employees employed on a permanent or contractual basis over the duration of the contract
   • Letters of Approval of Contractors
   • Mandatory Agreements
   • Letters of Good Standing
   • Appointments
h) Incident Records
i) Non-Conformance records
j) Agent's Audits
k) Method Statements
l) Risk assessments
m) Safe work procedures
n) Medical surveillance certificates of fitness. Medical records are to be kept according to the OH&S Act as amended
o) All drawings for temporary structures (suspended beams/scaffolds etc.)
p) All operating manuals for any systems that require on-going maintenance
q) Copies of test results, policies and procedures for environmental monitoring (silica, noise, dusts etc.)

Defect and Liability Period
The H&S files are to be kept ‘live’ for the defect and liability period by the Principal Contractor, including those of their Contractors. Any work required during the defect and liability period will require an assessment of the H&S file by the OCHS Agent prior to any work commencing.
A copy drawing records for the as-builds must be placed on file by the Designers once complete.
BILL OF QUANTITIES FOR OCCUPATIONAL HEALTH AND SAFETY (to be transferred to the main Bill of Quantities)

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<td>(f) Gloves</td>
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<td>(b) Periodic and exit examinations</td>
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<td>(c) Contractor's charges to allow for handling costs and profit in respect of sub-items 13/X.06 (a) and (b)</td>
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T3.4 : ANNEXURES

T3.4.1 : DRAWINGS

The following drawings are referred to in the Bills of Quantities and annexed hereto:

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<th>No</th>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
<td>Schematic Diagram</td>
<td>8599/E/02</td>
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T3.4.2 : EXTRACT FROM MAIN CONTRACT BILLS