PRINCE ALBERT MUNICIPALITY

PROJECT DOCUMENT

FOR

CONTRACT NO. 3/2017

FOR

DESCRIPTION: SUPPLY, INSTALLATION AND COMMISSIONING OF NEW SURFACE AERATORS FOR PRINCE ALBERT WASTEWATER TREATMENT WORKS

BIDDER		
TOTAL BID PRICE (VAT INCL):		
PRACTICAL COMPLETION PERIOD	……. weeks	
TEL NR: ……	**FAX NR: ……**	**EMAIL ADDRESS: ……**

JANUARY 2017

PARTICULARS OF TENDERER

1. TENDERER: .....

   ADDRESS: .....

   CONTACT PERSON: .....

   TELEPHONE NUMBER: .....

   FAX NUMBER: .....

2. BANK: .....

   BRANCH: .....

   CHEQUE ACCOUNT NUMBER: .....

   CONTACT PERSON: .....

   TELEPHONE NUMBER: .....

3. PERFORMANCE SECURITY: .....

   BRANCH - CONTACT PERSON: .....

   TELEPHONE NUMBER: .....

4. VAT REGISTRATION NUMBER: .....

5. CIDB REGISTRATION NUMBER: .....

....
SIGNATURE OF TENDERER **DATE**

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Part T1: Tendering procedures

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TENDER NOTICE AND INVITATION TO TENDER

CONTRACT 3/2017 : SUPPLY, INSTALLATION AND COMMISSIONING OF NEW SURFACE AERATORS FOR PRINCE ALBERT WASTEWATER TREATMENT WORKS

The Municipal Manager invites tenders for the abovementioned works, located in the Prince Albert Municipal jurisdiction.

Only tenderers who satisfy the eligibility criteria stated in the Tender Conditions and Tender Data (Clause F.2.1) are eligible to submit tenders. It is estimated that tenderers should have a CIDB grading of **3 ME** or higher. Tenderers are referred to the Special Conditions of Tender relevant to this tender included as Clause 4.5 under the Tender Data.

All bids received shall be evaluated in terms of the Prince Albert Municipality Supply Chain Management Policy and the Preferential Procurement Regulations of 2011. It is estimated that the 90/10 preference points system will be applicable. Tenders satisfying the qualifying criteria will be evaluated in terms of price and preference.

A set of tender documents may be obtained from the Prince Albert Municipality, at the office of Supply Chain Management, 23 Church Street, Prince Albert from 20 January 2017 during office hours, Monday to Friday, 08:30 to 13:00 and 13:45 to 15:30 from Christa Baajies, please contact Christa Baajies on 023 541 1036 before collection. Payment of a non-refundable tender participation fee of **R575,00** (VAT inclusive) is applicable. Alternatively the documents can be downloaded from Prince Albert Municipality website, www.pamun.gov.za free of charge. This is an eligibility criterion and is payable by means of electronic transfer or direct deposit only. If the document is collected from Prince Albert Municipality Proof of payment of the participation fee must accompany your tender document when submitting it. Refer enquiries **only in the aforementioned regard** to at info@pamun.gov.za

All **technical enquiries** must be directed to the Mr Tezren Pandither at Tezren.Pandither@rhdhv.com or fax no 021 936 7606 or telephone no. 021 936 7600.

All prospective tenderers will meet at the offices of the Prince Albert Municipality, 23 Church Street, Prince Albert on 03 February 2017 at 10:00, after which a compulsory clarification site visit with representatives of the Employer will take place to the site of the proposed works. Prospective tenderers who arrive later than 10:15 will not be allowed into the Clarification meeting. Tenderers should be represented at the site visit/clarification meeting by a person who is suitably qualified and experienced to comprehend the implications of the work involved.

The **closing time** for receipt of tenders is **12:00** on **Monday, 20 February 2017**, at Prince Albert Municipality Municipality, 23 Church Street, Prince Albert. Tenders, in sealed envelopes, marked “3/2017 – Supply, Installation and Commissioning of New Surface Aerators for Prince Albert Wastewater Treatment Works, must be placed in Tender Box , located at the main entrance of Prince Albert Municipality, 23 Church Street, Prince Albert. Please note that the tender box is open during office hours only. Telegraphic, telephonic, telex, facsimile, electronic / email and late tenders will not be accepted. Tenders may only be submitted on the tender documentation that has been issued.

Council reserves the right to accept a tender in full, partially or not at all and is not obliged to accept the lowest tender received.

H Mettler
Municipal Manager
Prince Albert Municipality
Private Bag X53
Prince Albert
6930

T1.2 TENDER DATA

The Conditions of Tender are the standard conditions of tender as contained in annex f of board notice 136 government gazette no 38960 of 10 July 2015, construction industry development board (CIDB) standard for uniformity in construction procurement. (see www.cidb.org.za) which are reproduced without amendment or alteration for the convenience of tenderers as an annex to this tender data.

The standard conditions of tender make several references to the tender data for details that apply specifically to this tender. the tender data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender. each item of data given below is cross-referenced to the clause in the standard conditions of tender to which it mainly applies.

The following variations, amendments and additions to the standard conditions of tender as set out in the tender data below shall apply to this tender.

CLAUSE NO. TENDER DATA

F.1 GENERAL

F.1.1 ACTIONS

Add the following:

The Employer is the Prince Albert Municipality, represented by the director technical services

F.1.2 TENDER DOCUMENTS

Add the following:

The following documents form part of this tender**:**

VOLUME 1: The General Conditions of Contract for Construction Work (Third Edition) 2015 as published by the South African Institution of Civil Engineering. This Publication is available and tenderers must obtain copies at their own cost from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel (011) 805 5947, Fax: (011) 805 5971, email: civilinfo@saice.org.za.

VOLUME 2: SANS 1200 the Standardized Specification for civil engineering construction. This publication is available and tenderers must obtain copies at their own cost from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, fax: (011) 805 5971, e-mail: civilinfo@saice.org.za.

Volumes 1 and 2 may be inspected, by appointment, at the offices of RHDHV during normal working hours.

VOLUME 3: The Tender Document (this document), in which is bound:

The Tender

Part T1: Tendering Procedures

T1.1 Tender Notice and Invitation to Tender

T1.2 Tender Data

Part T2: Returnable Documents

T2.1 List of Returnable Documents

T2.2 Returnable Schedules

T2.3 Data Sheets

The Contract

Part C1: Agreements and Contract Data

C1.1 Form of Offer and Acceptance
C1.2 Contract Data
C1.3 Form of Guarantee
C1.4 Adjudicators Agreement
C1.5 Occupational Health and Safety Agreement
C1.6 Contract of Temporary Employment as Community Liaison Officer
C1.7 Insurance Broker's Warranty

Part C2: Pricing Data

C2.1 Pricing Instructions
C2.2 Bills of Quantities

Part C3: Scope of work

C3.1 Description of the Works
C3.2 Engineering
C3.3 Procurement
C3.4 Construction
C3.5 Management
C3.6 Health & Safety Specification
C3.7 Environmental Management Plan

PART C4: SITE INFORMATION

C4.1 Site Information
C4.2 Location of Works
C4.3 Site Conditions
C4.4 Topography
C4.5 Climate

Part C5: Drawings Attached With Document

Volume 3 is deemed the "returnable documents" which must be returned to the Employer in terms of submitting a tender offer.

F.1.3 COMMUNICATION AND THE EMPLOYER'S AGENT

Add the following:

Attention is drawn to the fact that verbal information, given by the Engineer during site briefing sessions or at any other time prior to the award of the Contract, will not be regarded as binding on the Employer. Only information issued formally by the Employer in writing to tenderers will be regarded as amending the Tender Documents.

The Engineer is:

Tezren Pandither
Royal HaskoningDHV (Pty) Ltd.
PO Box 5195
Tyger Valley
7536

TEL : 021 936-7600
FAX : 021 936-7606

F.1.5 **The Employer's right to accept or reject any tender offer**
Add the following:

F.1.5.3 The Employer may reject a tender if, in the opinion of the Employer, the tenderer will be unable to achieve the contract participation goal tendered, in the performance of the contract.

F.1.6.2 **Competitive negotiation procedure**
Add the following to F.1.6.2
A competitive negotiation procedure will not be followed.

F.1.6.3 **Proposal procedure using the two-stage system**
Add the following to F.1.6.3
A two-stage system will not be followed.

F.2 TENDERER'S OBLIGATIONS

F.2.1 ELIGIBILITY

Add the following:
Only those tenderers who substantiate their offer by providing sufficient proof, relevant to each of the following criteria and in terms of the scope of work included in this contract, are eligible to submit tenders:

a) CIDB Grading **3 ME** or higher. Certificate must be appended to the **Schedule 2A** in the Returnable schedules
b) Payment of the tender deposit of R575.00 (Vat Inclusive). Proof of payment to be attached to **Schedule 2K** of the tender submission or state it was downlaoded from Prince Albert Municipality website.
c) Attendance of the compulsory clarification meeting. For proof of attendance see **Schedule 2N.**
d) Functionality- Tenders will be evaluated in accordance with the Functionality criteria – refer to **Schedule 1L.** Tenderers must score a minimum of 52 points out of 70 in order to qualify in terms of functionality.

F.2.1.1 **Construction Industry Development Board (CIDB) Registration**
Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations, for a **3 ME** class of construction work, are eligible to have their tenders evaluated.

Joint ventures are eligible to submit tenders provided that:

1. every member of the joint venture is registered with the CIDB;
2. the lead partner has a contractor grading designation in the 3 ME class of construction work;
3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Board Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a 3 ME class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations.

As the Municipality does not have a Contractor Development Programme in place, Potentially Emerging Contractors may tender only in accordance with their grading designation.

For alpha-numeric associated with the contractor Grading Designations see Annex G attached.

F.2.1.1.2 **Experience of key-personnel**

The work required in terms of this project is considered to require considerable expertise and it is essential that suitably qualified and experienced personnel be assigned to this project. It would be extremely advantageous if the key-personnel to be directly involved with this contract have relevant experience related to similar successfully completed projects and particular fields of specialisation.

Tenderers must complete **Schedule 1K**, T2.1 Returnable Schedules, for the key personnel identified for each listed position to point out similar successfully completed projects and experience that is relevant to this project for each of the key-personnel indicated based upon which up to 30 points for functionality will be awarded to the tenderer under consideration (See **Schedule 1L**, T2.1 Returnable Schedules, for criteria of points allocation) in this regard.

Note: One person only to qualify for each listed position. The key-personnel to be used in this regard will be subject to the approval of the Engineer prior to the commencement date of the contract. Should any of the persons identified in **Schedule 1K**, T2.1 Returnable Schedules, not be available for the position which they are indicated for, then a suitable candidate with equal or superior tertiary qualification and/or relevant experience than that of the person which he/she replaces shall be used for every such position.

F.2.1.1.3 Previous experience relating to this contract specification and value
Tenderers must complete **Schedule 1J**, T2.1 Returnable Schedules, which is a list of the tenderer's past work experience in terms of similar successfully completed projects. The value and scale of the projects indicated for these purposes must be supplied together with the other relevant information requested based upon which up to 20 points for functionality will be awarded to the tenderer under consideration (See **Schedule 1L**, T2.1 Returnable Schedules, for criteria of points allocation) in this regard.

Note: Where the entity tendering is a joint venture, a score for track record will be awarded to each party to the joint venture which will then be combined in proportion to the percentage contribution of each party to the joint venture.

F.2.1.1.4 Financial Standing
Tenderers must substantiate their financial standing and capacity by including in their submission evidence of at least a "C" level bank rating. Tenderers are to complete **Schedule 2J** for evaluation in this regard. This financial standing shall be awarded up to 20 points for functionality (See **Schedule 1L**, T2.1 Returnable Schedules, for criteria of point's allocation) and will be based on the following classes:

Bank Code definitions:
Code A: Undoubted for the amount
Code B: Good for the Amount
Code C: Good for the amount under normal working conditions
Code D: Reasonable risk for amount
Code E: Amount to high
Code F: Financial position unknown
Code G: RD commission occurs/payment deferred
Code H: RD commissions occurs frequently

The scoring sheets that will be used to evaluate the functionality submissions are included as **Schedule 1L** in T2.1 Returnable Schedules: Functionality Evaluation Form. Tenderers are advised to carefully study these sheets to ensure that the correct information in this regard is provided in the relevant schedules, T2.1 Returnable Schedules, of their tender offers.

These sheets only serve as an indication to the tenderers on the methods and points criteria that will apply to the evaluation of functionality of their tender offers. The sheets will be completed by the Engineer based on the information supplied in the relevant schedules, T2.1 Returnable Schedules, prior to tender evaluation.

Tenderers that fail to supply the information requested in any of these schedules and in the specific format with their tender offers will score NO eligibility points in the particular regard.

F.2.1.1.5 Minimum score for functionality (quality)
In order to be considered for a contract in terms of this tender, tenderers must achieve the minimum score for quality as stated below.

The tenderer must be registered with CIDB at the level required for this project as defined above in F2.1.1 to be eligible.

The description of the quality criteria and the maximum possible score for each is shown in the table below. The score achieved for quality will be the sum of the scores achieved in the evaluation process, for the individual criteria. Details of capability are to be given on the Schedules indicated, and based on this; the score will be indicated on **Schedule 1L**.

Item	Description	Points (max)	Schedule
1	Demonstrated experience of the tendering entity with respect to comparable projects;	**20**	**1J**
2	Qualifications and demonstrated experience of the key staff in relation to the scope of work;	**30**	**1H & 1K**
3	Financial Standing	**20**	**2J**
Overall Scores for Quality (M_S)		**Maximum 70**	

The minimum responsive score for quality is 52 points. Tenderers that fail to achieve the minimum score will be deemed non-responsive.

Where the entity tendering is a Joint Venture the tender must be accompanied by a statement describing exactly what aspects of the work will be undertaken by each party to the joint venture (appended to Schedule 2B, Part T2.2: Returnable Schedules).

A more detailed explanation of the quality criteria is given below.

1. <u>Demonstrated experience of the tendering entity with respect to comparable projects completed</u>

Tenderers will be awarded points for the number of projects completed, i.e. received Practical Completion, after January 2010 as shown on the tables below.

The projects' scope must also include responsibility through the defects notification period(s) to be eligible for points. All projects must have received Practical Completion Certificates after January 2010.

Points will be allocated on **Schedule 1L,** as shown in the tables below, from the information returned in **Schedule 1J**:

Item	Description	Points (max)	Schedule
1	Demonstrated experience of the tendering entity with respect to comparable projects;	**20**	**1J**
2	Qualifications and demonstrated experience of the key staff in relation to the scope of work;	**30**	**1H & 1K**
3	Financial Standing	**20**	**2J**
Overall Scores for Quality (M_S)		**Maximum 70**	

2. <u>Minimum qualifications and demonstrated experience of the key staff</u>

Key staff includes: i) the Contracts manager (contractor's representative), (ii) site agent and (iii) site foreman. Detailed curricula vitae must be submitted for the key staff with the tender in Returnable **Schedules 1H and 1K**.

Points will be allocated to each as per the provisions in the table below.

Contracts Manager	Description	Points	Maximum Points
Minimum qualifications	▪ National Diploma: Civil/Mechanical Engineering	3 points	10
Experience: Wastewater treatment related mechanical engineering works design, construct and operations	▪ 5 projects or more ▪ 3-4 projects ▪ 1-2 projects ▪ 0 projects	4 points 3 points 1 point 0 points	
Minor civil works	▪ 5 projects or more ▪ 3-4 projects ▪ 1-2 projects ▪ 0 projects	3 points 2 points 1 point 0 points	

Site agent	Description	Points	Maximum Points
Minimum qualifications	▪ National Diploma: Mechanical Engineering ▪ Artisan	3 points 2 points	10
Experience: Wastewater treatment related mechanical engineering works design, construct and operations	▪ 3 projects or more ▪ 2 projects ▪ 1 projects ▪ 0 projects	4 points 3 points 1 point 0 points	
Minor civil works	▪ 3 projects or more ▪ 2 projects ▪ 1 projects ▪ 0 projects	3 points 2 points 1 point 0 points	

Site foreman	Description	Points	Maximum Points
Minimum qualifications	▪ Artisan ▪ None	3 points 1 point	10
Experience: Minor civil works	▪ 3 projects or more ▪ 2 projects ▪ 1 project ▪ 0 projects	8 points 6 points 2 point 0 points	

Each key staff member must be a full-time employee of the Tenderer, or there must be provided a Memorandum of Understanding confirming the availability of the staff member for the full duration of this project.

3. Financial standing and capacity

Tenderers must substantiate their financial standing and capacity by including in their submission evidence of at least a "C" level bank rating applicable to the contract value over the contract period:

Bank Code definitions:
Code A: Undoubted for the amount
Code B: Good for the Amount
Code C: Good for the amount under normal working conditions
Code D: Reasonable risk for amount
Code E: Amount to high
Code F: Financial position unknown
Code G: RD commission occurs/payment deferred
Code H: RD commissions occurs frequently

Points will be allocated on **Schedule 1L**, as shown in the table below, from information returned in **Schedule 2I**:

Allocation of resources	**Points**
Code A & B : Good for the amount	**20**
Code C : Good for the amount quoted if strictly in the way of business	**15**
Code D : Reasonable risk for amount	**0**
Code E-H : Figure considered too high	**0**

F.2.1.1.4 **Evaluation of Functionality**

The scoring sheets that will be used to evaluate the functionality submissions are included as **Schedule 1L** in T2.1 Returnable Schedules: Functionality Evaluation Form. Tenderers are advised to carefully study these sheets to ensure that the correct information in this regard is provided in the relevant schedules, T2.1 Returnable Schedules, of their tender offers.

These sheets only serve as an indication to the tenderers on the methods and points criteria that will apply to the evaluation of functionality of their tender offers. The sheets will be completed by the Engineer based on the information supplied in the relevant schedules, T2.1 Returnable Schedules, prior to tender evaluation.

Tenderers that fail to supply the information requested in any of these schedules and in the specific format with their tender offers will score **NO** eligibility points in the particular regard.

F.2.7 **Clarification meeting**

Add the following:

The arrangements for a compulsory site visit/clarification meeting are as stated in the Tender Notice and Invitation to Tender.

Tenderers should be represented at the briefing session by a person who is suitably qualified and experienced to comprehend the implications of the work involved.

F.2.12 Alternative Tender Offers

Add the following to F 2.12.1:

F.2.12.1 *No Alternative offers will be considered*

F.2.13 Submitting a tender offer

Replace sub-clause F 2.13.2 with the following

F.2.13.2 Return all returnable documents to the employer after completing them in their entirety, by writing in non-erasable ink.

Add the following to F 2.13.3

F.2.13.3 Parts of each tender offer communicated on paper shall be submitted as an original, plus 0 (nought) copies.

Add the following after the first sentence of F.2.13.4:

F.2.13.4 The tender shall be signed by a person duly authorised to do so. tenders submitted by joint ventures of two or more firms shall be accompanied by the document of formation of the joint venture, authenticated by a notary public or other official deputed to witness sworn statements, in which is defined precisely the conditions under which the joint venture will function, its period of duration, the persons authorised to represent and obligate it, the participation of the several firms forming the joint venture, and any other information necessary to permit a full appraisal of its functioning.

Add the following after the first sentence of F.2.13.5:

F.2.13.5 The employer's address for delivery of tender offers and identification details to be shown on each tender offer package are:

Location of tender box:	Tender Box at the entrance of the Municipal Head Office
Physical address:	Prince Albert Municipality, 23 Church Street, Prince Albert
Reference number:	Tender number: **3/2017**
Title of Tender:	Supply, Installation and Commissioning of New Surface Aerators for Prince Albert Wastewater Treatment Works

Sealed tenders with the Tenderer's name and address and the endorsement, **"3/2017: SUPPLY, INSTALLATION AND COMMISSIONING OF NEW SURFACE AERATORS FOR PRINCE ALBERT WASTEWATER TREATMENT WORKS"** on the envelope, must be placed in the appropriate official tender box at the abovementioned address.

Add the following to F.2.13.6:

F.2.13.6 A two–envelope procedure will **not** be followed (F3.5).

Add the following sub-clause after F.2.13.9:

F.2.13.10 By signing the offer part of c1.1 form of offer and acceptance the tenderer declares that all information provided in the tender submission is true and correct.

F.2.15 Closing Time

Add the following to F.2.15.1

F.2.15.1 The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender. Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted

F.2.16 Tender Offer Validity

Add the following to F.2.16.1:

F.2.16.1 The tender offer validity period is 90 days.

F.2.17 **Clarification of tender offer after submission**

Add the following to F.2.17:

A tender will be rejected as non-responsive if the tenderer fails to provide any clarification requested by the employer within the time for submission stated in the employer's written request for such clarification. A tender will also be rejected as non-responsive if the tenderer fails, within the time stated in writing by the Employer, to comply with the requirements of F.4.3.

F.2.23 CERTIFICATES

Add the following:

The tenderer is required to submit the following certificates with his tender:

F.2.23.1 **Certificate of Contractor Registration (CIDB)**

A Certificate of Contractor Registration, issued by the Construction Industry Development Board, must be submitted. Where a tenderer satisfies CIDB contractor grading designation requirements through joint venture

formation, such tenderers must submit the Certificates of Contractor Registration in respect of each partner. Append to **Schedule 2A.**

F.2.23.2 **Tax Clearance Certificate**

Tenderers shall be registered and in good standing with the South African Revenue Services (SARS) and shall submit/append documentary evidence/proof in the form of an original valid Tax Clearance Certificate issued by SARS. Failure to provide a valid Tax Clearance Certificate will prejudice the tender and it shall be rejected for such reason. Append to **Schedule 2C.**

Each party to a Consortium/Joint Venture shall submit a separate Tax Clearance Certificate.

F.2.23.3 **Bargaining Council Certificates**

Where applicable, a certificate of compliance issued by the relevant Bargaining Council must be submitted. Append to **Schedule 2M**.

Each party to a Consortium/Joint Venture shall submit separate certificates in the above regard.

F.3 The Employer's undertakings

F.3.2 **Issue Addenda**

Add the following to F.3.2:

Notwithstanding any requests for confirmation of receipt of Addenda issued, the tenderer shall be deemed to have received such addenda if the employer can show proof of transmission thereof (or a notice in respect thereof) via electronic mail, facsimile or registered post.

F.3.4 OPENING OF TENDER SUBMISSIONS

Add the following to F3.4.1

F3.4.1 THE TIME AND LOCATION FOR OPENING OF THE TENDER OFFERS IS:

Time: Tenders will be opened immediately after the closing time for receipt of tenders, as stated in the Tender Notice and Invitation to Tender, or as stated in any Addendum extending the closing date.

Location: COUNCIL CHAMBERS, PRINCE ALBERT MUNICIPALITY, 23 CHURCH STREET, PRINCE ALBERT, 6930.

TENDERS WILL BE OPENED IMMEDIATELY AFTER THE CLOSING TIME FOR TENDERS AT 12:00.

F.3.8 **Test for responsiveness**

Add the following to F3.8:

Tenders will be considered non-responsive if, inter alia: (This is a requirement on **submission** of tender document)

- the tenderer does not comply with the eligibility criteria listed in F2.1;
- the tenderer has failed to complete and sign the Offer portion of C1.1 Form of Offer and Acceptance in non-erasable ink;
- the tender is not in compliance with the Scope of Work;
- if the tenderer failed to comply to the Special Conditions of Tender contained in F4.5.

Add the following two sub-clauses after F.3.8

Test for Administrative Compliance

Tenders will be considered non-compliant if, inter alia (these documents may be requested):

a) The tenderer has failed to clarify or submit any supporting documentation within the time for submission stated in the employer's written request.
b) The tenderer has failed to include, append and sign, where prompted in the Returnable Schedules, any and all additional information requested.
c) The tenderer has not submitted a municipal account of where the head office of the company is registered or in case where the premises are leased, the tenderer has not provided a copy of the lease of the premises. The successful contractor will be required to submit updated municipal accounts on a quarterly basis.

d) The tenderer has failed to submit a valid original tax clearance certificate. A valid original tax clearance certificate may be requested.
e) The tenderer has failed to submit a certified B-BBEE certificate, whereas points were claimed and a copy of the certificate was supplied, a certified copy of the B-BBEE certificate may be requested.
f) The tenderer has failed to submit proof of good standing from the Department of Labour related to good standing with regards to COIDA payments. A certified copy of the proof of good standing may be requested.
g) The tenderer has failed to submit proof of registration with the relevant Bargaining Council (or relevant affiliation). Should such be in place, a certified copy of the proof of registration may be requested.

The Employer reserves the right to accept a tender offer which does not, in the Employer's opinion, materially and/or substantially deviate from the terms, conditions, and specifications of the tender documents.

F.3.11 EVALUATION OF RESPONSIVE TENDER OFFERS

F.3.11.1 **General**

Tenders shall be evaluated in terms of the Preferential Procurement Regulations 2011. The value of the tender is estimated to exceed R1 000 000-00 and therefore the 90/10 system shall be applicable. The financial offer will be scored using Formula 2 (Option 1) where the value of W1 is 90 points. Up to a maximum of 10 points for this tender will be awarded in terms of the tenderers B-BBEE status level of contribution.

F.3.11.3 **Method 2: Financial offer and preference**

The procedure for the evaluation of responsive tenders is **Method 2,** where the total number of tender evaluation points, $T_{EV}= N_{FO} + N_P$ as detailed below.

Where N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7
N_P is the number of tender evaluation points awarded for B-BBEE Status

F.3.13 ACCEPTANCE OF TENDER OFFER

Add the following to F.3.13:

F.3.13.1 a) the tenderer has in his or her possession an original valid Tax Clearance Certificate issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations. Where a tax clearance certificate expires during the duration of the construction period, the tenderer must provide a valid tax clearance certificate within 21 days;
b) the tenderer is registered with the CIDB with an approximate category of registration;
c) the tenderer is not in arrears for more than THREE (3) months with municipal rates and taxes and municipal service charges;
d) the tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector;
e) the tenderer has not:
   i) abused the Employer's Supply Chain Management System; or
   ii) failed to pay municipal rates and taxes or service charges and such rates, taxes and charges are in arrears for more than three months;
   iii) failed to perform on any previous contract and has been given a written notice to this effect;
f) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process.

*Renumber sub-clause F.3.13.2 to read "**F.3.13.3**" and add the following new sub-clause "**F.3.13.2**";*

F.3.13.2 **SCM Related Appeals**

Clause 50 of the Prince Albert Municipality Supply Chain Management Policy gives any person whose rights have been affected by such a decision, the right to appeal such decision within 21 days of notification of the decision.

Any tenderer wishing to exercise this right, must submit their appeal in writing to the Municipal Manager, marked for the attention of the PRINCE ALBERT MUNICIPALITY, Private Bag X53, Prinbce Albert, 6930. The format of the appeal must:

- set out the reasons for the appeal;
- state in which way the appellant's rights have been affected by the decision;
- state the remedy sought, and
- be accompanied by a copy of the notification advising the tenderer of the decision of the Supply Chain Management Bid Adjudication Committee.

Tenderers are hereby informed also of their right to request reasons for the decision in terms of the Promotion of Administrative Justice Act (No. 3 of 2000).

The notification of the decision sent to the successful tenderer is **not** acceptance of the tender and no rights shall accrue to the successful tenderer in terms of this notification. The successful tenderer will be notified in writing after 21 days of the notification of any final decision (i.e. Acceptance) or of any developments with respect to the appeal process, and if applicable, procedures for the commencement of the work.

The consideration of appeals and if necessary, the invalidation of any decision made, shall be dealt with in terms of the Municipality's appeals process.

F.3.18 **Provide copies of the contract**
Add the following:
The number of paper copies of the signed contract to be provided by the Employer is one.

F.4 ADDITIONAL CONDITIONS OF TENDER

The additional conditions of tender are:

F.4.1 **Compliance with Occupational Health and Safety Act 1993**
Tenderers are to note the requirements of the Occupational Health and Safety Act No. 85 of 1993 and the Construction Regulations of 2014 issued in terms of Section 43 of the Act. The tenderer shall be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all costs in compliance therewith.

The Health and Safety Plan shall cover inter-alia the following details:

1) Management Structure, Site Supervision and Responsible Persons including a succession plan.
2) Contractor's induction training programme for employees, sub-contractors and visitors to the Site.
3) Health and safety precautions and procedures to be adhered to in order to ensure compliance with the Act, Regulations and Safety Specifications.
4) Regular monitoring procedures to be performed.
5) Regular liaison, consultation and review meetings with all parties.
6) Site security, welfare facilities and first aid.
7) Site rules and fire and emergency procedures.

Tenderers are to note that the Contractor is required to ensure that all sub-contractors or others engaged in the performance of the contract also comply with the above requirements.

The Contractor shall prepare and maintain a Health and Safety File in respect of the project, which shall be available for inspection on Site at all times and handed over to the Employer on Final Completion of the project.

The Contractor is required to submit to the Employer the Occupational Health and Safety Agreement (included in C1.4 of the Contract Document) and a letter of good standing from the Compensation Commissioner, or a licensed compensation insurer, within 14 days after the Commencement Date of the contract.

F.4.2 **Eligibility with respect to expanded public works programme**
This Contract does **not** qualify for consideration as an Expanded Public Works Programme project.

F.4.3 **Claims arising after submission of tender**

No claim for any extras arising out of any doubt or obscurity as to the true intent and meaning of anything shown on the Contract Drawings or contained in the Conditions of Contract, Scope of Work and Pricing Data, will be admitted by the Employer/ Engineer after the submission of any tender and the Tenderer shall be deemed to have:

1) inspected the Contract Drawings and read and fully understood the Conditions of Contract.
2) read and fully understood the whole text of the Scope of Work and Pricing Data and thoroughly acquainted himself with the nature of the works proposed and generally of all matters which may influence the Contract.
3) visited the site of the proposed works, carefully examined existing conditions, the means of access to the site, the conditions under which the work is to be done, and acquainted himself with any limitations or restrictions that may be imposed by the Municipal or other Authorities in regard to access and transport of materials and plant to and from the site and made the necessary provisions for any additional costs involved thereby.
4) requested the Employer or his duly authorised agent to make clear the actual requirements of anything shown on the Contract Drawings or anything contained in the Scope of Work and Pricing Data, the exact meaning or interpretation of which is not clearly intelligible to the Tenderer.

Before submission of any tender, the Tenderer should check the number of pages, and if any are found to be missing or duplicated, or the figures or writing indistinct, or if the Pricing Data contain any obvious errors, the tenderer must apply to the Employer/ Engineer at once to have the same rectified, as no liability will be admitted by the Employer/ Engineer in respect of errors in any tender due to the foregoing.

F.4.4 **Imbalance in tendered rates**

In the event of tendered rates or lump sums being declared by the Employer to be unacceptable to it because they are either excessively low or high or not in proper balance with other rates or lump sums, the Tenderer may be required to produce evidence and advance arguments in support of the tendered rates or lump sums objected to. If, after submission of such evidence and any further evidence requested, the Employer is still not satisfied with the tendered rates or lump sums objected to, it may request the tenderer to amend these rates and lump sums along the lines indicated by it.

The Tenderer will then have the option to alter and/or amend the rates and lump sums objected to and such other related amounts as are agreed on by the Employer, but this shall be done without altering the Contract Price.

Should the Tenderer fail to amend his Tender in a manner acceptable to the Employer, the Employer may reject the Tender.

F.4.5 **Community liaison officer**

It is a requirement of this Contract that a local Community Liaison officer (CLO) be appointed for the area represented by the Tender.

F.4.6 **Labour intensive construction/use of local labour**

It is a requirement of the Contract that the work be executed in such a manner as to maximise the use of labour intensive systems. Tenderers are referred to the special conditions regarding local labour relevant to this tender under Clause F.5.

F.4.7 **Invalid tenders**

Tenders shall be considered invalid and shall be endorsed and recorded as such in the tender opening record, by the responsible official who opened the tender, in the following circumstances:

a) if the tender offer is not submitted on the Form of Offer and Acceptance bound into this tender document (form C1.1, Part C1: Agreements and Contract Data);
b) if the tender is not completed in non-erasable ink;
c) if the offer has not been signed;
d) if the offer is signed, but the name of the tenderer is not stated or is indecipherable.

F.4.8 **Negotiations with preferred tenderers**

The Employer may negotiate the final terms of a contract with tenderers identified through a competitive tendering process as preferred tenderers provided that such negotiation:

a) does not allow any preferred tenderer a second or unfair opportunity;
b) is not to the detriment of any other tenderer; and
c) does not lead to a higher price than the tender as submitted.

Minutes of any such negotiations shall be kept for record purposes.

F.4.9 **General supply chain management conditions applicable to tenders**

In terms of its Supply Chain Management Policy the Municipality may not consider a tender unless the provider who submitted the tender:

a) has furnished the Municipality with that provider's:
   - full name;
   - identification number or company or other registration number; and
   - tax reference number and VAT registration number, if any;
   - Certificate of attendance at a compulsory site inspection, where applicable.

b) has indicated whether:
   - the provider is in the service of the state, or has been in the service of the state in the previous twelve months;
   - the provider is not a natural person, whether any of the directors, managers, principal shareholders or stakeholders is in the service of the state, or has been in the service of the state in the previous twelve months;
   - whether a spouse, child or parent of the provider or of a director, manager, shareholder or stakeholder referred to above is in the service of the state, or has been in the service of the state in the previous twelve months; or

c) Irrespective of the procurement process followed, the Municipality is prohibited from making an award to a person:
   - who is in the service of the state;
   - if the person is not a natural person, a juristic entity of which any director, manager, principal shareholder or stakeholder is in the service of the state; or
   - who is an advisor or consultant contracted with the Municipality.

In this regard, tenderers shall complete **Schedule 1A**, Part T2.2: Returnable Schedules: Compulsory Enterprise Questionnaire. Failure to complete this schedule may result in the tender not being considered.

F.4.10 **Combating abuse of the Supply Chain Management Policy**

In terms of the Municipality's Supply Chain Management Policy, the Employer may reject the tender of any tenderer if that tenderer or any of its directors has:

a) failed to pay municipal rates and taxes or municipal service charges and such rates, taxes and charges are in arrears for more than three months:
b) failed, during the last five years, to perform satisfactorily on a previous contract with the Municipality or any other organ of state after written notice was given to that tenderer that performance was unsatisfactory;
c) abused the supply chain management system of the Municipality or has committed any improper conduct in relation to this system;
d) been convicted of fraud or corruption during the past five years;
e) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
f) been listed with the Register of Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004) or has been listed on National Treasury's database as a person or juristic entity prohibited from doing business with the public sector.

In this regard, tenderers shall complete **Schedule 2I,** Part T2.1: Returnable Schedules: Declaration in terms of the Municipal Finance Management Act. Failure to complete this schedule may result in the tender not being considered.

F.4.11 **COIDA payments**

The Tenderer shall submit to Council a letter from the Department of Labour indicating his good standing with regard to COIDA payments. Complete **Schedule 2L** and append the letter in this regard

F.4.12 **Registration with Bargaining Council (or relevant affiliation)**

Tenderers must be registered with a relevant Bargaining Council (if such be in place) and provide the applicable Certificate of Compliance in terms of the relevant Government Gazette. Complete **Schedule 2M** and append the certificate in this regard

F.4.13 **Price Variations**

The Contract Price shall not be subject to any contract price adjustment, the rates and prices tendered in the bills of quantities shall be final and binding throughout the period of the contract.

F.4.14 **Requests for contract documents, or parts thereof, in electronic format**

The Employer shall not formally issue tender documents in electronic format as contemplated in F.2.13.2 and F.2.13.3 and shall only issue tender documents in hardcopy. An electronic version of the issued tender documents may be made available to the tenderer, upon written request in terms of this clause, subject to the following:

a) Electronic copies of the contract document, or parts thereof, will only be provided to tenderers who have been issued with the tender documents as contemplated in F.1.2 in hardcopy.
b) The electronic version shall not be regarded as a substitute for the issued tender documents.
c) The Employer shall not accept tenders submitted in electronic format. Tenderers may not complete and submit a printed copy of the electronic version of the tender document or part thereof. Only those tenders that have been completed on the issued hard copy tender document shall be considered.
d) The Employer accepts no responsibility or liability arising from any reliance on or use of the electronic version provided in terms of this clause. The Employer further does not guarantee that the electronic version corresponds with the issued tender documents in all respects. Tenderers are alerted to the fact that electronic versions of the tender documents may not reflect any notices or addenda that amend the tender document.
e) Any non-compliance with these provisions, including effecting any unauthorised alterations to the tender document as contemplated in F.2.11, shall render the tender invalid. The Employer reserves the right to take any action against such tenderer allowed in law including, in circumstances where the tender had already been awarded, the right to cancel the contract.
f) In requesting the electronic version of the tender document or parts thereof, the tenderer is deemed to have read, understood and accepted all of the above conditions.

Annex F
(normative)

Standard Conditions of Tender

NOTE: As published in Annexure F of the CIDB Standard for Uniformity for Construction Procurement, Board Notice 136 Government Gazette No. 38960 of 10 July 2015.

F.1 General

F.1.1 Actions

F.1.1.1 The employer and each tenderer submitting a tender offer shall comply with these conditions of tender. In their dealings with each other, they shall discharge their duties and obligations as set out in F.2 and F.3, timeously and with integrity, and behave equitably, honestly and transparently, comply with all legal obligations and not engage in anticompetitive practices.

F.1.1.2 The employer and the tenderer and all their agents and employees involved in the tender process shall avoid conflicts of interest and where a conflict of interest is perceived or known, declare any such conflict of interest, indicating the nature of such conflict. Tenderers shall declare any potential conflict of interest in their tender submissions. Employees, agents and advisors of the employer shall declare any conflict of interest to whoever is responsible for overseeing the procurement process at the start of any deliberations relating to the procurement process or as soon as they become aware of such conflict, and abstain from any decisions where such conflict exists or recuse themselves from the procurement process, as appropriate.

Note: *1) A conflict of interest may arise due to a conflict of roles which might provide an incentive for improper acts in some circumstances. A conflict of interest can create an appearance of impropriety that can undermine confidence in the ability of that person to act properly in his or her position even if no improper acts result.*

2) Conflicts of interest in respect of those engaged in the procurement process include direct, indirect or family interests in the tender or outcome of the procurement process and any personal bias, inclination, obligation, allegiance or loyalty which would in any way affect any decisions taken.

F.1.1.3 The employer shall not seek and a tenderer shall not submit a tender without having a firm intention and the capacity to proceed with the contract.

F.1.2 Tender Documents

The documents issued by the employer for the purpose of a tender offer are listed in the tender data.

F.1.3 Interpretation

F.1.3.1 The tender data and additional requirements contained in the tender schedules that are included in the returnable documents are deemed to be part of these conditions of tender.

F.1.3.2 These conditions of tender, the tender data and tender schedules which are only required for tender evaluation purposes, shall not form part of any contract arising from the invitation to tender.

F.1.3.3 For the purposes of these conditions of tender, the following definitions apply:

a) **conflict of interest** means any situation in which:
   i) someone in a position of trust has competing professional or personal interests which make it difficult to fulfil his or her duties impartially;
   ii) an individual or organisation is in a position to exploit a professional or official capacity in some way for their personal or corporate benefit; or
   iii) incompatibility or contradictory interests exist between an employee and the organisation which employs that employee.

b) **comparative offer** means the tenderer's financial offer after all tendered parameters that will affect the value of the financial offer have been taken into consideration in order to enable comparisons to be made between offers on a comparative basis
c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process; and
d) **fraudulent practice** means the misrepresentation of the facts in order to influence the tender process or the award of a contract arising from a tender offer to the detriment of the employer, including collusive practices intended to establish prices at artificial levels
e) **organization** means a company, firm, enterprise, association or other legal entity, whether incorporated or not, or a public body
f) **quality (functionality)** means the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

F.1.4 Communication and employer's agent

Each communication between the employer and a tenderer shall be to or from the employer's agent only, and in a form that can be readily read, copied and recorded. Communication shall be in the English language. The employer shall not take any responsibility for non-receipt of communications from or by a tenderer. The name and contact details of the employer's agent are stated in the tender data.

F.1.5 The employer's right to accept or reject any tender offer

F.1.5.1 The employer may accept or reject any variation, deviation, tender offer, or alternative tender offer, and may cancel the tender process and reject all tender offers at any time before the formation of a contract. The employer shall not accept or incur any liability to a tenderer for such cancellation and rejection, but will give written reasons for such action upon written request to do so.

F.1.5.2 The employer may not subsequent to the cancellation or abandonment of a tender process or the rejection of all responsive tender offers re-issue a tender covering substantially the same scope of work within a period of six months unless only one tender was received and such tender was returned unopened to the tenderer.

F.1.6 Procurement procedures

F.1.6.1 General

Unless otherwise stated in the tender data, a contract will, subject to F.3.13, be concluded with the tenderer who in terms of F.3.11 is the highest ranked or the tenderer scoring the highest number of tender evaluation points, as relevant, based on the tender submissions that are received at the closing time for tenders.

F.1.6.2 Competitive negotiation procedure

F.1.6.2.1 Where the tender data require that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of F.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of F.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

F.1.6.2.2 All responsive tenderers, or not less than three responsive tenderers that are highest ranked in terms of the evaluation method and evaluation criteria stated in the tender data, shall be invited in each round to enter into competitive negotiations, based on the principle of equal treatment and keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of F.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort competition or have a discriminatory effect.

F.1.6.2.3 At the conclusion of each round of negotiations, tenderers shall be invited by the employer to make a fresh tender offer, based on the same evaluation criteria, with or without adjusted weightings. Tenderers shall be advised when they are to submit their best and final offer.

F.1.6.2.4 The contract shall be awarded in accordance with the provisions of F.3.11 and F.3.13 after tenderers have been requested to submit their best and final offer.

F.1.6.3 Proposal procedure using the two stage-system

F.1.6.3.1 Option 1

Tenderers shall in the first stage submit technical proposals and, if required, cost parameters around which a contract may be negotiated. The employer shall evaluate each responsive submission in terms of the method of evaluation stated in the tender data, and in the second stage negotiate a contract with the tenderer scoring the highest number of evaluation points and award the contract in terms of these conditions of tender.

F.1.6.3.2 Option 2

F.1.6.3.2.1 Tenderers shall submit in the first stage only technical proposals. The employer shall invite all responsive tenderers to submit tender offers in the second stage, following the issuing of procurement documents.

F.1.6.3.2.2 The employer shall evaluate tenders received during the second stage in terms of the method of evaluation stated in the tender data, and award the contract in terms of these conditions of tender.

F.2 Tenderer's obligations

F.2.1 Eligibility

F.2.1.1 Submit a tender offer only if the tenderer satisfies the criteria stated in the tender data and the tenderer, or any of his principals, is not under any restriction to do business with employer.

F.2.1.2 Notify the employer of any proposed material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used by the employer as the basis in a prior process to invite the tenderer to submit a tender offer and obtain the employer's written approval to do so prior to the closing time for tenders.

F.2.2 Cost of tendering

Accept that, unless otherwise stated in the tender data, the employer will not compensate the tenderer for any costs incurred in the preparation and submission of a tender offer, including the costs of any testing necessary to demonstrate that aspects of the offer complies with requirements.

F.2.3 Check documents

Check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.

F.2.4 Confidentiality and copyright of documents

Treat as confidential all matters arising in connection with the tender. Use and copy the documents issued by the employer only for the purpose of preparing and submitting a tender offer in response to the invitation.

F.2.5 Reference documents

Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are not attached but which are incorporated into the tender documents by reference.

F.2.6 Acknowledge addenda

Acknowledge receipt of addenda to the tender documents, which the employer may issue, and if necessary apply for an extension to the closing time stated in the tender data, in order to take the addenda into account.

F.2.7 Clarification meeting

Attend, where required, a clarification meeting at which tenderers may familiarize themselves with aspects of the proposed work, services or supply and raise questions. Details of the meeting(s) are stated in the tender data.

F.2.8 Seek clarification

Request clarification of the tender documents, if necessary, by notifying the employer at least five working days before the closing time stated in the tender data.

F.2.9 Insurance

Be aware that the extent of insurance to be provided by the employer (if any) might not be for the full cover required in terms of the conditions of contract identified in the contract data. The tenderer is advised to seek qualified advice regarding insurance.

F.2.10 Pricing the tender offer

F.2.10.1 Include in the rates, prices, and the tendered total of the prices (if any) all duties, taxes (except Value Added Tax (VAT), and other levies payable by the successful tenderer, such duties, taxes and levies being those applicable 14 days before the closing time stated in the tender data.

F.2.10.2 Show VAT payable by the employer separately as an addition to the tendered total of the prices.

F.2.10.3 Provide rates and prices that are fixed for the duration of the contract and not subject to adjustment except as provided for in the conditions of contract identified in the contract data.

F.2.10.4 State the rates and prices in Rand unless instructed otherwise in the tender data. The conditions of contract identified in the contract data may provide for part payment in other currencies.

F.2.11 Alterations to documents

Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer, or necessary to correct errors made by the tenderer. All signatories to the tender offer shall initial all such alterations. Erasures and the use of masking fluid are prohibited.

F.2.12 Alternative tender offers

F.2.12.1 Unless otherwise stated in the tender data submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. The alternative tender offer is to be submitted with the main tender offer together with a schedule that compares the requirements of the tender documents with the alternative requirements the tenderer proposes.

F.2.12.2 Accept that an alternative tender offer may be based only on the criteria stated in the tender data or criteria otherwise acceptable to the employer.

F.2.12.3 An alternative tender offer may only be considered in the event that the main tender offer is the winning tender.

F.2.13 Submitting a tender offer

F.2.13.1 Submit one tender offer only, either as a single tendering entity or as a member in a joint venture to provide the whole of the works, services or supply identified in the contract data and described in the scope of works, unless stated otherwise in the tender data.

F.2.13.2 Return all returnable documents to the employer after completing them in their entirety, either electronically (if they were issued in electronic format) or by writing legibly in non-erasable ink.

F.2.13.3 Submit the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with an English translation of any documentation in a language other than English, and the parts communicated electronically in the same format as they were issued by the employer.

F.2.13.4 Sign the original and all copies of the tender offer where required in terms of the tender data. The employer will hold all authorized signatories liable on behalf of the tenderer. Signatories for tenderers proposing to contract as joint ventures shall state which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer.

F.2.13.5 Seal the original and each copy of the tender offer as separate packages marking the packages as "ORIGINAL" and "COPY". Each package shall state on the outside the employer's address and identification details stated in the tender data, as well as the tenderer's name and contact address.

F.2.13.6 Where a two-envelope system is required in terms of the tender data, place and seal the returnable documents listed in the tender data in an envelope marked “financial proposal” and place the remaining returnable documents in an envelope marked “technical proposal”. Each envelope shall state on the outside the employer’s address and identification details stated in the tender data, as well as the tenderer's name and contact address.

F.2.13.7 Seal the original tender offer and copy packages together in an outer package that states on the outside only the employer's address and identification details as stated in the tender data.

F.2.13.8 Accept that the employer shall not assume any responsibility for the misplacement or premature opening of the tender offer if the outer package is not sealed and marked as stated.

F.2.13.9 Accept that tender offers submitted by facsimile or e-mail will be rejected by the employer, unless stated otherwise in the tender data.

F.2.14 Information and data to be completed in all respects

Accept that tender offers, which do not provide all the data or information requested completely and in the form required, may be regarded by the employer as non-responsive.

F.2.15 Closing time

F.2.15.1 Ensure that the employer receives the tender offer at the address specified in the tender data not later than the closing time stated in the tender data. Accept that proof of posting shall not be accepted as proof of delivery.

F.2.15.2 Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of these conditions of tender apply equally to the extended deadline.

F.2.16 Tender offer validity

F.2.16.1 Hold the tender offer(s) valid for acceptance by the employer at any time during the validity period stated in the tender data after the closing time stated in the tender data.

F.2.16.2 If requested by the employer, consider extending the validity period stated in the tender data for an agreed additional period with or without any conditions attached to such extension.

F.2.16.3 Accept that a tender submission that has been submitted to the employer may only be withdrawn or substituted by giving the employer's agent written notice before the closing time for tenders that a tender is to be withdrawn or substituted.

F.2.16.4 Where a tender submission is to be substituted, submit a substitute tender in accordance with the requirements of F.2.13 with the packages clearly marked as "SUBSTITUTE".

F.2.17 Clarification of tender offer after submission

Provide clarification of a tender offer in response to a request to do so from the employer during the evaluation of tender offers. This may include providing a breakdown of rates or prices and correction of arithmetical errors by the adjustment of certain rates or item prices (or both). No change in the competitive position of tenderers or substance of the tender offer is sought, offered, or permitted.

Note: *Sub-clause F.2.17 does not preclude the negotiation of the final terms of the contract with a preferred tenderer following a competitive selection process, should the Employer elect to do so.*

F.2.18 Provide other material

F.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer’s commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be

provided, by the time for submission stated in the employer's request, the employer may regard the tender offer as non-responsive.

F.2.18.2 Dispose of samples of materials provided for evaluation by the employer, where required.

F.2.19 Inspections, tests and analysis

Provide access during working hours to premises for inspections, tests and analysis as provided for in the tender data.

F.2.20 Submit securities, bonds, policies, etc.

If requested, submit for the employer's acceptance before formation of the contract, all securities, bonds, guarantees, policies and certificates of insurance required in terms of the conditions of contract identified in the contract data.

F.2.21 Check final draft

Check the final draft of the contract provided by the employer within the time available for the employer to issue the contract.

F.2.22 Return of other tender documents

If so instructed by the employer, return all retained tender documents within 28 days after the expiry of the validity period stated in the tender data.

F.2.23 Certificates

Include in the tender submission or provide the employer with any certificates as stated in the tender data.

F.3 The Employer's undertakings

F.3.1 Respond to requests from the tenderer

F.3.1.1 Unless otherwise stated in the Tender Data, respond to a request for clarification received up to five working days before the tender closing time stated in the Tender Data and notify all tenderers who drew procurement documents.

F.3.1.2 Consider any request to make a material change in the capabilities or formation of the tendering entity (or both) or any other criteria which formed part of the qualifying requirements used to prequalify a tenderer to submit a tender offer in terms of a previous procurement process and deny any such request if as a consequence:

a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying requirements;
b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or
c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

F.3.2 Issue Addenda

If necessary, issue addenda that may amend or amplify the tender documents to each tenderer during the period from the date the tender documents are available until three working days before the tender closing time stated in the Tender Data. If, as a result a tenderer applies for an extension to the closing time stated in the Tender Data, the Employer may grant such extension and, shall then notify all tenderers who drew documents.

F.3.3 Return late tender offers

Return tender offers received after the closing time stated in the Tender Data, unopened, (unless it is necessary to open a tender submission to obtain a forwarding address), to the tenderer concerned.

F.3.4 Opening of tender submissions

F.3.4.1 Unless the two-envelope system is to be followed, open valid tender submissions in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data. Tender submissions for which acceptable reasons for withdrawal have been submitted will not be opened.

F.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the tender data, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, preferences claimed and time for completion for the main tender offer only.

F.3.4.3 Make available the record outlined in F.3.4.2 to all interested persons upon request.

F.3.5 Two-envelope system

F.3.5.1 Where stated in the tender data that a two-envelope system is to be followed, open only the technical proposal of valid tenders in the presence of tenderers' agents who choose to attend at the time and place stated in the tender data and announce the name of each tenderer whose technical proposal is opened.

F.3.5.2 Evaluate the quality of the technical proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals will be opened. Open only the financial proposals of tenderers, who score in the quality evaluation more than the minimum number of points for quality stated in the tender data, and announce the score obtained for the technical proposals and the total price and any preferences claimed. Return unopened financial proposals to tenderers whose technical proposals failed to achieve the minimum number of points for quality.

F.3.6 Non-disclosure

Not disclose to tenderers, or to any other person not officially concerned with such processes, information relating to the evaluation and comparison of tender offers, the final evaluation price and recommendations for the award of a contract, until after the award of the contract to the successful tenderer.

F.3.7 Grounds for rejection and disqualification

Determine whether there has been any effort by a tenderer to influence the processing of tender offers and instantly disqualify a tenderer (and his tender offer) if it is established that he engaged in corrupt or fraudulent practices.

F.3.8 Test for responsiveness

F.3.8.1 Determine, after opening and before detailed evaluation, whether each tender offer properly received:

a) Complies with the requirements of these Conditions of Tender,
b) has been properly and fully completed and signed, and
c) is responsive to the other requirements of the tender documents.

F.3.8.2 A responsive tender is one that conforms to all the terms, conditions, and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would:

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,
b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or
c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.

F.3.9 Arithmetical errors, omissions and discrepancies

F.3.9.1 Check responsive tenders for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern.

F.3.9.2 Check the highest ranked tender or tenderer with the highest number of tender evaluation points after the evaluation of tender offers in accordance with F.3.11 for:

a) the gross misplacement of the decimal point in any unit rate;
b) omissions made in completing the pricing schedule or bills of quantities; or
c arithmetic errors in:
   i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or
   ii) the summation of the prices.

F.3.9.3 Notify the tenderer of all errors or omissions that are identified in the tender offer and either confirm the tender offer as tendered or accept the corrected total of prices.

F.3.9.4 Where the tenderer elects to confirm the tender offer as tendered, correct the errors as follows:

a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

F.3.10 Clarification of a tender offer

Obtain clarification from a tenderer on any matter that could give rise to ambiguity in a contract arising from the tender offer.

F.3.11 Evaluation of tender offers

F.3.11.1 General

Appoint an evaluation panel of not less than three persons. Reduce each responsive tender offer to a comparative offer and evaluate them using the tender evaluation methods and associated evaluation criteria and weightings that are specified in the tender data.

F.3.11.2 Method 1: Financial offer

In the case of a financial offer:

a) Rank tender offers from the most favourable to the least favourable comparative offer.
b) Recommend the highest ranked tenderer for the award of the contract, unless there are compelling and justifiable reasons not to do so.
c) Re-rank all tenderers should there be compelling and justifiable reasons not to recommend the highest ranked tenderer and recommend the highest ranked tenderer, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F.3.11.3 Method 2: Financial offer and preference

In the case of a financial offer and preferences:

a) Score each tender in respect of the financial offer made and preferences claimed, if any, in accordance with the provisions of F.3.11.7 and F.3.11.8.
b) Calculate the total number of tender evaluation points *(T_{EV})* in accordance with the following formula:

$T_{EV} = N_{FO} + N_P$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
N_P is the number of tender evaluation points awarded for preferences claimed in accordance with F.3.11.8.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.

d) Recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points, and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F.3.11.4 Method 3: Financial offer and quality

In the case of a financial offer and quality:

a) Score each tender in respect of the financial offer made and the quality offered in accordance with the provisions of F.3.11.7 and F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any.
b) Calculate the total number of tender evaluation points *(T_{EV})* in accordance with the following formula:

$T_{EV} = N_{FO} + N_Q$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
N_Q is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.
d) Recommend tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F.3.11.5 Method 4: Financial offer, quality and preferences

In the case of a financial offer, quality and preferences:

a) Score each tender in respect of the financial offer made, preference claimed, if any, and the quality offered in accordance with the provisions of F.3.11.7 to F.3.11.9, rejecting all tender offers that fail to score the minimum number of points for quality stated in the tender data, if any.
b) Calculate the total number of tender evaluation points *(T_{Ev})* in accordance with the following formula, unless otherwise stated in the Tender Data:

$T_{EV} = N_{FO} + N_{P+} N_Q$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer made in accordance with F.3.11.7;
N_p is the number of tender evaluation points awarded for preferences claimed in accordance with F.3.11.8;
N_Q is the number of tender evaluation points awarded for quality offered in accordance with F.3.11.9.

c) Rank tender offers from the highest number of tender evaluation points to the lowest.
d) Recommend the tenderer with the highest number of tender evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
e) Rescore and re-rank all tenderers should there be compelling and justifiable reasons not to recommend the tenderer with the highest number of tender evaluation points and recommend the tenderer with the highest number of tender evaluation points, unless there are compelling and justifiable reasons not to do so and the process set out in this subclause is repeated.

F.3.11.6 Decimal places

Score financial offers, preferences and quality, as relevant, to two decimal places.

F.3.11.7 Scoring Financial Offers

Score the financial offers of remaining responsive tender offers using the following formula:

$N_{FO} = W_1 \times A$

where: N_{FO} is the number of tender evaluation points awarded for the financial offer.
W_1 is the maximum possible number of tender evaluation points awarded for the financial offer as stated in the Tender Data.

A is a number calculated using the formula and option described in Table F.l as stated in the Tender Data.

Table F.1: Formulae for calculating the value of *A*

Formula	Comparison aimed at achieving	Option 1[a]	Option 2[a]
1	Highest price or discount	$A = (1 + \frac{(P - Pm)}{Pm})$	$A = P/Pm$
2	Lowest price or percentage commission/ fee	$A = (1 - \frac{(P - Pm)}{Pm})$	$A = Pm/P$
[a] *Pm* is the comparative offer of the most favourable comparative offer. *P* is the comparative offer of the tender offer under consideration.			

F.3.11.8 Scoring Preferences

Confirm that tenderers are eligible for the preferences claimed in accordance with the provisions of the tender data and reject all claims for preferences where tenderers are not eligible for such preferences.

Calculate the total number of tender evaluation points for preferences claimed in accordance with the provisions of the tender data.

F.3.11.9 Scoring Quality

Score each of the criteria and subcriteria for quality in accordance with the provisions of the Tender Data.

Calculate the total number of tender evaluation points for quality using the following formula:

$N_Q = W_2 \times S_O / M_S$

where: S_O is the score for quality allocated to the submission under consideration;
M_s is the maximum possible score for quality in respect of a submission; and
W_2 is the maximum possible number of tender evaluation points awarded for the quality as stated in the tender data.

F.3.12 Insurance provided by the employer

If requested by the proposed successful tenderer, submit for the tenderer's information the policies and/or certificates of insurance which the conditions of contract identified in the contract data, require the employer to provide.

F.3.13 Acceptance of tender offer

Accept the tender offer, if in the opinion of the employer, it does not present any unacceptable commercial risk and only if the tenderer:

a) is not under restrictions, or has principals who are under restrictions, preventing participating in the employer's procurement,
b) can, as necessary and in relation to the proposed contract, demonstrate that he or she possesses the professional and technical qualifications, professional and technical competence, financial resources, equipment and other physical facilities, managerial capability, reliability, experience and reputation, expertise and the personnel, to perform the contract,
c) has the legal capacity to enter into the contract,
d) is not 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 any of the foregoing,
e complies with the legal requirements, if any, stated in the tender data, and
f) is able, in the opinion of the employer, to perform the contract free of conflicts of interest.

F.3.14 Prepare Contract Documents

F.3.14.1 If necessary, revise documents that shall form part of the contract and that were issued by the employer as part of the tender documents to take account of:

a) addenda issued during the tender period,
b) inclusion of some of the returnable documents, and
c) other revisions agreed between the employer and the successful tenderer.

F.3.14.2 Complete the schedule of deviations attached to the form of offer and acceptance, if any.

F.3.15 Complete adjudicator's contract

Unless alternative arrangements have been agreed or otherwise provided for in the contract, arrange for both parties to complete formalities for appointing the selected adjudicator at the same time as the main contract is signed.

F.3.16 Notice to unsuccessful tenderers

F.3.16.1 Notify the successful tenderer of the employer's acceptance of his tender offer by completing and returning one copy of the form of offer and acceptance before the expiry of the validity period stated in the tender data, or agreed additional period.

F.3.16.2 After the successful tenderer has been notified of the employer's acceptance of the tender, notify other tenderers that their tender offers have not been accepted.

F.3.17 Provide copies of the contracts

Provide to the successful tenderer the number of copies stated in the Tender Data of the signed copy of the contract as soon as possible after completion and signing of the form of offer and acceptance.

F.3.18 Provide written reasons for actions taken

Provide upon request written reasons to tenderers for any action that is taken in applying these conditions of tender, but withhold information which is not in the public interest to be divulged, which is considered to prejudice the legitimate commercial interests of tenderers or might prejudice fair competition between tenderers.

F.3.19 Transparency in the procurement process

F.3.19.1 The CIDB prescripts require that tenders must be advertised and be registered o the CIDB i.Tender System.

F.3.19.2 The employer must adopt a transparency model that incorporates the disclosure and accountability as transparency requirements in the procurement process.

F.3.19.3 The transparency model must identify the criteria for selection of projects, project information template and the threshold value of the projects to be disclosed in the public domain at various intervals of delivery of infrastructure projects.

F.3.19.4 The client must publish the information on a quarterly basis which contains the following information:

- Procurement planning process;
- Procurement method and evaluation process;
- Contract type;
- Contract status;
- Number of firms tendering;
- Cost estimate;
- Contract title;
- Contract firm(s);
- Contract price;
- Contract scope of work;
- Contract start date and duration;
- Contract evaluation reports.

F.3.19.5 The employer must establish a Consultative Forum which will conduct a random audit in the implementation of the transparency requirements in the procurement process.

F.3.19.6 Consultative Forum must be an independent structure from the bid committees.

F.3.19.7 The information must be published on the employer's website.

F.3.19.8 Records of such disclosed information must be retained for audit purposes.

Annex G
(normative)

Alpha-numerics associated with the Contractor Grading Designations

Table G1: Contractor grading designations and associated parameters

Contractor Grading Designations	Tender Value Range designation	Maximum value of a contract that a contractor is considered capable of performing (R)
1 (class of construction works)	1	R 200 000
2 (class of construction works)	2	R 650 000
3 (class of construction works)	3	R 2 000 000
4 (class of construction works)	4	R 4 000 000
5 (class of construction works)	5	R 6 500 000
6 (class of construction works)	6	R 13 000 000
7 (class of construction works)	7	R 40 000 000
8 (class of construction works)	8	R 130 000 000
9 (class of construction works)	9	No limit

Table G2 **CLASSES OF CONSTRUCTION WORK**

Description	Designation	Definition	Works types	Examples
Civil engineering works	CE	Construction works that are primarily concerned with materials such as steel, concrete, earth and rock and their application in the development, extension, installation, maintenance, removal, renovation, alteration, or dismantling of building and engineering infrastructure	Water, sewerage, roads, railways, harbours and transport, urban development and municipal services	Structures such as a cooling tower, bridge, culvert, dam, grand stand, road, railway, reservoir, runway, swimming pool, silo or tunnel. The results of operations such as dredging, earthworks and geotechnical processes. Township services, water treatment and supply, sewerage works, sanitation, soil conservation works, irrigation works, storm-water and drainage works, coastal works, ports, harbours, airports and pipelines.
Electrical engineering works (Infrastructure)	EP	Construction works that are primarily concerned with development, extension, installation, removal, renovation, alteration or dismantling of engineering infrastructure: a) relating to the generation, transmission and distribution of electricity; or b) which cannot be classified as EB.	Electrical power generation, transmission, control and distribution equipment and systems.	Power generation Street and area lighting Substations and protection systems Township reticulations Transmission Lines Supervisory control and data acquisition systems
Electrical engineering works (buildings)	EB	Construction works that are primarily concerned with the installation, extension, modification or repair of electrical installations in or on any premises used for the transmission of electricity from a point of control to a point of consumption, including any article forming part of such an installation	All electrical equipment forming an integral and permanent part of buildings and/or structures, including any wiring, cable jointing and laying and electrical overhead line construction	Electrical installations in buildings Electrical reticulations within a plot of land (erf) or building site Standby plant and uninterrupted power supply Verification and certification of electrical installations on premises

Description	Designation	Definition	Works types	Examples
General building works	GB	Construction works that: a) are primarily concerned with the development, extension, installation, renewal, renovation, alteration, or dismantling of a permanent shelter for its occupants or contents; or b) cannot be categorised in terms of the definitions provided for civil engineering works, electrical engineering works, mechanical engineering works, or specialist works.	Buildings and ancillary works other than those categorised as being: a) civil engineering works; b) electrical engineering works; c) mechanical engineering works; or d) specialist works.	Buildings for domestic, industrial, institutional or commercial occupancies Car ports Fences other than classified as SS [SQ] Stores Walls
Mechanical engineering works	ME	Construction works that are primarily concerned with the development, extension, installation, removal, alteration, renewal of engineering infrastructure for gas transmission and distribution, solid waste disposal, heating, ventilation and cooling, chemical works, metallurgical works, manufacturing, food processing and, materials handling	Machine systems including those relating to the environment of building interiors: a) gas transmission and distribution systems b) pipelines c) solid waste disposal d) materials handling, lifting machinery, heating, ventilation and cooling, pumps, e) continuous process systems f) chemical works, metallurgical works, manufacturing, food processing such as that in concentrator machinery and apparatus, oil and gas wells, smelters, cyanide plants, acid plants, metallurgical machinery, equipment and apparatus, and works necessary for the beneficiation of metals, minerals, rocks, petroleum and organic substances or other chemical processes.	Air-conditioning and mechanical ventilation Boiler installations and steam distribution Central heating Centralised hot water generation Cranes and hoists Dust and sawdust extraction Compressed air, gas and vacuum installations Conveyor and materials handling installations Continuous process systems involving chemical works, metallurgical works, oil and gas wells, acid plants, metallurgical machinery, equipment and apparatus, and works necessary for the beneficiation of metals, minerals, rocks, petroleum and organic substances and other chemical processes Kitchen equipment Laundry equipment Lift installations and escalators Refrigeration and cold rooms Waste handling systems (including compactors)

Description	Designation	Definition	Works types	Examples
Specialist works	SB	A subset of construction works identified and defined by the Board that involves specialist capabilities for its execution	The extension, installation, repair, maintenance or renewal, or removal, of asphalt	
	SC		The development, extension, installation, removal, and dismantling, as relevant, associated with building excavations, shaft sinking and lateral earth support	
	SD		The development, extension, installation, repair, renewal, removal, or alteration of corrosion protection systems (cathodic, anodic and electrolytic)	
	SE		Demolition of buildings and engineering infrastructure and blasting	
	SF		The development, extension, installation, renewal, removal, renovation, alteration or dismantling of fire prevention and protection infrastructure (drencher and sprinkler systems and fire installation)	
	SG		The development, extension, installation, renewal, removal, renovation, alteration or dismantling of glazing, curtain walls and shop fronts	
	SH		The development, extension, installation, maintenance, renewal, removal, alteration or dismantling, as relevant, of landscaping, irrigation and horticultural works	
	SI		The development, extension, installation, repair, maintenance, renewal, removal, renovation, alteration or, dismantling of lifts, escalators, travellators and hoisting machinery	
	SJ		The development, installation, removal, or dismantling, as relevant, of piles and other specialized foundations for buildings and structures	
	SK		The installation, renewal, removal, alteration or dismantling, as relevant, road markings and signage	
	SL		The development, extension, installation, renewal, removal, renovation, alteration or dismantling of structural steelwork and scaffolding	
	SM		Timber buildings and structures	
	SN		The extension, installation, repair, maintenance, renewal, removal, renovation or alteration, as relevant, of the waterproofing of basements, roofs and walls using specialist systems.	
	SO		The development, extension, installation, renewal, removal, alteration or dismantling or demolition of water installations and soil and waste water drainage associated with buildings (wet services, plumbing)	
	SQ		The development, extension, installation, repair, removal, alteration, dismantling or demolition of precast concrete or steel fencing	

Part T2: Returnable Documents

Pages

T2.1 LIST OF RETURNABLE DOCUMENTS

The following documents are to be completed and returned as they constitute the tender. Whilst many of the returnables are required for the purpose of evaluating the tenders, some will form part of the subsequent contract, as they form the basis of the tender offer. For this reason, it is very important that tenderers return **all information requested.**

1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES (included hereafter for completion)

Schedule : 1A	Compulsory Enterprise Questionnaire
Schedule : 1B	Authority of Signatory
Schedule : 1C	Contractor's Information
Schedule : 1D	Schedule of Plant and Equipment available for the Contract
Schedule : 1E	Preliminary Programme
Schedule : 1F	Estimated Monthly Cash-flow
Schedule : 1G	Schedule of Proposed Sub-contractors
Schedule : 1H	Schedule of Tenderer's Key Staff
Schedule : 1I	Proposed amendments and qualifications
Schedule : 1J	Schedule of Work satisfactorily carried out by the Tenderer
Schedule : 1K	Experience of Key Personnel
Schedule : 1L	Functionality and Eligibility Evaluation Form
Schedule : 1M	Estimated Local Labour to be Employed on the Contract

2. OTHER DOCUMENTS REQUIRED FOR TENDER EVALUATION PURPOSES (append to schedule in document)

Schedule : 2A	Certificate of Contractors Registration issued by the CIDB
Schedule : 2B	Documents of Incorporation
Schedule : 2C	Tax Clearance Certificate Requirements (MBD 2)
Schedule : 2D	Declaration of Interest (MBD 4)
Schedule : 2E	Declaration for Procurement above R10 million (all applicable taxes included) (MBD 5)
Schedule : 2F	Preference Points Claim Form in Terms of Preferential Procurement Regulations 2011 – (MBD 6.1)
Schedule : 2G	Declaration of Bidders past supply chain practices (MBD 8)
Schedule : 2H	Certificate of Independent Bid Determination (MBD 9)
Schedule : 2I	Declaration in terms of the MFMA in terms of Municipal Rates & Services
Schedule : 2J	Financial Standing
Schedule : 2K	Proof of Payment of Tender Fee
Schedule : 2L	Proof of Letter of Good Standing with COIDA
Schedule : 2M	Proof of Registration with Relevant Bargaining Council
Schedule : 2N	Certificate of Attendance at Clarification Meeting

3. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT (to be attached with submission)

Schedule : 3A	Record of Addenda to Tender Documents
Schedule : 3B	Occupational Health and Safety Plan
Schedule : 3C	Form of Indemnity

4. OTHER SCHEDULES AND AFFIDAVITS THAT WILL BE INCORPORATED INTO THE CONTRACT (included hereafter for completion)

C1.1 :	Form of Offer and Acceptance
C1.2 :	Contract Data (Part1 & Part 2)
C1.3 :	Form of Guarantee
C1.4 :	Adjudicator's Agreement
C1.5 :	Occupational Health and Safety Agreement
C1.6:	Contract of Temporary Employment as Community Liaison Officer
C1.7	Insurance Broker's Warranty
C2.1 :	Pricing Instructions
C2.2 :	Bills of Quantities

T2.2 RETURNABLE SCHEDULES

SCHEDULE 1A: COMPULSORY ENTERPRISE QUESTIONNAIRE

The following particulars must be furnished. In the case of a joint venture, **separate** enterprise questionnaires in respect of each partner must be completed and submitted.

Section 1: Name and address of enterprise: .....

Section 2: VAT registration number, if any: .....

Section 3: CIDB registration number, if any: .....

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity Number*	Personal Income Tax Number*

***** Complete only if sole proprietor or partnership and attach separate page if more than three (3) partners

Section 5: Particulars of companies and close corporations

Company registration number: .....

Close corporation number: .....

Tax reference number: .....

Section 6: Record of service of the state

Indicate by marking the relevant boxes with a cross, if any sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months in the service of any of the following:

- ☐ a member of any municipal council
- ☐ a member of any provincial legislature
- ☐ a member of the National Assembly or the National Council of Province
- ☐ a member of the board of directors of any municipal entity
- ☐ an official of any municipality or municipal entity
- ☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ an employee of Parliament or a provincial legislature

If any of the above boxes are marked, disclose the following:

Name of sole proprietor, partner, director, manager, principal shareholder or stakeholder	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

*Insert separate page if necessary

Section 7: Record of spouses, children and parents in the service of the state

Indicate by marking the relevant boxes with a cross, if any spouse, child or parent of a sole proprietor, partner in a partnership or director, manager, principal shareholder or stakeholder in a company or close corporation is currently or has been within the last 12 months been in the service of any of the following:

- ☐ a member of any municipal council
- ☐ a member of any provincial legislature
- ☐ a member of the National Assembly or the National Council of Province
- ☐ a member of the board of directors of any municipal entity
- ☐ an official of any municipality or municipal entity
- ☐ an employee of any provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act 1 of 1999)
- ☐ a member of an accounting authority of any national or provincial public entity
- ☐ an employee of Parliament or a provincial legislature

Name of spouse, child or parent	Name of institution, public office, board or organ of state and position held	Status of service (tick appropriate column)	
		Current	Within last 12 months

*insert separate page if necessary

The undersigned, who warrants that he/she is duly authorized to do so on behalf of the enterprise:

i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;
ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Bid Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;
iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;
iv) confirms that I / we are not associated, linked or involved with any other biding entities submitting bid offers and have no other relationship with any of the bidders or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and
v) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed ..... **Date** .....

Name ..... **Position** .....

Enterprise name .....

* The schedule should be used where tenders are subject to the local Government: Municipal Finance Management Act

SCHEDULE 1B: AUTHORITY OF 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.

A Company	B Partnership	C Joint Venture	D Sole Proprietor	E Close Corporation

A. **CERTIFICATE FOR COMPANY**

I, ……., chairperson of the board of directors of …… acting in the capacity of ……., was authorized to sign all documents in connection with this tender for contract …… and any contract resulting from it on behalf of the company.

As witnesses:

1. …… **Signature : Sole owner :** ……

2. …… **Date :** ……

Tenderers must attach a copy of the Resolution of the Board - refer to Schedule 2……..….

B. **CERTIFICATE FOR PARTNERSHIP**

We, the undersigned, being the key-partners in the business trading as …….. ……..……. hereby authorize Mr/Ms ……..…….. acting in the capacity of ……. to sign all documents in connection with the tender for Contract ……. and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

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

C. **CERTIFICATE FOR JOINT VENTURE**

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorize Mr/Ms ……, authorized signatory of the company ……., acting in the capacity of lead partner, to sign all documents in connection with the tender offer for Contract and any contract resulting from it on our behalf.

This authorization is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

NAME OF FIRM	ADDRESS	AUTHORISING SIGNATURE, NAME & CAPACITY
Lead partner		

D. **CERTIFICATE FOR SOLE PROPRIETOR**

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

As witnesses:

1. ..... **Signature : Sole owner:** .....

2. ..... **Date :** .....

E. **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 Contract and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

NOTE: This certificate is to be completed and signed by all of the key-members upon who rests the direction of the affairs of the Partnership as a whole.

SCHEDULE 1C : CONTRACTOR'S INFORMATION

COMPLETE AS FULLY AS POSSIBLE, WHERE APPLICABLE
CONTRACTORS, SUPPLIERS AND SERVICES PROVIDERS (PROFESSIONAL AND NON-PROFESSIONAL)

PART ONE

1. NAME OF COMPANY

2. ADDRESS: PHYSICAL

POSTAL

CODE WEBSITE http

E-MAIL

2.1 PHYSICAL ADDRESS IN LOCAL AREA (if applicable)

CODE

CONTACT PERSON (Name & Details)

TELEPHONE FAX

CELL PHONE

3. SECTOR (e.g. Construction)

3.1 NATURE OF BUSINESS *(e.g. Plumbing)* 1.

2.

4. REGISTERED AS:

- ☐ CLOSE CORPORATION
- ☐ PTY LTD COMPANY
- ☐ CO-OPERATIVE
- ☐ SOLE TRADER
- ☐ LTD COMPANY
- ☐ PARTNERSHIP
- ☐ NOT REGISTERED

4.1 REGISTERED NO. (if applicable)

5. VAT REGISTRATION NO. *(if applicable) (Attach certified copy)*

5.1 RATES SERVICES ACCOUNT NO.

6. ANNUAL SALES/TURNOVER (Previous financial year)
20..... R .....
20..... .. R .....
20..... R .....

7. TOTAL ASSETS (Previous financial year)
20..... R .....
20..... R .....
20..... R .....

8. CURRENT CONTRACTS WITH COUNCIL

	1.	2.	3.
CONTRACT NO.			
DURATION			
APPROXIMATE VALUE	R	R	R
DATES CONTRACTS WERE SIGNED			
PAYMENT TERMS			

9. PREVIOUS CONTRACTS WITH COUNCIL

CONTRACT NO. (Last financial year only)			
APPROXIMATE VALUE	R	R	R

10. NAME AND ADDRESS OF AUDITORS/ACCOUNTING OFFICERS

NAME

ADDRESS

CODE

11. PROFESSIONALS ATTACHED TO THE CONCERN WITH QUALIFICATIONS (Name and Qualification)

Initials	Qualifications	Surname

Initials	Qualifications	Surname

PART TWO

12. NAMES AND NUMBERS OF DIRECTORS/PARTNERS/MEMBERS - % SHAREHOLDING

	Initials	Surname	ID Number	Sex	%	*HDI Holding
1.						YES/NO
2.						YES/NO
3.						YES/NO
4.						YES/NO
5.						YES/NO
6.						YES/NO
7.						YES/NO
8.						YES/NO

13. INDICATE ON WHICH DATE YOUR BUSINESS STARTED ITS CURRENT

TYPE OF BUSINESS

*DEFINITION OF HISTORICALLY DISADVANTAGED INDIVIDUAL (HDI) MEANS A SOUTH AFRICAN CITIZEN.

- WHO, DUE TO THE APARTHEID POLICY THAT HAD BEEN IN PLACE, HAD NO FRANCHISE IN NATIONAL ELECTIONS PRIOR TO THE INTRODUCTION OF THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1983 (ACT NO. 110 OF 1983) OR THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1993 (ACT NO. 200 OF 1993) ("THE INTERIM CONSTITUTION") AND/OR
  - WHO IS A FEMALE; AND/OR
  - WHO HAS A DISABILITY

PROVIDED THAT A PERSON, WHO OBTAINED SOUTH AFRICAN CITIZENSHIP ON OR AFTER THE COMING INTO EFFECT OF THE INTERIM CONSTITUTION, IS DEEMED NOT TO BE A HDI.

I ..... (FULL NAME) HEREBY CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND CORRECT

....

SIGNATURE **DATE**

(*ADDITIONAL INFORMATION MAY BE ATTACHED IF NECESSARY.*)

SCHEDULE 1D : SCHEDULE OF PLANT AND EQUIPMENT AVAILABLE FOR THE CONTRACT

The following are lists of major items of relevant equipment that I/we presently own or lease and will have available for this contract or will acquire or hire for this contract if my/our tender is accepted.

(a) Details of major equipment that is owned by and immediately available for this contract.

Quantity	Description, Size, Capacity, etc.

Attach additional pages if more space is required.

(b) Details of major equipment that will be hired, or acquired for this contract if my/our tender is acceptable.

Quantity	Description, Size, Capacity, etc.

Attach additional pages if more space is required.

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

SCHEDULE 1E : PRELIMINARY PROGRAMME

The tenderer shall attach a preliminary programme, to this schedule.

This programme shall be in the form of a bar chart (Gantt chart) or similar acceptable time/activity form reflecting the proposed sequence and tempo of the various activities and the quantities that will be carried out every week under each of the elements, comprising the work for this contract. The programme shall also indicate the point where the tenderer intends to commence work operations and the direction in which the work will proceed. The working hours shall be indicated.

The tenderer shall also take into account the additional requirements stated in the Project Specifications when drawing up the programme.

Details of the preliminary programme shall be appended to this Schedule.

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

The construction duration will be ……. (weeks)

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

SCHEDULE 1F : ESTIMATED MONTHLY CASH-FLOW

The Tenderer shall state below the estimated value of work to be completed every month, based on his preliminary programme and his tendered unit rates.

The amounts for Contingencies and Contract Price Adjustment must not be included. The Tenderer must make note of any cash-flow restrictions.

MONTH	VALUE
1	
2	
3	
TOTAL	

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

SCHEDULE 1G: SCHEDULE OF PROPOSED SUB-CONTRACTORS

We notify you that it is our intention to employ the following Subcontractors to work on this contract.
If we are awarded the contract we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

No.	Name and Address of Proposed Sub-contractor	Nature and Extent of Work	Previous Experience with Sub-contractor
1.			
2.			
3.			
4.			
5.			
6.			
7.			

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

SCHEDULE 1H: SCHEDULE OF TENDERER'S KEY STAFF

CVs of the Key Staff members shall be attached to this Schedule. Tenderers shall set out in the Schedule hereunder details of their Key Staff members' experience in work of a similar nature (bulk sewer field) to that for which their Tender is submitted.

Tenderers will be awarded points in terms of the qualifications of the Contracts Manager, Site Agent and Site Foreman as outlined in F2.1.1.5, Functionality (Quality)

CONTRACTS MANAGER	**NAME**: ……..…….	
TERTIARY QUALIFICATION, INSTITUTION, YEAR	**REGISTRATION and NO.**	**YEARS of Civil engineering experience**

SITE AGENT	**NAME**: ……..…….	
TERTIARY QUALIFICATION, INSTITUTION, YEAR	**REGISTRATION and NO.**	**YEARS of Civil engineering experience**

SITE FOREMAN	**NAME**: ……..…….	
TERTIARY QUALIFICATION, INSTITUTION, YEAR	**REGISTRATION and NO.**	**YEARS of Civil engineering experience**

SIGNED BY TENDERER: ……

SCHEDULE 1I : PROPOSED AMENDMENTS AND QUALIFICATIONS

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such deviations and qualifications in a covering letter to his tender and reference such letter in this schedule.

The Tenderer's attention is drawn to clause F.3.8 of the Standard Conditions of Tender referenced in the Tender Data regarding the employer's handling of material deviations and qualifications.

Page	Clause or Item	Proposal

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

SCHEDULE 1J : SCHEDULE OF WORK SATISFACTORILY CARRIED OUT BY THE TENDERER

The following is a statement of work successfully executed by myself/ourselves, completed after January 2012. Tenderers will be awarded points for the number of 3 ME projects completed, ie received Practical Completion, after January 2012.

Tenderers will be awarded functionality points in terms of clause F2.1.1.5, Functionality (Quality)

Municipality/Other Entity	Contact person	Tel no.	Project Description	Project value R	Date commenced	Date completed

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

SCHEDULE 1K : EXPERIENCE OF KEY-PERSONNEL

The tenderer shall set out in the tables hereafter details of the relevant experience in similar successfully completed projects of the persons identified for each listed position based upon which up to **30 points** for functionality will be awarded to the tenderer (Refer to F2.1.1.2 of Part T1.2 Tender Data for explanation of functionality criteria and **Schedule 1L** T2.1 Returnable Schedules, for criteria of points allocation) in this regard.

Tenderers that fail to supply the information requested in this schedule (both pages of this schedule included) with their tender offers and in this format will score **NO** eligibility points in this regard.

Note: One person only to qualify for each of the positions listed below. The key-personnel to be used in this regard will be subject to the approval of the Engineer prior to the commencement date of the contract. Should any of the persons identified not be available for the position which they are indicated for, then a suitable candidate with equal or superior tertiary qualification and/or relevant experience than that of the person which he/she replaces shall be used for every such position.

Contract's Manager	**NAME: ……..** **TERTIARY QUALIFICATION:**				
Contact and Client	**Project Description**	**Position held**	**Value of work (Incl. VAT) (R million)**	**Year commenced**	**Year completed**

Site Agent	**NAME:** **……..** **TERTIARY QUALIFICATION:**				
Contact and Client	**Project Description**	**Position held**	**Value of work (Incl. VAT) (R million)**	**Year commenced**	**Year completed**

* To be filled in by Tenderer

Site Foreman	**NAME:** **……..** **TERTIARY QUALIFICATION:**				
Contact and Client	**Project Description**	**Position held**	**Value of work (Incl. VAT) (R million)**	**Year commenced**	**Year completed**

* To be filled in by Tenderer

Signed ..... Date _____

Name ..... Position _____

Tenderer .....

SCHEDULE 1L : FUNCTIONALITY AND ELIGIBILITY EVALUATION FORM

Name of Tenderer: …….....

Name of Evaluator: ……

1. FUNCTIONALITY EVALUATION CRITERIA

1.1. Previous experience on contracts of similar value and nature (maximum 20 points)

Points for the tenderer's past experience in terms of similar successfully completed (3 ME graded) projects will be scored based on the information supplied by the tenderer in **Schedule 1J** of Part T 2.1: Returnable Schedules (also refer to F2.1.1.3 of Part T1.2 Tender Data for explanation of functionality criteria).

Successfully completed 3 ME projects	No. off projects listed	Status
3 = Responsive 0 = Non-responsive		

Points will be allocated according to the table below:

Successfully completed mechanical engineering projects	Points	Score (A)	
	Score (A)		

1.2. Experience of key-personnel (maximum 30 points)

Points for demonstrated experience of the tenderer's key personnel to be directly involved with this contract (if awarded) will be scored based on the information supplied by the tenderer in **Schedule 1K** of Part T2.1: Returnable Schedules (also refer to F2.1.1.2 of Part T1.2 Tender Data for explanation of functionality criteria).

Points will be allocated according to the tables below:

CONTRACT'S MANAGER			
Experience as Contract's Manager on successfully completed civil/mechanical engineering projects	**Points**	**Score (B)**	
	Score (B)		

SITE AGENT		
Experience as Site Agent on successfully completed civil engineering projects	**Points**	**Score (C)**
	Score (C)	

SITE FOREMAN		
Experience as Site Foreman on successfully completed civil engineering projects	**Points**	**Score (D)**
	Score (D)	

Note: One person only to qualify for each position listed above.

1.3. Financial standing (maximum 20 points)

Points for tenderer's financial standing will be scored based on the information as received from the financial institution. (Refer to F 2.1.1.4 of Part T1.2: Tender Data for explanation of functionality criteria. Also see Schedule 2J).

Points will be allocated according to the table below:

Allocation of resources	**Points**	**Score (E)**
Code A : Undoubted for the amount	**20**	
Code B : Good for the amount	**20**	
Code C : Good for the amount if strictly in the way of business	**15**	
Code D – H : Fair trade risk for the amount to RD commissions occurs frequently	**0**	
	Score (E)	

TOTAL SCORE A + B + C + D + E =

2. ELIGIBILITY CRITERIA

2.1. Completion of applicable schedules

Returnable Schedule	Page	YES	NO	Comments
Schedule 1L				
Schedule 2A				
Schedule 2J				
Schedule 2N				

SCHEDULE 1M : ESTIMATED LOCAL LABOUR TO BE EMPLOYED ON THE CONTRACT

Description	Number				Total
Description of Task / Element / Trade	Artisans and or Skilled Labour	Semi-Skilled Labour	Labourers	Others	Labour / Task
TOTAL ACTUAL LABOUR: ……..…….……					

SIGNED BY TENDERER: ……

Note: Where the same labour is to be re-used on various tasks the Total Labour/Tasks and the Total Actual Labour will differ.

SCHEDULE 2A: CERTIFICATE OF CONTRACTOR REGISTRATION ISSUED BY THE CIDB

The tenderer must attach to this page a certified copy of the certificate of contractor registration of his/her company, close corporation or partnership issued by die CIDB. In the case of a joint venture between two or more firms, the tenderer shall attach a copy of the document of incorporation of the joint venture.

SCHEDULE 2B: DOCUMENTS OF INCORPORATION

The tenderer must attach to this page a certified copy of the certificate of incorporation of his/her company, close corporation or partnership. In the case of a joint venture between two or more firms, the tenderer shall attach a copy of the document of incorporation of the joint venture.

Where the entity tendering is a Joint Venture the tender must be accompanied by a statement describing exactly what aspects of the work will be undertaken by each party to the joint venture (appended to this Schedule).

SCHEDULE 2C: TAX CLEARANCE CERTIFICATE REQUIREMENTS

MBD 2

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

1 In order to meet this requirement bidders are required to complete in full the attached form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.

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

3 The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.

4 In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.

5 Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch Office nationally or on the website www.sars.gov.za.

6 Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

TAX CLEARANCE
BELASTINGKLARING

TCC 001

Application for a Tax Clearance Certificate
Aansoek om 'n Belastingklaringsertifikaat

Purpose
Doel

Select the applicable option
Kies die toepasike opsie
Tenders / Tenders ☐ Good standing / Goeie stand ☐

If "Good standing", please state the purpose of this application
Indien "Goeie stand", verstrek asseblief die oogmerk van hierdie aansoek

Particulars of applicant
Besonderhede van aansoeker

Name/Legal name
Naam/Geregistreerde naam
(Initials & Surname or registered name / Voorletters en Van of Geregistreerde naam)

Trading name (If applicable)
Handelsnaam (Indien van toepassing)

ID/Passport number
ID/Paspoortnommer

Company/Close Corp. reg no
Maatskappy/Beslote Korp reg nr

Income Tax ref no
Inkomstebelasting verw.nr

PAYE ref no
LBS verw.nr 7

VAT registration number
BTW registrasienommer 4

SDL ref no
SDL verw.nr L

Customs code
Doeanekode

UIF ref no
UIF verw.nr U

Telephone number
Telefoonnommer

Fax no
Faksnr

Cell phone number
Selfoonnommer

E-mail address
E-posadres

Physical address
Fisieke adres

Postal address
Posadres

Particulars of representative (Public Officer/Trustee/Partner)
Besonderhede van verteenwoordiger (Openbare Amptenaar/Trustee/Vennoot)

Surname
Van

First names
Voorname

ID/Passport no
ID/Paspoortnr

Income Tax ref no
Inkomstebelasting verw. nr

Telephone no
Telefoonnr

Fax no
Faksnr

Cell phone no
Selfoonnr

E-mail address
E-posadres

Physical address
Fisieke adres

TCC001 v2 Effective Date: 2009/12/08

1 - 2

Particulars of tender (If applicable)
Besonderhede van tender (Indien van toepasing)

Tender number
Tendernommer

Estimated tender amount
Geraamde tenderbedrag R ,

Expected duration of the tender
Verwagte duurte van die tender Year(s) Jaar (jare)

Audit
Oudit

Are you currently aware of any Audit investigation against you/the company?
Is u bewus van enige oudit ondersoek teen u/die maatskappy? YES JA NO NEE
If "YES" provide details
Indien "JA" verskaf besonderhede.

Appointment of representative/agent (Power of Attorney)
Aanstelling van 'n verteenwoordiger/agent (Magtingingsbrief)

I the undersigned confirm that I require a Tax Clearance Certificate in respect of Tenders or Goodstanding.
Ek die ondergetekende bevestig dat ek 'n Belastingklaring benodig ten opsigte van Tenders of Goeie Stand.

I hereby authorise and instruct to apply to and receive from SARS the applicable
Hiermee gee ek volmag en opdrag aan om namens my aansoek te doen en my

Tax Clearance Certificate on my/our behalf.
Belastingklaringsertifikaat namens my in ontvangs te neem by SARS

Signature of representative/agent
Handtekening van verteenwoordiger/agent

C C Y Y — M M — D D
Date
Datum

Name of representative/ agent
Naam van verteenwoordiger/ agent

Declaration
Verklaring

I declare that the information furnished in this application as well as any supporting documents is true and correct in every respect.
Hiermee verklaar ek dat die inligting verskaf in hierdie aansoek asook enige ondersteunende dokumentasie waar en korrek is in alle opsigte.

Signature of applicant/Public Officer
Handtekening van aansoeker/Openbare Amptenaar

C C Y Y — M M — D D
Date
Datum

Name of applicant/ Public Officer
Naam van aansoeker/Openbare Amptenaar

Notes
Notas

1. It is a serious offence to make a false declaration.
   Dit is 'n ernstige oortreding om 'n vals verklaring te doen.
2. Section 75 of the Income Tax Act, 1962, states: Any person who
   Afdeling 75 van die Inkomstebelastingwet, 1962, meld: Iemand wat
   (a) fails or neglects to furnish, file or submit any return or document as and when required by or under this Act; or
   versuim of nalaat om 'n opgawe of dokument te verstrek, in te dien of voor te lê soos en wanneer deur of ingevolge hierdie Wet vereis; of
   (b) without just cause shown by him, refuses or neglects to-
   Sonder om goeie redes aan te toon, weier of nalaat om-
   (i) furnish, produce or make available any information, documents or things;
   enige inligting, dokumente of goed te verskaf, voor te lê of beskikbaar te stel;
   (ii) reply to or answer truly and fully, any questions put to him ...
   te antwoord op of om ware en volledige antwoorde te gee op vrae aan hom gestel ...
   As and when required in terms of this Act ... shall be guilty of an offence ...
   Soos en wanneer ingevolge hierdie Wet vereis ... is aan 'n misdryf skuldig ...
3. **SARS will, under no circumstances, issue a Tax Clearance Certificate unless this form is completed in full.**
   SARS sal in geen omstandighede u aansoek om 'n Belastingklaringsertifikaat oorweeg tensy die aansoek volledig voltooi is nie.
4. Your Tax Clearance Certificate will only be issued on presentation of your South African Identity Document or Passport (Foreigners only) as applicable.
   U Belastingklaringsertifikaat sal alleenlik uitgereik word by die toon van u Suid-Afrikaanse Identiteisdokument of in die geval van 'n buitelander, 'n paspoort.

2 - 2

SCHEDULE 2D : DECLARATION OF INTEREST (MBD4)

1. No bid will be accepted from persons in the service of the state[1]

2. Any person, having a kinship with persons in the service of the state[1], including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

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

   3.1 Full Name of bidder or his or her representative: .....

   3.2 Identity Number: .....

   3.3 Position occupied in the Company (director, trustee, shareholder[2]) .....……..

   3.4 Company Registration Number: .....

   3.5 Tax Reference Number.....

   3.6 VAT Registration Number: .....

   3.7 The names of all directors/ trustees/ shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.

   3.8 Are you presently in the service of the state? **YES □ / NO □**

   3.8.1 If yes, furnish particulars. .....

   ……

   3.9 Have you been in the service of the state for the past twelve months? **YES □ / NO □**

   3.9.1 If yes, furnish particulars. .....

   ……

   3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and/ or adjudication of this bid? ..... **YES □ / NO □**

   3.10.1 If yes, furnish particulars. .....

   ……

   3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? ..... **YES □ / NO □**

---

[1] MSCM Regulations: "In the service of the state" means to be –

(a) a member of –
- **i) any municipal council;**
- **ii) any provincial legislature; or**
- **iii) the national Assembly or the national Council of provinces;**

(b) a member of the board of directors of any municipal entity;
(c) an official of any municipality or municipal entity;
(d) an employee of 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);
(e) a member of the accounting authority of any national or provincial public entity; or
(f) an employee of Parliament or a provincial legislature.

[2] Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

3.11.1 If yes, furnish particulars. .....

……

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? ..... **YES □ / NO □**

3.12.1 If yes, furnish particulars. .....

……

3.13 Are any spouse, child or parent of the company's directors trustees, managers, principle shareholders or stakeholders in service of the state? ..... **YES □ / NO □**

3.13.1 If yes, furnish particulars. .....

……

3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract. ..... **YES □ / NO □**

3.14.1 If yes, furnish particulars. .....

……

4. Full details of directors/ trustees/ members/ shareholders:

Full Name	Identify Number	State Employee Number

…….. ……
Signature Date

…….. ……..
Capacity Name of Bidder

SCHEDULE 2E : DECLARATION FOR PROCURMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED) (MBD 5)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire:

1 Are you by law required to prepare annual financial statements for auditing? ***YES / NO**

1.1 If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.

……

……

……

2 Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days? **YES / NO**

2.1 If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days.

2.2 If yes, provide particulars.

……

……

……

3. Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract? **YES / NO**

3.1 If yes, furnish particulars

……

……

……

4. Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity are expected to be transferred out of the Republic? **YES / NO**

4.1 If yes, furnish particulars

……

……

……

CERTIFICATION

I, THE UNDERSIGNED (NAME) ……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

…….. ……..
Signature Date

……..... ……
Position Name of Bidder

SCHEDULE 2F: PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2011 (MBD 6.1)

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

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2011.

---

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 90/10 system for requirements with a Rand value of above R1 000 000 (all applicable taxes included); and

1.2 The value of this bid is estimated to exceed R1 000 000 (all applicable taxes included) and therefore the 90/10 system shall be applicable.

1.3 Preference points for this bid shall be awarded for:

(a) Price; and
(b) B-BBEE Status Level of Contribution.

1.3.1 The maximum points for this bid are allocated as follows:

		POINTS
1.3.1.1	**PRICE**	**90**
1.3.1.2	**B-BBEE STATUS LEVEL OF CONTRIBUTION**	**10**
	Total points for Price and B-BBEE must not exceed	**100**

1.4 Failure on the part of a bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or an Accounting Officer as contemplated in the Close Corporation Act (CCA) together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.5. The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

2.1 **"all applicable taxes"** includes value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies;

2.2 **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad -Based Black Economic Empowerment Act;

2.3 "**B-BBEE status level of contributor"** means the B-BBEE status received by a measured entity based on its overall performance using the relevant scorecard contained in the Codes of Good Practice on Black Economic Empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

2.4 **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of services, works or goods, through price quotations, advertised competitive bidding processes or proposals;

2.5 **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

2.6 **"comparative price"** means the price after the factors of a non-firm price and all unconditional discounts that can be utilized have been taken into consideration;

2.7 **"consortium or joint venture"** means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract;

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

2.9 **"EME"** means any enterprise with an annual total revenue of R5 million or less.

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

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

2.12 **"non-firm prices"** means all prices other than "firm" prices;

2.13 **"person"** includes a juristic person;

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

2.15 **"sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing, another person to support such primary contractor in the execution of part of a project in terms of the contract;

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

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

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

3. ADJUDICATION USING A POINT SYSTEM

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

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

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

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

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

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

4. POINTS AWARDED FOR PRICE

4.1 THE 90/10 PREFERENCE POINT SYSTEMS

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

90/10

$$Ps = 90\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where:

Ps = Points scored for comparative price of bid under consideration
Pt = Comparative price of bid under consideration
Pmin = Comparative price of lowest acceptable bid

5. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

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

B-BBEE Status Level of Contributor	Number of points (90/10 system)
1	10
2	9
3	8
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	0

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

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

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

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

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

5.7 A person will not be awarded points for B-BBEE status level if it is indicated in the bid documents that such a bidder intends sub-contracting more than 25% of the value of the contract to any other enterprise that does not qualify for at least the points that such a bidder qualifies for, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.

5.8 A person awarded a contract may not sub-contract more than 25% of the value of the contract to any other enterprise that does not have an equal or higher B-BBEE status level than the person concerned, unless the contract is sub-contracted to an EME that has the capability and ability to execute the sub-contract.

6. BID DECLARATION

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

7. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF 1.3.1.2 AND 5.1

7.1 B-BBEE Status Level of Contribution: .....…. = ……(maximum of 10 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 5.1 and must be substantiated by means of a B-BBEE certificate issued by a Verification Agency accredited by SANAS or a Registered Auditor approved by IRBA or an Accounting Officer as contemplated in the CCA).

8 SUB-CONTRACTING

8.1 Will any portion of the contract be sub-contracted? YES / NO
(delete which is not applicable)

8.1.1 If yes, indicate:
i) what percentage of the contract will be subcontracted? .....……%
ii) the name of the sub-contractor? ……
iii) the B-BBEE status level of the sub-contractor? …….....
iv) whether the sub-contractor is an EME? YES / NO
(delete which is not applicable)

9 DECLARATION WITH REGARD TO COMPANY/FIRM

9.4 Type of company/ firm

- ☐ Partnership/Joint Venture / Consortium
- ☐ One person business/sole propriety
- ☐ Close corporation
- ☐ Company (LTD)
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

9.5 Describe principal business activities

……

……

……..

9.6 Company classification

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional service provider
- ☐ Other service providers, e.g. transporter, etc.

[TICK APPLICABLE BOX]

9.7 Municipal Information

Municipality where business is situated ……

Registered Account Number ……..……..……

Stand Number …….

9.8 Total number of years the company/firm has been in business? ……

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

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in Paragraph 1 of this form.

iii) In the event of a contract being awarded as a result of points claimed as shown in Paragraph 7, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If the B-BBEE status level of contribution has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –
   a) disqualify the person from the bidding process;
   b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
   c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
   d) restrict the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
   e) forward the matter for criminal prosecution

WITNESSES:

1. ……

2. ……

……..
SIGNATURE(S) OF BIDDER(S)

DATE:……..……..

ADDRESS: ……

…….

…….

SCHEDULE 2G: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES (MBD 8)

1 This Municipal Bidding Document must form part of all bids invited.

2 It serves as a declaration to be used by municipalities and municipal entities 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 bid of any bidder may be rejected if that bidder, or any of its directors have:

a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
b. been convicted for fraud or corruption during the past five years;
c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

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

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers 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 Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website (**www.treasury.gov.za**) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder 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)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
4.4	**the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?**	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		

Item	Question	Yes	No
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

a. e past five years; or
b. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

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

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME) ……..……..……..
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM 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 Bidder

SCHEDULE 2H: CERTIFICATE OF INDEPENDENT BID DETERMINATION (MBD9)

CERTIFICATE OF INDEPENDENT BID DETERMINATION

1 This Municipal Bidding Document (MBD) must form part of all bids[1] 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 bidding (or bid rigging).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. take all reasonable steps to prevent such abuse;
b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

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

5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.
[2] Bid rigging (or collusive bidding) 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 bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

MBD 9

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____
(Bid Number and Description)

in response to the invitation for the bid made by:

_____
(Name of Municipality / Municipal Entity)

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 Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
   a) has been requested to submit a bid in response to this bid invitation;
   b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
   c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 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 to calculate prices;
   d) The intention or decision to submit or not to submit, a bid;
   e) The submission of a bid which does not meet the specifications and conditions of the bid: or
   f) Bidding with the intention not to win the bid.
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 bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

[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.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids 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.

……...	……..
Signature	Date
…….	……..
Position	Name of Bidder

SCHEDULE 2I: DECLARATION IN TERMS OF THE MFMA (ACT 56 OF 2003) IN TERMS OF MUNICIPAL RATES AND SERVICES

NAME OF ENTERPRISE / TENDERER* : ……

I the undersigned, who warrants that he/she is duly authorized to do so on behalf of the abovementioned enterprise/tenderer, do hereby declare that, to the best of my knowledge, neither the enterprise nor any of its directors, members or partners has:

a. failed to pay municipal rates and taxes or municipal service charges and such rates, taxes and charges are in arrears for more than three months:
b. failed, during the last five years, to perform satisfactorily on a previous contract with the Prince Albert Municipality or any other organ of state after written notice was given to that tenderer that performance was unsatisfactory;
c. abused the supply chain management system of the Prince Albert Municipality or has committed any improper conduct in relation to this system;
d. been convicted of fraud or corruption during the past five years;
e. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
f. been listed with the Register of Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004) or has been listed on National Treasury's database as a person or juristic entity prohibited from doing business with the public sector.

I acknowledge that any misrepresentation in respect of this declaration may be regarded as reason to cancel any contract arising out of this tender.

SIGNED BY ENTERPRISE/TENDERER: ……

DATE: ……..

* where the entity tendering is a joint venture, each party to the joint venture must sign a declaration in terms of the Municipal Finance Management Act and attach it to this schedule

DOCUMENTARY EVIDENCE IN TERMS OF GOOD STANDING WITH MUNICIPAL RATES AND TAXES AND SERVICE CHARGES SHALL BE ATTACHED TO THIS FORM.

SCHEDULE 2J: FINANCIAL STANDING

"TENDERERS MUST APPEND PROOF OF BANK GRADING TO THIS SCHEDULE"

BANKING DETAILS OF COMPANY

NAME OF ACCOUNT HOLDER	
ACCOUNT NUMBER	
BANK	
BRANCH	

COMPLETION OF WORKS: …… (WEEKS)

SIGNED BY TENDERER: ……

SCHEDULE 2K: PROOF OF PAYMENT OF TENDER FEE

The tenderer must attach to this page proof of payment of the tender fee.

SIGNED BY TENDERER: ……

SCHEDULE 2L: LETTER OF GOOD STANDING TO RELEVANT AUTHORITIES

The tenderer must attach to this page a letter from the relevant authorities indicating his good standing with regard to UIF payments and COIDA. Each party to a Joint Venture or Consortium shall submit separate documents.

SIGNED BY TENDERER: ……

SCHEDULE 2M: BARGAINING COUNCIL – CERTIFICATE OF COMPLIANCE

Where applicable, a Certificate of Compliance issued by the relevant Bargaining Council shall be attached to this schedule. Each party to a Joint Venture or Consortium shall submit separate documents.

SIGNED BY TENDERER: ……

SCHEDULE 2N : CERTIFICATE OF ATTENDANCE AT CLARIFICATION MEETING

This is to certify that

…… (Tenderer)

of ……..…….. (address)

……

was represented by the person(s) named below at the compulsory meeting held for all tenderers at …….

…… (location) on ……. (date), starting at ……..

We acknowledge that the purpose of the meeting was to acquaint ourselves with the site of the works and / or matters incidental to doing the work specified in the tender documents in order for us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting:

Name …….……. Signature …….…….

Capacity …….…….

Name …….……. Signature …….…….

Capacity …….…….

Attendance of the above persons at the meeting is confirmed by the Employer's representative, namely:

Name …….……. Signature …….…….

Capacity …….…….

SCHEDULE 3A: RECORD OF ADDENDA TO TENDER DOCUMENTS

We confirm that the following communications received from the Employer before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer :

No.	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signed ..... Date .....

Name ..... Position .....

Tenderer .....

SCHEDULE 3B : OCCUPATIONAL HEALTH AND SAFETY PLAN

OCCUPATIONAL HEALTH AND SAFETY ACT (Act No 85 of 1993)

Tenderers are to note the requirements of the Occupational Health and Safety Act No. 85 of 1993 and the Construction Regulations 2014 issued in terms of Section 43 of the Act. The Tenderer shall be deemed to have read and fully understood the requirements of the above Act and Regulations and to have allowed for all costs in compliance therewith.

In this regard the successful Tenderer shall prepare a Health and Safety Plan in respect of the Works in order to demonstrate the necessary competencies and resources to perform the construction work all in accordance with the Act and Regulations. Such Health and Safety Plan shall cover inter-alia the following details:

1. Management Structure, Site Supervision and Responsible Persons including a succession plan.
2. Contractor's induction training programme for employees, sub-contractors and visitors to the Site.
3. Health and safety precautions and procedures to be adhered to in order to ensure compliance with the Act, Regulations and Safety Specifications.
4. Regular monitoring procedures to be performed.
5. Regular liaison, consultation and review meetings with all parties.
6. Site security, welfare facilities and first aid.
7. Site rules and fire and emergency procedures.

Tenderers are to note that the Contractor is required to ensure that all sub-contractors or others engaged in the performance of the contract also comply with the above requirements.

The Tenderer shall also take into account the additional requirements stated in the Scope of Work when drawing up the Health and Safety Plan for the contract.

Number of sheets, appended by the Tenderer to this Schedule, ... (If nil, enter NIL).

SIGNED BY TENDERER: ……

SCHEDULE 3C : FORM OF INDEMNITY

THE MUNICIPAL MANAGER, Prince Albert Municipality

INDEMNITY

Given by ..... (Name of Company)

of .....

.....

(registered address of Company) a company incorporated with limited liability according to the Company Laws of the Republic of South Africa (hereinafter called the Contractor),

represented herein by .....

.....(Name of Representative) in his capacity as

.....Designation) of the Contractor is

duly authorised hereto by a resolution dated .....

To sign on behalf of the Contractor.

WHEREAS **THE CONTRACTOR** has entered into a Contract, dated……with **PRINCE ALBERT MUNICIPALITY** (hereinafter called the Municipality), **WHO REQUIRE THIS INDEMNITY FROM THE CONTRACTOR FOR THE CONTRACT: 3/2017: SUPPLY, INSTALLATION AND COMMISSIONING OF NEW SURFACE AERATORS FOR PRINCE ALBERT WASTEWATER TREATMENT WORKS**

NOW THEREFORE THIS DEED WITNESSES that the Contractor does hereby indemnify and hold harmless the Municipality in respect of all loss or damage that may be incurred or sustained by the Municipality by reason of or in any way arising out of or caused by operations that may be carried out by the Contractor in connection with the aforementioned contract; and also in respect of all claims that may be made against the Municipality in consequence of such operations, by reason of or in any way arising out of any accidents or damage to life or property or any other cause whatsoever; and also in respect of all legal or other expenses that may be incurred by the Municipality in examining, resisting or settling any such claims; for the due performance of which the Contractor binds itself according to law.

SIGNATURE:

THUS DONE AND SIGNED for and on behalf on the Contractor.

At ……..on this ……day of ……20…… in the presence of the subscribing witnesses.

AS WITNESSES:

1. …… (Designation) ……

2. …… (Designation) ……

T2.3 DATA SHEETS

TECHNICAL DATA SHEETS: ELECTRICAL

DATASHEETS TO BE COMPLETED BY TENDERER

DATASHEET NO.	DESCRIPTION	REQUIRED
ETD1	LOW VOLTAGE CABLES	YES
ETD2	CABLE SUPPORTS	YES
ETD3	MOTOR CONTROL CENTRES	YES

ETD 1

LOW VOLTAGE CABLES

General	1	Tag Number	NA
	2	Service	Low Voltage Cables
	3	Line No.	NA
	4	Function	Low Voltage Cables
Specifications		LV Cables:	
		Manufacturer	*
		Type	*
		Rating	*
		SABS Approval	*
		In accordance with specification:	*
		Instrument Cables:	
		Manufacturer	*
		Type	*
		Rating	*
		SABS Approval	*
		In accordance with specification:	*
		Control Cables:	
		Manufacturer	*
		Type	*
		Rating	*
		SABS Approval	*
		In accordance with specification:	*
		Fibre Optic Cables:	
		Manufacturer	*
		Type	*
		Rating	*
		SABS Approval	*
		In accordance with specification:	*
		Cables Glands:	
		Manufacturer	*
		Type/Model	*
Notes:		1. The Tenderer is to fill in items marked with an *	

ETD 2

CABLE SUPPORTS

General	1	Tag Number	NA
	2	Service	Cable Supports
	3	Line No.	NA
	4	Function	Cable Supports
Specifications		Cable Ladder (Heavy Duty):	
		Manufacturer	*
		Type/Material	*
		SABS Approval	*
		In accordance with specification:	*
		Cable Mesh Tray (Light Duty):	
		Manufacturer	*
		Type	*
		SABS Approval	*
		In accordance with specification:	*
		Unistrut	
		Manufacturer	*
		Type	*
		SABS Approval	*
		In accordance with specification:	*
Notes:		1. The Tenderer is to fill in items marked with an *	

ETD 3

MOTOR CONTROL CENTRES

General	1	Tag Number	NA
	2	Service	Motor Control
	3	Line No.	NA
	4	Function	Motor Control
Specifications		General:	
		Manufacturer	*
		Place of Manufacture	*
		Certified to:	*
		In accordance with specification:	*
		Deviation	*
		Certification attached	*
		Construction:	
		Material	*
		Moulded Case CB's:	
		Make	*
		Model (up to 100A)	*
		Model (over 100A)	*
		IED:	
		Make	*
		Model	*
		Fieldbus Connection	*
		Power Meter:	
		Make	*
		Model	*
		Accessories (Make/Model):	
		Pushbuttons	*
		Indicator lights	*
		Selector Switches	*
		Ammeters	*
		Voltmeters	*
		Running hour meters	*
		CT's	*
		Control Transformer:	
		Make	*
		Model	*
		Rating	*
		Field Control Stations:	
		Make	*
		Model (E-Stop)	*
		Models (E-Stop/Start)	*
Notes:		1. The Tenderer is to fill in items marked with an * 2. Where there is a difference between various MCCs multiple datasheets must be completed.	

Part C1: Agreements and Contract Data

C1.1 FORM OF OFFER AND ACCEPTANCE

Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of:

CONTRACT NO: 3/2017: SUPPLY, INSTALLATION AND COMMISSIONING OF NEW SURFACE AERATORS FOR PRINCE ALBERT WASTEWATER TREATMENT WORKS

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

By the representative of the tenderer, deemed to be duly authorized, signing this part of this form of offer and acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

Rand. .....

…… (in words); R …… (in figures)

This offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the Contractor in the conditions of contract identified in the contract data.

Signature(s) ……. …….

Name(s) ……. …….

Capacity ……. …….

For the Tenderer

……

……

……
(Name and address of organization)

Name and signature of witness ……. Date …….

Acceptance

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the tenderer's offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the Employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract are contained in:

Part C1: Agreements and contract data (which includes this agreement)
Part C2: Pricing data
Part C3: Scope of work
Part C4: Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts 1 to 4 above.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the tender schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this agreement. No amendments to or deviations from said documents are valid unless contained in this schedule.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

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

Signature(s) ……. …….

Name(s) ……. …….

Capacity ……. …….

For the Employer PRINCE ALBERT MUNICIPALITY
23 Church Street
Prince Albert
6930

Name and signature of witness ……. Date …….

Schedule of Deviations

Notes:

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

1. Subject .....

   Details .....

2. Subject .....

   Details .....

3. Subject .....

   Details .....

4. Subject .....

   Details .....

By the duly authorised representatives signing this agreement, the Employer and the tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the tender schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.

For the Tenderer:

Signature(s) .....

Name(s) .....

Capacity .....

(Name and address of organization) .....

Name and signature of witness …….. Date ……..

For the Employer:

Signature(s) .....

Name(s) .....

Capacity .....

(Name and address of organization) .....

Name and signature of witness …….. Date ……..

C1.2 CONTRACT DATA

Part 1: Contract Data Provided by the Employer

GENERAL CONDITIONS OF CONTRACT

The following standardised General Conditions of Contract:

General Conditions of Contract for Construction Works (Third Edition, 2015)

Prepared by the South African Institution of Civil Engineering (SAICE) shall apply to and from the General Conditions of Contract for this contract. Copies of these conditions of contract are obtainable from the South African Institution of Civil Engineering (SAICE), Private Bag X200, Halfway House 1685, Tel: (011) 805 5947, Fax: (011) 805 5971, e-mail: civilinfo@saice.org.za.

Copies of the General Conditions of Contract are available for inspection and scrutiny at the offices of the Engineer.

The Pro-formas bound with the General Conditions of Contract 2015, on pages 96 to 116 shall not apply to this contract and shall be replaced with the documentation bound into this tender document.

The General Conditions of Contract 2015 make several references to the Contract Data 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 Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the general conditions of contract.

The General Conditions of Contract shall be read in conjunction with the variations, amendments and additions set out in the Contract Specific Data below. Each item of data given is cross-referenced to the clause in the General Conditions of Contract to which it mainly applies.

CONTRACT SPECIFIC DATA

THE FOLLOWING CONTRACT SPECIFIC DATA ARE APPLICABLE TO THIS CONTRACT:

Clause 1.1.1.13:

The Defects Liability Period is **12** months.

Clause 1.1.1.14:

The maximum time for achieving Practical Completion is **(12) weeks**, inclusive of the 14 day period referred to in Clause 5.3.2 below, and inclusive of non-working days referred to in Clause 5.8.1 below, but exclusive of special non-working days (Clause 5.8.1). Should the total Contract value not be available to complete the project the time for achieving Practical Completion will be adjusted pro rata to the Contract Value plus 2 weeks.

CLAUSE 1.1.1.15

The **Employer** is the PRINCE ALBERT MUNICIPALITY, represented by the Municipal Manager and/or such person or persons duly authorised thereto by the Employer in writing.

and is referred to in this Contract Document by the terms “Employer”, “PRINCE ALBERT MUNICIPALITY” or “Council” as the context provides.

Clause 1.1.1.16

The **Employer’s Agent**, referred to in the documents, is the firm of Royal HaskoningDHV (Pty) Ltd., acting through a director, an associate or an official authorised thereto in writing.

The name of the Employer's Agent is: Tezren Pandither, or their successors duly appointed by the employer.

For the purposes of this tender the Employer's Agent will be the same person as the Engineer referred to in this document and in the SABS 1200.

Clause 1.1.1.26:

The Pricing Strategy is a Re-measurement Contract.

CLAUSE 1.1.1.28:

REPLACE WITH THE FOLLOWING:

"Scope of Work" means the document(s) containing the standard specifications, the project/particular specifications and the drawings, that specifies and describes the works, which are to be provided, and any other requirements and constraint relating to the manner in which the work is to be performed.

Add the following clauses after Clause 1.1.1.34:

1.1.1.35 "**Drawings**" means all drawings, calculations and technical information forming part of the Contract Documents and any modifications thereof or additions thereto from time to time approved in writing by the Engineer or delivered to the Contractor by the Engineer.

1.1.1.36 "**Letter of Notification**" means the letters of formal notification, signed by the Employer, of the decision of the Supply Chain Management Bid Adjudication Committee sent to all tenderers. The notification of the decision does not form part of the Employer's Acceptance of the successful tenderer's Offer and no rights shall accrue.

CLAUSE 1.2.1.2:

THE ADDRESS OF THE EMPLOYER IS: **PRINCE ALBERT MUNICIPALITY**
23 Church Street
Prince Albert
6930

THE ADDRESS OF THE ENGINEER IS: **ROYAL HASKONINGDHV (PTY) LTD**
Tygerberg Park
Royal HaskoningDHV House
163 Uys Krige Drive
Plattekloof, 7599
Tel: (021) 936-7600
Fax: (021) 936-7606

Clause 3.2.3:

The Employer's Agent shall obtain the specific approval of the Employer before executing any of his functions or duties according to the following Clauses of the General Conditions of Contract:

1. Clause 3.3.1 Nomination of Engineer's Representative
2. Clause 3.3.4 Engineer's authority to delegate
3. Clause 5.8.1 Non-working times
4. Clause 5.11.2 Suspension of the Works by Engineer
5. Clause 5.12.1 Extension of time for Practical Completion
6. Clause 5.12.4 Acceleration instead of extension of time
7. Clause 6.3.1 Variations

Clause 4.3:

Add the following clause after Clause 4.3.2.:

4.3.3 The Employer and the Contractor shall enter into an agreement to complete the work required for the construction of the works in terms of the provisions of Section 37(2) of the Occupational Health and Safety Act (Act 85 of 1993) and the Construction Regulations promulgated thereunder.

An agreement is included in the Contract Document (C1.4 of Contract Data) and shall be completed and submitted to the Employer together with a letter of good standing from the Compensation Commissioner (if not insured with a Licenced Compensation Insurer). The Contractor shall ensure that any letter of good standing shall be timeously renewed in order that it remains in full force for the duration of the Contract.

Clause 5.3.1:

The documentation required before commencement with Works execution is:

1) Health and Safety Plan (Refer to Clause 4.3)
2) Initial programme (Refer to Clause 5.6)
3) Security (Refer to Clause 6.2)
4) Insurance (Refer to Clause 8.6)
5) Occupational Health and Safety Agreement (C1.5 of the Contract Document)
6) Letter of Good Standing from the Compensation Commissioner (if not insured with a Licensed Compensation Insurer)

Clause 5.3.2:

The time to submit the documentation required (Clause 5.3.1 above) before commencement with Works execution is 14 days.

Clause 5.4.2:

Access to and possession of the site shall not be exclusive to the Contractor insofar as the provisions of Clause 4.8 apply, and where ongoing use by the general public is required.

Add the following clause after Clause 5.4.3:

5.4.4 The Contractor shall bear all costs and charges for special and temporary rights of way required by him in connection with access to the Site.

Clause 5.8.1:

The non-working days are Sundays.

The special non-working days are:

1) All gazetted public holidays falling outside the year end break.
2) The year end breaks as recommended by the SAFCEC

Extension of time claims will be adjudicated based on a 6 (six) day working week even should the Contractor choose to work 5 (five) days per week.

Clause 5.12.2.2:

No extension of time will be granted in respect of any delays attributed to normal climatic conditions. Normal climatic conditions shall be deemed to include normal rainfall and associated wet conditions and materials, strong winds and extremes of temperature. However, in the event that delays to critical activities exceed the number of working days listed below for each month, then abnormal climatic conditions shall be deemed to exist, and an extension of time may be claimed in accordance with the provisions of Clause 5.12.

The number of days quoted below shall be regarded as a fair estimate of the delays to be anticipated and allowed for under normal climatic conditions where inclement weather prevents or disrupts critical work.

Month	Expected Number of Working Days Lost as a Result of Normal Rainfall	Average Monthly Rainfall per Station 0048043:Prince Albert TKN (mm)
January	8 day	168.0
February	6 day	182.3
March	9 day	291.3
April	9 day	222.6
May	11 days	279.6
June	3 days	70.3
July	5 days	119.0
August	6 days	136.9
September	1 days	32.4
October	5 days	104.4
November	5 days	217.3
December	6 days	208.2
TOTAL	**74 days**	**2032.3**

Claims for delays for abnormal climatic conditions shall be accompanied by substantiating facts and evidence, which shall be submitted timeously as each day or half-day delay is experienced.

It shall be further noted that where the critical path is not affected, no extension of time for abnormal climatic conditions or for any other reason (including days following rain events) will be entertained.

Clause 5.13.1:

The penalty for failing to complete the Works is **R5 000.00** per calendar day.

Clause 5.16.3:

The latent defects period is **10** (ten) years.

Clause 6.2.1:

The security to be provided by the Contractor shall be a performance guarantee of **10%** of the Contract Sum. The performance guarantee shall contain the wording of the document included in C1.3.

Clause 6.2.2:

Delete Clause 6.2.2 in its entirety.

Clause 6.2.3:

Delete Clause 6.2.3 in its entirety and replace with the following:

The Contractor shall ensure that the performance guarantee remains valid and enforceable until the Certificate of Completion of the Works is issued.

Clause 6.5.1.2.3:

The percentage allowance to cover overhead charges is **10%**.

Clause 6.8.2:

Add the following to Clause 6.8.2:

The Contract Price shall **not** be subject to any contract price adjustment and the rates and prices tendered in the bill of quantities shall be final and binding throughout the period of the Contract.

Clause 6.8.4:

Add the following to Clause 6.8.4:

Notwithstanding the above, in the event that a public holiday is proclaimed after 28 days before the closing date for tenders, no costs other than those that can be claimed under Clause 5.12.3 shall be added to the contract price.

Clause 6.10.1.5:

The percentage advance on materials not yet built into the Permanent Works is **80%**.

Clause 6.10.3:

Add the following to Clause 6.10.3:

Notwithstanding the provision of a performance guarantee in terms of Clause 6.2.1, interim payments to the Contractors shall be subject to retention by the Employer of an amount of **10%** of the said amounts due to the Contractor, with no limit. A guarantee in lieu of retention is not permitted.

Clause 6.10.4:

Add the following to clause 6.10.4:

Furthermore, payment shall be subject to the Employer being in possession of an original valid tax clearance certificate at the time payment is due (it is the responsibility of the Contractor to submit an updated original tax clearance certificate to the Municipal Supplier Management Office.

In the event that certificate expires during the construction period, the Contractor must submit a new valid certificate within 14 days after expiry of the original certificate.

Notwithstanding anything above, the Employer's Agent shall be empowered to withhold the delivery of the payment certificate until the Contractor has complied with his obligations to report in terms of GCC Clause 4.10.2 and as described in the Scope of Work.

Clause 8.6.1.1.2:

The value of Plant and materials supplied by the Employer to be included in the insurance sum is **R0,00 (Nil)**.

Clause 8.6.1.1.3:

The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is **R100 000,00 (One Hundred Thousand Rand).**

Clause 8.6.1.3:

The limit of indemnity for liability insurance is R20 000 000.00 for any single claim – the number of claims to be unlimited during the construction and defects liability periods.

Clause 8.6.1.5:

In addition to the insurances required in terms of General Conditions of Contract Clauses 8.6.1.1 to 8.6.1.4 the following insurance is also required:

a) Insurance of Construction Equipment (including tools, offices and other temporary structures and contents) and other things (except those intended for incorporation into the Works) brought onto the site for a sum sufficient to provide for their replacement.
b) Insurance in terms of the provisions of the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993.
c) Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger Liability Indemnity.
d) Where the contract involves manufacturing and/or fabrication of the works or part thereof at premises other than the Site, the Contractor shall satisfy the Employer that all materials and equipment for incorporation in the works are adequately insured during manufacture and/or fabrication. In the event of the Employer having an insurable interest in such works during manufacture or fabrication then such interest shall be noted by endorsement to the Contractor's Policies of Insurance.

Clause 8.6.6:

The evidence that the insurances have been effected in terms of Clause 8.6.1, shall be in the form of an insurance broker's warranty worded precisely as given in part C1.7 Insurance Broker's Warranty.

Clause 9.2.1:

Add the following to Clauses after Clause 9.2.1.3.8:

9.2.1.3.9 The Contractor committed a corrupt or fraudulent act during the procurement process or the execution of the contract.

9.2.1.3.10 An official or other role player committed any corrupt or fraudulent act during the procurement process or in the execution of the contract that benefited the Contractor.

Clause 10.5.3:

The number of ad-hoc Adjudication Board Members to be appointed is 1(one).

ADDITIONAL CONDITIONS OF CONTRACT

Add the following clause after clause 10

Clause 11: Details to be confidential

The Contractor shall treat the details of the Works comprised in this Contract as private and confidential (save in so far as may be necessary for the purposes hereof) and shall not publish or disclose the same or any particulars thereof in any trade or technical paper elsewhere without the prior written consent of the Engineer.

Part 2: Data provided by the Contractor

Clause 1.1.8:

The name of the Contractor is .....

Clause 1.2.2:

The address of the Contractor is

Physical Address:	……..	Postal Address:	……..
	……..		……..
	……..		……..
	……..		……..
Telephone:	……..	Fax:	……..
e-mail :	……..……		

SIGNED BY TENDERER: …….

C1.3 FORM OF GUARANTEE

Contract No: 3/2017

WHEREAS **the PRINCE ALBERT MUNICIPALITY,**
(hereinafter referred to as the Employer") entered into, a Contract with:

.....

(hereinafter called "the Contactor") on the ……. day of ……..…….. 20……

for .....

.....

at …….. (*indicate site location)*

AND WHEREAS it is provided by such Contract that the Contractor shall provide the Employer with security by way of a guarantee for the due and faithful fulfilment of such Contract by the Contractor;

AND WHEREAS ..... has/have at the request of the Contractor, agreed to give such guarantee;

NOW THEREFORE WE ..... do hereby guarantee and bind ourselves jointly and severally as Guarantor and Co-principal Debtors to the Employer under renunciation of the benefits of division and excursion for the due and faithful performance by the Contractor of all the terms and conditions of the said Contract, subject to the following conditions:

1. The Employer shall, without reference and/or notice to us, have complete liberty of action to act in any manner authorized and/or contemplated by the terms of the said Contract, and/or to agree to any modifications, variations, alterations, directions or extensions of the completion date of the works under the said Contract, and that its rights under this guarantee shall in no way be prejudiced nor our liability hereunder be affected by reason of any steps which the Employer may take under such Contract, or of any modification, variation, alterations of the completion date which the Employer may make, give, concede or agree to under the said Contract.

2. This guarantee shall be limited to the payment of a sum of money.

3. The Employer shall be entitled, without reference to us, to release any guarantee held by it, and to give time to or compound or make any other arrangement with the Contractor.

4. This guarantee shall remain in full force and effect until the issue of the Certificate of Completion in terms of the Contract, unless we are advised in writing by the Employer before the issue of the said Certificate of his intention to institute claims, and the particulars thereof, in which event this guarantee shall remain in full force and effect until all such claims have been paid or liquidated.

5. Our total liability hereunder shall not exceed the Guaranteed Sum of Rand .....

   ……..…….. (in words); R ……(in figures)

6. The Guarantor reserves the right to withdraw from this guarantee by depositing the Guaranteed Sum with the beneficiary, whereupon our liability hereunder shall cease.

7. We hereby choose our address for the serving of all notices for all purposes arising here from as

   .....

   .....

IN WITNESS WHEREOF this guarantee has been executed by us at .....

on this ……. day of ……..... 20……

Signature:.....

Duly authorized to sign on behalf of:.....

Address:.....

.....

.....

As witnesses:

1. ……

2. ……

Guarantor's seal or stamp

ANNEXURE

LIST OF APPROVED FINANCIAL INSTITUTIONS

The following financial institutions are currently (as at 25th January 2015) approved for issue of contract guarantees to the Municipality:

National Banks:
ABSA Bank Ltd.
Development Bank of Southern Africa
FirstRand Bank Ltd.
Gensec Bank Ltd.
Investec Bank Ltd.
Land & Agricultural Bank of SA
Nedbank Ltd.
Standard Bank of SA Ltd.

International Banks (with branches in SA):
Barclays Bank plc.
Citibank n.a.
Commerzbank Aktiengesellschaft
Credit Agricole Corporate and Investment Bank
Deutsche Bank AG
HSBC Bank : Johannesburg
JP Morgan Chase Bank
Societe Generale
Standard Chartered Bank

Insurance companies:
ABSA Insurance
AIG South Africa
Coface s.a.
Compass Insurance Co.
Constantia Insurance Co.
Credit Guarantee Insurance Co.
Guardrisk Insurance Co.
Hollard Insurance Company Ltd.
Home Loan Guarantee Co.
Infiniti Insurance Limited
Lombard Insurance
Mutual & Federal Insurance Co.
New National Assurance Co.
Regent Insurance Co.
Renasa Insurance Company Ltd.
Santam Limited
Zurich Insurance Co.

C1.4 ADJUDICATOR'S AGREEMENT

(For a One-Person DAB)

Name and details of Contract .....

Name and address of Employer .....

.....

Name and address of Contractor .....

Name and address of Member .....

Whereas the Employer and the Contractor have entered into the Contract and desire jointly to appoint the Member to act as sole adjudicator who is also called the "DAB".

The Employer, Contractor and Member jointly agree as follows:

1. The conditions of this Dispute Adjudication Agreement comprise the "General Conditions of Dispute Adjudication Agreement", which is appended to the General Conditions of the "Conditions of Contract for Construction" First Edition 1999 published by the *Fédération Internationale des Ingénieurs-Conseils* (FIDIC), and the following provisions. In these provisions, which include amendments and additions to the General Conditions of Dispute Adjudication Agreement, words and expressions shall have same meanings as are assigned to them in the General Conditions of Dispute Adjudication Agreement.

2. The following clauses of the General Conditions of Dispute Adjudication Agreement are amended or deleted as follows :

   - In Clause 4(i), *insert before the words*, "with the progress of the Works", "and if deemed necessary by the Employer and Contractor".

   - In Clause 6, "Payment", delete paragraph (a) and (b) and replace with the following sub-clause:

     a) an hourly fee in respect of all time spent upon, or in connection with, the adjudication including time spent travelling.
     b) In Clause 6 "Payment" *delete the words*, "retainer and daily" in the second paragraph commencing 'The retainer and daily fees shall be ....."

   - In Clause 6 "Payment" *delete the third paragraph commencing* "The Member shall submit invoices …." / *the third and fourth paragraphs commencing with* 'Immediately after …. "And" Thereafter the Member ……." and replace with the following:

     The Member shall submit invoices for payment of expenses and fees at the conclusion of a decision given in terms of clause 20.4 of the General Conditions. The Member may invoice for a progress payment of his daily fees if for any reason the DAB is caused to extend the time for giving its decision beyond the 42 days stated in Clause 20.4 of the General Conditions. All invoices shall be accompanied by a brief description of activities performed during the relevant period and shall be addressed to the Contractor."

     - With reference to the Annex, "Procedural Rules"
       The DAB is not required to visit the site during the course of the Works at the intervals stated in Rule 1 and further referred to in Rules 2 and 3. However, the Member at his discretion may visit the site in connection with any matter arising from the dispute referred to him.

The DAB shall not conduct any hearings in order to resolve a dispute as provided for in Rule 6 or referred to in Rule 7.

- Add the following Rule 10.
  "The DAB may obtain legal or technical advice after first having notified the Parties of his intention".

3. In accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement, the Member shall be paid an hourly fee of R .

4. In consideration of these fees and other payments to be made by the Employer and the Contractor in accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement, the Member undertakes to act as the DAB (as adjudicator) in accordance with this Dispute Adjudication Agreement.

5. The Employer and the Contractor jointly and severally undertake to pay the Member, in consideration of the carrying out of these services, in accordance with Clause 6 of the General Conditions of Dispute Adjudication Agreement.

6. This Dispute Adjudication Agreement shall be governed by the law of South Africa.

SIGNED BY:	SIGNED BY:	SIGNED BY: .....
who warrants that he/she is duly authorised to sign for and on behalf of the **Employer** in the presence of	who warrants that he/she is duly authorised to sign for and on behalf of the **Contractor** in the presence of	the Member in the presence of
Witness	Witness	Witness .....
Name	Name	Name .....
Address	Address	Address .....
.....	.....	.....
Date	Date	Date .....

C1.5 Occupational Health and Safety Agreement

AGREEMENT MADE AND ENTERED INTO BETWEEN THE PRINCE ALBERT MUNICIPALITY (HEREINAFTER CALLED THE "EMPLOYER") AND

.....
(Contractor/Mandatory/Company/CC Name)

IN TERMS OF SECTION 37(2) OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, ACT No. 85 OF 1993 AS AMENDED.

I, ..., representing

....., as an Employer in its own right, do hereby undertake to ensure, as far as is reasonably practicable, that all work will be performed, and all equipment, machinery or plant used in such a manner as to comply with the provisions of the Occupational Health and Safety Act (OHSA) and the Regulations promulgated there under.

I furthermore confirm that I am/we are registered with the Compensation Commissioner and that all registration and assessment monies due to the Compensation Commissioner have been fully paid or that I/We are insured with an approved licensed compensation insurer.

COID ACT Registration Number: ……..

OR Compensation Insurer: …….. Policy No.: ……..

Please attach a certified copy of the COID Act certificate to this schedule.

I undertake to appoint, where required, suitable competent persons, in writing, in terms of the requirements of OHSA and the Regulations and to charge him/them with the duty of ensuring that the provisions of OHSA and Regulations as well as the Council's Special Conditions of Contract, Way Leave, Lock-Out and Work Permit Procedures are adhered to as far as reasonably practicable.

I further undertake to ensure that any sub-contractors employed by me will enter into an Occupational Health and Safety Agreement separately, and that such subcontractors comply with the conditions set.

I hereby declare that I have read and understand the appended Occupational Health and Safety Conditions and undertake to comply therewith at all times.

I hereby also undertake to comply with the Occupational Health and Safety Specification and Plan.

Signed at ..... on the ..... day of ..... 20.....

……. ……
Witness **Mandatory**

Signed at ..... on the ..... day of ..... 20.....

……. ……
Witness **for and on behalf of Prince Albert Municipality**

OCCUPATIONAL HEALTH AND SAFETY CONDITIONS

1. The Chief Executive Officer of the Contractor shall assume the responsibility in terms of Section 16(1) of the Occupational Health and Safety Act (as amended). Should the Contractor assign any duty in terms of Section 16(2), a copy of such assignment shall immediately be provided to the representative of the Employer as defined in the Contract.

2. All work performed on the Employer's premises shall be performed under the supervision of the construction supervisor who understand the hazards associated with any work that the Contractor performs on the site in terms of Construction Regulations 2014.

3. The Contractor shall appoint a Competent Person who shall be trained on any occupational health and safety aspects pertaining to them or to the work that is to be performed.

4. The Contractor shall ensure that he familiarizes himself with the requirements of the Occupational Health and Safety Act and that he, his employees, and any sub-contractors, comply with them.

5. Discipline in the interests of occupational health and safety shall be strictly enforced.

6. Personal protective equipment shall be issued by the Contractor as required and shall be worn at all times where necessary.

7. Written safe work procedures and appropriate precautionary measures shall be available and enforced, and all employees shall be made conversant with the contents of these practices.

8. No substandard equipment/machinery/articles or substances shall be used on the site.

9. All incidents referred to in terms of Section 24 of the Occupational Health and Safety Act shall be reported by the Contractor to the Department of Labour and the Employer.

10 The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of Section 32 of the Occupational Health and Safety Act and into any incident involving a Contractor and/or his employees and/or his sub-contractor/s.

11. No use shall be made of any of the Employer's machinery / plant / equipment / substance / personal protective equipment or any other article without prior arrangement and written approval.

12. No alcohol or any other intoxicating substance shall be allowed on the site. Any person suspected of being under the influence of alcohol or any other intoxicating substance shall not be permitted access to, or allowed to remain on the site.

13. Prior to commencement of any work, verified copies of all documents mentioned in the agreement, must be presented to the Employer.

OCCUPATIONAL HEALTH AND SAFETY AGREEMENT (2) and INDEMNITY FORM
OCCUPATIONAL HEALTH AND SAFETY ACT 1994 (Act No 85 of 1993)

TO BE COMPLETED AND SIGNED BY ALL MANDATORIES

NOTE: Section 1 (1)(XXVIII) of the Act defines a "mandatory" as including an Agent, a Contractor or a Sub-contractor.

AGREEMENT MADE AND ENTERED INTO BETWEEN PRINCE ALBERT MUNICIPALITY

(Hereinafter referred to as the "PRINCIPAL")
and

.....

Herein represented and duly authorised by its director/official (hereinafter referred to as the **MANDATORY**")

WHEREAS the Occupational Health and Safety Act No 85 of 1993, as amended, (hereinafter called the "**ACT**") provides that the principal shall be accountable for the compliance and application of the provisions of the ACT and more specifically Section 37(2) of the Act, with regard to the execution of work of whatever nature by private independent contractor specifically engaged by the PRINCIPAL for the purpose;

AND WHEREAS the contractor, so engaged. (Hereinafter called the "MANDATORY") is statutory compelled in its/his own right as employer, to comply with the obligations prescribed by section 37(2) and other provisions of the ACT applicable to his/her employees;

AND WHEREAS the PRINCIPAL, has in fact engaged the services of the MANDATORY on account of the fact that the PRINCIPAL is not in the position to execute the work departmentally resulting in the MANDATORY's presence on site for the specific purpose of executing the work by means of his own employees and is bound therefore, to adhere to the obligations and provisions of Section 37(2) of the ACT;

AND NOW THEREFORE, the PRINCIPAL and the MANDATORY hereby agree as follows:

1. The MANDATORY hereby unconditionally accepts the responsibility and accountability for the relevant work or contract in accordance with the provisions of Section 37(2) of the ACT.

2. The MANDATORY undertakes to take due care that all machines, equipment and implements are in approved good order and state of repair and shall be utilised by any employee in its/his employ in a manner which fully complies with any and all relevant provisions of the ACT.

3. The MANDATORY hereby unconditionally grants the PRINCIPAL indemnity against any and all claims and steps that may be instituted against the PRINCIPAL on account of non- compliance with the provisions of Section 37(2) of the ACT and any other relevant provision thereof.

4. The MANDATORY, without encroaching upon the indemnity granted to the PRINCIPAL as per paragraph 3 hereof undertakes to inform the PRINCIPAL summarily should the MANDATORY at any time during the execution of the specific contract, for whatever reason find that he cannot comply with the provision of the ACT and afore-mentioned indemnity given to the PRINCIPAL or its/his inability to perform as per the Agreement or that compliance be detrimentally affected for whatever reason. In such an event the MANDATORY shall liaise with the PRINCIPAL , who however, reserves the right not to release the MANDATORY from the provisions of the Agreement between parties and the indemnity herein referred to unless otherwise agreed upon.

5. The MANDATORY hereby certifies that it/he has taken note of the addendums to this Agreement and unconditionally undertakes to comply with the provisions thereof, failing which it/he shall be fully liable for all consequential legal proceedings that may be instituted and indemnifies the PRINCIPAL against any action arising out of non-compliance with Section 37(2) of the ACT.

6. The MANDATORY's sole responsibility in terms of this agreement terminates when the PRINCIPAL releases the MANDATORY from his obligations under the contract.

7. The MANDATORY undertakes to indemnify the PRINCIPAL in the same manner herein provided for, against any claims instituted on account of non-compliance in terms of the ACT against subcontractors employed by the MANDATORY.

8. Appoint Mr/Mrs ..... as our representative and the responsible person on site for the duration of my/our work on the premises of Prince Albert Municipality in terms of Section 8(2)(i), GAR1, GSR 11, GMR 2 and EIR 4 & 5 of the Occupational Health and Safety Act.

9. Registration number with Compensation Commissioner: .....

THUS DONE AND SIGNED at ..... on this ..... day of ..... 20....

AS WITNESSES:

1. ……..

2. ……..

……
PRINCIPAL
for and on behalf of Prince Albert Municipality

THUS DONE AND SIGNED at ..... on this ..... day of ..... 20....

AS WITNESSES:

1. ……..

2. ……..

……
MANDATORY
Contractor

C1.6 Contract of Temporary Employment as Community Liaison Officer

Construction Contract No.: …….....

PROJECT:

AGREEMENT made between the CONTRACTOR and the Community Liaison Officer ……., hereafter referred to as the CLO, for the appointment and employment of a CLO for the duration of the work in respect of the above named construction contract.

1. **THE PARTIES HAVE AGREED THAT**

The CLO will be employed by the CONTRACTOR on a temporary basis for the duration of the work from the date of signing this agreement to the date of practical completion as defined in the Contract, subject to all the conditions set out below.

2. **THE DUTIES OF THE COMMUNITY LIAISON OFFICER SHALL BE:**

a) to keep the community informed on the progress of the project;
b) to keep the Contractor informed on relevant Community affairs and possible grievances;
c) to manage the recruitment of workers from the Sub-Council Job-Seekers Database;
d) to assist the Contractor's supervisory staff in the management of the workers.

3. **THE FOLLOWING CONDITIONS OF EMPLOYMENT SHALL APPLY:**

The Conditions of Temporary Employment as applicable on this Contract for the workers recruited from the Community shall apply equally to the CLO, except that the rate of remuneration shall be R235.00 per working day. These conditions that apply are listed below as they appear in the Contract of Temporary Employment:

3.1 If required to work on a statutory public holiday or Sunday the payment will be double the amount stated in the previous paragraph.

3.2 Maximum hours of work:
- 9¼ hours per day
- 45 hours per week;
- 5 days per week;
- 5 hours without an interval, whereupon there shall be an interval of at least 30 minutes;
- A spread-over period of 12 hours.

3.3 The CLO shall be entitled to payment where he is prevented from working by reasons which are within the control of the Contractor.

3.4 On days when it is raining the Contractor may, before 9 a.m., decide not to open the site and there will be no pay.

If the Contractor closes the site between 9 a.m. and 1 p.m., the CLO will be paid half the daily wage.

If the site works later than 1 p.m., the CLO will be paid the full daily wage.

3.5 Workers and the CLO will not be permitted to work under conditions of:
- undisciplined or unruly behaviour;
- insubordination to Team Leader, Supervisors or Management;
- abuse of intoxicating substances;
- criminal actions by the employee;
- strike action or political stay-aways.

3.6 Workers, including the CLO, may be dismissed after two official written warnings for the following behaviour:
- undisciplined or unruly behaviour;
- insubordination to Team Leader, Supervisors or Management;
- abuse of intoxicating substances;
- willful or negligent damage to or loss of machines or equipment.

The Contractor shall ensure that he has statements from at least two witnesses concerning any of the above situations.

The Contractor shall inform the CLO within 24 hours of any warning issued to workers employed from the Job-Seekers Database.

3.7 The CLO will be paid on a Friday afternoon every two weeks, one week in arrears.

3.8 The CLO shall be given a statement with each payment on which is recorded:
- the name of the Contractor;
- the CLO's name;
- the number of days worked by the CLO;
- the rate per day;
- the details of any deductions made;
- the actual amount paid to the CLO.

3.9 No deduction shall be made from the remuneration except where the CLO consents in writing or unless the Contractor is permitted or required to do so by law or the order of any competent court.

3.10 The CLO shall be supplied free of charge with all health and safety equipment required by the Occupation Health and Safety Act. The equipment shall remain the property of the Contractor.

3.11 The Contractor must give the CLO at least one week's notice of the termination of the Contract of Temporary Employment. If this is not done, the CLO must be paid earnings for five days. This condition does not apply if the CLO is dismissed.

3.12 At the end of the period of temporary employment, the Contractor shall provide a Certificate of Service recording the Contractor's name, the CLO's name and address, the period of service, the type of work on which the CLO was engaged and the rate of remuneration on termination.

4. **TERMINATION OF AGREEMENT**

4.1 If the CLO can no longer perform and execute his/her duties as detailed in this agreement, this agreement will be terminated without prejudice to any rights under this agreement.

5. **THE CONDITIONS OF THIS AGREEMENT**

5.1 The parties expressly declare that this agreement contains all the conditions negotiated between them, and no condition or stipulation not contained herein shall be binding upon the parties.

6. **THUS AGREED AND SIGNED BY THE PARTIES**:

Contractor: .....

Community Liaison officer: .....

Date: .....

C1.7 Insurance Broker's Warranty

Pro Forma

Logo

Letterhead of Contractor's Insurance Broker

Date _____

Prince Albert Municipality
Municipal Manager
Private Bag X53
Prince Albert
6930

Dear Sir

CONTRACT NO.:3/2017

CONTRACT TITLE: **SUPPLY, INSTALLATION AND COMMISSIONING OF NEW SURFACE AERATORS FOR PRINCE ALBERT WASTEWATER TREATMENT WORKS**

NAME OF CONTRACTOR: _____

I, the undersigned, do hereby confirm and warrant that all the insurances required in terms of the abovementioned contract have been issued and/or in the case of blanket/umbrella policies, have been endorsed to reflect the interests of the Prince Albert Municipality with regard to the abovementioned contract, and that all the insurances and endorsements, etc, are all in accordance with the requirements of the contract.

I furthermore confirm that all premiums in the above regard have been paid.

Yours faithfully

Signed:_____

For: _____

Part C2: Pricing Data

C2.1 PRICING INSTRUCTIONS

The Schedule of Quantities consists of items covering the measurement and payment of the Contractor's costs for general liabilities, the construction of temporary and permanent works, maintenance (when specified) and profit.

The Conditions of Bid, Conditions of Contract, Specifications (including the Project Specification) and Drawings shall be read in conjunction with the Schedule of Quantities.

1. Rates and Prices

The price to be inserted in the Schedule of Quantities shall be the full inclusive price to be paid by the Employer for the work described under Part 3.1 Descriptions of Works. Such price shall cover all costs and expenses that may be required in and for the construction of the work described and the cost of all general risks, liabilities and obligations set out or implied in the documents on which the bid is based.

The quantities as indicated in the pricing schedule are only estimated quantities which will be used in order to evaluate the bid. The actual quantities ordered and delivered shall depend on the needs of the municipality.

2. Method of Measurement and Payment

The Schedule of Quantities consists of re-measurable items only.

3. Descriptions, Directions and References

Descriptions and directions of materials to be used and works to be executed given in the Schedule of Quantities are for identification purposes only, are abbreviated and are not necessarily complete.

4. Nett Measurement

N/A

5. Sales Tax and Surcharge

The bid rates and prices, including (where applicable) rates for Daywork Items, shall include any relevant statutory surcharge(s) as applicable at the time of the closing of the bid, but exclude Value Added Tax (VAT).

6. Errors in the Priced Schedule

Responsive bids will be checked for arithmetical errors and corrected in the following manner:

a) Where there is a discrepancy between the amounts in figures and words, the amounts in words shall govern.
b) If bills of quantities (or schedule of quantities or schedule of rates) apply and there is an error in the line item total resulting from the product of the unite rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.
c) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer’s addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

7. Rejection of Bid

A bid may be rejected if the price is, in the opinion of the Employer, obviously unreasonable, out of proportion high or low measured against the other tenders received. No reasons for rejection will be given other than the above.

8. Use of the Schedule of Quantities

N/A

9. Entries

The bidder shall make all entries in the Bill of Quantities in legible BLACK INK.

10. The units of measurement indicated in the bill of quantities are metric units.

The following abbreviations are used in the bill of quantities:

mm	=	millimetre	h	=	hour
m	=	metre	kg	=	kilogram
km	=	kilometre	t	=	ton (1000 kg)
m^2	=	square metre	No	=	number
ha	=	hectare	MN	=	meganewton
ℓ	=	litre	kW	=	kilowatt
m^3	=	cubic metre	Prov Sum	=	Provisional Sum
kℓ	=	kilolitre	MPa	=	megapascal
m^3.km	=	cubic metre-kilometre	%	=	per cent

AC	-	Asbestos-Cement
b	-	barrel
br	-	branch
c	-	centre
CI	-	Cast Iron
CID	-	Constant Internal Diameter
COD	-	Constant Outer Diameter
df	-	double flanged (both faces flanged)
dia	-	diameter
f`	-	flange or flanged face where a dimension is indicated
GRP	-	Glass Reinforced Polyester
h	-	hour
HDG	-	Hot Dipped Galvanised
ID	-	Internal Diameter
kPa	-	kilopascal
LR	-	Long Radius
MR	-	Medium Radius
MS	-	Mild Steel
OD	-	Outside Diameter
p	-	plain end unmachined
pf	-	puddle flange
pm	-	plain end to suit jointing with couplings
OTY	-	quantity (refers to a heading in the bill of quantities)
RL	-	Reduced Level
SS	-	Stainless Steel
VJ	-	Viking Johnson
wt	-	wall thickness

C2.2 BILL OF QUANTITIES

INDEX **PAGES**

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	Rate	AMOUNT
	1200 A PSA	**SCHEDULE 1 : PRELIMINARY AND GENERAL**				
1.1	**8.3**	**SECTION 1.1 : FIXED CHARGE AND VALUE RELATED ITEMS:**				
1.1.1	8.3.1	Contractual Requirements	Sum	1		
1.1.2	**8.4.2.1 PSA 8.3**	**Facilities for Engineer:**				
		a) Office Buildings				
		Office type 1 and furniture (1 No)	Sum	1		
1.1.3	8.3.2.2	Facilities for Contractor:				
		a) Offices and storage sheds	Sum	1		
		d) Ablution and latrine facilities	Sum	1		
		e) Tools and equipment	Sum	1		
1.1.5	PSA 8.10 C3.6.1	Environmental Specification & Compliance	Sum	1		
1.1.6	PSA 8.9 C3.6.2	Compliance with the OHS Act and Construction Regulations	Sum	1		
1.1.7	8.3.4	Removal of site establishment	Sum	1		
1.1.8	PSA 8.3.5	Security of Contractor's plant and personnel	Sum	1		
1.2	**8.4**	**TIME RELATED ITEMS**				
1.2.1	8.4.1	Contractual Requirements	Sum	1		
1.2.2	8.4.2.1 PSA8.4	Facilities for Engineer:				
	PSA 8.4 PSAB	a) Office Buildings	Sum	1		
		e) Nameboards (1 No)	Sum	1		
		f) Survey assistant and survey materials	Sum	1		
1.2.3	8.4.2.2	Facilities for Contractor:				
		a) Offices and storage sheds	Sum	1		
		b) Workshops	Sum	1		
		c) Living accommodation	Sum	1		
TOTAL CARRIED FORWARD						

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	Rate	AMOUNT
		BROUGHT FORWARD				
		d) Ablution and latrine facilities	Sum	1		
		e) Tools and equipment	Sum	1		
		f) Water supplies, electric power and communications	Sum	1		
		g) Dealing with water	Sum	1		
		h) Access	Sum	1		
1.2.4	8.4.3	Supervision for duration of construction	Sum	1		
1.2.5	8.4.4	Company and head office overhead costs for the duration of the contract	Sum	1		
1.2.6	8.4.5	Other time-related obligations	Sum	1		
1.2.7	PSA 8.10 C3.6.1	Environmental specification	Sum	1		
1.2.8	PSA 8.9 C3.6.2	Compliance with the OHS Act and Construction Regulations	Sum	1		
1.2.9	PSA 8.4.6	Security of Contractor's plant and personnel	Sum	1		
1.2.12		Providing 2 draft copies of the Installation, Operation and Maintenance Manual 1 week prior to handover of the Works	Sum	1		
1.2.13		Inspection, Tests, etc. of all equipment outside the Prince Albert area other than the contract Site	Sum	1		
1.2.14		Provision of all Test Certificates and Certificate of Compliance in terms of the Code of Practice for Wiring of Premises	Sum	1		
1.2.15		Checking, starting up, testing and commissioning of the complete Works	Sum	1		
1.2.16		Operational Acceptance Testing of the complete works	Sum	1		
1.2.17		Operational and Maintenance Training	Sum	1		
1.2.18		Trial Operation Period	Sum	1		
1.3		**Dayworks**				
1.3.1		Tractor Loaded Backactor (TLB)	hr	0		Rate Only
		TOTAL CARRIED FORWARD TO SUMMARY				

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	Rate	AMOUNT
		SECTION 2: AERATORS				
		Mechanical Components				
2.1		Supply, install and commission 11kW Aspirating Aerators on floating pontoons and anchored to eliminate movement. The pumps must be able to have a transfer efficiency of 1,8 kgO/kWh	No.	2		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	Rate	AMOUNT
		SECTION 3 : **MISCELLANEOUS MECHANICAL EQUIPMENT**				
3.1		Allow for all costs in connection with the installation of Metsi Chem Chlorine Chip Dosing Units on the inlet to the Chlorine contact tank (The Unit have been supplied by other), the unit is to be installed with saddles on either side of the already install RSV valve on the 315ø pipe on either side of a manhole				
3.1.1		Installation of the Metsi Chem Units	No	1		
3.1.2		Supply and install saddles on 315ø PVC-U pipe	No	2		
3.1.3		Connect Metsi Chem Unit and commission	Sum	1		
TOTAL CARRIED FORWARD TO SUMMARY						

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		SECTION 4 : ELECTRICAL				
4	**D8**	**LOW VOLTAGE SWITCHBOARDS / MCCs** Complete including all control equipment to suit the mechanical equipment offered and in accordance with Clauses D8 of the Specification.				
4.1		**Aeration MCC**				
4.1.1		Supply Aeration MCC	Item	1		
4.1.2		Install Aeration MCC	Item	1		
4.1.3		Factory Acceptance Testing of all new Aeration MCC	Item	1		
4.1.4		Site Acceptance Testing and Commissioning of new Aeration MCC	Item	1		
4.2	**D9**	**LV POWER CABLES** PVC PVC SWA PVC 600/ 1000 V cables with stranded copper conductors in accordance with Clause D9 of the Specification.				
4.2.1		**Supply LV cables**				
4.2.1.1		35 mm², 4C	m	14		
4.2.1.2		25 mm², 4C	m	37		
4.2.1.3		16 mm², 4C	m	576		
4.2.1.4		10 mm², 4C	m	89		
4.2.1.5		6 mm², 4C	m	12		
4.2.1.6		4 mm², 4C	m	21		
4.2.1.7		16 mm², 3C	m	82		
4.2.1.8		2.5 mm², 3C (E-Stop)	m	665		
4.2.2		**Install LV cables**				
4.2.2.1		35 mm², 4C	m	14		
4.2.2.2		25 mm², 4C	m	37		
4.2.2.3		16 mm², 4C	m	576		
CARRIED FORWARD						

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
4.2.2.4		10 mm², 4C	m	89		
4.2.2.5		6 mm², 4C	m	12		
4.2.2.6		4 mm², 4C	m	21		
4.2.2.7		16 mm², 3C	m	82		
4.2.2.8		2.5 mm², 3C (E-Stop)	m	665		
4.2.3		**Supply Terminations for LV cables**				
4.2.3.1		35 mm², 4C	No	2		
4.2.3.2		25 mm², 4C	No	2		
4.2.3.3		16 mm², 4C	No	8		
4.2.3.4		10 mm², 4C	No	2		
4.2.3.5		6 mm², 4C	No	2		
4.2.3.6		4 mm², 4C	No	2		
4.2.3.7		16 mm², 3C	No	2		
4.2.3.8		2.5 mm², 3C (E-Stop)	No	8		
4.2.4		**Install Terminations for LV cables**				
4.2.4.1		35 mm², 4C	No	2		
4.2.4.2		25 mm², 4C	No	2		
4.2.4.3		16 mm², 4C	No	8		
4.2.4.4		10 mm², 4C	No	2		
4.2.4.5		6 mm², 4C	No	2		
4.2.4.6		4 mm², 4C	No	2		
4.2.4.7		16 mm², 3C	No	2		
4.2.4.8		2.5 mm², 3C (E-Stop)	No	8		
		CARRIED FORWARD				

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
4.3	**D11**	**CABLE TRENCH EXCAVATIONS** Trenching in accordance with Clause D11 of the Detailed Specification.				
4.3.1		Low Voltage Trench				
4.3.2		Excavation in hard material	m	15		
4.3.3		Excavation in intermediate material	m	360		
4.3.4		Excavation in soft material	m	20		
4.3.5		Backfilling and compacting (extra imported if required and will only be used with the approval of the Engineer)	m^3	30		
4.3.6		Danger tape (full width of the cable trench = 600mm)	m	900		
4.4	**D12**	**EARTHING AND BONDING** Earthing and Bonding in accordance with Clause D12 of the Specification.				
4.4.1		Earth Electrode Resistance Measurement	Sum	1		
4.4.2		**Supply Earth Continuity Conductors**				
4.4.2.1		1C 16 mm^2 BCEW	m	37		
4.4.2.2		1C 10 mm^2 BCEW	m	17		
4.4.2.3		1C 6 mm^2 BCEW	m	50		
4.4.2.4		1C 4 mm^2 BCEW	m	3		
4.4.2.5		1C 2.5 mm^2 BCEW	m	15		
4.4.3		**Install Earth Continuity Conductors**				
4.4.3.1		1C 16 mm^2 BCEW	m	37		
4.4.3.2		1C 10 mm^2 BCEW	m	17		
4.4.3.3		1C 6 mm^2 BCEW	m	50		
4.4.3.4		1C 4 mm^2 BCEW	m	3		
4.4.3.5		1C 2.5 mm^2 BCEW	m	15		
		CARRIED FORWARD				

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
4.4.4		**Termination of Earth Continuity Conductors**				
4.4.4.1		1C 16 mm² BCEW	No	2		
4.4.4.2		1C 10 mm² BCEW	No	2		
4.4.4.3		1C 6 mm² BCEW	No	2		
4.4.4.4		1C 4 mm² BCEW	No	2		
4.4.4.5		1C 2.5 mm² BCEW	No	2		
4.4.4.6		Bonding of all extraneous items in accordance with SANS 10142-1	Sum	1		
4.5	**D10**	**CABLE SUPPORTS** Cable supports in accordance with Clause D10 of the Specification, including all supports, unistrut, joint kits, nuts, bolts etc.				
4.5.1		**Supply 316L Stainless Steel Cable Ladder**				
4.5.1.1		200 mm wide straight	m	80		
4.5.1.2		200 mm wide riser / dropper	No.	1		
4.5.1.3		200 mm wide 90° elbow	No.	1		
4.5.1.4		200 mm wide T-piece	No.	1		
4.5.2		**Install 316L Stainless Steel Cable Ladder**				
4.5.2.1		200 mm wide straight	m	80		
4.5.2.2		200 mm wide riser / dropper	No.	1		
4.5.2.3		200 mm wide 90° elbow	No.	1		
4.5.2.4		200 mm wide T-piece	No.	1		
4.5.3		**Supply 316L Angle Iron runners**				
4.5.3.1		20mm x 20mm x 5mm	m	80		
4.5.3.2		40mm x 40mm x 5mm	m	64		
		CARRIED FORWARD				

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
4.5.4		**Install 316L Angle Iron runners**				
4.5.4.1		20mm x 20mm x 5mm	m	32		
4.5.4.2		40mm x 40mm x 5mm	m	15		
4.5.5		**Supply 316L Wire Tray**				
4.5.5.1		50mm wide	m	40		
4.5.5.2		100mm wide	m	15		
4.5.5.3		200mm wide	m	15		
4.5.6		**Install 316L Wire Tray**				
4.5.6.1		50mm wide	m	40		
4.5.6.2		100mm wide	m	15		
4.5.6.3		200mm wide	m	15		
4.6	**D13**	**FIELD CONTROL STATIONS** Field control stations in accordance with Clause D13 of the Specification				
4.6.1		Supply field control stations (E-stop)	No	2		
4.6.2		Install field control stations (E-stop)	No	2		
4.6.3		Site testing and commissioning field control stations	No	2		
4.7	**D4**	**DRAWINGS, MANUALS & TRAINING** In accordance with Clause D4 of the Specification				
4.7.1		Drawings and other project documentation	Sum	1		
4.7.2		Operation and Maintenance Manuals	Sum	1		
4.7.3		Training of Municipal staff in the Maintenance and Operations of the new Electrical and Electronic equipment	Sum	1		
		CARRIED FORWARD				

ITEM	PAYMENT	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
		BROUGHT FORWARD				
4.8		**PROVISIONAL SUMS**				
4.8.1		Alterations to existing electrical systems	PSum	1	R40 000.00	R 40 000.00
4.8.2		Overheads, charges and profit on item 4.8.1	%		R40 000.00	
4.9		**ROAD CROSSINGS**				
4.9.1		Supply 110mm Kabelflex Ducts	m	12		
4.9.2		Install 110mm Kabelflex Ducts	m	12		
4.10	**D3**	**LIAISE WITH MUNICIPALITY** In accordance with Clause D3 of the Specification				
4.10.1		Liaise with Municipality regarding switching etc	Sum	1		
4.11		**All other items not included above but which are nevertheless necessary to meet the Scope of Work and/or are required for the proper, safe and effective operation of the plant (Specify)**				
4.11.1		…… …… ……				
4.11.2		…… …… ……				
4.11.3		…… …… …… ……				
		TOTAL CARRIED FORWARD TO SUMMARY				

SUMMARY OF SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	AMOUNT
Section 1	Preliminary and General	R
Section 2	Aerators	R
Section 3	Miscellaneous mechanical equipment	R
Section 4	Electrical	R
	Sub-total of Sections Contingencies: Allow the sum of 10% (ten percent) of the above Sub-total for Contingencies to be spent as the Engineer may direct and to be deducted in whole or in part if not required.	R
	TOTAL INCLUDING CONTINGENCIES	R
	ALLOW 14% FOR VALUE ADDED TAX	R
TOTAL CARRIED FORWARD PART C1.1 FORM OF OFFER AND ACCEPTANCE on Page 87		**R**

Part C3: Scope of Work

Status

Should any requirement or provision in the parts of the Scope of Work conflict with any requirement of any Standardised Specification, particular specification or any drawings, the order of precedence, unless otherwise specified, is:

Drawings
Scope of Work (Parts C3.1, C3.4 C3.5 and C3.6)
SANS Standardised Specifications

C3.1 Description of Works

C3.1.1 EMPLOYER'S OBJECTIVE

The Employer's objectives are to improve the hydraulic and the biological treatment capacity of the existing wastewater treatment works as well as to improve the effluent quality. This project has been identified by Council and deemed critical/urgent to prevent any further delays for future service delivery projects. To ensure that the project is completed within the shortest time frame suitable, service providers are requested to submit bids for the proposed scope of work.

C3.1.2 OVERVIEW OF THE WORKS

The work to be carried out under the Contract is as provided for in the Bill of Quantities. Any scope changes/variations instructed by the Engineer will be measured and paid for at the rates tendered in the Schedule of Quantities.

This Contract provides for the design, supply and installation of 2 no. of 11 kV aspirating aerators on floating pontoons, LV cabling and MCC panel.

This Contract is for the mechanical, electrical, control and instrumentation as well as civil works at the Prince Albert Wastewater Treatment Plant.

C3.1.2.1 Location of the Site

The site of the Works is municipal property in Prince Albert, which falls under the jurisdiction of the Prince Albert Municipality.

C3.1.2.2 Occupation of the Site

Access to the site of the Works will be given to the Contractor on the Commencement Date.

C3.1.2.3 Private Properties

Although all of the construction work will be on municipal or public property, some of the work to be carried out is adjacent to private property and the Contractor shall exercise strict control over his employees to ensure that they do not trespass beyond any fences.

C3.1.3 EXTENT OF THE WORKS

The work that is to be carried out under this contract is as provided for in the bill of quantities. Variations introduced will be measured and paid for at the rates tendered for appropriate items listed elsewhere in the bill of quantities or in the absence of such rates, as extra work.

The following is merely an overview of the Work and shall in no way limit the work to be carried out by the Contractor:

- Establishment on site of the Contractor's campsite and plant, materials and personnel;
- Supply, installation, commissioning, design where necessary and trial period for 2 no. of 11 kV aspirating aerators on floating pontoons;
- Supply and installation of MCC panel as well as electrical cabling;
- The excavation of trenches and laying of electrical cabling;
- Setting out of the Works;
- Construction of cable supports;
- Protection and crossing of existing services.

C3.2 Engineering

C3.2.1 DESIGN SERVICES AND ACTIVITY MATRIX

Works designed by, per design stage*:*

Concept, feasibility and overall process	Employer
Layout to tender stage	Employer
Final design to be approved for construction stage for civil and structural Works	Employer
Final design to be approved for construction stage for mechanical, electrical, control and instrumentation	Contractor
Temporary works	Contractor
Preparation of as-built (marked up Engineers drawings)	Contractor

C3.2.2 DESIGN, DRAWINGS AND INFORMATION TO BE PROVIDED BY CONTRACTOR

No.	Information	Required when …	Format	No. of copies	Engineer's approval required	Further info.
1	Project team details	1 week ACD	As appropriate	3	Yes	Note 1
2	Project program	2 weeks ACD	Gantt chart	3	Yes	Note 5
3	Requirements for civil works	3 weeks AG	Drawings	3	Yes	Note 2
4	Piping and Instrumentation Diagrams (P&ID).	3 weeks ACD	Drawings	3	Yes	Note 6
5	Control Philosophy (Clause 2, Part C3.2)	3 weeks ACD	Documents	3	Yes	Note 6
6	Detailed design, manufacturing drawings & calculations	on-going	Inspection at the manufacturer's premises			Note 3
7	Unpriced purchase orders	on-going	Documents	1	Yes	Note 4
8	Progress reports	monthly	as appropriate	2	No	Note 7

Abbreviations:
ACD = after Commencement Date
AG = after "go ahead" for that equipment

Note 1:

Project team organogram, showing names and positions of key personnel, including their CVs. Contact details of project manager and responsible director.

Note 2:

Fully dimensioned drawings of the plant, the necessary data concerning the geometry of structures housing the plant, the position and sizes of all foundations, bolt holes, openings in walls or floors and all other special features affecting the design and construction of the Works for his approval, so that the Engineer can arrange for the necessary concrete work, foundations, bolt holes, openings for pipes, cable ducts, etc. for the proper erection and installation of the plant.

The Contractor shall be responsible for any errors or omissions in the Contractor's Drawings unless they are due to incorrect Engineer's Drawings or other written information supplied by the Engineer. Approval by the Engineer of the Contractor's Drawings shall not relieve the Contractor from any responsibility under this Subclause.

Within the following 14 days the Contractor shall deal with any amendments to the drawings required by the Engineer, and submit the final version to the Engineer.

Any cutting or alteration of structural work arising from inadequate or incorrect dimensions and particulars afforded by the Contractor, or through late receipt of such particulars, may be arranged by the Engineer to be carried out as he thinks fit at the expense of the Contractor concerned under this Contract. In any event, the Contractor shall bear any costs he may incur as a result of delay in providing Contractor's Drawings and other information or as a result of errors or omissions therein, for which the Contractor is responsible.

The Contractor shall at his own cost carry out any alterations or remedial work necessitated by such errors or omissions for which he is responsible and modifies the Contractor's Drawings and such other information accordingly.

Note 3:

Including, but not limited to –

- strength and durability calculations of all gearboxes in accordance with AGMA 218.01
- calculations of relay settings, including graphs where applicable

Note 4:

Including all technical information or documentation appended to or included with the order.

Note 5:

The Programme shall identify all major activities, principal items of plant and equipment and their components. The following activities and their duration shall, in addition to the requirements of Clause 8.3 of the Conditions of Contract, form the minimum basis for the preparation of the Programme:

- Insurance Bond and general obligations
- Design
- Plant equipment and arrangement drawings
- Project Quality Plan
- Schedules
- HAZOPS
- Procurement
- Inspection and works testing
- Delivery
- Installation
- Adjustment
- Testing
- Commissioning
- Defects Liability Period

Note 6:

The Contractor shall provide a Piping and Instrumentation Diagram (P&ID) which will cover all equipment provided under this contract. The preliminary P&ID shall be submitted within four (4) weeks, which will be checked and tag numbers will be provided by the Engineer for inclusion into the P&ID.

The Control Philosophy shall also be provided within four (4) weeks.

C3.2.3 EMPLOYER'S DESIGN

The civil and structural Works have been designed by the Engineer.

C3.2.3 DESIGN BRIEF

The Contractor will be responsible for designing the following infrastructural components of the Works.

i. All formwork and scaffolding.
ii. Mechanical engineering related works.
iii. Electrical engineering related works.
iv. Control and instrumentation engineering related works.

C3.2.4 DRAWINGS

The Contractor will be responsible for the provision of mechanical, electrical, control and instrumentation drawings as per C3.2.2.

The following standard drawings are applicable to the Contract and are bind as part of this Contract Document.

DRAWING TITLE	DRAWING NO.
General Layout	MD2608-C-001
Aeration MCC General Arrangement and Single Line Diagram	MD2608-E-010
Typical MCC Schematic	MD2608-E-020
Typical Cable Trench Layout	MD2608-E-021
Typical E-Stop Station	MD2608-E-022
Typical MCC Door Layout	MD2608-E-023

Notes:

1. The drawings that form part of the tender documents shall be used for tender purposes only.
2. The Contractor will be supplied with three (3) paper prints of each of the drawings required for construction. These copies are issued free of charge and the Contractor shall make any additional copies he may require at his own cost.
3. Only figured dimensions shall be used and drawings shall not be scaled unless otherwise instructed.
4. Any information in the possession of the Contractor, which the Engineer requires to complete his record drawings shall be supplied to the Engineer's Representative before a certificate of completion will be issued.

C3.3 Procurement

C3.3.1 PREFERENTIAL PROCUREMENT PROCEDURES

The works shall be executed in accordance with the conditions attached to preferences granted in accordance with the Preferencing Schedules.

C3.3.2 SUBCONTRACTING

The Contractor may subcontract portions of the Works included in the Contract. Clause 4.4 of the General Conditions of Contract makes provision for subcontracting.

C3.4 Construction

CONTENTS **PAGE**

PART A: APPLICABLE STANDARD SPECIFICATIONS

For the purposes of the contract, the latest issues of the following standardised specifications, applicable on the date of tender advertisement, shall apply. These specifications are not bound into this document.

SABS 1200 STANDARD SPECIFICATIONS

SABS 1200 A	:	General
SABS 1200 AA	:	General (Small Works)
SABS 1200 D	:	Earthworks
SABS 1200 DB	:	Earthworks (Pipe Trenches)
SABS 1200 LB	:	Bedding (Pipes)
SABS 1200 LD	:	Sewers

PART B: PROJECT SPECIFICATIONS REFERRING TO THE STANDARD SPECIFICATIONS

Amendments to the standard specifications are included in this Part B: Project Specifications.

i) The project specifications form an integral part of the contract documents and supplement the standard specifications.
ii) In the event of any discrepancy between the project specifications and a part of the standard specifications, the schedule of quantities, or the drawings, the project specifications shall take precedence.
iii) The standard specifications, which form part of this contract, have been written to cover all phases of civil work, and they may therefore cover items not applicable to this particular contract.

In certain clauses the standard specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains some additional specifications required for this particular contract.

The number of each clause and each payment item in this part of the project specifications consists of the prefix B followed by a number corresponding to the number of the relevant clause or payment item in the standard specifications. The number of a new clause or a payment item which does not form part of a clause or a payment item in the in the standard specifications and which is included here, is also prefixed by B followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the standard specifications.

PART A: APPLICABLE STANDARD SPECIFICATIONS

BAA: GENERAL (Small Works)
(Applicable to SABS 1200AA - 1986)

BAA 4 PLANT

BAA 4.2 Contractor's Office and Stores

On completion of the Works or as soon as the facilities are no longer required, the Contractor shall remove such facilities and clear away all surface indications of their presence.

BAA 5 CONSTRUCTION

BAA 5.1 Survey

BAA 5.2 Protection of Underground Services (Subclause 5.2)

The Contractor is fully responsible for the protection of all existing services. The Contractor will be held responsible for all damage by himself to services, which are:

i) In the approximate position of services indicated on construction drawings;
ii) Where the presence of such services can be reasonably foreseen by an experienced Contractor from associated surface structures or markings or underground warning tape;
iii) Where he has been informed of the presence of such service by any person or authority.

Although the location of all known services will be shown on the Engineer's drawings, the Contractor should anticipate encountering services which have been abandoned or services which are in use, but not recorded.

Protection of services shall be priced on the basis of the service remaining in place and operating at all times during construction.

Any service that are damaged or disrupted by the Contractor shall be repaired by the Contractor or the relevant authority. All costs involved will be charged to the Contractor

BAA 5.6 Pollution

The Contractor shall take all reasonable measures to minimise any dust nuisance, noise, pollution, litter and inconvenience to or interference with the public or others arising out of the execution of the Works.

BAA 5.7 Security

BAA 5.7.1 Security of Contractor's Plant and Personnel

The Tenderer shall note that, notwithstanding the insurances effected by the Employer, the Contractor shall be responsible for the effecting of safety and security of plant and personnel on and around the site of the works, and that no claims in this regard will be entertained by the Employer.

The Contractor's attention is drawn to the fact that the work is to be carried out in an area where there is a high incidence of criminal activity.

The sum entered by the Contractor in the Schedule of Quantities for effecting of safety and security of plant and personnel on and around the site of the works shall be deemed to include full compensation for all the measures necessary to effect the safety and security,

BAA 8 MEASUREMENT AND PAYMENT

BAA 8.5 Dayworks

The Daywork Schedule will be used at the discretion of the Engineer for valuation of extra work which cannot conveniently be valued at rates submitted in the Bills of Quantities.

The rates entered for labour, materials and plant shall be inclusive of overhead charges and profit, site supervision of staff, insurance, holidays with pay and use and maintenance of small hand tools and non-mechanical plant, travelling allowances, other emoluments and allowances.

Add the following items:

BAA 8.9 **Obtaining of and allowance for payment of all applicable wayleaves**. Unit: Sum

The tendered sum shall include full compensation to the Contractor for all the costs involved in obtaining wayleaves as specified in Section 3.5 Management, including payment of deposits).

BAA 8.10 **Compliance with OHS Act and Regulations** Unit: Sum
(including the Construction Regulations 2014)

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and Regulations (including the Construction Regulations 2014) at all times for the full duration of the Contract, as described in Section 3.6 Annex 1. The successful tenderer shall provide the Engineer with a complete breakdown of this tendered sum. This sum will be paid to the Contractor in equal monthly amounts subject to proper/ substantial compliance.

BAA 8.11 **Compliance with Environmental Regulations** Unit: Sum
(including the NEMA Act and Environmental Regulations)

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the NEMA Act, latest Environmental Regulations and Section 3.5 Management at all times for the full duration of the Contract. The successful tenderer shall provide the Engineer with a complete breakdown of this tendered sum.
This sum will be paid to the Contractor in equal monthly amounts subject to proper/substantial compliance.

BAA 8.12 **Security of Contractor's Plant and Personnel** Unit: Sum

The tendered sum shall include full compensation for all costs incurred in effecting the safety and security of plant and personnel on site as described in Clause BAA5.7.1.

BAA 8.13 **Appointment Local Labourers and CLO** Unit: Prov Sum

The Contractor shall appoint a minimum of five (5) local labourers for a duration of 63 days each for this Contract. All personnel appointed on a temporary basis for this Contract will be from the local community. The Contractor must appoint workers as listed on the Prince Albert Municipality unemployment database.

Local labourers will be remunerated at a rate of at least the minimum required wage (Labour Department) whichever is the highest.

The remuneration of the five (5) local labourers is to be included in this item.

BAA 8.14 **As-built Survey** Unit: km

This item includes all work related to surveying the completed installation, including all labour and equipment required. The item will be measured in km and the Contractor will be remunerated for each km surveyed.

BC: SITE CLEARANCE

(Applicable SABS 1200 C - 1980 As Amended 1982)

BC 3 MATERIALS

BC 3.1 Disposal of Material

Notwithstanding the provisions of Subclause 3.1, the Contractor shall make his own arrangements for locating an acceptable dumping site for demolishing- and unused excavation material. Any charges for use of such dumping site or other costs involved, including transport, will be deemed to be included in the rates tendered for excavation and clearing operations.

BC 8 MEASUREMENT AND PAYMENT

BC 8.2.8 Demolish and remove structures / buildings and dismantle steelwork, cement, etc.

Change the unit to "m or m^2" and replace the contents of this item with the following:

The rate shall cover the cost of carefully removing the **structures / buildings and dismantle steelwork, cement, etc.**, stacking, storing and safeguarding all materials, the cost of loading, transporting and off-loading such materials, the cost of re-instating the paving in its original position and condition using the dismantled material and the cost of appurtenant materials that may be required to restore to its original condition before dismantling.

BC 8.2.10 Amend the description of 8.2.10 to read:

Remove topsoil to depth ordered by the Engineer and stockpile and maintain.

BC 8.2.11 Saw Cutting

The rate shall cover the cost for saw cutting of premix including all markings and setting out to ensure that all saw cutting is done in a straight line.

BD: EARTHWORKS

(Applicable to SABS 1200 D - 1982)

BD 8 MEASUREMENT AND PAYMENT

BD 8.3 Scheduled Items

BD 8.3.10 Topsoiling

Change the unit to "m³" and replace the contents of this item with the following:

The unit of measurement shall be the cubic metre and the quantity shall be calculated from the authorised dimensions.

The tendered rate shall include loading of the topsoil from stockpiles, transporting it for the free-haul distance, and off-loading, spreading, shaping and lightly compacting the topsoil.

BDB: EARTHWORKS (Pipe Trenches)

(Applicable SABS 1200 DB - 1989)

BDB 3 MATERIALS

BDB 3.5 Backfill Materials

Add the following paragraphs to Subclause BDB 3.5:

c) Cement-stabilized backfilling

Backfilling shall, where directed by the Engineer, be stabilized with 5% cement. The aggregate shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed with 5% cement and shall be compacted in layers of 100 mm thick to 90% of modified AASHTO density.

d) Soilcrete backfilling

The aggregate for soilcrete shall be mixed with 5% cement and shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed in a concrete mixer with the cement and enough water to acquire a consistency that allows the mixture to be placed with vibrators to fill all voids between the pipe and the sides of the trench. Shuttering shall be used where necessary.

BDB 3.7 Selection

Replace the words "if he so wishes" *in the first line of the second paragraph with the words* "at his own cost."

BDB 5 CONSTRUCTION

BDB 5.1 Precautions

BDB 5.1.2 Stormwater, Seepage and Dewatering of Excavations

In addition to the Contractor's responsibilities for dealing with water, the Engineer may order the Contractor to place a crushed stone bedding layer (min. thickness 150 mm) on the trench bottom.

Prior to the provision of the stone layer, a Grade 3 filter fabric of minimum mass of 150 g/m^2, must be installed on the trench bottom. After placement of the stone bedding, the filter fabric shall be folded over the stone with a minimum overlap of 300 mm to form an enclosed drain. The specified bedding material shall then be used to bed the pipe.

The Contractor will only be paid for providing and laying the stone bedding layer and filter fabric after receipt of a written order to do so from the Engineer.

BDB 5.1.3 Accommodation of Traffic and Access to Properties

Replace the semicolon and the word and *at the end of Subclause* BDB 5.1.3(a) *with a full stop and replace item (b) with the following:*

b) Where necessary to achieve compliance by the Contractor with his obligations in terms of the Project Specifications to provide and maintain pedestrian and vehicular access to properties affected by the works, the Contractor shall construct and maintain to the satisfaction of the Engineer, such temporary access roads around, and/or steel or timber bridges over excavations in roads, pavements, entrances or accesses to properties.

Temporary pedestrian access bridges shall be at least 1.2 m wide and temporary access bridges for vehicles shall be at least 3.6 m wide. All temporary access bridges shall be fitted with handrails as well as protective mesh fencing on both sides.

On completion of the work, the Contractor shall dismantle and remove all such temporary constructions and reinstate these areas to their former condition. Except only where the Engineer has included in the Schedule of Quantities, particular payment items specifically therefore, the Contractor will not be paid directly for the construction and maintenance of temporary access roads and/or the provision and maintenance of bridges as aforementioned, and the costs thereof shall be deemed included in the Contractor's tendered rates for excavation.

Add the following new subclause to Subclause BDB 5.1:

BDB 5.1.5 Removal of existing pipelines

Where existing pipes have to be removed, they shall be carefully opened up by machine excavation to 300 mm above the pipes after which the whole pipe shall be fully exposed by means of hand excavation. The excavation width shall comply with Subclause BDB 8.2.3.

The pipes shall be removed from the trench in a manner approved by the Engineer, and brought to the surface for inspection by the Engineer.

Pipes that are declared suitable for reuse and pipes declared unfit for reuse shall be dealt with in an applicable manner described in the specifications, or on the Drawings or on the Engineer's instructions, as relevant.

BDB 5.4.1 Shoring of Pipe Trenches

The Contractor shall assume full responsibility for the safety of excavations, and shall carry out all measures necessary to make secure, by timbering and strutting or sheet piling, the excavated face. All timbering and strutting must be of sufficient strength and capable of being removed readily as the work proceeds.

The Contractor shall further take all precautions to safeguard existing services and structures near or next to excavations carried out by him and shall provide and erect any shoring or underpinning that may be necessary.

The timbering, strutting or sheet piling of pipe trenches shall not relieve the Contractor of any responsibility and all claims for compensation for damage or injury caused or aggregated by the Contractor not taking all precautions to safeguard persons or property, shall be met entirely by the Contractor.

BDB 5.4.2 Existing Services

The Contractor shall bear the full cost of the repairs to any services damaged due to the Contractor's negligence.

BDB 5.6 Backfill

BDB 5.6.3 Disposal of soft excavation material

Replace the words "unless otherwise required in the project specification" *at the end of Subclause BDB5.6.3 with*:

"… or to spoil in accordance with the requirements of Subclause BD 5.2.2.3, as instructed by the Engineer."

BDB 8 MEASUREMENT AND PAYMENT

BDB 8.3 Scheduled Items

BDB 8.3.2 Excavation

a) Excavate in all materials, for trenches, backfill compact and dispose of surplus material

*Replace "*of 1.0 m" *in the first sentence* of 8.3.2(a) *with*:

"as specified in the Schedule of Quantities."

b) Extra over item (a) above for:

Add the following at the end of the existing sub-item 2:

No payments will be made under subitems (1) and (2) in respect of any materials measured and paid for under Subitem 3 below.

And add the following new subitems in 8.3.2(b):

3) Hand excavation where ordered by the Engineer in:

a)	Soft material	Unit: m³
b)	Intermediate material	Unit: m³
c)	Hard material	Unit: m³

The unit of measurement shall be the cubic metre of material, measured in place according to the authorised dimensions, which was excavated by hand on the specific prior written instructions of the Engineer; provided always that the Engineer's said instruction shall have stated that measurement and payment for such hand excavation will be in accordance with this item.

The tendered rate shall include full compensation for the additional cost, effort and time resulting from excavating in the respective materials using hand methods only.

The Engineer shall not be obliged to authorise payment under this item in respect of any hand excavation carried out (whether ordered in writing or otherwise), which hand excavation was in any case necessary to achieve compliance by the Contractor with his obligations under the Contract to

a) utilise construction appropriate to the nature of the specific parts of the works; and/or
b) protect existing structures and/or services; and/or
c) comply with all prevailing legislation and regulations.

4) Backfill stabilized with 5% cement where directed by the Engineer Unit: m³

The unit of measurement shall be the cubic metre of backfill material, measured in place after compaction according to the authorised dimensions, which was stabilized on the Engineer's instructions in accordance with Subclause BDB 3.5(c).

The tendered rate shall include full compensation for supplying the cement and for selecting, mixing, backfilling and compacting the stabilized material to 90% of modified AASHTO density.

5) Soilcrete backfill where directed by the Engineer Unit: m³

The unit of measurement shall be the cubic metre of soilcrete placed on the Engineer's instructions in accordance with Subclause BDB 3.5(d), measured in place according to the authorised dimensions.

The tendered rate shall include full compensation for supplying the cement and for selecting, mixing and placing the soilcrete as well as for the cost of shuttering if required.

Add the following Subitems in 8.3.2 after Sub-item 8.3.2(c):

d) Excavate in all materials beyond specified minimum trench base width for manholes, catchpits, valve chambers and the anchor blocks and beams, cut off collars and backfill around structures: Unit: m³

The unit of measurement shall be the cubic metre of material excavated, measured in place according to the authorised dimensions, and excluding the volume of material excavated and paid for under sub-item (a).

The tendered rate shall include for the costs of excavating in all materials, backfilling, compacting, trimming and tidying the final surface around the structure, disposing of surplus and unsuitable materials within the free-haul distance and, where applicable, selecting and keeping separate, excavated material suitable for use as backfill compacted to 90% of modified AASHTO around the structures.

e) Extra over subitems (d) for excavating in:

1) Intermediate material Unit: m³
2) Hard rock material Unit: m³

Measurement and payment shall be in accordance with the provisions of 8.3.2(b) of SABS 1200 D (as amended).

BDB 8.3.3 Excavation ancillaries

BDB 8.3.3.3 Compaction in road reserves

Replace the heading of this sub-item with the following:

BDB 8.3.3.3 Compaction in road crossings

Replace the sentence, "The volume will be measured as specified in 8.2.2, 8.2.3 and 8.3.3.1," *with the following*:

To determine the volume in the case of gravel roads, the depth will be measured from the underside of the gravel wearing course to the top of the fill blanket, and in the case of bitumen roads, from the underside of the subbase to the top of the fill blanket.

The rest of the trench shall be backfilled as specified in Clauses 5.9.3, 5.9.4 and 5.9.5, as applicable, and payment will be made under item 8.3.6.1.

BDB 8.3.7 Accommodation of traffic

Replace the heading and contents of item 8.3.7 with the following:

BDB 8.3.7 Accommodation of traffic Unit: sum

The tendered sum shall, (except where particular items are scheduled to cover particular costs) include full compensation for compliance with the requirements of 5.1.3 of SABS 1200 DB (as amended), including the construction and maintenance of bypasses and the use of existing roads as bypasses during the construction period.

It shall also include full compensation: for the provision, maintenance and removal of all traffic control measures, including temporary traffic signs, road markings, lighting, barricading, flagmen and, where necessary, communications equipment to regulate traffic; for the construction of temporary drainage works; for the maintenance of drainage works; and for arrangements for moving and subsequently reinstating services for the purposes of accommodating traffic, attending to traffic problems and complying with the requirements of the Road Traffic Ordinance and the relevant local authorities.

The tendered lump sum shall not be adjusted in the event of any extension of time for completion being granted by the Engineer in accordance with Clause 5.12 of the General Conditions of Contract.

Payment shall be made in equal monthly instalments over the entire period allowed for completion, provided that where any extension of time for completion is granted, the amount which shall be payable under this item in any subsequent monthly payment certificate shall be the outstanding unpaid amount of the lump sum, divided by the number of months remaining until the due completion date of the Contract, as revised in accordance with the General Conditions of Contract.

BDB 8.4 Crushed Stone Bedding Layer

Where the use of a crushed stone bedding layer and filter fabric in the trench bottom has been authorised by the Engineer, it will be measured by volume calculated according to length multiplied by the minimum base width and specified thickness.

The tendered rate shall cover the cost of preparation of the trench bottom to accommodate the filter fabric and the crushed stone layer, the supply and placing of the filter fabric and the stone layer over at least the specified width and closing up of filter fabric, including the specified overlap in order to produce a stable platform for the pipes.

BDB 8.5 Trench Shoring

The rate shall cover the cost for trench shoring where ordered by the Engineer, including all items noted in BDB5.4.1. Unit: m^2

BLB : BEDDING (Pipes)

(Applicable to SABS 1200 LB-1983)

BLB 3 MATERIALS

BLB 3.3 Bedding

All pipes are to be considered as flexible and the bedding to all pipes shall be as specified on Drawing LB-2, unless otherwise specified, scheduled or ordered by the Engineer.

BLB 8 MEASUREMENT AND PAYMENT

BLB 8.3 Crushed Stone Bedding Layer

Unit: m^3

Where the use of a crushed stone bedding layer and filter fabric in the trench bottom has been authorised by the Engineer, it will be measured by volume calculated according to length multiplied by the minimum base width and specified thickness.

The tendered rate shall cover the cost of preparation of the trench bottom to accommodate the filter fabric and the crushed stone layer, the supply and placing of the filter fabric and the stone layer over at least the specified width and closing up of filter fabric, including the specified overlap in order to produce a stable platform for the pipes.

BLB 8.4 Screening of Material for Bedding

Screening material for bedding:

a) Selected granular material — Unit: m^3
b) Selected fill material — Unit: m^3

The rates for screening shall cover the extra-over cost for screening (where so ordered by the Engineer) material obtained and paid for in accordance with Subclause 8.2.1 in order to obtain material as specified.

PART B: PROJECT SPECIFICATIONS REFERRING TO THE STANDARD SPECIFICATIONS

STANDARD IEC SPECIFICATIONS: AERATOR

PART 1 GENERAL

1.1 SUMMARY

A. SCOPE OF WORK

1) This specification defines an electric motor-driven, air assist, propeller-type floating aerator equipped with a regenerative blower. The aerator induces the flow of air below the surface of the water and provides flow-linkage mixing in multiple unit arrangements.
2) The aerator shall provide a minimum of 1,8kg O2/kwh;
3) The aerator shall provide a directional mixing stream, to ensure Oxygen dispersion and destratification throughout the entire water body.
4) The aerator operate by propelling air into the water and shall not operate by propelling water into the air.

B. SYSTEM DESCRIPTION

1) The unit supplied must be able to provide and be operated in both a mixing and aeration mode controlled completely independently of each other.
2) The aerator consists of an electric motor and regenerative blower located above the water surface.
3) The motor is connected to a hollow shaft within a protective housing positioned at a 45° angle downward into the water. Aerators with submersible motors are not acceptable.
4) Solid shafts are not acceptable.
5) The hollow shaft drives a mixing propeller and Saturn Ring-type diffuser beneath the water surface. Attached to the primary propeller is a Saturn ring diffuser, which disperses the air into the stream of displaced water beneath the water surface.

1.2 QUALITY ASSURANCE

A. STANDARDS

1) The air will be dispersed as fine bubbles (2.0-2.5 mm diameter) as defined by the U.S. EPA Report Number EPA-600/2-82-003. The Manufacturer shall verify compliance.

1.3 DELIVERY, STORAGE AND HANDLING

A. Aerator shall arrive at the installation site fully assembled and ready for attachment to the flotation or support equipment.

- Units with couplings that can become misaligned during shipment or installation are not acceptable.

1.4 WARRANTY

A. The aerator Manufacturer shall supply a 1 year non-prorated factory warranty.
B. All parts supplied by the aerator Manufacturer must be warranted the same.
C. Field replacement of aerator components shall in no way affect the factory warranty.
D. All warranty repairs must be done in accordance with the factory O & M Manual.

PART 2 PRODUCTS

2.1 MANUFACTURER

A) Equipment Manufacturers shall have a minimum of five installations of the same equipment model and design in a similar application for a period of five years.

A. AERATOR DRIVE MOTOR

1) The motor shall deliver 11 kilowatts at 750 RPM nominal and shall be rated for 400 volts, 50 cycle, 3 phase service, IEC Motor.

2) Motors shall be specifically designed for operating at an angle.

3) Motor enclosure configuration shall be totally enclosed, fan cooled TEFC.

4) Insulation shall be class F insulation with B temperature rise.

5) Motor shall meet IP55 specifications.

6) Motor shall be capable of a 1.0 service factor.

7) The noise level of the motor shall be in accordance with IEC specifications.

B. BLOWER

1) The equipment shall include a high efficiency regenerative blower sized to provide sufficient airflow to yield the rated oxygen transfer capacity. Each blower includes the following features:

   a) Maintenance free
   b) Aluminum alloy construction
   c) Inlet and outlet sound attenuating silencers to minimize noise.
      - Inlet filters with epoxy-coated wire mesh media rated for 70 microns or better.
      - The blowers shall be corrosion resistance and deliver 2,2 kilowatts maximum rated for 400 volts, 50 hertz cycle, 3phase service.
      - Blower motors shall be wired separately.

C. MOUNTING FLANGE

1) The mounting flange shall be stainless steel and shall permit removal of the aerator mechanism leaving the motor in place.
2) The mounting flange will allow the aerator to be rotated out of the water for inspection, maintenance or storage.

D. SHAFT/UNIVERSAL JOINT COUPLING

1) The shaft shall be stainless steel full-welded to a forged carbon steel universal joint coupling. The shaft must be hollow to promote maximum air flow and oxygen transfer. Units with solid shafts are not acceptable.
2) The shaft shall be dynamically balanced.
3) The universal joint coupling shall include a standard grease fitting for maintenance lubrication. Units which utilize flexible couplings to attach to the shaft of the motor are not acceptable.
4) The shaft shall be stabilized by a replaceable water lubricated bearing located within one inch from the propeller hub.
5) Any shafts requiring factory replacement to validate warranty requirements are not acceptable.

E. HOUSING

1) The housing shall be stainless steel and flanged for mounting to the aerator.

F. BEARING

1) The aerator shall be supplied with a field replaceable water lubricated lower support bearing. The bearing shall be constructed of an appropriate material for the application inside a fiber backing. The bearing shall be press-fitted into the housing to allow ease of replacement.

2) Units utilizing a cantilever design without a lower support bearing or regreaseable tapered roller bearings are not acceptable.

3) Bearings requiring factory replacement to validate warranty requirements are not acceptable.

G. SLEEVE

1) The replaceable sleeve shall be the only moving part in contact with the bearing and shall spin with the shaft as one unit. The sleeve shall be solid and homogeneous. Units supplied without sleeves are not acceptable.

H. PROPELLERS

1) The stainless steel mixing propeller shall be specifically designed to maximize oxygen transfer and mixing characteristics. Propellers shall be self-tightening such that the propeller threads tighten on the shaft threads during normal operation. The entire flow of air shall pass through the propeller shaft via the hollow drive shaft along the axis of the propeller hub. Aluminum and standard marine type propellers are not acceptable.

2) The propeller shall be designed to allow easy removal and replacement in the field.

I. SATURN RING / DIFFUSER

1. The Aerator shall be equipped with a stainless steel secondary Saturn Ring diffuser, smaller than the mixing propeller, consisting of two concentric rings of differing diameters fixed to the diffuser body. The rings shall be specially designed to maximize oxygen transfer and to prevent self aspiration when the regenerative blower is turned off to accomplish anoxic mixing.

2) The entire flow of forced air shall exit through the propeller /diffuser opening.

J. VORTEX SHIELD

- A vortex shield shall be furnished with each mounting assembly to eliminate the formation of vortices, maximize shaft airflow and prevent cavitation damage to the propeller during operation. Units without vortex shields are not acceptable.

K. FLOTATION

1) The aerator flotation assembly shall be constructed of molded low-density polyethylene with ultraviolet inhibitor, filled with urethane foam. The pontoon shape shall be designed with smooth, beveled edges to allow freezing into ice without breakage. The pontoons shall be connected by galvanised steel, structural members to prevent corrosion. To allow for servicing by not removing the aerator from the flotation, the flotation assembly shall be designed so the aerator may be rotated completely out of the water. Structural aluminum is not acceptable. Welded stainless steel floats will not be acceptable.

3.2 SERVICING

A. Aerator mounting assemblies shall be designed so the aerator may be pivoted completely out of the water to allow servicing without removing the aerator from the flotation. Units that must be sent back to the factory for service are not acceptable.

3.3 FIELD SERVICES

A. The aerator Manufacturer, through its factory trained field service technician shall provide service to verify the proper installation and supervise the start-up of the aerators. Operation and maintenance instructions shall be given to the Engineer/Owner through the use of illustrated material within the manual.

PART B: STANDARD ELECTRICAL SPECIFICATIONS

B200.1 SCOPE OF WORK

The scope of work for the electrical portion of the Works is set out in the Project Specification*** and associated drawings and schedules.

This Standard Specification shall be read in conjunction with the Project Specification where referenced in the Project Specification***. In the event of conflict the Project Specification shall take precedence over this Standard Specification.

B200.2 ELECTRICITY SUPPLY

2.1 The electricity supply will be made available by the Supply Authority as described in the Project Specification, and the Contractor shall ensure that the completed Works complies with the Supply Authority's requirements regarding voltage, current and quality of supply limits, and with any other requirements which may be imposed by the Supply Authority.
2.2 The electrical characteristics of the electricity supply will be as specified in the Project Specification***.
2.3 Where specified in the Project Specification***, the Contractor shall make application for the electricity supply, liaise with the Supply Authority to plan and coordinate work, liaise with the Supply Authority regarding protection settings, and attend technical meetings and provide inputs for the planning of switching operations.

B200.3 GENERAL

3.1 Standard Specification

This Standard Specification specifies the detail requirements for plant, and the standard of workmanship and quality of materials, for the electrical portion of the Works as varied by the Project Specification.

Where this Standard Specification and the Project Specification refer to "relevant codes and specifications", it shall be taken to refer to those listed in the table contained in Clause F200.5 and the normative references listed in SANS 10142, as applicable.

The use of the triple asterisk "***" after the words “Project Specification” is intended as a prompt for the Specifier only, and does not infer an intention to cross-referencing.

3.1.1 Definitions

3.2.1 "Extra low voltage" shall mean voltages of 50 V or less.
3.2.2 "Low voltage" shall mean voltages not exceeding 1 000 V.
3.2.3 "Medium voltage" shall mean voltages exceeding 1 000 V.
3.2.4 "Supply" shall mean manufacture, procure, store off site as necessary, deliver to site, and off-load, position, stack and store on site as necessary.
3.2.5 "Install" shall mean set out, erect, mount, align, fix, connect, adjust, test and commission and hand over in proper working order.
3.2.6 "Provide" shall mean supply and install.
3.2.7 "Installation" shall mean the electrical installation covered by this document.
3.2.8 "Approved" shall mean acceptable to the Employer in the sole opinion of the Engineer.

B200.4 COMPLIANCE WITH REGULATIONS AND STANDARDS

4.1 The electrical installation shall comply with the latest revisions and amendments of the following:

4.1.1 The South African Bureau of Standards Code of Practice for the Wiring of Premises, SANS 10142, referred to herein as the "Wiring Code".
4.1.2 The Occupational Health and Safety Act and Regulations (Act No 85 of 1993) in its entirety.
4.1.3 The Municipal By-laws and Regulations and any regulations of the electrical supply authority.
4.1.4 The Local Fire Office regulations.
4.1.5 Regulations of Telkom.
4.1.6 The relevant codes and specifications as defined under Clause B200.3.
4.1.7 The regulations of the local gas supplier where applicable.
4.1.8 The standard regulations of any Government Department or other statutory body where applicable.

4.2 No claims for extra costs arising from failure of the Contractor to comply with any of the regulations and standards listed above will be considered.

4.3 Where conflict appears to exist between any of the regulations and standards listed above and the Specification, such conflict shall be referred to the Engineer in writing for his ruling.

4.4 Immediately after award of the Contract, and at any time thereafter as may be necessary, the Contractor shall notify all relevant authorities, pay fees and take any other steps which may be required or prescribed to execute the Works.

The Contractor shall copy related correspondence to the Engineer who shall be kept informed at all times. This shall not, however, release the Contractor of his responsibilities.

B200.5 STANDARD SPECIFICATIONS

All the equipment and materials shall conform to the relevant SANS, NRS, or IEC Specifications and the latest revisions thereof, where applicable. For equipment and materials not covered by the following table, reference shall be made to the list of normative references in SANS 10142.

	DESCRIPTION	SANS	IEC	NRS
1.	**SWITCHGEAR AND CONTROL GEAR**			
1.1	HV switches for rated voltages above 1 kV and less than 52 kV	60265-1		
1.2	A.C. metal-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV	62271-200		
1.3	HV a.c. switch-fuse combinations	62271-105		
1.4	HV a.c. contactors and contactor-based motor starters	60470		
1.5	Common specifications for HV switchgear and control gear standards	60694		
1.6	A.C. insulation-enclosed switchgear and control-gear for rated voltages above 1 kV and up to and including 52 kV	62271-201		
1.7	Metal-enclosed switchgear for rated a.c. voltages above 11 kV and up to and including 36 kV	1885		
1.8	HV a.c. circuit breakers	62271-100		
1.9	Metal-clad switchgear for rated voltages above 11 kV and up to and including 24 kV - Part 2 : Standardized panels			003-2
1.10	Moulded-case circuit breakers	156		
1.11	LV switchgear and control gear assemblies - Part 1 : Type-tested and partially type-tested assemblies above 10 kA	1973-1. 60439-1		
1.12	LV switchgear and control gear assemblies - Part 2 : Busbar trunking systems	60439-2		
1.13	LV switchgear and control gear assemblies – Part 3 : Type-tested and partially type-tested assemblies up to and including 10 kA	1973-3		
1.14	LV switchgear and control gear assemblies – Part 8 : Safety of MTAs above 10 kA	1973-8		
1.15	LV switchgear and control gear assemblies - Part 5 : Particular requirements for assemblies intended to be installed outdoors in public places - cable distribution cabinets	60439-5		
1.16	LV switchgear and control gear - Part 2 : Circuit breakers	60947-2		
1.17	LV switchgear and control gear - Part 3 : Switches, disconnectors, switch-disconnectors and fuse-combination units	60947-3		
1.18	LV switchgear and control gear -			
	Part 4 - 1 : Contactors and motor starters (electro-mechanical)	60947-4-1		
	Part 4 - 2 : Contactors and motor starters (semi-conductor)	60947-4-2		
	Part 5-1 : Electromechanical control circuit devices	60947-5-1		
	Part 5 - 2 : Proximity switches	60947-5-2		
	Part 5 - 5 : Electrical emergency stop device with mechanical latching function	60947-5-5		
	Part 6 - 1 : Automatic transfer switching equipment	60947-6-1		
1.19	Earth-leakage protection units - Part 1 : Fixed earth-leakage protection circuit breakers	767-1		

	DESCRIPTION	SANS	IEC	NRS
1.20	RCCBs without integral overcurrent protection for household and similar use - Part 1 : General rules	61008-1		
1.21	Switches for appliances - Part 1 : General requirements	61058-1		
1.22	AC disconnectors and earthing switches above 1 kV	62771-102		
1.23	Busbars	1195		
1.24	Metal-enclosed ring main units for ac voltages 1 kV to 24 kV	1874		
2.	**TRANSFORMERS AND MINISUBS**			
2.1	Power transformers	60076		
2.2	Dry-type power transformers		60726	
2.3	Distribution transformers	780		
2.4	Semi-conductor converters - Part 1 - 3 : General requirements and line commutated convertors - Transformers and reactors	60146-1-3		
2.5	Convertor transformers - Part 1 : Transformers for industrial applications	61378-1		
2.6	Safety of power transformers, power supply units and similar - Part 2 - 4 : Particular requirements for isolating transformers in general use	61558-2-4		
	Part 2 - 6 : Particular requirements for safety isolating transformers in general use	61558-2-6		
	Part 2 - 15 : Particular requirements for isolating transformers for the supply of medical locations	61558-2-15		
2.7	Miniature sub-stations	1029		
3.	**CABLES**			
3.1	The selection, handling and installation of electric power cables of rating not exceeding 33 kV (Parts 1 to 14)	10198		
3.2	Impregnated paper-insulated metal-sheathed cables for rated voltages 3,3 kV to 33 kV	97		
3.3	XLPE-insulated cables for voltages from 6,6 kV to 33 kV	1339		
3.4	Paper-insulated metal-sheathed cables for voltages up to 18/30 kV			
	- Part 1 : Test on cables and their accessories		6055-1	
	- Part 2 : General construction requirements		6055-2	
3.5	Electric cables with extruded solid dielectric insulation for fixed installations (300 / 500 V to 1900 / 3300 V)	1507		
3.6	Flexible electric cables for use in mines			
	- Part 1 : LV (640/1100 V and 1900 / 3300 V)	1520-1		
	- Part 2 : HV (6,6 kV to 33 kV)	1520-2		
3.7	Flexible cords and cables	1574		
3.8	Materials of insulated electric cables and flexible chords (Parts 1 to 7)	1411		
3.9	Mechanical cable glands	1213		
3.10	Single core arc welding cable	1576		
3.11	Lugs and ferrules for insulated electric cables - Part 1 : copper conductors	1803-1		
3.12	Power cables with extruded insulation and their accessories from 1 kV to 30 kV - Part 4 : Test requirements on accessories	60502-4		
3.13	Accessories for MV power cables			053
4.	**CURRENT AND VOLTAGE TRANSFORMERS**			
4.1	Instrument transformers			
	- Part 1 : Current transformers	60044-1		
	- Part 2 : Inductive voltage transformers	60044-2		
	- Part 3 : Combined transformers	60044-3		
	- Part 5 : Capacitive voltage transformers	60044-5		

	DESCRIPTION	SANS	IEC	NRS
5.	**EARTHING AND LIGHTNING / SURGE PROTECTION**			
5.1	Earth rods and couplers	1063		
5.2	Design and installation of an earth electrode	10199		
5.3	Neutral earthing in MV industrial power systems	10200		
5.4	Protection of structures against lightning	10313		
5.5	Protection against lightning			
	- Part 1 : General principles	62305-1		
	- Part 2 : Risk management	62305-2		
	- Part 3 : Physical damage to structures and life hazard	62305-3		
	- Part 4 : Electrical and electronic systems within structures	62305-4		
5.6	Surge protective devices connected to LV power distribution systems - Part 1 : Performance requirements and testing methods	61643-1		
5.7	Surge arrestors - Part 1 : Non-linear resistor type gapped surge arrestors for a.c. systems	60099-1		
5.8	Surge arrestors - Part 4 : Metal-oxide surge arrestors without gaps for a.c. systems	60099-4		
6.	**METERS, INSTRUMENTS AND RELAYS**			
6.1	Meter cabinets	60439-5		
6.2	Electrical instruments and meters		60051	
6.3	A.C. electromechanical watt-hour meters	62052-11		
6.4	Electrical relays - Part 3 : Single input energizing quantity measuring relays with dependent or independent time		60255-3	
6.5	Electrical relays - Part 20 : Protection systems		60255-6	
6.6	Watt-hour meters - A.C. electronic meters for active energy	1799		
6.7	Electricity metering equipment – static meters	62053-21 to 23		
7.	**CAPACITORS**			
7.1	Shunt capacitors for a.c. power systems having a rated voltage above 1000 V			
	- Part 1 : General - Performance, testing and rating - safety requirements - Guide for installation and operation		60871-1	
	- Part 2 : Endurance testing		60871-2	
	- Part 3 : Protection of shunt capacitors and shunt capacitor banks		60871-3	
	- Part 4 : Internal fuses		60871-4	
7.2	Shunt power capacitors of the self-healing type for a.c. systems having a rated voltage up to and including 1000 V			
	Part 1 : General - Performance, testing and rating - Safety requirements - Guide for installation and operation		60831-1	

B200.6 BUILDER'S WORK

6.1 Building and Casting-In

The Contractor shall be responsible for placing in position all wireways, conduits, conduit boxes, etc., for the building contractor to build in/cast in, provide attendance to the building contractor during building-in/casting-in, and ensure firm fixings acceptable to the building contractor and accurate positioning.

6.2 Chasing

6.2.1 The Contractor shall chase only where it is impossible to build in/cast in.
6.2.2 No face-brick or finished surface may be chased without the permission of the Engineer and the building contractor.
6.2.3 No structural concrete may be chased without the permission of the Engineer and the building contractor.
6.2.4 The building contractor will make good all chases and openings in building work.
6.2.5 The Contractor will be held responsible for any damage caused by him to the building work or any other service.

6.3 Ducts, Sleeves and Openings

6.3.1 The Contractor shall provide attendance to the building contractor with the installation of ducts, sleeves, manholes, openings and any other building work associated with the electrical installation to ensure correct and accurate positioning.
6.3.2 No openings or cuts may be made in structural concrete without prior permission of the building contractor and Engineer.
6.3.3 The Contractor shall in good time provide to the building contractor dimensions, details and positional information for frames, pipe sleeves, recesses, access ways, servitudes, apertures and openings for equipment installed under this Contract.

B200.7 DRAWINGS, MANUALS, LITERATURE, TUITION, SPARES AND TOOLS

7.1 The Engineer's drawings covering the various sections of the installation are listed in the schedule of drawings. The working drawings of the Contract shall, however, consist of the following, where applicable:

7.1.1 The Engineer's drawings;
7.1.2 The Architect's drawings;
7.1.3 The Structural Engineer's drawings;
7.1.4 The Engineer's drawings of the other disciplines, as applicable.
7.1.5 The drawings of other services installations that are relevant for co-ordination and installation.
7.1.6 The installation drawings of other Contractors and Subcontractors where applicable.

7.2 Unless otherwise specified, three sets of the Engineer's drawings will be issued to the Contractor for construction purposes. Any further copies may be purchased from the Engineer.

7.3 The Contractor shall submit four copies (or as required in the Project Specification***) of shop drawings to the Engineer for examination and to demonstrate compliance with the Contract. Shop drawings shall include drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor, Manufacturer, Supplier or Distributor and which illustrate some portion of the work.
The Engineer's examination of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of this Contract unless the Contractor has informed the Engineer in writing of such deviations at the time of submission of shop drawings or samples and the Engineer has given written approval for the specific deviation, nor shall the Engineer's examination relieve the Contractor of responsibility for errors or omissions in the shop drawings or samples or for responsibility for erection or installation fit.

7.4 The Contractor shall submit to the Engineer four copies (or as required in the Project Specification***) of marked-up structural drawings, or other drawings, showing changes and/or additional requirements to be made in the structure in order to accommodate equipment installed under this Contract.

7.5 The Contractor will not be allowed to rely on the Engineer for as-installed information which he may have compiled, to produce record drawings.

7.6 Drawings to be entitled "Record" shall bear the signature of the Contractor, or his authorised representative, and the date.

7.7 The Contractor shall obtain from the Engineer, if available, a CD containing the Engineers' drawings, which have been drawn on a PC-based CAD system for the preparation of record drawings to be provided by the Contractor. One set of paper prints of the record drawings shall be provided for verification by the Engineer. A CD containing

the record drawings shall be provided upon completion of the contract. Otherwise the Engineer will issue a set of Engineer's drawings to the Contractor at completion of the installation. The Contractor shall mark these drawing to indicate the record of the installation.

7.8 A set of final layout and schematic record drawings shall be provided in a purpose made holder inside the door of each distribution board and motor control centre, or where no doors are fitted, to the front plate of the cabinet. The frame shall be adequately sized to receive the equivalent of two A1 size drawings folded to a nominal size of A4.

For MV switchboards, MCCs and main LV distribution boards the Contractor shall provide laminated as-built drawings of single-line diagrams in aluminium/wooden frames fixed to the wall of the room housing the switchboards/MCCs.

7.9 The Contractor shall submit to the Engineer four (or quantity as specified in the Project Specification***) manuals bound between hard covers including the following:

1) Dimensioned drawings of the layout of the equipment and systems.
2) Wiring diagrams cross referred to the drawings described above, and to the Engineer's layout drawings and single-line diagrams.
3) All Test Certificates for tests done at the factories and on the site.
4) System and equipment descriptions.
5) Operating instructions.
6) Maintenance, adjustment and calibration instructions with preventive maintenance schedule and fault-finding procedures.
7) Spare parts list with names and address of component suppliers and price list of all components and a list of recommended spare components to be kept in stock.

The Contractor shall submit preliminary copies of the manual to the Engineer for scrutiny.

7.10 The Contractor shall provide thorough tuition of the Employer's staff in the operating and maintenance of the plant forming part of the Works.

7.11 When specified in the Project Specification*** the Contractor shall allow in his price for photographs to be taken with a digital camera on monthly basis, for the duration of the Contract, of all the areas and plant forming part of the Works. The photographs shall be properly dated with comments e.g. access to substation not possible etc. A CD with the photographs shall be handed each month to the Engineer at the site meeting. These photographs may be used for the evaluation of claims.

7.12 The Contractor shall provide all tools required for operating and/or maintaining the Works as specified in the applicable Standard Specification and the Project Specification***.

B200.8 INSPECTION, TESTS AND COMMISSIONING

8.1 On completion of erection and installation on site the Contractor shall perform all the tests that may be required by the Engineer in his presence to ensure that the Works are ready for handing over and putting into regular use.

8.2 Near completion, inspect and test the services installation in accordance with the Wiring Code, the Regulations of the Supplier of Electricity and the Occupational Health and Safety Act 85/1993. Record test results on printed test sheets and submit to the Engineer.

8.3 Testing of the electrical installation shall be in accordance with the Project Specification, but shall include the following:

- Ensure correct polarity, phase rotation and balance load between the phases. Verify polarity and phase identification.
- Continuity and resistance of earth conductor including all bonding conductors.
- Continuity of ring circuit.
- Earth electrode resistance.
- Insulating resistance.
- Earth fault loop impedance test.
- Operation of earth leakage protection devices and circuit breakers.

8.4 After inspection and testing, timeously arrange for any inspection and test by the Supplier of Electricity if required, and assist as necessary the Inspector of the Supplier of Electricity by providing access, tools, instruments and attendance.

8.5 Replace any portion of the electrical installation that does not comply with the Wiring Code or the Specification. Such replacement shall be done at the Contractor's expense.

8.6 Submit a "Certificate of Compliance by an accredited person" Annexure 1 in terms of the Occupational Health and Safety Act 85/1993, Electrical Installation Regulation 1992, to the Employer and forward a copy to the Engineer.

8.7 Carry out additional special tests as required by the Engineer and provide the required test equipment.

8.8 Timeously advise the Engineer of all inspections and tests as the Engineer reserves the right to witness such inspections and tests.

8.9 Provide access, tools, instruments and attendance, to assist the Engineer who may perform verification tests at any time.

8.10 The Engineer shall have the power at any time to examine any part of the Works or materials intended for use in or on the Works either on site, or at the place of manufacture or storage.

8.11 On completion of the works, the Contractor shall submit four indexed volumes of all test certificates to the Engineer for tests done at factories and on site (to be included in the manuals).

8.12 The Contractor shall be responsible to calculate all relay settings. The settings shall be submitted to the Engineer for approval at least two weeks before the commissioning of the works commences. The settings shall be substantiated by calculation sheets and graphs where applicable.

8.13 The Contractor shall check that all protection relays and overload devices are properly set to protect equipment such as motors, cables and capacitors etc., before the system is energised or any motors are switched on. Where overload devices are overrated or the ranges of relays insufficient to protect equipment, the Engineer shall be informed and the equipment shall not be energised.

8.14 Inspections, Tests and Commissioning with Reference to Material and Equipment

8.14.1 Factory Tests and Inspections

The manufacturer shall perform all routine tests in the factory as described by SANS, IEC and/or BSS as well as the manufacturers own standard routine tests on all materials, equipment and auxiliary equipment. Type tests shall be performed as described in the relevant equipment specifications.
The Contractor shall submit a list of tests and inspections to be performed on the equipment for approval.
The Contractor shall perform any additional standard tests that may be required by the Engineer.
The Engineer shall indicate which tests shall be witnessed by a representative of the Employer and the Engineer.
The Contractor shall submit four copies of the test certificates with the test results of all the tests performed to the Engineer not later than the delivery date of the equipment.

8.14.2 Site Tests

On completion of erection and installation on site the Contractor shall perform all the tests that may be required to ensure that the Works are ready for handing over and putting into regular use.

Contractors shall provide their own test equipment which shall be of accepted standards.
The Contractor shall submit a list of tests and inspections to be performed on the equipment for approval.
The Contractor shall perform any additional standard test that may be required by the Engineer.
All the tests shall be witnessed by a representative of the Employer and the Engineer.

Four copies of site test certificates shall be submitted to the Engineer within 7 days after completion of each test.

8.14.3 Arrangements for Witnessing Tests

The Contractor shall make arrangements with the Engineer for tests to be witnessed.
Timeous (at least two weeks, or as specified in the Project Specification***) notice shall be given to avoid undue delays in the completion of tests.
Arrangements for tests on site shall be made only after the Contractor has pre-commissioned the equipment and satisfied himself that it is in running order.

B201 MATERIALS

1. Materials and equipment used in this Contract shall, where possible, be of South African manufacture and shall comply with this specification and relevant SANS, BSI and IEC Specifications and shall be approved and installed to the satisfaction of the Engineer.
2. The Contractor shall submit samples of all materials and equipment for examination by the Engineer before installation, unless prior consent to the contrary has been obtained in writing from the Engineer. Such samples will be held for comparison with equipment and materials installed and will be released on satisfactory completion of the Contract. Similar equipment and material shall be of the same manufacture and interchangeable and be standard products from established manufacturers.
3. Where a certain manufacturer's material or equipment is specified, listed in the Schedules or noted on the drawings, such materials or equipment shall be provided as specified, except where an alternative is allowed.
4. Where certain products of a specified manufacturer are unobtainable, substitutes may be offered, but shall only be supplied after written consent by the Engineer.
5. Where the words 'or approved equivalent' follow a manufacturer's name and catalogue reference, the materials shall be of the specified manufacture and reference, or, if the Contractor wishes to use a substitute the onus shall be on the Contractor to prove such substitute is equivalent to the specified manufacture and reference. The decision as to the acceptance of such substitute shall rest solely with the Engineer, whose decision shall be final. If the Engineer instructs the Contractor to install the materials of the specified manufacture and reference, then no alteration to the Contract value or rates will be allowed.
6. Where a detailed specification for material or equipment is not provided, the Contractor shall select such material or equipment to comply with normal practice and to suit the particular application in all respects.

B202 FINISHING AND PAINTING OF MATERIALS AND EQUIPMENT

1. The Contractor shall select materials and their finishing to avoid corrosion.
   Exterior applications within 50 km of the coast shall be deemed corrosive.
   Aluminium shall be anodized to SANS 999 - 1986 Grade A for exterior and Grade B for interior applications.

2. Unless otherwise specified, finish steel as follows:

   - Interior Applications and Non-corrosive Exterior Applications
   - Galvanize to SANS 121 or paint by:
   - Preparing surface
   - Priming with zinc chromate of dry film thickness of 25 microns (minimum)
   - Applying two final coats of high gloss enamel paint to SANS 630 Grade 1, each coat of dry film thickness of 25 microns (minimum).
   - Exterior Corrosive Applications
   - Hot dip galvanize to SANS 121
   - Prepare surface and prime with calcium plumbate of dry film thickness of 25 microns (minimum);
   - Apply undercoat to SANS 681 Type 2
   - Apply two final coats of high gloss enamel paint to SANS 630 Grade 1, each coat of dry film thickness of 25 microns (minimum).
   - NOTE: Measure dry film thickness to SANS Standard Test Method 140 or 141.
   - Hot-dip galvanize steel after all fabrication. Reinstate damaged hot-dip galvanizing with hot zinc spraying. Reinstate damaged electro-galvanizing with two coats of zinc-rich paint.
   - Any unpainted steel shall be chromium-plated or similarly plated to approval.

3. Where required paint aluminium surfaces as follows:

   - Thoroughly clean.
   - Apply a self-etch primer Plascon Hi-Sheen or approved alternative.
   - Apply two final coats of high gloss enamel paint to SANS 630 Grade 1, each coat of dry film thickness of 25 microns (minimum).

B203 FIXING OF MATERIALS

1. Fix surface-mounted luminaires, metal draw boxes, switched socket outlets and disconnectors, metal channels, wiring troughs or trays, cable trays, saddles, conduiting and accessories, brackets, braces, trunking and all other surface-mounted material and equipment as described below :

1.1 Concrete (in situ) - expanding cast-in, or gun-bolted, metal screw-fasteners.
1.2 Precast concrete - only with permission of the Engineer.
1.3 Brickwork - expanding, or built-in metal screw fasteners.

1.4 Ash brick - "J bolts" or approved alternative.
1.5 Steelwork - drilled, gun-bolted, or tapped and screwed metal screw fasteners; or steel gun-bolt nails or, where permitted by the Engineer, welding.
1.6 Woodwork – wood screws, not nails.
1.7 Hollow tiles - spring toggles of not less than 6 mm diameter, but only with permission from the Engineer.
1.8 Exposed to weather - solid brass or stainless steel screw-fasteners.

2. Where any equipment or material is to be mounted on the surface of ceilings, false ceilings, dry wall partitions, or other specialized surfaces, mount such equipment or material only as specified by the Engineer or as approved by the Engineer in writing.

3. Where sizes of fasteners etc. are not specified, submit samples and proposals to the Engineer for approval.

4. Do not gun-bolt into ash bricks, brickwork or precast concrete, except as permitted by the Engineer in writing.

5. The Contractor will be held responsible for any damage to Builder's work due to unauthorized inadmissible gun-bolting.

6. Do not use plastic plugs, wooden plugs or any other soft substance plugs.
"Fischer", or approved alternative hard nylon plugs of not less than 6 mm diameter may be used for fixing light materials to suitable surfaces.
Plugs shall not be installed in mortar joints between bricks.

7. Provide suitable washers under screw heads and nuts.
Install materials in accordance with manufacturer's instructions and recommendations in all respects including type, size and spacing of fixings.

B204 ENCLOSURES FOR DISTRIBUTION BOARDS, MOTOR CONTROL CENTRES AND OTHER ELECTRICAL SERVICES PANELS

1. GENERAL

1.1 This specification covers sheet metal enclosures for distribution boards (DBs), motor control centres (MCCs) and panels for other electrical services such as telephone, fire detection and intruder alarm systems.

1.2 This specification shall be read in conjunction with the following standard specifications to provide a complete s pecification for LV DBs and MCCs:

- B205 : LV switchgear and controlgear
- B206 : Busbars
- B207 : Current transformers
- B208 : LV motor protection
- B209 : Wiring in DBs, MCCs and panels
- B210 : Wiring- and cable terminations
- B211 : Glands and gland plates
- B213 : Switchboard accessories
- B214 : Nameplates and labels
- B215 : Metering and indication equipment

1.3 For MV MCCs, the following specifications shall also be read in conjunction with this specification and those listed under Clause 1.2:

- B225 : MV disconnectors and earth switches
- B226 : MV contactors
- B227 : Voltage transformers
- B228 : MV protection and relays

1.4 The Project Specification*** sets out which DBs, MCCs and panels shall be provided under the contract.

1.5 Unless otherwise stated in the Project Specification***, MCCs and floor-standing distribution boards shall be Form 4a to SANS 60439.

1.6 Enclosures shall be completely vermin-proof and unless otherwise stated in the Project Specification*** indoor enclosures shall have the following ingress protection:

IP44 with doors closed
IP2X with doors open
IP2X between compartments.
Outdoor enclosures shall have IP65 ingress protection with doors closed.

1.7 Enclosures containing heat-generating equipment shall be ventilated to prevent thermal damage to any equipment, and to prevent the temperature within the cabinet from exceeding the maximum allowable temperatures of the equipment and materials in the enclosure.

1.8 Wood or artificial wood products shall not be used inside enclosures as mounting panels or for partitions, except in accordance with Clause 3.1 (e).

1.9 Sufficient space shall be provided in enclosures for internal wiring, incoming and outgoing cabling, and cabling for any future circuits.

1.10 Whilst certain equipment may be installed abutting, undue cramping of wiring and equipment is not permitted. A minimum clearance of 75 mm shall be maintained between rows of equipment, between equipment and the top, bottom and sides of compartments.
DIN rails shall be installed at least 125 mm apart between horizontal centres.

1.11 For the purposes of evaluating clearances and creepage distances, and hence the size of the enclosure and its compartments, the environment shall be taken as Pollution Degree 3 unless otherwise specified in the Project Specification***.

2. CONSTRUCTION OF FLOOR-MOUNTED ENCLOSURES

2.1 Material and Fabrication

(a) The enclosure shall be fabricated from 3CR12 sheet metal unless otherwise stated on the Project Specification***. Outer panels and doors shall be 2 mm thick and internal partitions 1,6 mm thick.

(b) The sheet metal shall be suitably bent, braced and welded where necessary to form a rigid structure. Holes, doors, covers, rails, framework, etc. shall be accurately formed to provide a true and plumb structure when completed. Where welding is necessary the excess material shall be ground to the parent surfaces to present a smooth and blemish-free surface for painting.

(c) All screws employed in the manufacture of the enclosures shall be grade 316 stainless steel with machined threads. No self-threading screws or self-setting rivets (pop rivets) will be permitted. Where the thickness of material for screw tapping is less than 5 x screw pitch, an externally knurled, threaded insert shall be installed to accept the machine screw. The insert shall be fitted with a hydraulically operated tool, and properly clinched, to ensure it will not rotate in the sheet steel. The inserts shall also be manufactured from grade 316 stainless steel.
Alternative methods of providing suitable screw anchorages in sheet steel may be considered, such as captured or welded nuts, but the detailed alternatives shall be submitted for consideration at the time of tendering.

(d) Enclosures shall be made up of vertically separated sections which shall be divided into compartments to accommodate equipment for motor drives, instrumentation, switchgear for main and sub-main feeder switches, etc.
Each compartment shall be a minimum of 600 x 380 mm totally separated from the adjacent compartments with sheet steel barriers welded or bolted into position and where wiring is required to pass through these barriers, brass crushed holes shall be provided.

(e) A complete enclosure shall be mounted on and bolted to a hot-dipped galvanised 100 x 50 x 6 mm channel steel base with mitred external corners. The fixing bolts shall be 316 stainless steel M10 bolts.

(f) The height of an enclosure shall not exceed 2 100 mm when mounted on its base.

2.2 Doors

(a) The enclosures shall be fitted with doors on the front, back and ends as called for in the Project Specification***.

(b) All doors shall be arranged to stand off from the face/rear of the enclosure. Each door shall be properly stiffened and shall be twice returned at the periphery. The second return shall be gusseted in the corners to further brace the door.
Large doors (e.g. those fitted to the rear of individual sections) shall be further stiffened with "top hat" section channels welded to the inside of the door.

(c) Each door shall be mounted on pin type hinges and shall be secured by means of a lever operated tapered tongue catch or catches (hinges and catches shall be Perano, Barker Nelson or equal approved). The lever shall be provided with an external stop to prevent rotation in excess of 360° and to provide a padlocking facility (a hole in the stop and a hole in the lever).

(d) Where doors are mounted adjacent to one another the spacing shall be arranged to permit each door to open through at least 150°, without fouling the adjacent door. A stop shall be provided which shall prevent the door from opening further to avoid damaged paintwork.

(e) Doors fitted with flush mounted equipment shall be properly braced and stiffened to support the equipment. The hinges shall be easily able to support the mass added to the door when the flush fitted equipment is installed.

(f) Where coverplates are provided behind the doors, the coverplates shall be adequately recessed to permit the spindle on the lever to drive the tapered tongue catch into a slot in the framework of the board without fouling the coverplate. The space between the back of the door and the face of the coverplate shall be nominally 80 mm.

(g) Coverplates shall be fabricated as for the doors and shall be further stiffened to compensate for the machine-punched circuit breaker slots. The coverplates shall be secured at the top edge with at least two square key driven catches whilst at the lower edge they shall be located with two 6 mm diameter tapered dowel pins located in holes drilled in the architrave. Each pin shall be fitted with a 1,2 mm thick spacer washer. Both the pins and the washers shall be welded to the cover.

2.3 Corrosion Protection

The enclosures shall be painted with a high quality polyurethane-based powder coat suitable for interior and exterior conditions and applied by electrostatic spray. The sprayed powder coat shall be baked in accordance with the paint manufacturer's specification.
The enclosures shall be painted white internally and a biscuit colour (B64 to SANS 1091) externally unless otherwise stated in the Project Specification***.
The dry film coat shall be as uniform as possible but shall not be less than 50 microns nor more than 100 microns. The finish shall be high gloss with a minimum of surface defects / blemishes, and acceptance shall be at the Engineer's discretion.

2.4 Busbar Chambers

(a) A totally enclosed busbar chamber shall be provided throughout the length of enclosures for main DBs and MCCs. The busbar chamber shall be fitted with front, back and top covers to give full access to the busbars. The top covers shall be bolted on and the front and back covers secured with square-key latches, with one catch per cover being lockable with a padlock.

(b) The busbar chamber shall be so positioned at the top that each and every connection is easily accessible and sufficient space is provided to easily operate a torque wrench on each bolt / nut.

(c) Dielectric barriers shall be provided in the busbar chamber at every second section. The dielectric may not be split and installed as separate parts, but shall instead be slotted to allow the busbars to pass through. The slotted holes shall be fitted with U-shaped rubber gasketting to ensure a snug fit. These dielectric barriers may not be employed to support the busbars. The dielectric shall be bolted to the sheet steel at the periphery of the busbar chamber.
The penetrations for circuits into or out of the busbar chamber shall also be provided with similar dielectric barriers at the points of penetration.

(d) Where specified in the Project Specification*** the space normally used for the busbar chamber shall be divided into two separate, totally isolated chambers: a busbar chamber and a wiring channel for signal and communication cabling / wiring.
The wiring channel shall be 100 mm deep and shall be separated from the busbar chamber with a 1,6 mm thick sheet steel partition.

3. CONSTRUCTION OF WALL-MOUNTED ENCLOSURE

3.3 Material and Fabrication

(a) Both flush-and surface-mounting enclosures shall consist of a tray and an architrave frame on which the chassis, front panel and any door are mounted, except that surface-mounted enclosures of width and height both not greater than 400 mm need not have an architrave frame.

(b) Enclosures shall generally be constructed of sheet steel of minimum thickness of 1,2 mm except that cabinets of width and height both not greater than 400 mm may be constructed of sheet steel of minimum thickness of 0,8 mm.
Where called for in the Project Specification***, 3CR12 steel shall be used.

(c) Wall trays of flush-mounting enclosures shall be fitted with expanded metal spot welded to the rear and metal straps welded to the sides to ensure bonding with the structure of the wall.

(d) Trays of surface-mounting enclosures shall be slightly larger than the architrave frame and shall have a return to present a flat surface to the architrave frame.

(e) A mounting panel of 20 mm thick, fine grade, knot-free pine shall be fitted to the back of panels for telephone and electronic building services.

3.4 Doors and Cover Panels

(a) Doors shall be provided for wall-mounted enclosures unless otherwise stated in the Project Specififcation***.
(b) Doors shall be constructed of the same thickness and material as the remainder of the enclosure.
(c) Door hinges shall facilitate removal of doors without the use of tools. Hinge or hinge-pins shall not be removable when doors are closed.
Unless otherwise specified in the Project Specification***, doors shall be fitted with handles and spring-loaded catches without locks.
Where locks are specified, they shall be "Union", "Yale", "Solid" or an approved alternative, with master key facilities for the entire services installation and separate keys for each cabinet. Two keys for each enclosure and four master keys shall be provided.
(e) Where doors are fitted with locks, the operating handle or toggle or the main disconnector or local disconnector shall be accessible and operable without opening the door.
(f) Cover panels shall be secured by means of catches with square keys, or approved equivalent, quick-release fasteners and shall be fitted with chromium-plated knobs to facilitate removal.
Visible nuts shall be chromium-plated dome nuts. Visible bolts, washers or other fasteners shall be chromium-plated. Self-tapping screws will not be permitted.
(g) Cover panels shall have machine-punched openings for instruments and for equipment operating handles and toggles.
Openings shall be provided for spare accommodation which shall be blanked off by escutcheon blanks or clamped steel plates.

4. INSTALLATION

(a) The Contractor shall check the dimensions of access ways and the space provided for DBs, MCCs and other panels on the latest architectural drawings to ensure that the enclosures are appropriately designed.
(b) Unless otherwise stated in the Project Specification***, floor-mounted enclosures shall be mounted over cable trenches. Trench bridging supports shall be provided at the ends of the enclosure and at every second section. The supports shall be manufactured in the form of a top-hat section from 3 mm thick steel and then hot-dip galvanised.

B205 LOW VOLTAGE SWITCHGEAR AND CONTROLGEAR FOR DISTRIBUTION BOARDS, MOTOR CONTROL CENTRES, CUBICLES AND PANELS

1. GENERAL

Switchgear, controlgear and instrumentation shall be rated for the system voltage, frequency, number of phases, load current and applicable maximum prospective fault current as specified on the drawings and the Project Specification***.

2. SURGE ARRESTERS

2.1 Surge arresters shall be provided for each phase in all boards, connected to each phase of the incoming cables.
2.2 Surge arresters shall conform to the relevant SANS codes and other Specifications, shall bear the SABS mark, and shall be solidly earthed directly onto the cubicle earth bar by means of a copper strap and be as short and straight as possible.

3. AIR CIRCUIT BREAKERS (ACBs)

3.1 ACBs shall be of the metal-clad, withdrawable type complying with the relevant codes and specifications. Unless otherwise stated in the Project Specification***, the ACBs shall be three pole.
3.2 ACBs shall have an adjustable thermal overload trip unit and an adjustable magnetic short-circuit trip unit. All trip units shall be direct acting. Both trip units shall be replaceable by units of different ratings.
The ACBs noted on the drawings as "selective" shall incorporate an adjustable time-delay on the magnetic short-circuit trip unit***.
3.3 ACBs shall be designed for trip-free manual closing and electrical tripping of the type specified in the project specification or drawings, e.g., shunt, remote or under voltage tripping; delayed contacts; AC or DC coil voltage***.
3.4 Interlocking shall be provided to ensure that an ACB is fully isolated before access to any live terminals can be obtained.
3.5 ACBs shall be horizontally withdrawable allowing full maintenance and tests without the breaker having to be removed from the withdrawal mechanism.

3.6 Interlocks shall be provided to allow an ACB to be operated in the withdrawn maintenance/test position, and to prevent the circuit breaker from being closed unless fully in the engaged or test position and from being moved when the mechanism is closed.
Special equipment should not be required to remove the circuit breaker from its withdrawal mechanism for transporting. If special equipment is required, it shall be provided with the circuit breaker.

3.7 Lockable safety shutters shall be provided to screen the fixed contacts and shall operate automatically with the movement of the circuit breaker.

3.8 All non-current-carrying metal parts of the circuit breaker shall be solidly interconnected and connected to an earth contact which shall engage with a copper plate connected to the main earth bar of the cubicle, and the arrangement shall be such that the circuit breaker frame is earthed before the circuit breaker contacts engage with the live fixed contacts.

3.9 A mechanically operated "ON/OFF" or ("I/O") position indicator shall be incorporated.

3.10 Facilities for padlocking in the "off" position shall be provided.

3.11 Two normally open and two normally closed spare auxiliary contacts shall be provided, unless otherwise noted. It shall also be possible to install a change-over contact if required at a later stage. Auxiliary contacts shall be capable of making and carrying continuously 1A ac or dc. They shall be capable of breaking 500 VA AC at 0,2 PF and 20 watts DC at an L/R of < 40 ms.

3.12 Where noted on the drawings*** special purpose interlocking (key/mechanical/electrical) shall be provided between ACBs.

3.13 Unless otherwise stated in the Project Specification***, the ACBs shall have a one second fault withstand rating.

4. MOULDED CASE CIRCUIT BREAKERS (MCCBs)

4.1 Moulded case circuit breakers shall comply with the relevant codes and specifications. MCCBs shall be of flush panel mounting type.

4.2 MCCBs with ratings of 100 A and less shall be suitable for mounting on a DIN rail.

4.3 MCCBs with ratings in excess of 100 A for non-motor loads shall each have an adjustable thermal overload trip unit and an adjustable magnetic short-circuit trip unit. Both trip units shall be replaceable by units of different ratings. MCCBs for motor starter circuits shall be of the current limiting type with an adjustable magnetic short circuit trip unit.

4.4 MCCBs with ratings of 600 A or more and MCCBs inside MCC cubicles shall have extension type operating handles, which shall be interlocked with the enclosure compartment doors to prevent the door being opened unless the MCCB is in the off position.

4.5 Mechanically coupled single-pole circuit breakers used as double or triple-pole circuit breakers are not acceptable unless overload releases are internally coupled.

4.6 The fault current interrupting rating of MCCBs shall not be less than the maximum prospective fault current and not less than 5 kA.

4.7 Neutral bars associated with each bank of MCCBs in distribution boards shall be positioned below each bank and shall be wired in the same sequence as the MCCBs.

4.8 MCCBs with shunt release shall have an auxiliary contact arranged to interrupt the shunt release current at the end of the opening operation. MCCBs with an under-voltage release shall be equipped with a time delay relay when specified***.

4.9 MCCBs shall be fitted with the specified number of spare auxiliary contacts***. Where spare auxiliary contacts are not called for, it shall nevertheless be possible to fit at least one normally open and one normally closed contact or a change-over contact at a later stage. Auxiliary contacts shall be capable of making and carrying continuously 1A ac or dc. They shall be capable of breaking 500VA ac at 0,2 PF and 20 watts dc at an L/R of < 40ms.

4.10 Where called for, MCCBs shall be capable of remote closing using the specified control voltage***.

4.11 MCCBs shall be lockable in the "off" position. A separate locking device may be used for this facility if so stated in the Project Specification***.

4.12 Current limiting MCCBs will not be allowed unless otherwise stated in the Project Specification***.

4.13 Where MCCBs are of the current limiting type the Contractor shall determine, and offer suitable ratings in collaboration with the MCCB supplier, to ensure discrimination and adequate short-circuit current capability. Calculations shall be submitted with the tender indicating the degree of current limiting and discrimination achieved as well as techniques used. Full details shall be submitted of the current limiting characteristics of each MCCB rating offered.

4.14 MCCBs for direct current application shall be of the current limiting type and shall have at least one pole in the positive and one pole in the negative circuit. Where additional poles are required in series to meet requirements of the specified application, the series connections between poles of like polarity shall be such that they cannot be removed without special tools.

5. DISCONNECTORS

5.1 All disconnectors shall be of the "load-break-fault-make" type i.e. be switch disconnectors complying with the relevant SANS specification.

5.2 The disconnectors shall have the ratings specified on the drawings***.

5.3 Disconnectors with ratings of 600 A or more and disconnectors inside MCC cubicles shall have extension type operating handles, which shall be interlocked with the enclosure compartment doors to prevent the door being opened unless the disconnector is in the off position.
5.4 Disconnector handles shall have an integral key lock or padlocking facility.
5.5 The fault carrying capability of the disconnectors shall be equivalent to or higher than the fault level of the associated busbar but not less than 5 kA.

6. SWITCHES AND SELECTOR SWITCHES

6.1 Switches and selector switches shall be switch disconnectors complying with the relevant SANS specification.
6.2 Switches and selector switches shall be capable of carrying, making and breaking the full rated current and of making onto the maximum prospective fault current.
6.3 The fault rating of switches and selector switches shall not be less than the maximum prospective fault current and not less than 5 kA.
6.4 The operating knob and indicator plate shall be manufactured of insulating material and the switch positions shall be clearly and indelibly marked thereon.
6.5 The switches and selector switches shall be provided with substantial contacts and the terminals shall be clearly marked and arranged for easy wiring.
The voltmeter or ammeter selector switch shall be mounted directly below the associated volt or ammeter.
6.6 Voltmeter selector switches shall be arranged so that voltages between phases, and phases to neutral, can be read. Voltmeter selector switches shall be of the break-before-make type.
The voltmeter selector switch shall have one "off" and six "metering" positions and shall be suitable for panel mounting in such a way that the operation knob and indicator plate can be mounted on the front of a panel and the switch itself at the back of the panel.
6.7 Ammeter selector switches shall be of the make-before-break type with one "off" and four "metering" positions arranged to read the current in each phase and in the neutral. When in the "off" position the metering circuit shall be short-circuited.
The physical construction of ammeter selector switches shall conform to that of voltmeter selector switches.
6.8 Switch enclosures shall be provided with an interlocked cover to ensure that the switch is in the "OFF" position before the cover can be opened for inspection or fuse removal. It shall not be possible to close the switch without the cover being closed.
6.9 Switches shall be provided with a clear "ON/OFF" or "I/O" position indicator.

7. BUS-SECTION SWITCHING DEVICES

7.1 Bus-section switching devices shall be interlocked with the incoming switchgear by means of a special-purpose key interlocking facility when specified or indicated on the single-line diagrams***.
7.2 Bus-section switching devices of rating less than 1000 A shall be disconnectors unless otherwise indicated on the single-line diagrams***.
7.3 Bus-section switching devices rated 1000 A and higher shall be air circuit breakers incorporating magnetic short-circuit trip units without thermal overload trip units.
7.4 Busbar selector or change-over switches shall be provided with suitable position indicators.

8. TIME SWITCHES

8.1 The contacts of time switches shall be silver-to-silver or other approved single-pole changeover contacts rated at 16A and operated by a spring-driven clockwork, electrically wound with a spring reserve of 8 hours minimum.
8.2 Time switches shall be fitted with a manual overriding switch.
8.3 An external bypass switch shall be provided in each time switch circuit.
8.4 Time switches shall have the following features:
- daily programmable with minimum 30 minute "on" and "off" control facilities;
- weekly programmable with day omission facilities of minimum 12 hours, i.e. mornings or afternoons.

8.5 The whole mechanism shall be totally enclosed in a dust-proof enclosure.

9. PHOTO SWITCHES

9.1 Photo switches shall comply with the relevant codes and specifications.
9.2 Photo switches shall have silver to silver or other approved single-pole changeover contacts rated to switch a reactive load of 1800 VA at 230 V and 50 Hz.
9.3 An external bypass switch shall be provided in each photo switch circuit.
9.4 The photo-electric cell shall switch streetlights on when daylight drops to approximately 40 lux and it shall switch off at approximately 80 lux.
9.5 The photo-electric cells shall have a time delay of not less than 30 seconds.
9.6 Photo-electric cells shall be completely waterproof and shall be of robust construction.
9.7 The material of the cover shall not crack, deform or deteriorate in any way whatsoever and shall be colour-fast in all weather conditions.

9.8 The photo-electric cells shall be provided with built-in lightning arresters.
9.9 Samples of photo-electric cells shall be submitted to the Engineer for approval prior to the ordering thereof.
9.10 The prices for the installation of photo-electric cells shall include the supply and delivery and the connection of cables, etc., from the photocells to LV cubicles, DBs or mini-subs.

10. FUSE-COMBINATION UNITS

10.1 The fuse-combination units shall be of the switch-disconnector-fuse (SDF) type and shall comply with the relevant codes and specifications, and shall be fitted with high rupturing capacity (HRC) cartridge type fuses-links complying with the relevant codes and specifications.
10.2 SDFs shall be capable of breaking the full rated current and shall have a fault current rating of not less than the maximum prospective fault current and not less than 10 kA for one second.
SDFs which rely on the fuses to reduce the fault current through the switch portion to provide a higher fault current rating are not acceptable.
10.3 Fuse-combination units with the fuses mounted in the cover of the unit, with the cover forming the operating lever, are not acceptable.
10.4 SDFs shall be of the double air-break, quick-make, quick-break type and shall have a spring mechanism smoothly driven by springs on both sides of the mechanism.
10.5 The fixed contacts shall be shrouded and arranged so that when the switch is in the open position the double-break isolates the HRC fuse links so that they can be replaced in complete safety.
10.6 SDFs shall be triple-pole units unless otherwise indicated on the single-line diagrams***.
10.7 All components shall be capable of continuously carrying rated current without excessive temperature rise.
10.8 SDFs shall be provided with interlocks such that:
a) the cover panel cannot be opened whilst the switch is closed; and
b) the unit cannot be operated with the cover open unless an interlock is purposely defeated.
10.9 An SDF shall have a handle and an ON/OFF position indicator mechanically operated by the moving contacts to ensure accurate and positive indication.
10.10 Facilities for padlocking in the "off" position shall be provided.
10.11 In all cases, the top terminal of fuses shall be the live terminal.
10.12 Six spare fuses shall be provided for each rating fitted.

11. FUSE LINKS AND HOLDERS

11.1 Fuse links shall be high-rupturing capacity (HRC) cartridge type fuse links conforming to the relevant codes and specifications.
11.2 HRC fuse link holders shall be of the withdrawable type and shall conform to the relevant codes and specifications.
11.3 Each fuse link and holder shall incorporate a visual inspection eye for fault location.
11.4 Fuses protecting a specific instrument shall be mounted as a group in close proximity to the relevant instrument.
11.5 A label with the rating of each fuse shall be mounted in close proximity to the relevant fuse holder or fuse switch.
11.6 Striker pin switches shall be provided if specified in the Project Specification in order to trip the associated breaker or contactor to prevent the occurrence of single phasing***.
11.7 Six spare fuses shall be provided for each rating fitted.
11.8 The spare fuses shall not be used by the Contractor during erection, commissioning or maintenance.

12. EARTH LEAKAGE PROTECTION UNITS

12.1 Earth leakage protection units shall conform to the relevant codes and specifications.
12.2 All single and three phase socket outlet circuits shall be provided with earth leakage protection devices unless specifically excluded in the Code of Practice for the Wiring of Premises.
12.3 All units shall have test push buttons and, unless otherwise specified or indicated on the single-line diagrams, the sensitivity shall be 30 mA***.
12.4 Earth leakage protection units shall be arranged to disconnect the faulty circuit from both phase and neutral of a single phase system, and from all three phases of a three phase system.

13. CONTACTORS

13.1 All contactors for low voltage shall be of the electro-magnetic operated air-break type with specific requirements as specified in the Project Specification or drawings e.g. ac or dc coil voltage, dip-proofing, latched contacts etc***.
13.2 Contactors shall comply with the relevant codes and specifications. Category AC3 or DC2 shall generally be used, whichever is applicable. Category AC4 and DC3, whichever is applicable, shall be used for heavy plugging and inching duty systems, e.g. cranes, etc.
13.3 Contactors shall have suitable capacities for direct-on-line starting, star delta starting or any other form of starting, whichever is specified in the Project Specification and the drawings***. The contactors shall be rated for at least 130% of the associated load current.

13.4 Each contactor shall be provided with at least two normally open and two normally closed auxiliary contacts, unless otherwise specified.

13.5 Contactors shall be suitable for remote and automatic operation where specified***. Where the number of auxiliary contacts required for remote and automatic operation is greater than can be accommodated on the contactor, an auxiliary relay or on additional contactor, shall be provided.

13.6 Each contactor shall be capable of carrying, making and breaking overcurrents during the operating time of its own overcurrent tripping devices at a recovery voltage of 90% of the specified system voltage.

13.7 All Contactors for starting squirrel-cage motors direct-on-line shall be rated to break 10 times the full-load running current of the motor.
The contactor shall be co-ordinated with the short circuit protective device to ensure adequate protection for the specified operational current, voltage and the corresponding utilisation category*** according to Type 2 Co-ordination as per SANS 60947.

B206 BUSBARS

1. Busbars, metal-enclosed busbar trunking systems and connections shall comply with the relevant codes and specifications.
2. The main busbars, distribution busbars, risers and droppers shall be of hard drawn high conductivity copper, having a constant rectangular cross section throughout. They shall be rated as specified in the Project Specification or indicated on the single-line diagrams***, but the rating shall not be less than specified for the main incoming circuit breaker or disconnector. Where busbars are fed directly from a transformer, the busbar rating shall be 125% of the transformer rating.
3. The busbars shall be designed to withstand for 3 seconds the mechanical and thermal stresses associated with the prospective short-circuit current specified in the Project Specification or indicated on the single-line diagram***.
4. Where busbars terminating at the end of switchboards are intended for future extension***, these busbars shall be predrilled to accommodate the extension. Where pre-fitted space is specified for future equipment***, the busbars in the proposed position shall be predrilled and nuts and bolts shall be provided to accommodate the future busbars or cables feeding the equipment.
5. The main busbars shall be mounted horizontally with the longer dimension in the vertical plane. Joints in busbars shall be avoided as far as possible, but where they are necessary, the joint shall be formed by offsetting one of the bars by a deviation equal to its own thickness to overlap the adjoining busbar. The length of the overlap shall be equal to twice the width of the bar, and the joint shall be secured with a minimum of 4 hexagon-headed bolts, washers (plain and spring) and nuts. All joints shall be tightened to the correct torque before switchboards are delivered to site, and again checked just prior to commissioning.
6. Spacing of busbars shall not be less than twice the longer dimension of the busbar and not less than 50 mm between busbars, and 150 mm to the enclosure.
7. Busbars shall be mounted on substantial moulded epoxy or resin insulators fixed with robust steel brackets. Bare conductors shall be so spaced that with all clamps, lugs and lead-offs in position, the spacing between any conductor and earth shall not be less than 40 mm. Parallel busbars shall be separated by a minimum distance equal to the thickness of each single busbar. Parallel busbars shall be connected together at spacings of not more than 450 mm to equalise current distribution.
8. The minimum clearances between current carrying parts and between current carrying parts and other metal parts shall be in accordance with the relevant codes and specifications.
9. Busbars shall be mounted at least 100 mm away from the nearest equipment. Special attention should be given to spacing between fuse-switches and busbars.
10. All busbars shall be covered with coloured heat-shrinkable material. The colour shall correspond to the colour of the supply phase. Busbars may alternatively be covered with two coats of coloured insulation paint. Busbar joints shall be covered with a suitable non-hardening compound and then taped with coloured PVC tape. Busbars shall be radius-edged where they change direction. PVC tape shall not be allowed for phase identification.

11. The following colours shall be used:

NO. OF PHASES	PHASE COLOUR	NEUTRAL COLOUR	EARTH COLOUR	SPECIAL PURPOSE COLOUR
1	Red	Black	Green/ Yellow	Orange
2	Red and White	Black	Green/ Yellow	Orange
3	Red, White and Blue	Black	Green/ Yellow	Orange
4 and more	Any base colour except Green, Yellow and Orange with serial numbers (numerals or words)	Numbered as for the phase colours	Green/ Yellow	-

12. The switchgear manufacturer shall provide necessary copper flexible or bar connections between the riser t erminals and the cable terminals. The switchgear riser terminals shall be properly tinned.
13. Connections to the busbars shall be effected by means of the correct clamps or lugs with soldered connections or with connections crimped with the correct equipment.
14. The neutral busbar cross-section shall be equal to that of the phase busbars, and may not be reduced without the approval of the Engineer.
Unless fully tested in accordance with SANS 60439-1, the current density of copper busbars shall not exceed 2A/mm² for currents up to 1600 A, or 1,6A/mm² for currents above 1600 A.
16. All terminations onto busbars and busbar interconnections shall be bolted with cadmium-plated high tensile bolts, washers, spring washers and nuts. In corrosive areas, substitute lock nuts for spring washers. The largest possible size bolt that will fit into holes in lugs and fixing holes of equipment shall be used in every instance. Bolts shall be of sufficient length that at least two but not more than five threads protrude beyond the nut. Connections shall be kept as short and straight as possible and where dissimilar metals are connected means shall be provided to prevent electrochemical reactions and corrosion.
17. The maximum current density in busbars and connections shall be such that in no part of the switchgear equipment including circuit breakers, isolating equipment, busbars, current transformers, cable boxes, and connections shall exceed a temperature of 60°C i.e. a temperature rise of 20°C at an ambient temperature of 40°C.
18. Busbars shall be properly insulated and sufficiently supported to withstand the maximum fault current at the points where they pass through panels or partitions of the switchboard. This shall preferably be achieved by means of resin bound synthetic wood or similar material with cut-outs which fit tightly around the busbars. The insulating panel shall be firmly bolted to the frame. Busbars or "droppers" that pass through internal partitions in the switchboard shall be similarly insulated and supported.
19. Earth Bars
A main earth bar shall be mounted at the bottom along the full length inside the switchboard and may be bolted to the framework of the switchboard. For back access switchboards, the earth bar shall be mounted at the rear. The steelwork of a switchboard and in particular gland plates shall be solidly and effectively bonded to the main earth bar. Earth bars shall have sufficient ways for all the earth conductors and, in addition, 30% spare space shall be provided.

Switchboards with short-circuit ratings in excess of 5 kA shall be equipped with a copper earth bar with a cross section not less than S = 0,006 x I mm² where “S” is the area in mm² and “I” is the maximum prospective fault current in Amps. However, in main DBs and MCCs, the earth bar shall not be less than 70 mm x 8 mm in cross-section, and shall be fitted with earthing studs in each section of the enclosure.

Switchboards with short-circuit ratings not exceeding 5 kA shall be equipped with an earth bar comprising box terminals with pressure shoes on a rectangular copper bar measuring at least 2,5 mm x 12,5 mm mounted on insulating pedestals. An earthing stud shall be welded to the metal tray of the distribution board. An earthing conductor equal in cross-sectioned area to the incoming earthing conductor shall connect this earthing stud to the earth bar.

20. Busbar trunking

The neutral bar shall have a cross- sectional area equal to the phase bars.
An earthing bar shall be provided.

The busbar trunking shall be finished in the colour as specified in the Project Specification***.
The busbar trunking shall be vermin-proof and noiseless under load and completely maintenance-free.
Busbar trunking shall have rated short-time withstand current for one second equal to the indicated maximum prospective fault current.

The Contractor shall submit type tests for current rating, rated short-time withstand current, and impedance characteristics to the Engineer.
Pressure test low voltage busbar trunking after installation and before commissioning at 2 kV for one minute between phases, between phases and neutral and between phases and earth.
Confirm route access and dimensions on site and compile shop drawings. Submit shop drawings to the Engineer.
Bus trunking installed outdoors, in hostile or hazardous environments shall be IP65 enclosed or as specified***.
Epoxy or polyester moulded, enclosed bustrunking shall be subject to the Engineers approval. Test certificates according to the relevant cables and specification shall be submitted as required.
The Contractor shall allow in the pricing for a complete system including all inter-connectors, flexible links, terminations and suitable brackets to fix the busbars to structures.

B207 CURRENT TRANSFORMERS

1. Current transformers shall comply with the relevant codes and specifications and shall be marked clearly and indelibly as specified therein on a rating plate securely attached to the transformer.
2. Each panel shall be equipped with the current transformers as specified in the Project Specification and or drawings***.
3. Current transformers shall be suitable for a system with an effectively earthed neutral or a non-effectively earthed neutral as specified in the Project Specification***.
4. For current transformers with a system voltage less than 3,6 kV the insulation level shall be determined by the rated short duration power frequency withstand voltage e.g. 2 kV for a 400V system.
5. Current transformers with system voltages greater than 3,6 kV shall be insulated to withstand test voltages defined by the rated lightning-impulse and short-duration-power-frequency voltages and shall be as follows for indoor switchgear :

HIGHEST VOLTAGE FOR EQUIPMENT R.M.S.	RATED LIGHTING-IMPULSE WITHSTAND VOLTAGE	RATED POWER-FREQUENCY SHORT DURATION WITHSTAND VOLTAGE
kV	**(Peak) kV**	**(r.m.s.) kV**
3.6	40	10
7.2	60	20
12	95	28
24	125	50
36	170	70

6. The short-time thermal and dynamic current rating of current transformers shall not be less than that of the associated circuit breaker, isolator or busbar.
7. The rated primary currents of current transformers shall be 10, 15, 20, 30, 50 and 75 Amperes or their decimal multiples.
8. The current transformers secondary ratings shall be 5A unless otherwise specified***.
9. Current transformers shall be accessible and easily removable. All current transformers of any one type and rating shall be identical and interchangeable with one another.
10. The class of insulation of current transformers shall be Type A (maximum temperature rise 60°k) unless otherwise specified.
11. Protection current transformers shall be of the low reactance type having toroidal cores with fully distributed secondary windings. Turns compensation shall not be utilised on protection current transformers.
12. The error in turns ratio on any tapping of a Class X current transformer shall not exceed ±0,25%.
13. The same set of current transformers shall not be used for both indication instruments and protective relays, separate cores having a low saturation factor (<than 5 preferably) shall be used for metering.
14. The VA ratings shall be sufficient to operate the various metering equipment and relays but shall not be less than 10 VA.
15. The accuracy limit factor of the protection current transformers shall be 15 unless otherwise specified.

16. The following classes of current transformers shall be used.

FUNCTION	DESCRIPTION	CLASS
1. Metering	kVA, kW and KWh meters	0,5
2. Indication	Ammeters	1,0
3. Protection	Over-current, earth fault and thermal overload	10P
4. Special Protection	Differential protection, Restricted earth fault and pilot wire protection	X

17. The arrangement of the current transformer cores with respect to the primary terminals and mechanism of the circuit breaker shall be approved by the Engineer prior to manufacture.
18. Where it is not possible to easily read the rating plates of current transformers, additional rating plates shall be located on the rear inner panel of the breaker cubicle relay compartment for each current transformer where they can be easily read. These shall be a duplicate of the rating plates which appear on each current transformer. In addition the phase colour with which each current transformer is associated shall appear beneath each rating plate. Information shall be provided on the above rating plates to indicate which secondary terminals are associated with which winding. This information shall be in addition to that called for in the relevant codes and specifications.
The information on the additional plates shall include the relative arrangement of the current transformer cores with respect to the circuit breaker terminals and shall also indicate their polarity.
19. Secondary windings of current transformers shall be earthed to the approval of the Engineer at one point only. Each group of current transformers (i.e. protection, metering, etc.) shall be earthed directly to the earth bar by way of isolating links of the type where the link cannot be removed from the terminal. These links shall be readily accessible and safe with the circuit breaker in the isolated position. They shall not be in a live compartment.
20. All current transformer connections shall be brought to a terminal block in an easily accessible position inside the switchgear relay panel.
If remote metering is specified in the project specification***, then the metering current transformer shall also be wired to an easily accessible terminal block at the back of each panel. A metering test block with special links shall be provided to make changes to the remote metering circuits possible without the danger of opening the CT's on load.
21. Each LV current transformer shall be of the ring type and be provided with a robust mounting bracket and approved terminal studs on the circumference of the coil for the connections. The current transformers shall be mounted on rigid supports in such a manner that the axis of the coil is in a vertical plane to facilitate the threading through of the interconnecting wiring to the relevant switchgear.
22. Current Transformer Testing
Test certificates shall be submitted to the Engineer and be included in manuals. Test shall be executed in accordance with the relevant codes and specifications.

22.1 Type Tests

Type tests are not required if the manufacturer holds certificates of type tests on a similar transformer. Type test certificates shall be provided upon request by the Engineer.

22.2 Routine Tests: General

22.2.1 Verification of terminal markings and polarity tests.
22.2.2 Insulation test shall be made on the windings as specified as follows:
- Power frequency tests on primary windings and measurements of partial discharges.
- Power frequency tests on secondary windings and between sections of primary and secondary windings.
- Overvoltage interturn tests.

22.3 Additional Routine Tests for Measuring Current Transformers
- Tests shall be performed to verify limits of current error and phase displacement.

22.4 Additional Routine Tests for Protection Current Transformers: Class 10P
- Tests shall be performed to verify limits of current error and phase displacement.
- Tests shall be performed to verify limits of composite error.
- Secondary winding resistance corrected to 75°C.

22.5 Additional Routine Tests for Special Purpose Current Transformers: Class X
Routine tests shall be performed to verity and establish the following:
- Rated knee-point e.m.f.
- Exciting current.
- Secondary winding resistance corrected to 75°C.

- Turn ratios.

A magnetising curve shall also be provided to the Engineer for Class X current transformers prior to the installation of current transformers in the switchgear.

23. Witnessing of tests
It should be noted that inspection and witnessing of tests shall not relieve the Contractor of his responsibilities for meeting all the requirements of the specification, and it shall not prevent subsequent rejection if such material or equipment is later found to be not in compliance with the specification.

24. Additional information to be submitted with the tender
The manufacturer shall submit with the tender the following additional information:

- A typical drawing showing the assembly of the current transformer and its core and winding.

B208 LOW VOLTAGE MOTOR PROTECTION AND RELAYS

1. Motors up to and including 55 kW

1.1 All three phase motor contactors shall be provided with three pole thermal overload relays which are selected for the applicable motor ratings as specified***.

1.2 The overload relays shall have inverse time current characteristics which comply with the relevant codes and specifications. Where motors have exceptional long starting times the tripclass shall be selected to ensure that tripping doesn't occur during motor starting.

1.3 The overload thermal relays shall be phase loss sensitive and shall be provided with a manual reset button.

1.4 All three phase motors shall be provided with suitable phase failure relays providing protection against:
- Single phasing.
- Phase reversal.
- Phase angle errors.
- Unbalance supply voltage.

1.5 When motors for pumping installations or submersible pumps are specified, an underload or undercurrent relay with suitable current transformers shall be provided.

1.6 Where relays are mounted inside panels and the trip indicators on the relays are disabled due to the loss of control voltage when cubicle doors are opened, additional signal lamp indicators shall be provided on the cubicle doors otherwise the relays shall be flush mounted on the doors.

B209 WIRING IN DBs, MCCs AND PANELS

1. In general all internal wiring in the cubicles shall be carried out in 600V PVC insulated copper multi-strand conductors. If the internal ambient temperature of the cubicle is likely to exceed 50°C silicon rubber insulated stranded copper conductors shall be used. The minimum cross-sectional area for control circuits shall be 1,5 square mm and 2,5 square mm for load and CT circuits. The current carrying capacity of conductors shall be determined in accordance with the relevant codes and specifications taking the appropriate correction factors for ambient air temperatures, grouping and condition of use into account.

2. Where several conductors are used, these shall be neatly grouped and bound together in groups not exceeding 10 conductors and shall be arranged in neat vertical or horizontal rows or installed in PVC trunking with slotted sides. Wiring shall follow the board construction features as far as possible without the twisting or crossing of conductors.

3. No joints will be allowed in internal wiring, and all connections to busbars or earth bars shall be made with approved tinned copper cable lugs soldered or crimped to the ends of the conductors and bolted to busbars by means of cadmium-plated high tensile steel bolts and nuts provided with spring washers.
Connections of conductors to equipment i.e. circuit breakers, isolators or contactors shall be made by a ferrule of correct size or by the soldering of the end of the conductor. Conductors connected to terminal blocks need not to be soldered or ferruled.
Conductors terminating on meters, fuse holders and other equipment with screwed terminals shall be fitted with pre-insulated lugs. The lugs shall be soldered or crimped to the end of the conductor. The correct amount of insulation shall be stripped from the end to fit into the terminal. Strands may not be cut from the end of the conductor.
Crimping tools used shall be of the ratchet type and indent an identifying symbol on the terminal insulation.

4. All wiring is to be kept free and away from any exposed terminals or other uninsulated current carrying parts. Wiring shall also be kept free from metal edges and shall be protected where they cross metal edges. Grommets shall be installed in each hole in the metalwork through which conductors pass. Connections to equipment on swing doors shall be arranged so as to give a twisting motion and not a bending motion to the conductors.

5. Only wires of the same potential shall be grouped together and power control circuit wiring shall be in separate wiring channels. Wiring channels shall not be more than 60% full.

6. Wires shall be clearly marked at all termination points in accordance with the numbering of the board manufacturer's wiring diagram, by means of suitable markers.

7. Additional red cable markers marked "T" in white shall also be fitted on wires associated with trip circuits.

8. When the board main disconnector or local disconnector is switched off, no live incoming or other wiring shall be accessible. The incoming terminals shall be screened or inaccessible. Where connections are taken from the incoming sides of the main switch, they shall be screened by a screen marked "ISOLATE FEEDER BEFORE REMOVING SCREEN". If any circuits are energised from other sources, clear warning notices to that effect shall be fitted and such terminals shall be clearly marked.

9. All control terminals shall be accessible from the rear, except in the case of front access boards.

10. Where neutral connections are looped between the terminals of instruments a common lug or ferrule shall be used to ensure that the neutral is not broken when the instruments are removed.

11. The supply end connections to all equipment shall always be at the top and the load end connections at the bottom.

12. Solid copper busbars shall be used to connect equipment to the main busbars where the current rating exceeds 200A and shall be insulated by means of at least two half lapped layers of PVC tape.

13. A maximum of two conductors shall be used per equipment terminal.

14. Where small leads are connected directly onto busbars, such as for voltmeters, etc. they shall be provided with a 20A fuse mounted directly on the busbar and a 2 Amp fuse at the piece of equipment on the front of the panel.

15. Unless otherwise approved the following insulation colours shall identify wiring:

Red phase of 3-phase circuits	-	red
White phase of 3-phase circuits	-	white
Blue phase of 3-phase circuits	-	blue
Live of single-phase circuits	-	red
Neutral	-	black
Earth	-	green/yellow
Alarm circuits	-	orange
AC control circuits	-	red
DC control circuits	-	blue
Instruments	-	grey

In DBs and MCCs, accessible PVC wireways shall be provided for wiring between compartments. Signal cabling shall be run in galvanised steel conduit.

Internal wiring shall be kept separated from external wiring and, as far as possible, the internal serving of cables entering the enclosure shall be left around conductors until the cable enters the compartment to which it is connected.

Low current signal cables shall be kept separate from power cables up to the point where the conductors are connected to the terminals on the equipment. Where required, sheetmetal wireways shall be provided to ensure this separation.

B210 WIRING- AND CABLE TERMINATIONS AND TEST TERMINAL BLOCKS

1. General

1.1 Electrical terminal blocks shall comply with the relevant codes and specifications and shall be indelibly marked as stated in this specification in respect of ratings, conductor sizes and identification symbols.

1.2 Terminal metal parts, bolts and screws shall be of non-corrosive material, enclosed in fire resistant, moulded plastic insulating bodies. No metal part shall project beyond the insulating material to ensure protection against accidental contact by personnel, against short circuits and tracking.

1.3 The terminal blocks shall have a temperature rating of at least T40 for indoor and T55 for outdoor switchgear.

2. Rail-Mounted Wiring Terminal Blocks

2.1 The construction of the terminal blocks and mounting rail shall be of robust construction as to ensure a firm and positive location of the terminal blocks. It shall be possible to add additional terminal blocks or replace blocks within the terminal sequence without having to disconnect or dismantle the terminal block or adjacent terminal blocks, or having to loosen any fastening device at the rear of the mounting rail. The terminal blocks shall be held in position by means of an end barrier or a shield to insulate the open end.

2.2 It shall be possible to use terminals for different sizes of conductors on the same mounting rail. Where smaller terminal blocks occur adjacent to larger terminal blocks, suitable shielding barriers shall be inserted to cover the terminals that might otherwise be exposed.

2.3 Terminals shall be sized and rated to match the conductors that are connected to them.

2.4 Each terminal blocks shall have provision for clip-in numbering or labelling strips to be installed, together with clear protective caps and shall be clearly marked in accordance with the Board Manufacturer's drawings and wiring diagrams.

2.5 All outgoing circuits of the switchboards shall be provided with suitable terminal strips of the shoe clamping type, a rating of at least 15A and wired in such a manner that all incoming cables installed at the site can easily be connected. Terminals which rely on pinch screws rotating on wire strands shall not be acceptable.

2.6 Terminal strips for auxiliary power, control alarm and trip circuits etc. shall be kept separate to ensure that cables can be made off without disturbing power cables.

2.7 Full details and samples of terminal strips shall be submitted to the Engineer for prior approval.

2.8 Petroleum-jelly filled pilot cables shall be terminated and jointed in moisture-proof, blocking type terminations/joints which shall prevent the ingress of moisture, as well as the escaping of petroleum-jelly from the cable. Epoxy-filled terminations and joints will be acceptable. However, prior approval of terminations and joints shall be obtained from the Engineer.

3. Power Cable Terminals

3.1 The terminal strip shall consist of a metal mounting strip onto which cable connecting modules are fixed. The terminals for power cables shall be have bolt fixing, complete with arc shields and suitably rated for the applicable cable sizes. For cables up to and including 10 mm², clamp type terminals may be provided, but the type where the clamp screws are in direct contact with the conductor will not be acceptable.

3.2 The terminals for power cables shall be large enough for the terminating lugs of the cable sizes specified.

3.3 Terminals for power circuits, including the neutral connection, shall be arranged in a straight horizontal line with adequate clearance between live and earth connections with the cable lugs fitted. Rigid barriers, not the thin flexible type, shall be provided between terminals.

3.4 Diagonal or vertical arrangement of terminals for power circuits will not be accepted.

3.5 Where aluminium core cables are used, suitable tinned, copper or aluminium lugs with Densal paste shall be used for the termination.

3.6 The cost for the supply and delivery of lugs and paste shall form part of the price for the erection of the cabinets.

3.7 The terminal strip for power cables shall be positioned at least 50 mm from the gland plate. The terminals, to which a cable will be connected, shall be directly above/below the specific cable gland for bottom/top entry respectively.

3.8 Where terminals are mounted more than 400 mm from the gland plate, provision shall be made for bracing and for fixing the leads of smaller cables to prevent vibration.

3.9 The terminals of each individual circuit shall be clearly labelled with the circuit name and number.

4. Test Terminal Blocks

4.1 Switchboards shall be equipped with a test terminal block, when specified in the Project Specification***. The test block shall be mounted directly below the ammeters and voltmeters on the front panel of the board, and shall be wired in series with these instruments.

B211 GLANDS AND GLAND PLATES FOR PVC AND PILOT CABLES

1. Glands

1.1 Mechanical cable glands and flameproof glands shall comply with the relevant codes and specifications.

1.2 When specified in the project specification*** glands shall be weatherproof, dust ignition proof, hose-proof or for use on type 'e' enclosures i.e. use in explosive gas atmospheres.

1.3 Glands shall be provided with brass locknuts and double outer sealing in corrosive environments. Areas which are classified as highly corrosive shall be equipped with H-C (Hydrocarbon resistant) or UV-C (Ultra-Violet and chemical resistant) seals as may be applicable***.

1.4 Glands and components shall be manufactured of non-corrosive material such as nickel plated brass.

1.5 Adjustable cable glands of the correct size designation shall be provided in switchboards for all cable types as specified.

1.6 Glands shall be equipped with cable or armour gripping devices as may be applicable and shall be constructed to ensure electrical earthing continuity between the armour of the cable and the gland plate or the metallic structure. Glands shall be provided with an earthing bond attachment of acceptable rating.

1.7 It shall be possible to convert glands for armoured cables to be suitable for unarmoured cables by replacing the cone bush and compression ring with a rubber compression bush and rings.

1.8 Where cables with metal screens or metal sheaths are specified the gland shall be designed to earth the screen or sheath through the gland on the earth bar. It shall be possible to bring earth continuity conductors through glands for ECC cables without having to cut grooves in the barrel or cone bush. Suitable replacement parts shall be used.

1.9 Glands for outdoor use shall be equipped with a waterproofing shroud and an inner seal kit.

1.10 All pilot cable ends shall be made off in glands as prescribed by the manufacturer, of correct size and complete with neoprene shrouds if used outdoors at minisubs or outdoor cubicles. The armouring shall be clamped between substantial tapered sections, which form an integral part of the gland, secured by lock nuts to give an earth connection.

2. Gland Plates

2.1 Gland plates for cable entries to boards will be from above and/or from below as specified in the drawings of project specifications***.

2.2 Gland plates shall be at least 200 mm above the normal floor level.

2.3 Gland plates shall be from non-magnetizing material where single core cables are terminated to the boards.

B212 CABLE TERMINATIONS, JOINTS, CABLE END BOXES, ENCLOSURES AND CLAMPS FOR CABLES RATED 3,3 kV AND ABOVE

1. Cable terminations and enclosures shall comply with the relevant codes and specifications.
2. Suitable cable end boxes or terminations and clamps shall be provided for the types and sizes of cables as set out in the project specification.***
3. The Contractor shall confirm with the Engineer the size and type of cable end box or termination to be used, depending on the choice of PILC cable or cross-linked polyethylene cable and copper or aluminium core cable before the manufacture of the panels or switchboards.
4. The type of termination kits and joints used on paper insulated or XLPE cables shall be those recommended and accepted by the cable manufacturers.
5. If approved by the Engineer, heat shrink type cable terminations and joints may be provided.
6. Tender prices for switchgear shall include for the supply of wooden cable clamping blocks to support the cable inside the switchgear panel where heat shrink terminations are used.
7. The switchgear manufacturer shall provide the necessary copper flexible or bar connections between the riser terminals and the cable end box terminals. The switchgear riser terminals shall be properly tinned.
8. Heat shrink terminations shall be completely non-tracking and U.V. stabilized to ensure long life.
9. Outdoor heat shrink terminations shall be equipped with sheds to increase flashover distances as recommended by the supplier for the specific voltage.
10. Where XLPE cables are used, the switchgear manufacturer shall provide suitable tinned lugs, bolts, nuts and washers for the sizes of cables specified.
11. Where paper insulated cables are used, the switchgear manufacturer shall provide suitable cast aluminium or sheet steel fabricated compound filling cable end boxes suitable for the sizes of cables specified.
12. Where applicable cable end boxes with sealed stem bushings shall be provided. Cable boxes shall be large enough for phasing out cables. Special manufactured cable end boxes shall be used for cables larger than 120 mm².
13. Terminations or joints shall be packed as complete kits, clearly marked in respect of suitability for cable type, insulation, construction and voltage. Each kit shall be accompanied by a detailed set of the manufacturers' installation instructions. The terminations and joints shall be made off strictly in accordance with these instructions with the correct tools.
14. The Contractor, at the time of Tendering, and in the appropriate schedule, shall state the equipment with which each jointer will be equipped. Failure to complete this schedule may prejudice the Contractor's offer.
15. Only electricians who can provide a Certificate of Competence issued by the manufacturer of the accepted termination and joint kits shall be allowed to make off terminations and joints. Costs incurred due non-compliance shall be borne by the Contractor.
16. The Engineer reserves the right at any stage during the contract to instruct that any completed joint be opened for the purpose of carrying out an interior inspection. Should the workmanship of the joint be such that it fails to pass an inspection, the remaking of the joint shall be carried out at full cost to the Contractor. Should the workmanship pass the inspection the cost of making good the opened joint shall be to the Employer's account.
17. A loop of approximately 7,0 metre long shall be left, where possible, at each cable end where high voltage cables are laid underground for distances exceeding 60 metres.
18. Conductor joints shall preferably be done by means of suitable ferrules which shall be properly sweated onto the conductors. Crimped ferrules will only be allowed if the crimping tools and workmanship are approved by the Engineer. Suitable ferrules flux shall be used for aluminium cables.

19. On underground through joints, suitable ferrules shall be used for connecting the cores together. The strands shall be thoroughly tinned before being sweated onto the ferrules. In the case of aluminium cores, the strands shall be thoroughly tinned and sweated into the ferrules using suitable solder flux.
20. The joining of copper conductors to aluminium conductors shall be achieved by the use of properly tinned and sweated cores and ferrules respectively. The correct type of ferrules shall be used.
21. All cable joints shall be of the water blocking type for the prevention of the ingress of moisture from one cable to the next through the joint.
22. The electrical continuity of all the conductors, screen and armouring shall not be impaired by cable joints and the earth continuity shall be accomplished within the joints, i.e. no external earth continuity conductor that will be subject to corrosion, is acceptable. The joints shall be completely covered by a watertight sheath to prevent corrosion.
23. Cable ends shall be long enough for the making off of cable ends into cable through-joint boxes and/or cable end boxes. Excessive waste shall be avoided by the Contractor.
24. Cable connections throughout the system shall follow the same phase rotation, and all cores on the system shall follow the undernoted identification:-

    Red Phase : Core No. 1
    Yellow Phase : Core No. 2
    Blue Phase : Core No. 3
25. Where paper-insulated cables are made off into cable end boxes, the lead cover and armouring shall both be made off into a wiped joint. A 70 mm² stranded copper conductor shall be connected to the cable armouring inside the wipe. The copper conductor and armouring shall be properly cleaned and tinned before the connection is made. The other end of the copper conductor shall be connected to the earthing system by means of a suitable tinned lug. Wiped joints may be replaced by a mechanical assembly approved by the Engineer.
26. Compound shall conform to the relevant codes and specifications. Oil filling compounds shall not be acceptable.
27. Where anti-electrolytic cables are used the cable joint boxes shall be insulated from earth by means of rigid PVC pipes to be put over the joint boxes. The open ends of the pipes shall be sealed with a hard-setting bitumastic compound. Where the environment is sandy, the pipes with joint boxes shall be put onto reinforced concrete slabs. The costs for the supply, delivery and installation of the pipes and/or concrete slabs shall be included in the prices for making off the joints.
28. Lead sheets, or other approved material, approximately 75 mm wide, shall be clamped around the high voltage cables at every cable end box and cable joint box and underneath every cable marker. The following information shall be engraved on the sheets.

    a) Voltage, e.g. : 11 kV
    b) Sizes, e.g. : 185 mm² Al or Cu.
    c) Designation, e.g : Substation 1 - Substation 2

    Only the designation shall be engraved if the manufacturer has already printed the other information on the cable.
29. The installation Contractor shall pre-plan the laying of high voltage cables in order to avoid the installation of a through-joints inside premises. No joints inside premises shall be allowed.
30. Sealing of cable ends
    The ends of cables which are cut shall immediately be sealed by means of plumbed lead end caps should there be a delay before jointing is to take place.
    The sealing of cable ends by means of rubber or bituminised tapes shall not be allowed. Heat shrink caps may be used provided the seal is correctly applied. Where cable ends were left open for 24 hours or more, the cable ends shall be tested for moisture ingress.

B213 SWITCHBOARD ACCESSORIES

1. CONTROL PUSH BUTTONS

1.1 General

1.1.1 Push buttons shall comply with the relevant codes and specifications.
1.1.2 Push buttons shall be provided by a single reputable supply and shall be selected for the required rating, contact action, duty, environmental conditions e.g. temperatures and vibrations and mounting characteristics e.g. flush mounted, enclosed, self-contained, illuminated, etc.
1.1.3 All push buttons shall be of the same physical dimension and shall be interchangeable between normally open and normally closed contacts. Push buttons shall preferably also be interchangeable with indicator lamps, key switches, etc. All push buttons shall be provided with replaceable lenses.
1.1.4 Push button terminals shall be suitable for conductor sizes to be used. Push button assemblies mounted on doors of control boards shall be enclosed to prevent inadvertent contact with the terminals and when the doors are open.
1.1.5 Contacts shall be silver-tipped or be constructed of an approved high quality material.
1.1.6 Push buttons shall be labelled by means of removable legend plates clearly indicating it's function. Legend plates shall be interchangeable.

1.1.7 When specified*** keylock push buttons shall be supplied with duplicate keys. The removal action of the key shall suit the application.

1.1.8 Illuminated push buttons shall comply with the specification for indicator lamps and lights.

1.2 Motor Control Centres

1.2.1 All motor control cubicles shall be provided with "STOP/START" push buttons as follows (or as specified in the Project Specification):

-	Start Button	:	Green
-	Stop Button	:	Red

1.2.2 When specified in the Project Specification*** or indicated on drawings the following push buttons shall be provided:

-	Trip Reset Button	:	Black
-	Emergency Stop Button	:	Red with yellow background
-	Lamp Test Button	:	White
-	Any Other Function Button	:	Pale Blue

1.2.3 Start push buttons shall have normally open contacts. Stop push buttons shall have normally closed or normally open contacts, as may be required.

1.3 Switchgear

When specified in the Project Specification*** or indicated on drawings push buttons shall be provided as follows:

-	Electricity Controlled Switchgear		
	Open Button	:	Green (O)
	Close Button	:	Red (I)
-	Reset Button	:	Black
-	Lamp Test Button	:	White
-	Any other Function Button	:	Pale Blue

2. SIGNAL LIGHTS

2.1 General

2.1.1 Indicator lights shall comply with the relevant codes and specifications.

2.1.2 Indicator lights shall be provided as specified in the Project Specification*** and indicated on drawings.

2.1.3 Similar cluster multi-led (8 chip) long life signal lamps shall be provided for all indications.

2.1.4 LED's shall be selected and rated for the specified control voltage and shall be equipped with a suitable current limiting protection resistor. Each LED shall be provided with a Zener transient protection diode. Suitable LED's are type MDA 22 for AC applications under 110V and DC applications, and type MAC 22 for AC applications above and including 110V as obtainable from Mimic Crafts. Equivalents shall be submitted for approval by the Engineer.

2.1.5 Indicator light lenses shall be of the same size, shall have a minimum diameter of 22 mm and shall be of the front removable screw type. The lamps shall be replaceable from the front of the panel without the use of tools. Indicator light construction shall be suitable for the operating environment and shall be equipped with interchangeable lenses.

2.1.6 Indicator lights shall be labelled by means of a removable legend plate clearly indicating it's function. Legend plates shall be interchangeable.

2.1.7 Two spare lamps shall be provided for each type and colour lamp used on the boards unless otherwise specified.

2.1.8 The spare lamps shall not be used by the Contractor during erection, commissioning or maintenance.

2.2 Motor Control Centres

2.2.1 When specified in the Project Specification*** or indicated on the drawings, the following indicator lights shall be provided:

Drive stopped, power available	:	White	
Drive running	:	Green	
Drive tripped	:	Red	
Emergency stop activated	:	Yellow	
Moisture ingress	:	Blue	

2.3 Switchgear

2.3.1 The following lens colours shall be used:

Circuit Breaker, Isolator closed or abnormal state	:	Red

Circuit Breaker tripped (caution)		:	Yellow
Circuit Breaker open (ready for operation)		:	Green
Interlocking	:	White	
Other functions	:	White	

Painted lenses shall not be acceptable.

2.3.2 Where indicating lamps are supplied from the substation batteries, it shall be separately wired to an easily accessible terminal block at the back of the board and shall not form part of the wiring of the spring charge mechanisms of equipment or tripping circuits. The indicator lights shall be wired to a lamp test push button mounted on one of the cubicles, preferably a buscoupler or an incomer. The lamp test circuit shall be equipped with a timer (0-10 min) to prevent the unnecessary drainage of batteries.

3. SEMAPHORES

3.1 Semaphores shall be provided if specified in the project specification***.

3.2 Semaphores shall be of the electrically operated, totally enclosed type, suitable for the operation with the specified control voltage.

3.3 The semaphores shall be of the continuously energised type which will take up an abnormal position when de-energised, e.g. 45 deg. to the horizontal.

B214 NAME PLATES AND LABELS

1. Name Plates

All equipment shall be provided with a manufacturer's name plate/plates fixed in an easily accessible and readable position on equipment or inside cubicles showing the following data.

1.1 The manufacturers name or trademark.

1.2 Type, designation or identification number or other means of identification making it possible to obtain relevant information from the manufacturer of equipment.

1.3 SABS or IEC Designation.

1.4 Rated operational voltage.

1.5 Short circuit strength in kA.

1.6 Degree of protection IP rating.

1.7 Maximum current carrying capacity of busbars.

1.8 Maximum current carrying capacity of equipment.

1.9 Voltage transformer ratio (where applicable).

1.10 Current transformer ratio, burden, class and knee point voltage (where applicable).

1.11 Current transformer connection instructions for various CT ratios (where applicable provide separate nameplate close to the relevant terminal blocks).

2. Labelling

2.1 Labels shall generally have black lettering on a white background. Danger and safety notices shall have red lettering on a white back-ground and be in both official languages.

2.2 Labels shall be engraved "trafolite", aluminium or an approved alternative secured with screws, not glue, or in an approved aluminium guide rail.

2.3 Lettering shall generally be 6 mm high except that of "main switch", "hoofskakelaar", "local switch" and "plaaslike skakelaar" which shall be 10 mm high. The lettering of labels indicating names of panels shall be 20 mm high.

2.4 Each cubicle shall also be provided with labels of similar wording at the back of the cubicle.

2.5 Where possible labels shall not be fixed to removable panels or doors.

2.6 The manufacturer shall consider the wording on the drawings as preliminary only and shall obtain the correct final wording from the Engineer before the labels are manufactured.

2.7 All equipment situated inside the board, e.g. contactors, relays, fuses, timers and time switches, shall be clearly labelled indicating function and circuit controlled.

2.8 Typical labels are as follows:

2.8.1 Cabinet: cabinet description.

2.8.2 Incoming cables/busbar: size and origin.

2.8.3 Main disconnector: "main switch", "hoofskakelaar" and danger notice.

2.8.4 Local disconnector: "local switch", "plaaslike skakelaar" and danger notice.

2.8.5 Fuses and combination fuse switches: circuit designation and fuse rating.

2.8.6 Circuit breakers: circuit designation and overcurrent adjustment where applicable.

2.8.7 Earth leakage protection units: circuit designations.

2.8.8 Contactors, relays, time-switches, timers, control fuses, etc: designation of control circuit and circuits controlled, function and fuse ratings.

2.8.9 Push buttons: circuit designation and function.

2.8.10 Indicating lamps: circuit designation and condition.

2.8.11 Instruments and selector switches: circuit designation and phase colour.

2.8.12 Meters (kVA and/or kWh): circuit designation and phase colours where applicable, reading description, and a single multiplication factor for each reading.
2.8.13 Terminal blocks: terminal designations and function.
2.8.14 Current transformers: ratios and terminal designations.

3. Legend Cards for distribution boards or cubicles and Motor Control Centres

3.1 Install an index card in a holder, with a 2 mm thick transparent acrylic panel, screwed or welded inside a door, or where no doors are fitted, to the front plate of the cabinet. The legend card shall list the outgoing circuit designations in accordance with the layout and schematic drawings, functions and outlet locations.

B215 METERING AND INDICATION EQUIPMENT

1. GENERAL

1.1 All meters and indicating instruments shall be of the flush mounted type. Meters not designed for flush mounting, shall be mounted on suitable brackets inside the equipment panel for relay panels, control panels and distribution boards. A suitable door with a glass-covered window shall then be provided in front of the meter.
1.2 Metering and indicating instruments shall be mounted at between 1,2 m and 2 m above floor level, except where the dimensions, type and mounting position of the panel make this impossible.
1.3 All meters shall be protected with suitable fuses.

2. AMMETERS

2.1 Ammeters shall be of the flush mounted, 96 mm square, quadratic scale type unless otherwise approved by the Engineer.
2.2 Ammeters shall comply with the relevant codes and specifications.
2.3 All ammeters shall be of the combined instantaneous and 15 minute integrating time lag thermal demand type unless otherwise specified in the project specification. The instantaneous movement shall be of the moving iron type to Accuracy Class 2,5 of BS 89. The accuracy of the thermal demand movement shall be within 3%.
2.4 The ammeter full scale reading shall correspond with the rated primary current of the associated current t ransformer with an extended scale to at least 120 % of the full scale value.
2.5 The scale plates of ammeters shall be marked with a red line at the full load current of transformers and motors, and at the associated current transformer primary rating in all other cases.
2.6 Ammeter movements shall be suitable for use in either 1 A or 5 A current transformer secondary circuits as specified*** in the project specification.
2.7 Ammeters shall be fitted with zero adjustment screws.
2.8 Each ammeter shall be clearly marked with the appropriate colour of the phase to which it is connected.
2.9 Where ammeters are to be used with dual ratio current transformers, loose scale plates shall be supplied for each ratio. The ratio shall be indicated on the scale plate.
2.10 Ammeters shall be mounted in a horizontal line on cabinets and cubicles.

3. VOLTMETERS

3.1 Voltmeters shall be of the suppressed zero, 96 mm square, quadratic scale, flush mounted type, unless otherwise specified.
3.2 Voltage transformers will not be used on 400/231V systems. On all higher voltage systems, the voltmeters shall be supplied from voltage transformers with 110V secondary windings.
3.3 Voltmeters shall comply with the relevant codes and specifications, and shall be of Accuracy Class 2,5.
3.4 Voltmeter scales shall extend to at least 115% of the nominal system voltage. The nominal system voltage shall be clearly marked with a red line on the scale plate.
3.5 All voltmeters shall be fitted with zero adjustment screws.
3.6 All voltmeters shall be equipped with a voltage selector switch. This selector switch shall be suitable for phase to phase selection on high voltage three-wire systems and for both phase to phase and phase to neutral selection on low voltage four-wire systems. The selection switch shall be mounted directly underneath the voltmeter.

4. kWh, kW MAXIMUM DEMAND, kVA MAXIMUM DEMAND AND COMBINED kWh / kVA MAXIMUM DEMAND METERS

4.1 Three and single phase kWh meters, up to 80 A shall be directly-operated types and those above 80 A shall be operated through current transformers.
4.2 kW and kVA Maximum demand meters and combined kVA/kWh meters shall be operated through current transformers.
4.3 All the above types of meters shall be of the directly-operated voltage type for voltages up to 400/230 V unless otherwise specified. Meters to be used on higher voltage systems shall be operated through voltage transformers with 110 V secondary windings.

4.4 kWh-Meters shall have cyclometer dials and shall be direct reading without the use of a multiplication factor. kWh-Meters or combined kWh/kVA maximum demand meters can, however, be of the non-direct reading type, but in this case, only one multiplication factor shall be used to obtain both the kWh and kVA readings.

4.5 Any multiplication factor applicable to any meter shall be clearly indicated on the meter, or on a label adjacent to the meter, in unit form and not as a combination of several factors. The manner in which this factor is calculated shall however also be displayed indicating the CT and VT ratios used.

4.6 All meters shall be fitted with security seal fitting facilities.

4.7 Maximum demand indicators shall be resettable from the front without the removal of any covers being necessary, and shall have security seal facilities.

4.8 The integrating period on all maximum demand meters shall be 30 minutes, unless otherwise specified.

4.9 Combined kVA maximum demand and kWh meters shall be the relevant codes and specifications suitable for the type of system in which it is to be used.

4.10 Meters shall comply with the relevant codes and specifications with Class 2,0 accuracy, unless otherwise specified.

5. POWER FACTOR INDICATORS

5.1 Power factor meters shall comply with the relevant codes and specifications.

5.2 The meter shall be suitable for use on 3 phase, 3 or 4 wire system. Unbalanced conditions shall be allowed for.

5.3 Where power factor indication is specified in the project specification, only one meter shall be provided on each circuit where indication is required. The meter shall be installed on the Yellow phase circuit.

5.4 The meter shall be suitable for operation with the current and voltage transformers specified.

5.5 The scales of power factor indicators shall be calibrated at least from 0,6 leading to 0,6 lagging, or a wider range.

5.6 Power factor indicators shall be of the 96 mm square, or larger, flush mounted type.

B220 CABLE TRAYS AND LADDERS

1. GENERAL

Steel cable trays and ladders shall be galvanised.

Where painting is required, apply a calcium plumbate primer and apply two coats of high gloss enamel paint to SANS 630, or apply an epoxy-polyester powder coating to SANS 1274.

Cable trays and ladders and their accessories shall be pre-manufactured. On site fabrication will not be allowed without the express permission of the Engineer. Where standard lengths are cut on site, render smooth the cut edges, prepare the surface, apply two coats of zinc-rich paint and if painted, reinstate the paint system.

2. INSTALLATION

Install cable trays and ladders complete with cross-overs, tees, reducers, bends, elbows, cornices, splices, traying arms, fixings, brackets, "unistruts", clamps, hangers, nuts, bolts, washers, screws and all other accessories required to complete the installation.

Support cable trays and ladders to prevent sagging beyond 1/180th of the span or 3mm whichever is the lesser. Each length shall be supported in at least two places along the length. The diameter of expanding bolts, studs, etc., and nuts, bolts and patent fixings, etc., securing the trays and ladders shall not be less than 10mm.

3. HEAVY DUTY CABLE LADDERS

Cable ladders unless otherwise specified, shall be heavy duty manufactured of sheet steel at least 2,0 mm thick with shoulders at least 76 mm high. Cable ladders and accessories shall be hot-dip galvanised to SANS 121.

Rungs shall be spaced at intervals not greater than 300 mm. Bends, tees, elbows, cross-overs and reducers shall have minimum radii of 450 mm.

Support cable ladders on traying arms of length to suit ladder width and fitted with end caps.
Cable ladder lengths over 3 m shall be supported in at least three places along the length.
Bolts, nuts and washers securing splice pieces shall be at least 6 mm diameter.

Where cable ladders ramp slightly so that a bend is not required provide hinged splice pieces hinging on 8 mm nuts, bolts and washers and with radiused corners.

5. LIGHT DUTY CABLE LADDERS

Light duty cable ladders may only be installed where specified or where expressly permitted by the Engineer. These cable ladders shall be manufactured of sheet steel with shoulders comprising 41,3 mm x 10 mm x 1,6 mm pressed steel channels. Cable ladders and accessories shall be hot dip galvanised to SANS 121. Rungs shall be spaced at intervals not greater than 300 mm. Bends, tees, elbows, cross-overs and reducers shall have minimum radii of 300 mm. Support cable ladders on traying arms of length to suit ladder width and fitted with end caps. Cable ladder lengths over 3 m shall be supported in at least 3 places along the length. Changes of direction shall be undertaken with manufactured elbows hinged horizontal splices or hinged vertical splices. Bolts, nuts and washers securing splices shall be at least 10 mm diameter.
The hinge pin of the hinged horizontal splice shall be at least 8 mm diameter.
Hinged horizontal or vertical splices may be used for elbows and bends up to 45°. Manufactured elbows and bends shall be used for elbows and bends over 45°.

6. HEAVY DUTY CABLE TRAYS

Cable trays, unless otherwise specified, shall be heavy duty manufactured from perforated sheet steel at least 2,5 mm thick with shoulders at least 76 mm high. Heavy duty cable tray and accessories shall be hot-dip galvanised to SANS 121.
Provide cornices at changes of direction to allow minimum bending radii of cables.
Support heavy duty cable trays on traying arms of length to suit tray width and fitted with end caps.

7. LIGHT DUTY CABLE TRAY

Light duty cable trays may only be installed where specified or where expressly permitted by the Engineer and shall be manufactured from perforated sheet steel at least 1,2 mm thick with shoulders at least 19 mm high. Light duty cable trays and accessories shall be galvanised to SABS 121.

Provide cornices at changes of direction to allow minimum bending radii of cables.

Support light duty cable trays on traying arms of length to suit tray width.

B231 MEDIUM VOLTAGE (UP TO 33 kV), LOW VOLTAGE AND PILOT CABLES

1. GENERAL

1.1 The Contractor shall supply and install cables as specified in the Project Specification*** and indicated on the drawings.

2. CABLE CONSTRUCTION

2.1 Medium Voltage Cables

2.1.1 Paper-insulated Cables

1) Heavy duty, mass-impregnated, belted, non-draining, paper-insulated, lead-covered, steel wire armoured, unearthed, stranded 3-core cables, shall be supplied, which shall conform to the latest issue of SANS 97. If steel tape armouring and/or screened cables are preferred, it will be specified*** in the project specification.

2) Cables shall have an outer serving of PVC, unless otherwise specified.

3) Anti-electrolytic cables, where called for, shall finally be served with PVC. The following information shall be printed on the outer PVC sheath, in the factory, where possible:-

Voltage, e.g.	:	11 kV
Size, e.g.	:	185 Cu or 185 A1.
Name of Client	:	If required in Project Specification***

The abovementioned information shall be printed on the cable at reasonable intervals.

4) The cores of cables shall be stranded copper or aluminium conductors as specified or as alternatively offered.

2.1.2 Cross-linked Polyethylene Cables

1) Cross-linked polyethylene (XLPE), 3 core, steel wire armoured or unarmoured cables of an approved manufacture shall be used when specified***, provided that full technical information is submitted with the tender. All XLPE insulated cables offered shall comply with SANS 1339. Cores shall be individually screened.
2) The type of cable required shall be specified in the Project Specification***.
3) The following information shall be printed on the outer PVC sheath, in the factory, where possible:-

Voltage, e.g.	:	11 kV
Size, e.g.	:	185 Cu or 185 A1.
Name of Client	:	If required in Project Specification***

The abovementioned information shall be printed on the cable at reasonable intervals

2.2 Low Voltage Cables (1000 V)

2.2.1 Cables

1) All low voltage cables shall be polyvinyl chloride insulated with steel wire armouring or strip aluminium armouring, as specified***, and served overall with a final layer of polyvinyl chloride.
2) Cables shall be round with the number of cores specified and suitable for general service as prescribed in SANS 1507.
3) The cores shall be stranded copper or solid shaped aluminium.
4) The cables with stranded copper cores shall be armoured with single steel wire armouring, unless otherwise specified.
5) The cables with solid aluminium cores shall be armoured with strip aluminium armouring or steel wire armouring as specified.
6) Cables with tinned copper earth continuity conductors as part of the armouring shall only be provided when specified*** in the project specification.

2.3 Pilot Cables

2.3.1 Specification and Core Sizes

Pilot cables shall comply with the applicable SANS.
Pilot cable cores shall be 0,9 mm diameter unless otherwise specified.

2.3.2 Working Conditions

The pilot cables may be installed in the same trenches as low voltage or high voltage power cables at depths varying between 0,8 and 1,5 m. Pilot cables may also be installed directly underneath and parallel with overhead power lines.

Pilot cables shall be used for protection applications, as well as speech and data communications.

2.3.3 Electrical Requirements

1)	Continuous working voltage	:	250 V, 50 Hz between cores
2)	Maximum loop resistance	:	56 ohm/km
3)	Minimum insulation resistance	:	30 000 megaohm/km
4)	Mutual capacitance of pair	:	60 nanofarad/km maximum at 800Hz
5)	Capacitance unbalanced	:	600 pF/km maximum at 800Hz
6)	Overvoltage withstand capabilities	:	5 kV between any two cores; 10 kV between any core and any metal work that may be earthed
7)	General	:	Pilot cables shall be designed to ensure the minimum cross-talk level and maximum immunity against induced effects

2.3.4 Mechanical Requirements

1) Unless otherwise specified, pilot cables for outdoor use shall be petroleum-jelly filled. Contractors may offer cables with a polyethylene/ aluminium laminated sheath as alternative for consideration by the Engineer.

All pilot cables shall in any case be fully waterproof, even when operating for extended periods of time fully submerged in water or waterlogged soil.

1) Cable insulation shall be polyethylene.
2) Bedding layers shall be polyethylene.
3) Galvanized steel wire armouring shall be provided.
4) The outer sheath of the cable shall be PVC and an overall conductive coating of colloidal graphite or other conductive material shall be applied to the serving to facilitate voltage testing to earth.
5) All cores shall be clearly and indelibly identified by means of numbers or a colour code.
6) Contractors may offer alternative cables, but full constructional detail shall be submitted with tenders.

2.3.5 Tests and Inspections

1) All pilot cables offered shall in all respects comply with applicable international and/or Telkom Specifications.2) Tender prices shall include for the costs of performing the following tests on each drum of cable:-
   a) Conductor resistance test
   b) Overvoltage tests
   c) Capacitive tests
3) The Engineer shall be notified at least two weeks in advance of when such tests are to be performed. The Engineer reserves the right to witness all such tests.
4) Test certificates of all tests shall be submitted to the Engineer prior to or with the delivery of the cables.

2.3.6 Pilot Cable Terminal Boxes

1) The multicore cables shall be connected to the panels and equipment via terminal strips in terminal boxes in all substations when specified in the project specification***.
2) The Contractor shall allow for the supply and installation of centrally situated, wallmounted terminal boxes when applicable.
3) The terminal boxes shall be manufactured from mild steel of minimum thickness of 2 mm. A steel frame shall be used to ensure rigidity where necessary. The terminal boxes shall be fitted with front opening hinged lockable doors.
4) All doors shall be of a neat dustproof fit, and the enclosures shall be completely verminproof.
5) The terminal boxes shall be adequately ventilated for the prevention of condensation.
6) The terminal boxes shall be wall mounted.
7) The terminal strips inside the terminal box shall comply with the standard specification.
8) Terminal blocks shall have separate terminals for incoming and outgoing wires, and not more than two wires shall be connected to any one terminal. Insulating barriers shall be provided between adjacent pairs of terminals. The height of the barriers and the spacing of the terminals shall be such as to give adequate protection while allowing easy access to terminals. The connections shall be suitable for the cables provided.

3. Excavations and Laying of Cables

3.1 General

1) 11 kV Cables, low voltage cables, pilot cables, telecommunication cables and pipes shall be laid in the same trenches, where applicable, and in the positions as shown on the drawings.
   The rates for the laying of cables shall include for the laying of cables over or under other services.
2) The spacing between cables shall be exactly as shown on the drawings. The positions of cables shall always be measured from boundary lines of stands, unless otherwise specified.
3) After all cables have been laid and correctly spaced, they shall be inspected and approved by the Engineer before trenches are backfilled. In the event of the Contractor not notifying the Engineer well in advance of an inspection, the Contractor shall then open sections of the trenches for inspection at his own cost.
4) The tender prices for excavations shall include the following:-
   a) Excavations of cable trenches.
   b) Levelling of the bottom of trenches.
   c) Supply and laying of a 75 mm minimum layer of sifted soil.
   d) Supplying and covering of the cables with a 75 mm layer of sifted soil after the cables have been laid and spaced and after the inspection and approval by the Engineer.

e) The backfilling and consolidation of trenches with soft soil.
f) The removal of all surplus materials from the sites.
g) Finishing and levelling of sites where excavations were done.

5) Cables shall be drawn off drums in the same direction where more than one drum is involved in a cable laying route. The drums shall be suitably placed along the cable route. All drums shall be rolled as indicated by the arrows marked on the drums.
6) No crossing of cores shall be permitted in cable boxes.
7) The quantities of cable trench excavations as set out in the Bills of Quantities are estimated quantities. The Contractor will be paid according to the actual quantities as measured on site after the cable trenches have been excavated, measured, the cables laid and the trenches backfilled.
8) All cable trenches and especially road crossings shall be properly consolidated. All road surfaces shall be reinstated to the original condition, unless otherwise specified.
9) The widths of cable trenches which will be used for the purpose of measurements, where applicable, will be determined by the combination of the number of cables and/or pipes as specified in the Project Specification and as shown on the drawings.

3.2 Trench Preparation

Once the trench has been basically excavated, trimmed and levelled, the bed of the trench shall receive the following treatment:-

3.2.1 Trenching in Hand-Pickable Ground

1) The bed of the trench shall be checked for the presence of loose rocks or sharp objects. All loose foreign materials shall be removed, leaving the bed of the trench clear.
2) The cleared bed of the trench shall be lined with a layer of backfill screened through a 4 mm mesh, to a depth of 75 mm.

The bed of the trench shall be levelled in a manner which will prevent the cable riding high at any point along its installation. River sand or mine dump scrap will not be accepted as cable trench bedding.

3.2.2 Trenching in Ground requiring Rock-Breaking or Blasting

Where the cable trench has to be cut through ground requiring compressor drilling, rock breaking and/or blasting, the bottom screened soil backfill shall be laid so that 100 mm of screened backfill covers rocky protrusions. All jagged edges of rock, and foreign materials such as loose rocks and sharp objects shall be removed so as to present no risk of subsequent damage to the cable.

3.2.3 Trench Backfilling

1) Upon completion of the cable laying, the cable shall be covered with a layer of 75 mm of backfill screened through a 4 mm mesh.
2) Subsequent backfilling, above the 75 mm layer mentioned above, shall be screened through a 40 mm mesh.
3) Cable protective slabs (only if specified) shall be placed over a minimum backfill of 75 mm above the cables.
4) Excavated ground backfill shall follow upon Item 2 above, the backfill being consolidated at 300 mm levels. The backfill shall be consolidated to at least the same compaction of the original surrounding soil, but to the satisfaction of the Engineer.
   Backfilling and consolidation shall be in accordance with SANS 1200.
5) The backfilled trench shall be domed so as to provide drainage, the dome being 150 mm above the surrounding ground level.

3.3 Road and Railway Crossings

3.3.1 General

The Contractor shall allow in his price for the complete installation of the road and railway crossings as indicated on the drawings.

1) The crossing installations shall be in accordance with the detail drawings included in the contract.
2) All excavations, unless otherwise specified in the tender documents, shall be constructed at right angles to the roads and/or railway servitudes.
3) Rigid PVC or asbestos cement pipes shall be used for the crossings. The pipes shall be properly joined. The open ends of spare pipes shall be sealed with easily removable caps or plugs.

4) All crossings, their construction and implementation, shall be carried out in accordance with the requirements laid down by the Local Authorities, the Provincial Roads Department, and the Department of Transport, the Transnet and others.
5) The rates for the laying of cables shall include the pulling through of cables through sleeve pipes in road crossings.

3.3.2 Road Crossings

1) Excavations across roads shall be carried out with the minimum inconvenience to the public and the authorities.
2) Excavations across main roads where the width of the road between kerbs is 9 meters or more, shall be carried out in half road widths so that the flow of traffic can be maintained.
3) Where tarred road surfaces are cut, such cuts shall be neat and straight and no jagged edges shall be tolerated.
4) Road crossings in townships shall always be opposite a stand boundary peg unless otherwise shown.
5) The excavations shall be of such depth that the dimension from the top of pipe ducts to the road surfaces shall not be less than 1.2 m, or as otherwise specified on detailed drawings.
6) The Contractor shall be responsible for the provision of road warning signs, road barriers, the stringing of danger tapes and the positioning of warning lamps between sunset and sunrise. Flashing type warning lamps shall also be positioned at strategic points in the construction areas to caution motor vehicle traffic.

3.3.3 Cable Pipe Ducts

1) Concrete, asbestos cement, polyethylene or PVC pipes shall be used for cable pipe ducts which shall comply with the relevant SANS specification. Suitable approved joints shall be used for the pipes.
2) The cable pipe ducts shall protrude not less than 750 mm and not more than 1 000 mm on either side of the street kerbing.
3) The pipe ducts shall be neatly trimmed at the ends after laying, and a heat-shrinkable duct end cap shall be fitted over each and every open end through which no cable is installed. Where the size of the duct does not permit the fitting of these covers, then the open ends shall be sealed by means of a weak cement mix of 7 sand to 1 cement. Polystyrene plugs of suitable size may also be used.
4) All pipe ducts shall be fitted with galvanized steel draw wires.
5) The ducts shall be laid as shown on the enclosed drawings, the required depths and distances between duct centre lines being shown.

3.3.4 Trench Backfilling and Compaction

1) Only material which is compactable shall be used for the backfilling of road crossing excavations. At the discretion of the Engineer, suitable soil shall be imported for the backfill material. No rocks shall be included in the backfill.
2) The backfilling shall be carried out in 150 mm layers (after compaction), each layer being compacted by means of a compacting machine. Each layer so backfilled shall have sufficient moisture content to ensure that solid binding of the material is obtained. The backfill shall be compacted to modified AASHTO as specified in SANS 1200.
3) Tar re-instatement shall be carried out within four days of completing the trench backfilling. At this stage, the trench excavation shall be trimmed so as to permit the full thickness of tar re-instatement.

3.3.5 Railway Crossings

1) Crossings of railway tracks shall be carried out in accordance with the latest requirements as set out in the approvals received from the South African Transport Services (Transnet) and the requirements of SANS 15589 for cathodic protection of buried and submerged pipelines.
2) Railway crossings shall comply with the detail drawings issued in regard to main dimensions and installation details.
3) The installation Contractor shall fully familiarise himself with the railway's operational procedure, and the necessary forward planning shall be carried out by him for the safe execution of the work.

3.3.6 Types of Crossings and Duct Sizes

The crossings consist of the following:-

- High voltage cable crossings
- The cables shall be laid in 150 mm diameter pipes. One spare pipe shall be installed for each high voltage cable, unless otherwise specified.
- Low voltage cable crossing

The main low voltage cables and street-light cables shall be laid in 100 mm diameter pipes. No spare pipes are required for low voltage cables.

Low voltage service connection cable crossings

These are crossings between mini-subs or cubicles on the one side of the road reserve to low voltage connection boxes or service connection on the opposite side of the road reserve. More than one cable can be laid in the same 100 mm diameter pipes. No spare pipes are required. These pipes shall be installed from the cable reserve on one side of the road reserve to the cable reserve on the opposite side of the road reserve with the ends of the pipe 0,5 m from the stand boundaries.

Special crossings

Cable crossings below motor highways and wide railway reserves are special cases and will be specified separately.

3.4 Classification of Excavations

3.4.1 Tenders shall submit rates for excavations in the following soil types

1) Excavations in Soft Materials
Excavations which can, in the opinion of the Engineer, be carried out by pick and shovel or a machine shall be considered as excavations in soft material. The classification definition for "soft excavations" and "intermediate excavations" as set out in SANS 1200, are combined in this specification document as "excavations in soft materials".

2) Hard Rock Excavations
Excavations in formations that require blasting or wedging and splitting, will be classified as hard rock excavations. The rates shall include the removal of rock from site.

3) Boulder Excavations, Class "A"
Excavations in material containing by volume more than 40% boulders ranging in size from 0,03 m3 to 2,0 m3 in a matrix of soft material, will be classified as boulder excavations, Class "A". The rates shall include the removal of rock from site.

4) Boulder Excavations, Class "B"
Excavations in material containing by volume 40% or less boulders ranging in size from 0,03 m3 to 2,0 m3 in a matrix of soft material, will be classified as boulder excavations, Class "B". The rates shall include the removal of rock from site.

3.4.2 The excavations will be measured as set out in SANS 1200. Excavations in soft materials will be measured on a linear basis.

The measurement for the following excavations will be on a volumetric basis and it will be considered as an extra over rate:

1) Hard rock excavations
2) Boulder excavations, Class "A"
3) Boulder excavations, Class "B"

3.4.3 The Engineer's decision as to the type of excavations excavated shall be final and binding, and the Contractor shall be paid in accordance with the classification by the Engineer.

3.4.4 Jointing Pits

The Contractor shall provide workable jointing pits where cables are to be jointed. The costs of jointing pits are to be included in the normal excavation rates of cable trenches.

3.5 Cable Trench Layout

The standard minimum cable trench depths are as follows unless otherwise specified:-

1) 11 kV Cables only, or 11 kV plus LV cables : 1,0 m deep

2)	Pipes for cables underneath road surfaces	:	2 m to top of pipe measured from lowest point of final road surface
3)	LV cables and streetlight cables	:	800 mm deep
4)	Cables through premises and property		
a)	11 kV only, or 11 kV plus LV or LV Main Cables	:	1 000 mm deep plus slabs
b)	Service connection cables	:	800 mm deep without slabs

The widths of cable trenches which will be used for the purpose of measurements, where applicable, are determined by the combination of the number of cables and/or pipes as specified in the Project Specification and as shown on the drawings.

3.6 Cables in Servitudes inside Stands

The Contractor shall conform to the following requirements where cables are laid in servitudes inside stands:

1) The cable trenches shall be 1,0 m deep or as specified and as close as possible to the stand boundary, but inside the servitude.
2) The cable shall be laid on a 75 mm bedding of sifted soil.
3) The cable shall be covered with a 75 mm layer of sifted soil.
4) Concrete slabs shall be laid above the cable on top of the sifted soil covering mentioned in Item (3) above, for the full length of the stand. PVC marker tape shall be laid on top of the concrete slabs.
5) The trench shall be back-filled and consolidated as previously specified, and the site shall be levelled. All surplus materials shall be removed.
6) The costs of the concrete slabs shall be included in the prices for the laying of cables unless separate pricing is requested.

3.7 Cable Crossings

1) Where power cables cross communication cables and/or pipes and vice versa, the crossings shall be done in accordance with the requirements of Telkom. The power cables shall be laid underneath the communication cables and concrete slabs shall be laid above the power cables to separate the power and telecommunication cables.
2) Where power cables cross each other the cables shall not be laid directly on top of each other but shall be separated with a 100 mm layer of sifted soil. Where the cables cross, they shall not be bent with less than the minimum allowable radius.
3) After completion of the work the Contractor shall certify in writing that he complied with all the requirements specified by the authorities.

4. Land Surveyor Pegs

4.1 Stand boundary pegs which were installed by the Land Surveyor shall under no circumstances be removed or shifted.
4.2 Any stand boundary pegs which are found missing by the Contractor during the execution of his contract works, shall immediately be reported to the Engineer. If the Contractor does not report missing stand pegs when cables are laid and the cables are laid in wrong positions, then the Contractor shall re-lay the cables at his own cost.
4.3 The Contractor shall immediately notify the Engineer if any pegs are removed or shifted by the Contractor. In such cases these pegs shall not be reinstated by the Contractor.
4.4 The pegs will be reinstated by a Land Surveyor at the cost of the Contractor.
4.5 On completion of the contract the Contractor shall provide a Land Surveyor certificate to the effect that all pegs along the routes where the Contractor had worked are intact. For this reason Contractors are advised to ensure that all pegs are in position when taking over the site unless otherwise approved by the Engineer.

5. Bush Clearing

The absolute minimum number of bushes and trees shall be cleared by the Contractor for the purpose of laying cables.

6. Cable Markers

6.1 Marking Tape

Yellow PVC marking tape, 150 mm wide, with the wording "Buried Electric Cable - Caution" in both English and Afrikaans, printed in red or black, shall be laid approximately 300 mm below ground level above the high voltage cables. One marking tape shall be laid for every two high voltage cables installed.

6.2 Cable Markers

Cable markers shall be installed if specified*** in the Project Specification. Cable markers shall be approved by the Engineer prior to installation.

7. Damages to Fences, Walls, Street Surfaces, Kerb Stones and Properties

7.1 Before the Installation Contractor commences with any excavation work, he shall submit a detailed list of all existing damages to fences, walls, street surfaces, kerb stones, properties, etc. to the Engineer who will inspect and verify the list.

7.2 After the completion of all backfilling and compaction of cable trenches, the Installation Contractor may request an inspection to have all the damages brought about by his operations listed and verified by the Engineer.

7.3 The Installation Contractor shall then at his own, or his insurer's cost, be responsible for all such damages, except for damages so listed previously.

PART D: ELECTRICAL SCOPE OF WORKS

D1 GENERAL

The Works comprises the upgrades for various electrical equipment at the Prince Albert WWTW, Prince Albert, South Africa.

The electrical portions of the Works shall comply with the Particular Specification for Electrical Installations, but as varied by this Scope of Works.

References in the Particular Specifications to "Project Specification" shall be read as referring to this Electrical Scope of Works.

D2 SCOPE OF WORK AND PROGRAMME

D2.1 Scope of Work

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

- A new IP65 rated low voltage motor control centre (MCC)
- Low Voltage power cabling
- Cable support systems
- Field control stations
- Ground cable trenching (including danger tape and backfilling)
- Testing and commissioning of the new electrical equipment
- Earthing continuity and bonding conductors and associated equipment
- Training municipal staff members in the operation and maintenance of the new equipment.
- Operation and maintenance manuals
- The civil and building works associated with this contract shall include the following:
- Trenching for all cable installations

D2.2 Programme

It shall be noted that the installation of the new equipment must happen in parallel with the on going operation of the existing works and other contracts and the installation of new equipment and the change-over/ reconnections of existing equipment to the new installation, shall be done in such a manner that it does not disrupt the flow of sewage through the works.

A project programme showing designs and documentation submissions, delivery periods, factory testing/ inspections and planned installation for all electrical equipment shall be submitted to the Engineer after the contract has been awarded.

D3 ELECTRICITY SUPPLY

The existing electricity supply for this project will be upgraded by the client and is excluded from this scope of works. The client will extend the overhead line and install a new 200kVA pole mounted transformer. As part of this contract the Contractor shall connect to the secondary/ low voltage side of the transformer for the installation of the new cables to the new aeration MCC.

The Contractor shall be responsible for making all the required arrangement with the Prince Albert Municipality regarding any switching of the MV network. The Contractor shall liaise directly with the Municipality regarding switching on of power/ switching in general. The Contractor shall also be responsible for all outage/ switching costs associated to the electrical supply extension and these must cost must be included in the bill of quantities.

The Engineer must be copied in all correspondence between the Municipality and the Contractor. The Contractor shall note that the cable phasing and rotations must be checked in detail and a detailed methodology with installation durations etc must be submitted to the Engineer and Municipality prior to the work commencing.

D4 DRAWINGS, MANUALS, TRAINING (TUITION), SPARES AND TOOLS

D4.1 Drawings

In addition to the requirements of Particular Specification B200.7, these clauses shall take precedence over Particular Specification B200.7 where there is a conflict.

The following drawings shall be applicable to the electrical portion of the contract:

Description	Drawing Number
Aeration MCC single line diagram and general arrangement	MD2608-E-010
Typical cable trench layout	MD2608-E0-20
Typical E-stop station layout	MD2608-E-021
Typical MCC schematic	MD2608-E-022
Typical MCC door layout	MD2608-E-023

The Contractor shall submit manufacturing drawings to the Engineer for approval of all equipment. For all manufacturing drawings related to transformers, switchboards (MCCs, DBs, Field Control Stations, and Instrumentation Panels etc), the following information shall be shown:

- Project Name and Contract Number
- Manufacturer/Supplier
- Consulting Engineer and contact person
- Client details
- Drawing Number and Revision
- Drawing to be Signed
- Source of Supply - MCC or transformer name etc
- Switchboard General Description
- Fault level (kA and time rating)
- Form factor/Sectioning
- Busbar Details (cross-section, material type, tinned etc)
- Busbar Support Details - type, manufacturer
- Earth bar details (cross-section, full-length, front or rear etc)
- Switchboard Material type, grade, thickness etc.
- Gland Plate details - material type, thickness, mounting etc
- Colour - internal and external
- Switchboard Dimensions
- Base Dimensions and bolting arrangements
- Front door details - hinge and padlock requirements
- Rear door details - hinge and padlock requirements
- End panel details - removable cover details
- Door details - Stiffeners and restrainers installed etc.
- Hinge Details
- Locking Details
- Handle Details
- Cable Entry Details
- All bolts, nuts, screws material type (i.e. 316 Stainless Steel)
- Equipment details - CB ratings, fault levels, type, manufacturer etc
- Equipment Layout details - Cubicle name, function, equipment function etc
- Indication Light colours
- Section through switchboard
- The Contractor shall also submit electrical drawings for all equipment. These schematic drawings for transformers, switchboards (MCCs, DBs, field control stations, standby generators etc), the following information shall be shown:
- Project Name and Contract Number
- Manufacturer/Supplier
- Consulting Engineer and contact person
- Client details
- Drawing Number and Revision
- Revision details to be listed
- Drawing Page Number
- Drawing to be Signed

- Reference Grid required on each schematic page
- Source of Supply - MCC or transformer name etc
- Fault level (kA and time rating)
- Voltages for all circuit to be clearly indicated
- All devices to have reference number i.e. relays
- Equipment ratings to be given i.e. motor ratings
- All indication lamps to be labelled including required lamp colour
- Legend to be provided
- Equipment Tag Numbers as Water Services Plant Numbering System.
- The Contractor shall also submit the following design documents/ drawings as part of the contractual deliverables. All documents and drawing must be approved by the Engineer prior to ordering of any equipment. The following documents and drawings must be submitted within a month after the contract award:
- Cable schedules for all cables (LV power, control stations) for each MCC/ DB, e-stop etc. This shall be done in an electronic format and the Engineers will provide a spread sheet in which the cable schedule must be populated.
- Site trenching route that indicates the details of the cables that will be installed in the various sections of the ground trenching.
- Manufacturing drawings of all equipment including final equipment layouts showing how equipment will be installed in the relevant buildings. Building drawings will be issued to the Contractor in this regard and it is his responsibility to perform installation co-ordination between all services and his equipment/cables
- Functional Description Specifications (FDS) for the control of the plant based on the detailed control philosophy also produced by the Contractor.
- Please note that the items in the Bill are an allowance only and that the final ordering of materials shall only be done after the schedules/ drawings have been approved by the Engineer. It shall be noted that the Engineer requires a minimum of 7 working days for the review of individual drawings and documentation. In the case of the complete electrical design data pack the engineer requires at least 14 working days for the review of the complete design data pack. The Contractor shall include the Engineer's review durations in his project programme.

D4.2 Operation and Maintenance Manuals

Two copies of the O & M Manual shall be issued to the Engineer prior to commissioning of the Works. Before the Taking-over Certificate is issued, four copies of the final approved version of the O & M Manual shall be issued to the Engineer. These O & M manuals shall have the following information displayed clearly in the cover of the file:

Client Name	:	Prince Albert Municipality
Project Name	:	Prince Albert Waste Water Treat Works Upgrade
File Name	:	Operation and Maintenance Manuals
Contractor Name	:	T.B.C
Contractor Contact Details	:	Address, telephone and fax numbers

The manual shall be of a standard acceptable to the Engineer and shall be subject to his approval. At least one (1) manual shall contain originals.

Binders with hard, plastic covers and four-ring spring clip holders shall be used. Binders shall not be over-filled so as to allow use without damage to the contents.

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

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

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

Details of the electrical and electronic equipment supplied including the name and address of the supplier, and descriptive and technical literature, giving performance and service information.
Full details of control and protection systems including protection block diagrams, settings schedule, etc.
Circuit diagrams.

Dimensioned panel layout drawings.

Cable schedules for all cables. This shall include the cable type, start and finish points, route length, duty load, size, voltage drop, number of cores, number of cores used and gland size. For cable voltages above 400 Volts, the schedule shall also include the purchase details, specification and date of manufacture.

Record (as-built) drawings referenced to the above. Cable routes to be surveyed on layout drawings.

A list of spares, tools and testing equipment supplied under this contract. The spares list shall be split into commissioning spares, critical spares and maintenance spares. The spares lists shall also include base date costs and contact details of the suppliers where the spares can be procured from.

A comprehensive schedule of routine maintenance by time period for the system as installed.
All completed factory and site test certificates/ commissioning sheets for the works.

D4.3 Training

The Contractor shall arrange for six nominated municipal technical staff members to be trained in the operation and routine maintenance of the equipment provided under this Contract. The training shall be provided by way of formal courses by the equipment suppliers, who shall certify that the training has been completed satisfactorily.

Training shall at least cover the following items:

Low voltage motor control centre
Other associated installed equipment

D4.4 Spares and Tools

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

D5 INSPECTIONS, TESTS AND COMMISSIONING

In addition to the requirements of Particular Specification B200.8, the following requirements shall be complied with:

For equipment being manufactured in South Africa, the Engineer and a Municipal representative will attend one factory inspection and the Contractor shall bear all travel costs and disbursements associated with the inspections. It shall be noted that the Electrical Engineer resides in Cape Town and the Municipal representative in Prince Albert.

For all the inspections and tests the Contractor shall notify the Engineer in writing at least 2 weeks in advance, when his presence will be required for inspections or witnessing of tests. This time is required for the Contractor to make the required travel arrangements and Engineer to plan accordingly. In the event that tests fail, the Contractor shall be required to affect all corrections and perform such tests again. Should these tests require the Engineer to be present again, the Engineer's cost for time, travel and disbursements shall be recovered from the Contractor at rates as set out by the Engineering Council of South Africa.

D5.1 Inspections

Inspections of the equipment will be carried out by the Engineer during manufacturing at the following holding points prior to delivery to site:

- Switchboard design (drawings)
- After sheetmetal fabrication and before painting

- After painting and before installation of equipment
- After assembly and before factory testing
- All procured items shall be inspected by means of detailed design drawings and equipment schedules being submitted to the Engineer for checking. No items shall be procured/ manufactured prior to the Engineers approval of equipment and the Contractor design drawings. If any equipment does not meet the specifications the Contractor shall change the equipment to comply with the specification at no additional cost to the Municipality.
- The Contractor shall submit a quality control plan and procedures document for all main equipment. These documents shall include baseline delivery dates for checking by the Engineer.
- All cable trenches will be inspected by the Engineer's Representative prior to cables being laid and after the cables have been laid, but prior to backfilling.

For equipment being manufactured in South Africa, but outside of the Cape Town Metropolitan, the Engineer and a Council representative will attend one factory inspection and the Contractor shall bear all travel costs associated with the inspections. All travel costs for testing for the Client from Prince Albert and travel costs for the Engineer from Cape Town must be included. These costs shall include flights, car rentals and meals during the day. These costs must be included in the line items for the factory inspections and all these arrangements shall be made by the Contractor for the Client and the Engineer. It must be noted that this will be required for all factory inspections.

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

In the event that tests fail, the Contractor will be required to affect all corrections and perform such tests again.

Should these tests require the Engineer to be present again, the Engineer's cost for time and travel shall be recovered from the Contractor at rates as set out by the Engineering Council of South Africa.

D5.2 Tests

The tests listed below shall be carried out on site by the Contractor and witnessed by the Engineer and a municipal representative. Pricing items have been included in the Bill of Quantities for site tests. Factory tests shall be carried out in accordance with the particular equipment and material specifications in this Specification, and routine test certificates shall be provided.

D5.2.1 LV Switchboards

visual checks (including paintwork)
impedance measurements
insulation resistance measurement
current and voltage transformer tests
proving of protection scheme
high voltage tests
circuit breaker operation tests
control scheme test (site only)
load testing (site only)

D5.2.2 LV power, control and instrument cables

insulation resistance test (after jointing and termination)
phase rotation test (after jointing and termination)

D5.2.3 Earthing

earth electrode resistance measurements
bonding conductor continuity tests

D6 MATERIALS, FINISHING AND PAINTING OF MATERIALS AND EQUIPMENT

D6.1 Materials

Materials shall be provided in accordance with Standard Specification B201 where not specified in the particular specification and shall be suitable for the specified site conditions.

The environment in a wastewater treatment works is very corrosive, and the following materials shall therefore be used:

MCCs/ panels/ DBs/ JBs	:	3CR12, powder coated
Busbars	:	S6 tinned copper
Field control stations supports	:	316L stainless steel
Cable supports/ Unistrut	:	316L stainless steel
Fixings brackets, nuts and bolts	:	316L stainless steel

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

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

All busbars and copper control wires in MCC / control panels shall be tinned as described in Clause H9.4 to prevent the high level of corrosion associated with wastewater treatment works.

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

D6.2 Finishing and Painting

Finishing and painting shall be in accordance with Standard Specification B202. All material shall be degreased, with any sheared edges, welds or surfaces subjected to any form of heat treatment pickled and passivated. If there is any mill scale on the material, the materials shall be non-metallic blast cleaned to Sa2½, prior to degreasing.

A primer coat of Strontium Chromate Epoxy Primer or approved alternative shall be applied to a minimum dry film thickness (DFT) of 30 µm. A final coat of Epoxy / Polyester powder coating shall be applied by electrostatic spray and baked in accordance with the manufacturer's specification. This final coat shall be in the colour as specified, with a minimum DFT of 50 µm, but not more than 100 µm. The suppliers or manufacturers shall furnish paint thickness test certificates for all materials that are epoxy powder coated.

The MCCs shall be painted as follows:

Assembly frames	:	Frame A11, Doors varied
Inside assembly cubicles	:	White
Cubicle backplates	:	White
Assembly plinth	:	Black
Non-Essential Sections	:	Light Orange B26
Essential Sections (Standby Generator)	:	Signal Red A11

D7 FIXING OF MATERIALS

Materials shall be fixed in accordance with Standard Specification B203. All fasteners shall be 316L stainless steel. No electro-plated or zinc plated fasteners will be allowed.

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

Where there is a possibility of electro-galvanic reaction (e.g. between stainless steel and galvanizing) the Contractor shall make use of suitable insulating washers of rubber, teflon or similar material.

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

D8 LV MOTOR CONTROL CENTRES (LV MCCs)

D8.1 General

A new Aeration MCC will be installed next to the existing sludge ponds in close vicinity of the new overhead line termination. The final position of the MCC will be determined on site with the Engineer.

The requirements for the switchboards are shown in the attached Appendix A, Single Line Diagrams and General Arrangement drawings.

D8.2 Standard Specifications

The MCC shall comply with the following standard specifications but shall be varied by this detailed specification:

B204	:	Enclosures for MCCs
B205	:	LV switchgear and control gear
B206	:	Busbars
B207	:	Current transformers
B208	:	LV motor protection
B209	:	Wiring in MCCs
B210	:	Wiring and cable terminations
B211	:	Glands and gland plates
B213	:	Switchboard accessories
B214	:	Nameplates and labels
B215	:	Metering and indication equipment

D8.3 MCCs Construction

The MCCs shall be constructed as per the general arrangement drawings and the construction details below: Switchgear enclosures shall be fabricated fully from 3CR12 sheet metal. The outer panels of the MCC shall have a minimum thickness of 2.0 mm and the internal separations shall have a minimum thickness of 1.6 mm.

All cables will be bottom entry for the MCC. The MCC shall be equipped with a robust 3CR12 gland plate (at least 2,0 mm thick), sealing off the MCC at the bottom.

Switchgear compartments for electrical supply shall be constructed to form Type 2b as per SANS IEC 61439-

Hinged doors with square key driven latches shall be provided on the front and back of the MCC.

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

MCC shall have an ingress protection rating of IP65 with doors closed, and IP2X with the doors open.

All exposed copper shall be tinned with S6 solder using resin based flux, after all the drilling, bending and cutting has been completed. The finished, tinned copper, shall be free of solder lumps and shall be as smooth as the copper under the solder. All internal wiring shall be silicone insulated panel wiring with tinned stranded copper conductors.

D8.4 Busbars

The busbars in the MCCs shall be rated in accordance with the single line diagrams and sized in accordance with SANS 1973-1/3 for a current density of at least 2A/mm².

Copper busbars shall be tinned with S6 solder using resin based flux.

The specified covering of the busbars with heat-shrinkable material shall only apply to distribution busbars (i.e. droppers to functional units).

D8.5 Switchgear and Controlgear

The manufacturer of the LV switchboard shall strictly comply with the Standard Specification and the latest revisions of the following standards:

SANS 61439-2
SANS 1973-1/3

The motor ratings given on the single line diagram are the Engineer's estimates, which have been used for systems design purposes. Should the ratings of motors offered in the Tender differ from the Engineer's estimates, then the switchgear and controlgear shall be sized to suit the motors offered in the tender.

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

The MCCBs shall be fitted with key locks (Ronis, Keyguard, Keymaster or equal approved) for locking out individual circuit breakers.

Selector switches shall be provided on the front door of each drive's compartment for selecting auto /off/ manual operation modes.

The control supply for the MCC shall be obtained from a single-phase double wound air cooled transformer installed in the control & metering cubicle in the MCC. The control supply transformer shall be supplied with 5 taps at ±5%, 0% and ±10%.

The supply to the control supply transformer shall be from the distribution busbars through a suitable moulded case circuit-breaker (MCCB) and the outgoing feed to the auxiliary busbars shall be protected by suitable a miniature circuit breaker (MCB).

The control supply transformer shall be adequately rated to supply continuously all the connected load on the MCC simultaneously and shall be rated equal to the sum of twice all the functional unit control supply loads plus twice the inrush current of the largest contactor operating coil plus 20%. The control transformer shall have a standard VA rating and a turns ratio to provide a nominal 220V supply.

One leg of the transformer secondary supply shall be solidly earthed directly to the protective conductor.

D8.6 Motor Protection and Interlocking

All motor starters shall be equipped with the motor protection required in terms of Standard Specification B208, except as varied below.

Separate motor protection relays shall not be provided for drives equipped with variable frequency converters (VFCs) which provide all the required protection functions, and which cannot be bypassed.

Where thermal overload relays are mounted inside MCC compartments, an electrical reset facility shall be provided with a pushbutton on the front door of the compartment.

The overload, trip, moisture ingress, dry run, no flow and limit switch protection of the motor starters shall be wired into the control circuit in order to trip the drive in all modes of operation when required.

D8.7 Wiring in MCCs

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

The colour of the wiring shall be as follows for circuits other than power circuits:

220V ac control live	:	Brown
220V ac control neutral	:	Black
+24V dc control	:	Orange
-24V dc control	:	Violet or Purple
Wiring to lamps	:	Red
CT circuits	:	Blue
PLC digital inputs	:	Grey
PLC digital outputs	:	Pink
PLC analogue inputs	:	Red / black (twisted pair)
PLC analogue outputs	:	White / black (twisted pair)

D8.8 Wiring and Cable Terminations

Power cables shall be terminated directly onto circuit breakers, VFCs or contactors (as applicable) and shall not be connected up via separate terminal strips (i.e. Clause 3 of Standard Specification B210 shall not be applicable).

Power cables shall be labelled externally to the MCCs to indicate the equipment being fed. Incoming supply cables shall also be labelled to indicate the source of supply.

D8.9 Glands and Gland Plates

All cable glands shall be of the nickel-plated brass type and fitted with waterproof neoprene shrouds.

Gland plates shall be provided for cable entry into the MCC. The Contractor shall plan and pre-drill the gland plates.

Gland plates shall generally be mounted at 300mm above finished floor level and shall be bolted to robust brackets welded to the framework of the MCCs.

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

D8.10 Switchboard Accessories

The MCCs shall have switchboard accessories as per the Switchboard Matrix – Appendix A and these ections below. Where there is any ambiguity the Contractor shall be responsible to confirm the requirements with the Engineer during the tender stage.

D8.10.1 Control Push-buttons

Motor control compartments shall be equipped with control push buttons in accordance with Switchboard Matrix - Appendix A
Control push buttons shall be of the round, flush, spring-loaded type of 22,5mm diameter.

Pushbuttons shall be colour-coded as follows:

Emergency stop	:	Red
Lamp test	:	Black
Reset	:	Blue
Start	:	Green
Stop	:	Red

A single Lamp test button (black) shall be provided on the door of the control voltage section. This shall check all the lamps on the switchboard and shall work through a timer that is able to be set to a specified duration to check all lamps.

The MCC will also be equipped with a single E-stop on the control voltage cubicle door. This E-stop shall be wired directly into the trip circuit for the incomer.

D8.10.2 Indicator Lights

Motor control compartments shall be equipped with indicator lights in accordance with Switchboard Matrix - Appendix A.

Indicator lights shall have lamps comprising a cluster of four light-emitting diodes in a common housing. A light's lens shall be of the specified colour and shall be at least 20mm diameter. The lights shall be clearly visible through an angle of 180° in a brightly lit room (500 - 600 lux) and the contrast between an energized condition and a de-energized condition shall be clearly visible from all sides as well as from the front.

Indicator lights shall be colour-coded as follows:

Indication	Colour	Example / Comment
Earth Fault	Amber	
Emergency Stop	Amber	
Overload	Amber	
Running	Green	
Stopped & Power Available	Red	
Tripped	Amber	

D9.10.3 Metering and Indication Instruments

Metering and indication instruments shall be provided in accordance with the single-line diagram for the MCCs.

The size of ammeters and voltmeters shall be 96mm x 96mm on compartment doors that are 600mm x 600mm or larger in size, and 72mm x 72mm on all smaller compartment doors.
Runhour meters shall be provided for all motor starter compartments to match the ammeters and voltmeters in size. The runhour meter shall count to 99 999,9 before returning to zero, and it shall not be possible to reset the meter.

D8.11 Installation, Inspections & Testing

The MCC and associated equipment shall be fully tested at the manufacturer premises and inspected by the Engineer and a Municipal representative before release for installation on site. The equipment will again be fully tested on site as part of the site commissioning.

The Contractor shall submit a complete equipment register to the Engineer for checking before the procurement and manufacturing of any equipment.

D8.12 Measurement and Payment

Supply prices shall include for the delivery and packaging.

The FAT prices shall include for travel costs for the Engineer and the Client. It shall be noted that the Client is in Prince Albert and the Engineer in Cape Town. Thus all travel costs for test from Prince Albert must be included for the Client and travel costs for the Engineer from Cape Town must be included.

D9 LOW VOLTAGE (LV) CABLES

D9.1 General

The LV cables shall be supplied and installed in accordance with Standard Specification B231 as varied by this Detailed Specification.

LV power cables shall be provided as indicated on the single line diagrams. However, should the ratings of motors offered in the tender differ from the Engineer's estimates, then the motor supply cables shall be sized to suit the motors offered in the tender. The voltage drop from the MCC to the motor terminals shall not exceed 2% of motor rated voltage at motor rated current. Allowances shall also be made for the de-rating of cables in accordance with SANS 10142-1.

All multicore LV power shall be 600 / 1000V PVC/PVC/SWA/PVC (red striped) cables with stranded copper conductors.

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

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

D9.2 Installation

Cables shall be strapped and spaced to minimize the de-rating of the cables.

Excavations and the laying of cables, either directly in the ground or in ducts, shall be in accordance with Clause 3 of Standard Specification B231.

All cable routes indicated on the Engineer's drawings are provisional and the final routes shall be confirmed with the Engineer on site before cables are installed. Cable lengths given in the Bill of Quantities are provisional and subject to re-measurement on site. Unit prices shall allow for wastage, as only the net length will be measured for payment purposes.

The Contractor shall obtain written confirmation from the Prince Albert Municipality that the proposed cable routes are accepted and that the new cable routes will not disturb any existing services.

D9.3 Measurement and Payment

Prices for cable trench excavations and the laying of cables shall be determined in accordance with Clause 3 of Standard Specification B231.

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

Prices for the installation of cables on cable ladder / tray shall include for fixing clamps and cable ties.

Prices for the termination of cables shall include for all material required for the termination.

Cable lengths given in the Bill of Quantities are provisional and subject to re-measurement on site. Units prices shall allow for wastage, as only the net length will be measured for payment purposes.

D10 CABLE SUPPORTS

D10.1 General

All LV supply cables shall be installed on Heavy-duty cable ladder on the floors of all the cable trenches in all the buildings.

Welded wire mesh cable supports shall be used at the motors where smaller cables and E-stop cables are installed.

All cable supports shall be manufactured of Stainless Steel 316 grade.

The cable trays / ladders shall be manufactured and installed in accordance with Standard Specification E220.

Cutting of cable supports shall be kept to a minimum and only be done with approval of the Engineer.

The environment is to be considered corrosive therefore all brackets, straps, bolts, nuts, washers, fasteners, etc. employed for the cable support system to be manufactured from 316L stainless steel.

D10.2 Installation

Cable support shall be installed to support all cables around the site. The Contractor shall produce a detailed cable support schedule and layout drawings for all sites that shall be submitted to the Engineer for checking and approval.

All cable supports shall be supported at the ends of runs and on long runs at least every three (3) metres. Sections of supports must be electrically connected across the joints with 6mm2 insulated wiring to provide earth continuity.

Cable supports shall be wide enough to accommodate the cables required in terms of this contract plus 15% spare capacity for future additions.

Nylon washers must be employed to prevent galvanic reaction between galvanized steel and 316 stainless stell (for specialized installation), but careful consideration shall be given to ensure earthing continuity of all metallic items is achieved.

D10.3 Measurement and Payment

The price for all cable supports shall include for all unistruts, fixing clamps, bolts, cable straps and cable ties to complete the installation of the cable supports and cables.

Cable supports given in the Schedule of Quantities are provisional and subject to re-measurement on site. Only the installed items/ length will be measured for payment purposes. It shall be noted that not excess cable supports shall be paid and cable supports must not be ordered prior to all cable routing being finalised. It shall be the responsibility of the Contractor to ensure that superfluous cable supports are not ordered.

D11 CABLE TRENCHES AND EXCAVATIONS

Cable trenches shall be as per drawing E040. It shall be noted that the price per metre for the trenching shall include backfilling. Additional imported backfilling has been allowed in the document if required.

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

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

Where cables are drawn into sleeves, they shall be drawn according to the manufacturer's recommendations. Cable routes shall be so planned that the minimum number of crossovers occurs in a cable trench and where signal or control cables are installed in the same trench a minimum clearance distance of 300 mm shall be adhered to.

Cable route markers shall be installed every 50 m in straight runs and at every change of direction. These shall be of concrete pyramid type, with engraved aluminium label. All cable routes shall furthermore be surveyed as-built and a coordinate provided at every point where the routes change direction.

All trenches shall be inspected by the Engineer prior to backfilling.

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

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

D12 EARTHING

D12.1 General

The MCCs shall be supplied with a dedicated earth bar.

All earthing conductors shall be continuous lengths without joints between terminations. Any damage to the earthing conductors shall be reported in writing to the Engineer and, subject to his approval, shall be repaired by means of exothermic welding. The resistance across a repair joint shall be measured and submitted to the Engineer for approval.

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

D12.2 Earth Continuity Conductors

Earth continuity conductors shall be provided for all electrical and electronic equipment in accordance with Standard Specification B216, and as shown on the single line diagram and earthing diagram. A spare core in a power or control cable may be used as an earth continuity conductor.

D12.3 Bonding

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

D13 FIELD CONTROL STATIONS

D13.1 General

Field control stations shall be provided with each motor starter/ drive or package plant included in the MCCs.

D13.2 Equipment Specification

All enclosures as well as mounting stands for the field control stations shall be manufactured from 316L stainless steel.

The field control stations' control buttons shall be at 1,2 m height after installation. These field stations have a red mushroom head mechanical latching, twist-to-release type emergency stop push button.

The Contractor shall include all mounting bolts and accessories required for the installation of the field control stations as part of the pricing.

D13.3 Installation

The field control stations shall be installed within 1 m of the corresponding pump-set in a position such that it is easily accessible. Field control stations shall either be floor-mounted (pedestal) or wall mounted. The proposed positions shall be discussed with and approved by the Engineer before installation commences.

D14 VARIATIONS AND ADDITIONAL ITEMS

No additional items or variations to the Contract shall in any way be accepted if not approved in writing by the Engineer and a Municipal representative.

The requirement of any additional items shall be submitted to the Engineer in writing. The request shall include the full description and the cost of the additional items required.

APPENDIX A **SWITCHBOARD MATRIX PRINCE ALBERT WWTW**

The highlighted items in this matrix indicate the detailed new equipment required for the MCCs under this Contract.
It is intended that this table be read in conjunction with, and complement the single line diagram.

					Selector Switches			Pushbuttons				Indicator lamps						Indication & metering				Protection					
Item	Switchboard	Section	Rating (kW)	Starter	duty	auto / man.	local / rem.	start	stop	lamp test	reset	run on	avail	auto	trip	E stop	other	kVA	amp	volt	run hour	PFR	Dry run	No Flow	Torque	Other	Other
1	**Aeration MCC**																										
		Main Incomer/ Control		FDR						1						1			3	1		1					E-stop on control cubicle
1.1		Aerator No.1	11.2	DOL		1		1	1		1	1	1		1	1			1		1						
1.2		Aerator No.2	11.2	DOL		1		1	1		1	1	1		1	1			1		1						
1.3		Aerator No.3	11.2	DOL		1		1	1		1	1	1		1	1			1		1						
1.4		Aerator No.4	11.2	DOL		1		1	1		1	1	1		1	1			1		1						

C3.5 Management

CONTENTS **PAGES**

C3.5.1 PROGRAMME AND PLANNING

A bar-chart type construction programme shall be submitted to the Engineer, within fourteen (14) days from the Commencement Date.

In addition to the requirements of Clause 5.6 of the General Conditions of Contract 2010, the programme shall indicate critical path activities, and include for expected weather conditions and special non-working days as indicated in the tender document.

C3.5.2 CONTRACTOR'S RESPONSIBILITY IN TERMS OF THE OHS ACT

The Contractor shall be responsible for complying with the Occupational Health and Safety Act, Act 85 of 1993, and specifically the Construction Regulations 2014 issued in terms of the Act.

The Contractor is referred to Part C1.4 (Health and Safety Agreement) and the Health and Safety Specification (Section C3.6, Annex 1) in this regard.

C3.5.3 MANAGEMENT MEETINGS

C3.5.3.1 Site Meetings

Site meetings shall be held monthly on site and will be called by the Engineer. The Contractor shall arrange for his project manager to attend these meetings.

The Engineer will take minutes of the meeting and shall provide all present with copies of the minutes within four working days.

C3.5.3.2 Health & Safety Meetings

Health & Safety meetings shall be combined with the monthly site meetings, but Health & Safety Audits will be done at any time during construction.

C3.5.4 PROCEDURES DURING CONSTRUCTION

The Contractor must supply and keep the following documents on site, including the recording and maintaining of information thereof:

a) A full set of the latest edition of Construction Drawings to be on site permanently for use by the Engineer and others.
b) An A4 triplicate site instruction book.
c) An A4 duplicate dairy on site, for the Contractor to keep daily diary with at least the following information:
   - Weather conditions;
   - Record of any accidents and details;
   - Record of construction activities of the day;
   - Information regarding any strikes or labour related issues;
   - Any other relevant information.

C3.5.5 HEALTH AND SAFETY PLAN

In compliance with the Construction Regulations the Contractor shall, after performing a risk assessment, prepare a health and safety plan for approval by the Employer.

The health and safety plan shall include, but not be limited to, the following:

a) The safety management structure including the names of all designated persons such as his safety officer, the construction supervisor and any other competent persons;
b) Safety method statements and procedures to be adopted to ensure compliance with the OHSA. Aspects to be dealt with shall include:
   - Public vehicular and pedestrian traffic accommodation measures;
   - Control of the movement of construction vehicles;
   - The storage and use of materials;
   - The use of tools, vehicles and plant;
   - Temporary support structures;
   - Dealing with working at height;
   - Environmental conditions and safety requirements in working hazardous materials including asbestos cement products;

- Security, access control, and the exclusion of unauthorised persons.

c) The provision and use of temporary services;
d) Compliance with wayleaves, permissions and permits;
e) Safety equipment, devices and protective clothing to be employed;
f) Emergency procedures;
g) Provision of welfare facilities;
h) Induction and training;
i) Provision and maintenance of the health and safety file and other documentation;
j) Arrangement for monitoring and control to ensure compliance with the safety plan.

Also refer to Section C3.6 OHS Specification.

C3.5.6 ENVIRONMENTAL SPECIFICATIONS

C3.5.6.1 Construction camp

a) Location of construction camp

"Construction Camp" refers to all storage stockpiles sites, site offices, container sites, other areas required to undertake construction and rest areas for workmen. The construction camps shall be located at an easily accessible point and within an area of low environmental sensitivity. The Contractor shall submit a Method Statement indicating the layout and preparation of the construction camp(s).

b) Site demarcation and no-go areas

The Contractor shall provide suitable sanitary arrangements on site as per building guidelines (SABS 0400). There should be one toilet for every 15 workers on site. Toilets must be easily accessible and shall be secured in order to prevent them from blowing over.

The siting of toilets shall be done in consultation with the RE and Safety Officer. Toilets shall not be placed in areas susceptible to standing or flowing water. They shall be sited away from any identified environmentally sensitive areas and outside the 1:5 year floodlines.

The Contractor shall be responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition to the satisfaction of the RE. The Contractor shall provide toilet paper.

The Contractor shall appoint a suitable Sub-contractor to empty toilets on a regular basis. The Sub-contractor shall ensure that there is no spillage when the chemical toilets are cleaned and that the contents are properly removed from site.

The Contractor shall be responsible for enforcing the use of these facilities. Performing ablutions outside of established toilet facilities is strictly prohibited (refer to List of Fines (Appendix 5).

c) Eating areas

The Contractor shall establish eating areas, as agreed with the RE.

The Contractor shall provide adequate refuse bins at all eating areas to the satisfaction of the RE and shall ensure that all eating areas are cleaned up on a daily basis. Collected waste shall be stored in a central waste area within the construction camp that has been approved by the RE and Safety Officer.

Any cooking of food on site shall be done using gas cookers.

d) Water provision

The Contractor shall be responsible for ensuring that there is access to clean drinking water for all employees on site. If water is stored on site, drinking water and multi-purposed water storage facilities shall be clearly distinguished and demarcated.

e) General aesthetics

All construction areas shall be kept neat and tidy at all times. Different materials and equipment must be kept in designated areas and storing/ stockpiling shall be kept orderly.

f) Accommodation

No living accommodation is available on site for any of the Contractor's employees and no employees will be allowed to sleep overnight on site. A night watchman shall be allowed within the construction camp with written permission from the RE.

C3.5.6.2 Site demarcation and no-go areas

The "site" refers to the total area where the contract will take place awarded to the Contractor and any other area reasonably required by the Contractor to undertake the construction activities in order to fulfil the contract. Construction areas will be identified by the project team and shall be demarcated prior to the commencement of construction

In order to limit the impact of construction activities, the Contractor shall limit activities to work spaces as defined at the site inspection during the tender process and subsequently as agreed with the Re and Safety Officer. Areas outside the site are considered "no-go" areas and shall be demarcated to ensure that environmentally sensitive areas are not impacted by the construction activities. Demarcation barriers are to be erected according to an agreed sequence and time programme, and coordinated with the arrival of equipment, staff and materials onto site.

Particular "no-go" areas that will be fenced off will be indicated during the tender site inspection. The RE may declare no-go areas at any time during the construction phase as deemed necessary and/or at the request of the Safety Officer. Entry into these areas by any person, vehicle or equipment without the RE's written permission may result in a penalty

C3.5.6.3 Site clearing and excavation

a) Vegetation clearing and plant/ seed collection

The Contractor shall only be allowed to clear indigenous vegetation in areas indicated by the appointed Safety Officer or Landscape Architect. This will be done after consultation with the Landscape Contractor and following the removal or translocation of any previously identified species, and necessary seed and bulb collection. Plants marked for removal or transplanting should be replanted as soon as possible in the areas demarcated for this purpose.

Before clearing of vegetation, the Contractor shall ensure that all litter and foreign material is removed from site. Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible.
All indigenous plant material removed from cleared areas shall be stockpiled for mulching or temporally stockpiled in a demarcated area, which meets the satisfaction of the RE, before disposal at an approved landfill site.

b) Topsoil

Topsoil (an approximately 150 mm layer) shall be removed from areas to be disturbed during construction and stockpiled for rehabilitation purposes. Top soil stockpiles shall be convex and no more than 2 m high stockpiles shall be located in areas agreed to by the RE.

The discovery of any electric cables, pipes, drains and the like during any excavation work, which are not noted in the provisions of work, shall be immediately drawn to the attention of the RE. Notwithstanding the aforesaid, any damage whatsoever inflicted upon any cables, pipes, drains and the like shall be immediately reported to the RE.

Topsoil stockpiles shall not be subject to compaction greater than 1500 kg/m^2 and shall not be pushed by a bulldozer for more than 50 m.

Appropriate measures, as agreed with the RE, shall be taken to protect topsoil stockpiles for erosion by wind or water by providing suitable stormwater and cut off drains, containment using hessian or similar material and/or by establishing suitable temporary vegetation. Stockpiles shall not be covered with materials such as plastic that may cause it to compost or would kill the seed bank.

C3.5.6.4 Materials handling and storage

a) Handling

The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions in terms of this EMP.

The Contractor (and suppliers) shall ensure that all materials are appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials. The Contractor shall ensure that delivery drivers are supervised during offloading.

b) Storage of construction materials and hazardous substances

All fuel, oil and other hazardous substances (i.e. fuel, poisons, etc.) shall be confined to demarcated, adequately bunded areas within the construction amp and stored in suitable containers.

Hazardous signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Fuel shall be stored in steel tank(s) supplied and maintained by the fuel suppliers. Tank(s) shall be adequately bunded (110% of volume). The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled/ leaked fuel, oil or hazardous substance into the soil. Suitable fire fighting equipment, to the approval of the RE, shall be supplied and installed by the Contractor in the hazardous substances storage area.

The relevant Material Safety Data Sheets for all hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) shall be submitted to the RE. The Contractor shall have a copy of the Material Safety Data Sheets readily available and ensure that he/ she or his/ her employees who are required to use such substances are fully conversant with the safe handling precautions, protective equipment to be used and storage precautions to be taken.

The Contractor shall obtain a permit to store fuels and hazardous materials on site in terms of Prince Albert Municipal's Fire and Emergency Services. The Contractor shall append a copy of the permit to any relevant Method Statement. The temporary storage of fuel shall be installed and managed in accordance with the Community Fire Safety By-law permit as well as Oil Industry Standards and SANS codes.

Areas for the temporary stockpiling of excavated material and other construction material shall be as agreed with the RE. No material of any description shall be stockpiled in any wetland areas.

The Contractor shall ensure that run-off from any stockpile, fuel/ oil or hazardous substance storage area is contained and does not enter Prince Albert Municipal's stormwater system (i.e. stormwater drains).

c) Storage of equipment

All plant, construction equipment, vehicles or other items shall be stored within the construction camp, unless prior arrangements have been made with the RE.

Drip trays shall be provided for stationary plant (such as compressors, pumps, generators, etc.) and for "parked" plant (e.g. mechanised equipment).

C3.5.6.5 Refuelling and maintenance

a) Refuelling

Where reasonably practical, vehicles shall only be refuelled in a demarcated refuelling/ servicing area (as agreed to with the RE). No refuelling shall be within 20 m of any local drainage channel.

The surface under the refuelling/ servicing area shall be protected against pollution (e.g. the use of drip trays) to the reasonable satisfaction of the RE and Safety Officer prior to any refuelling activities.

b) Maintenance

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the site.

Where reasonably practical, maintenance activities shall only be undertaken in a demarcated maintenance area (as agreed to with the RE). No maintenance activities shall be allowed within 20 m of any local drainage channel, unless this is absolutely necessary.

When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. All hazardous waste from maintenance activities shall be disposed of as specified under the section Waste Management.

The washing of equipment shall be restricted to urgent maintenance requirements only. All washing shall be undertaken in the maintenance area, and these areas must be equipped with suitable wastewater collection measures. The use of detergents for washing shall be restricted to flow phosphate and nitrate containing, low sudsing-type detergents.

C3.5.6.6 Accidental leaks and spills

The Contractor shall ensure that his/ her employees are aware of the procedure to be followed for dealing with spills and leaks. Any accidental leak and spill of fuel, oil or other hazardous substances is to be reported to the RE or Safety Officer immediately so that the best remediation method can be quickly implemented. In the event of a large spill, the RE or Safety Officer shall inform Prince Albert Municipal's Pollution Control Department and Fire Brigade immediately.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown spills.

The quantity of such materials shall be able to handle the total volume of the hydrocarbon/ hazardous substance stored on site. This material must be accepted by the RE prior to any refuelling activities. Hydrocarbon contaminated material and/or soil shall be collected and stored in a bunded area until future disposal (Section C3.5.6.7.1).

The relevant Material Safety Data Sheets for all hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) shall be on site. Procedures detailed in the Material Safety Data Sheets shall be followed in the event of a spill or emergency situation.

The Contractor shall be liable to arrange for professional service providers to clear the area affected by the spill, if required.

The Contractor shall submit a Method Statement detailing the precautions that shall be implemented to limit spills and leakage of these hydrocarbons and other hazardous substances (see Section C3.5.6.4.2).

C3.5.6.7 Waste management

a) Hydrocarbon and hazardous waste

All hydrocarbon, (e.g. fuel, oils and contaminated soil/ materials) and other hazardous waste resulting from spills, refuelling and maintenance activities shall be disposed of in a Department of Water Affairs (DWA) licensed hazardous waste site or, where possible, sold to an approved used-oil recycling company. The Contractor shall provide disposal certificates issued by the hazardous waste disposal facility to the RE, in addition, disposal certificates shall be kept at the site office for inspection by any relevant authority. Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery may be collected in holding tanks prior to disposal.

No hydrocarbon and hazardous waste shall be burnt or buried on site. Under no circumstances shall the spoiling or burial of tar or bituminous products be allowed on site. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant.

b) Solid waste

Solid waste includes all construction waste (rubble, cement bags, old cement, tags, wrapping materials, timber, cans, wire, nails, etc.) and surplus food, food packaging, organic waste, etc.

The Contractor shall be responsible for the establishment of a solid waste control and removal system that is acceptable to the RE and Safety Officer in order to prevent the spread of waste in, and beyond, the construction area. An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, reused and recycling of materials. Containers for glass, paper, metals and plastics shall be provided. The Contractor shall remove all construction waste from site at his/her own expense.

The Contractor shall provide bins (with lids) of sufficient number and capacity to store solid waste produced on a daily basis. The lids shall be kept firmly on the bins at all times. Bins shall to be located within the construction camp, eating areas and construction areas where there will be a concentration of labour. Bins shall be emptied on a weekly basis or more frequently as required. The general cleanliness of the site shall form part of the RE's and Safety Officer's inspections. All solid waste may be temporarily stored on site in a demarcated area, which meets the satisfaction of the RE. All solid waste shall be disposed of offsite at a licensed landfill site. The stockpiling of construction rubble or other material shall only be permitted in areas approved by the RE. No waste material or litter shall be burnt or buried on site.

c) Waste water

The Contractor(s) shall prevent pollution of surface or groundwater from the release, accidental or otherwise of contaminated water (including contamination with chemicals, oils, fuels, cement, sewage, construction water, water carrying products, etc.) as a result of construction activities.

The Contractor shall be responsible for the construction and operation of necessary collection facilities in order to prevent such pollution and/or settlement of suspended matter, and shall dispose of the collected waste as approved by the RE. Water from any kitchen, showers, laboratories, sinks, etc. shall be discharged into a conservancy tank for removal from the site.

The Contractor shall ensure that water run-off from fuel depots, workshops, truck washing areas and concrete swills passes through an oil separation/ settlement system before being released or alternatively is directed into a conservancy tank for disposal at a site approved by the Safety Officer and local authority.

Temporary stormwater drainage from the works shall be designed in collaboration with the RE and Safety Officer. No wastewater shall be disposed of directly or indirectly into the sewer or stormwater system without approval from Prince Albert Municipality.

C3.5.6.8 Erosion and sedimentation control

The Contractor shall, as an on-going exercise, provide sedimentation and erosion control to the satisfaction of the RE. During construction the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking measures necessary to prevent surface water from being concentrated in streams and from scouring slopes, banks or other areas.

Lateral excavation of the riverbanks shall be isolated from the low flow channel by a wall of sandbags (woven, not plastic) where a risk of siltation is present. If necessary, sediment traps/ screens shall be placed downstream of the construction activities to reduce sedimentation downstream. During construction the Contractor shall implement measures to prevent the migration of material (fines) from the works into the river. This may include the use of cut-off trenches, straw bales or geofabric siltation barriers constructed across the site at specific points.

Any runnels or erosion channels developed during the construction period shall be backfilled and compacted, and the areas restored to an acceptable condition (as determined by the RE). Stabilisation of cleared areas to prevent and control erosion and/or sedimentation shall be actively managed. The method of stabilisation shall be determined in consultation with the RE and Safety Officer. Consideration and provision shall be made for the following methods (or combination thereof):

- Brushcut packing (although no alien plant material may be used for this purpose);
- Mulch or chip cover (although no alien plant material may be used for this purpose);
- Straw stabilizing (at a rate of one bale/m^2 rotated into the top 100 mm of the completed earthworks – only straw bales held with string (not wire) may be used);
- Watering;
- Planting/ sodding;
- Hand seeding/ sowing;
- Application of soil binders and anti-erosion compounds; and/or
- Mechanical cover/ packing structures (including the use of geofabric, hessian cover, log/ pole fencing).

The Safety Officer shall demarcated stabilised areas with painted stakes or hazard tape. Traffic and movement over stabilised areas shall be restricted and controlled by the Safety Officer, and damage to stabilised areas shall be repaired and maintained by the Contractor to the satisfaction of the RE and Safety Officer.

C3.5.6.9 Work in watercourse and wetland areas

As far as is reasonably possible, work in the river shall take place outside of the expected rainy season when flow is at its lowest (January to April) and allow sufficient time for rehabilitation processes to be effected before the rains commence.

No machinery is allowed in the river (defined as the current low flow or "wet" area of the watercourse). Where the Contractor believes that it is necessary to enter the river with a vehicle, a Method Statement must be submitted prior to the anticipated activity for consideration by the RE and Safety Officer. The Method Statement shall include a motivation for the need of mechanised work in the river and measures that will be adopted to reduce the impact of such activity.

If machinery is to be used in the river, it should not cross over the low flow area any more than absolutely necessary. Any work requiring the fording of the river by machinery and vehicles shall be undertaken at slow speed and with clean vehicles (no leaks, etc.) and along a single track.

All temporary and permanent fill used adjacent to or within the riverbed shall be comprised of clean sand or larger particles. Silts, clays, granitic sands and boulders shall not be permitted in the fill.

Banks shall be suitable stabilised incrementally immediately after construction. Stabilisation facilities shall be continuously maintained.

Construction may not permanently alter the surface or subsurface flow of water through any aquatic ecosystem. Unless otherwise specified by the EMC, the post-construction profile of the river and wetlands shall be returned to one similar to that before construction, with no created "ridge or channel" features present.

C3.5.6.10 Protection of Natural Features, Flora and Fauna

a) Protection of natural features

The Contractor shall not deface, paint, damage or mark any natural features outside the site unless agreed beforehand with the RE. Any features affected by the Contractor in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the RE and Safety Officer.

No river boulders/ rock shall be removed from the river without the Contractor first submitting a Method Statement. All river boulders removed from the river for use in gabions or as fill shall be done by hand. Only stones from dry cobble beds may be removed. No excavation of cobble beds by machinery shall be allowed. As a matter of principle the areas immediately adjacent to bridges across the river should be cleared first.

The Contractor shall not permit his employees to make use of any natural water sources (e.g. rivers and wetlands) situated on or outside the site for the purposes of swimming, personal washing and the washing of machinery or clothes.

b) Protection of flora and fauna

The removal, damage or disturbance of flora, fauna or avifauna is forbidden outside the site without the written approval of the RE. The clearing of vegetation within construction areas shall be undertaken as specified in Section C3.5.6.3.1.

The Contractor shall ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place. The feeding of any wild animals is prohibited. No domestic pets or livestock are permitted on site.

C3.5.6.11 Protection of Heritage and Cultural Features

If an archaeological site is discovered during any construction activity, the work is to be halted and the RE notified immediately. Only after the site has been inspected will the Contractor be allowed to continue. The RE is to be kept informed of al developments in the event where modifications are made to the clearing or earthworks schedule.

Archaeological finds can take the form of buried walls, old bottles, porcelain fragments, earthenware fragments, accumulations of bone and ash dumps. If such material is found the Contractor shall immediately notify the RE, who shall contact the South African Heritage Resources Agency (SAHRA) or Heritage Western Cape (HWC).

The Contractor will be required to abide by the specifications as set out by SAHRA, HWC or the heritage specialist appointed to investigate the find. The Contractor may not, without a permit issues by the relevant heritage resources authority, destroy, damage, excavate, alter, deface or otherwise disturb archaeological material.

C3.5.6.12 Access Roads and Speed Limit

The speed limit for light vehicles is 40 km/hr and for heavy vehicles 20 km/hr. No vehicles are to leave or reverse off designated access roads unless at areas previously agreed to with the RE and Safety Officer.

C3.5.6.13 Fire Control

No open fires shall be allowed on site for the purpose of cooking or warmth. *Bona fide* braai fires (such braai fires shall be limited to the traditional "month end" braais and not individual daily cooking fires) may be lit within the construction camp.

The Contractor shall take all reasonable steps to prevent the accidental occurrence or spread of fire. The Contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire. The Contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire.

The appointed Fire Officer shall notify Prince Albert Municipal's Fire and Emergency Services in the event of a fire and shall not delay doing so until such time as the fire is beyond his/ her control.

The Contractor shall ensure that there is basic fire-fighting equipment on site at all times. The equipment shall include fire extinguishers and beaters.

The Contractor shall pay the costs incurred by organisations called to put out fires started by himself/ herself, his/ her staff or any Sub-contractor. The Contractor shall also pay the costs incurred to reinstate burnt areas as deemed necessary by the RE.

Any work that requires the use of fire may only take place at that designated area and as approved by the RE and Safety Officer. Fire-fighting equipment shall be available in these areas.

The Contractor shall ensure that the telephone number of the local Fire and Emergency Service are displayed at the site offices.

C3.5.6.14 Dust Control

The Contractor shall ensure that the generation of dust is minimised and shall implement a dust control programme to maintain a safe working environment, minimise nuisance for surrounding tenants, residential areas/ dwellings, etc.

Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible. The Contractor shall ensure that exposed areas and material stockpiles are adequately protected against the wind (e.g. wetting exposed soil/ gravel areas during windy conditions, covering of material stockpiles, etc.). The location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.

Material loads shall be suitably covered and secured during transportation.

C3.5.6.15 Noise Control and Working Hours

The Contractor shall be familiar with and adhere to, any local by-laws and regulations regarding the generation of noise and hours of operation. In addition, the provisions of SANS 1200 A: Subclause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.

The Contractor shall avoid construction activities outside of "normal working hours". This should be determined together with the local authority. The Contractor shall negotiate for any permits requiring deviation from local by-laws and/or regulations with the local authority. However, the Contractor shall advise the RE and Safety Officer in writing of such intention prior to negotiating for these permits. The Contractor shall be held responsible for any complaints received from the authority and/or public with respect to any contravention of the agreed conditions.

C3.5.6.16 Access onto Private Property

The Contractor shall contact and notify the landowner(s) prior to undertaking any construction activities on his/ her property as per the defined works.

C3.5.6.17 Security in Adjacent Residential Areas

The Contractor shall ensure that his/her staff does not enter the adjacent residential areas under any circumstances except on official business.

C3.5.6.18 Cement and Concrete Batching

Any concrete batching activities shall be located in an area of low environmental sensitivity to be identified and approved by the RE. Cement and concrete mixing directly on the ground shall not be permitted and shall take place on impermeable surfaces to the satisfaction of the RE.

Unused cement bags shall be stored out of the rain where run-off won't affect them. Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination. Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system (Section C3.5.6.7.2).

All excess concrete shall be removed from site on completion of concrete works and disposed of at a licensed landfill site. Washing of the excess concrete into the ground is prohibited.

C3.5.6.19 Site Rehabilitation and Revegetation

a) Site Rehabilitation

On completion of the project, the Contractor shall ensure that all structures, equipment, materials, waste, rubble, notice boards and temporary fences used during the construction operation are removed with minimum damage to the surrounding areas. The Contractor shall clean and clear the site to the satisfaction of the RE.

In the case of accidental spills of oil or chemicals in the construction camp, the affected soil shall be dug out and removed from site for disposal at a hazardous waste site and replaced with fresh topsoil.

b) Revegetation and Maintenance

A Landscape Contractor shall be appointed to undertake the revegetation/ rehabilitation and maintenance of all areas identified in the rehabilitation plan prepared for the current phase. The Landscape Contractor shall provide the Contractor with detailed instructions *vis a vie* site preparation for revegetation.

The Landscape Contractor's procedure for revegetation and maintenance shall be approved by the RE and Landscape Architect prior to commencement. In this regard the landscape Contractor shall submit a Method Statement that sets out the procedures to be followed.

C3.5.7 FORMS FOR CONTRACT ADMINISTRATION

The Contractor shall submit with each monthly statement for payment the following updated returns:

- Project Labour Report

The Project Labour Report must include details of all labour (including that of sub-contractors) earning less than R180,00 per day (excluding any benefits) employed on this contract in the month in question.

C3.5.8 WAYLEAVES, PERMISSIONS AND PERMITS

The Contractor shall be responsible for obtaining all of the necessary wayleaves, permissions or permits applicable to working near any existing services or other infrastructure on Site and shall abide by the safety conditions imposed by such wayleaves, permissions or permits.

The Contractor shall ensure that all wayleaves, permissions and permits are kept on site and are available for inspection by the relevant service authorities on demand.

The Contractor shall also ensure that any wayleaves in respect of electricity services are renewed timeously every three months.

The following wayleaves are anticipated to be obtained:

- Electrical (Prince Albert/Eskom)
- Water (Prince Albert)
- Sewer (Prince Albert)
- Roads & Stormwater (Prince Albert)

C3.6 Health and Safety Specifications

PORTION 1: G1000 : HEALTH AND SAFETY REQUIREMENTS

This part of the Project Specifications contains comprehensive additional specifications for health and safety matters not covered by nor carried out in terms of the Standard Specifications.

The number of each clause and each payment item in this part of the Project Specification is prefixed with a G to differentiate these clauses and items as additional requirements.

The following additional requirements are covered under this part of the Project Specifications:

G1001 SCOPE

This section covers health and safety matters applicable during construction.

G1002 GENERAL

The Contractor shall comply with the Occupational Health and Safety Act (Act No. 85 of 1993) (OHS Act) and in particular with its Construction Regulations, 2014.

All the work included in this Contract shall, for the purpose of complying with the OHS Act and the Construction Regulations, be deemed to be "construction work".

The Contractor is also referred to Clauses 4.5 and 5.3.1 of the General Conditions of Contract in this regard.

It should be noted that, with a few exceptions, the Standard Specifications and the Project Specifications are "end product specifications" and not "method specifications". As the methods of construction to be used are generally determined by the Contractor detailed safety requirements applicable to all the operations to be carried out on Site are not provided in the project documentation. The Contractor shall apply all the relevant safety regulations and requirements to the work methods and materials used.

Penalty: In the event of any negligence or non-conformance with the requirements as stated herein the Municipal OHS consultant agent will be instructed to visit the site, investigate and review the event daily until satisfactorily rectified. The agents' costs will be deducted from the contractor's payment certificates.

G1003 DESCRIPTION OF THE CONSTRUCTION WORK

The temporary and permanent Works required under this Contract are described in the following:
- The Project Specification;
- The Standard Specifications;
- The Drawings;
- The Schedule of Quantities;
- The other Volumes of the Specification.

The Contractor, in complying with the OHS Act and the Construction Regulations, shall consider all aspects of the Works described and take into account the construction methods and materials to be used.

G1004 EXISTING CONDITIONS

The Contractor shall take into account; inter alia, the following existing conditions when complying with the OHS Act:
- Existing utility services;
- Existing ground and foundation conditions;
- Traffic accommodation requirements;
- Surrounding land use;
- Anticipated weather conditions.

The existing conditions on this Contract are described in the following:
- The Project Specifications;
- The Drawings;
- The other Volumes of the Specification.

G1005 DESIGN INFORMATION

Design information provided for safety planning purposes, such as design loads for structures, foundation conditions etc., is provided on the Drawings, in the Project Specifications or in other Volumes of the specification.

G1006 CONSTRUCTION MATERIALS

The following commonly used construction materials and substances potentially pose health and safety hazards:

- All materials contained in pressurized containers;
- Bitumen products;
- Cement;
- Epoxies;
- Lime and other stabilizing agents;
- Paints;
- Tar products;
- Timber preservatives.

The materials to be used to construct the Works are described in the following:

- The Scope of Work;
- The Project Specifications;
- The Standard Specifications;
- The Drawings;
- The Bills / Schedule of Quantities;
- The other Volumes of the Specification.

The Contractor shall take appropriate measures to manage the risks associated with the use of all the materials required to complete the Works, i.e. not only those listed above, and shall, inter alia, implement all the precautionary measures provided by manufacturers and suppliers for the storage, use and application of materials used.

G1007 SITE WIDE ELEMENTS

(a) Site access, egress, deliveries and vehicular and pedestrian routes

Access to the site is obtained directly from the adjacent streets. Materials should be dumped in central areas away from the trafficked and walking surfaces used by vehicles and pedestrians. Where obstructions are present safe detour must be provided for pedestrians.

(b) Environment

Environmental conditions and requirements particular to this Contract are indicated in the Project Specification.

G1008 USE OF SITE BY THE EMPLOYER

Any continued use of the Site required by the Employer to maintain traffic flows or to allow work to be done by other contractors or authorities is indicated in the Project Specification.

G1009 SITE RULES

a) Wayleaves, permissions and permits

The Contractor shall be responsible for obtaining all the wayleaves, permissions or permits applicable to working near any existing services or other infrastructure on Site and shall abide by the safety conditions imposed by such wayleaves, permissions or permits.

b) Reporting of incidents

All incidents shall be reported strictly in accordance with the requirements of the OHS Act and the General Conditions of Contract.

G1010 HEALTH AND SAFETY PLAN

In compliance with the Construction Regulations the Contractor shall, after performing a risk assessment, prepare a health and safety plan for approval by the Employer.

The health and safety plan shall include, but not be limited to, the following:

- The safety management structure including the names of all designated persons such as the construction supervisor and any other competent persons;
- Safety method statements and procedures to be adopted to ensure compliance with the OHS Act. Aspects to be dealt with shall include:
- Public vehicular and pedestrian traffic accommodation measures;
- Control of the movement of construction vehicles;
- The storage and use of materials;
- The use of tools, vehicles and plant;
- Temporary support structures;
- Dealing with working at height;
- The use of batch plants;
- Excavation work;
- Demolition work;
- Security, access control and the exclusion of unauthorised persons.
- The provision and use of temporary services;
- Compliance with wayleaves, permissions and permits;
- Safety equipment, devices and clothing to be employed;
- Emergency procedures;
- Provision of welfare facilities;
- Induction and training;
- Provision and maintenance of the health and safety file and other documentation;
- Arrangements for monitoring and control to ensure compliance with the safety plan.

G1011 AUDITS BY THE EMPLOYER

The Contractor shall permit the Employer to regularly audit, at an agreed interval, the implementation and maintenance of the approved health and safety plan and shall co-operate and provide all the required documentation, as may be required, in this regard.

G1012 VARIATIONS

Should any variations be ordered or design amendments issued the Engineer shall inform the Contractor of all the associated potential hazards to ensure that the health and safety aspects of the work ordered are taken into account.

G1013 MEASUREMENT AND PAYMENT

Item		Unit
G10.01	**Contractor's obligations in respect of Health and Safety**	lump sum

Payment of the lump sum tendered shall include full compensation for all costs resulting from complying with Occupational Health and Safety Act and its Construction Regulations and requirements in terms of health and safety requirements in respect of the contract as specified.

The lump sum tendered will be payable monthly in instalments in relation to the month under consideration and the total time of the completion of the Works

PORTION 2: PARTICULAR CLIENT SPECIFICATIONS

PARTICULAR SPECIFICATIONS: THE CLIENT'S PRE-CONSTRUCTION HEALTH AND SAFETY SPECIFICATION

1. INTRODUCTION AND BACKGROUND

1.1 Background

The Construction Regulations to the Occupational Health and Safety Act (Act 85 of 1993) which were promulgated in February 2014 place the onus on the Employer (defined as the Client in terms of the Construction Regulations) to prepare a pre-construction health & safety (H&S) specification, highlighting all risks not successfully eliminated during design.

1.2 Purpose of the Pre-construction Health and Safety (H&S) Specification

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

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

1.3 Status of the Pre-construction Health and Safety Specification

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

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

2. HEALTH AND SAFETY SPECIFICATION

2.1 Scope

This health and safety (H&S) specification is the Client's H&S specification prepared in accordance with Clause 5(1)(b) of the Construction Regulations. It covers the requirements for eliminating and mitigating incidents and injuries during the construction phase of the project. The specification addresses legal compliance, hazard identification and risk assessment, risk control, and promoting a health and safety culture amongst those working on the project. The specification also makes provision for the protection of those persons other than employees of the Principal Contractor and Contractors.

2.2 Interpretations

2.2.1 Application

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

2.2.2 Definitions

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

2.3 Minimum Administrative Requirements

2.3.1 Notification of Intention to Commence Construction Work

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

2.3.2 Assignment of the CEOs' Responsibility for Health and Safety on Site

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

2.3.3 Appointment of the Construction Manager and Supervisor

The Principal Contractor's CEO (or his duly assigned employee) shall appoint (in writing) one full time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor. A construction manager must (in writing) appoint construction supervisors responsible for construction activities and ensuring occupation health and safety compliance on the construction site.

The Principal Contractor's and the Contractors' competent persons for the various roles shall fulfil the criteria as defined the Construction Regulations. Copies of these appointments, together with proof of competence of the individuals concerned, shall be attached to the H&S plan. Proof of competencies shall take cognisance of the definition of a "competent person" as set out in the Construction Regulations and may comprise CV's and written motivations/recommendations by the persons' direct report.

2.3.4 Compensation of Occupational Injuries and Diseases Act 130 of 1993 (COIDA)

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

2.3.5 Occupational Health and Safety Policy

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

2.3.6 Health and Safety Organogram

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

2.3.7 Health and Safety Representative(s)

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

2.3.8 Health and Safety Committees

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

2.3.9 Health & Safety Audits, Monitoring and Reporting

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

2.3.10 Emergency Procedures

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

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

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

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

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

2.3.11 Accident / Incident Reporting and Investigation

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

2.3.12 General Record Keeping

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

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

2.3.13 Project H&S File

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

The Project H&S File shall contain:

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

2.4 Health and Safety Induction, Training and Equipment

2.4.1 H&S Induction, Awareness and Competency

Induction of Site Personnel

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

Medical certificate of fitness

The Principal Contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3 of the Construction Regulations 2014.

Awareness of Site Personnel

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

Competency of Site Personnel

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

Public and Site Visitor Health & Safety

Both the Client and the Principal Contractor have a duty in terms of the OHS Act to do all that is reasonably practicable to prevent members of the public and site visitors from being adversely affected by the construction activities.

The Principal Contractor shall ensure that every person working on or visiting the site, as well as the public in general, shall be made aware of the dangers likely to arise from site activities, including the precautions to be taken to avoid or minimise those dangers. Appropriate H&S notices and signs shall be posted up, but this shall not be the only measure taken.

Site visitors must be briefed on the hazards and risks they may be exposed to and what measures are in place or should be taken to control these hazards and risks. A record of these inductions/briefings shall be kept in the Project H&S File.

2.4.2 First Aid Boxes and First Aid Training

The Principal Contractor and all other Contractors shall appoint First Aider(s) in writing. All Contractors with more than 10 employees shall have a trained, certified First Aider on site at all times. The appointed First Aider(s) are to be sent for accredited first aid training. Copies of the valid First Aid certificates for each First Aider are to be kept in the Project H&S File. The Principal Contractor shall provide an on-site First Aid Station with First Aid facilities, including first aid boxes adequately stocked at all times. All Contractors with more than 5 employees shall supply their own first aid box(es).

2.4.3 Occupational Health and Hygiene

Exposure of workers to occupational health hazards and risks is very common in any work environment, especially in construction. Occupational exposure is a major problem and the Principal Contractor must ensure that proper health and hygiene measures are put in place to prevent exposure by any person to hazards such as inhalation, ingestion, absorption, and noise induction. Some of the more common occupational hazards to be considered are cement dust, sun exposure, and noise. In addition, the ergonomic issues relating to repetitive and/or strenuous body and limb movements must be considered and ameliorated wherever possible. Stress due to tight project schedules has been shown to adversely affect construction workers and this shall be taken into account when planning and managing work schedules. The preventative and/or the amelioration measures shall be addressed in the H&S plan by way of safe work procedures which are to be followed.

2.4.4 Alcohol and other Drugs

Alcohol and drug/other substance abuse have been shown to be a problem in the construction industry. No alcohol or other drugs will be allowed on site. No person may be under the influence of alcohol or any other drugs while on the construction site. Any person on prescription drugs must inform his/her superior, who shall in turn report this to the Principal Contractor forthwith. Any person suffering from any illness/condition that may have a negative effect on his/her safety performance must report this to his/her superior, who shall in turn report this to the Principal Contractor forthwith. Any person suspected of being under the influence of alcohol or other drugs must be sent off site immediately, to report back the next day for a preliminary inquiry. A full disciplinary procedure must be followed by the employer concerned and details of the disciplinary action taken must be forwarded to the Principal Contractor for his records.

2.4.5 Personal Protective Equipment (PPE) and Clothing

The Principal Contractor shall ensure that all workers are issued with, and wear, hard hats, safe footwear and overalls and specific PPE wherever such equipment is identified in the SWP's as being necessary for particular tasks. The Principal Contractor and all other Contractors shall make provision for, and keep adequate quantities of, SABS approved PPE on site at all times. The Principal Contractor shall clearly outline in the H&S plan the procedures to be taken when PPE or clothing is lost, stolen worn out, or damaged. This procedure applies to all Contractors, as they are all Employers in their own right.

2.4.6 Fire Extinguishers and Fire Fighting Equipment

The Principal Contractor and all other relevant Contractors shall provide adequate, regularly serviced firefighting equipment located at strategic points on site, specific to the classes of fire likely to occur. The appropriate notices and signs must be posted up as required.

2.4.7 Occupational Health and Safety (OHS) Signage

The Contractor shall provide adequate on-site H&S signage including, but not limited to, 'no unauthorised entry', 'report to site office', 'site office', 'beware of overhead work', 'hard hat area'. Signage shall be posted up at all entrances to site as well as on site in strategic locations e.g. access routes, stairways, entrances to structures and buildings, scaffolding, and other potential risk areas/operations.

2.5 Preliminary Hazard Identification and Risk Assessment and Progress Hazard Identification and Risk Assessment

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

The risk assessments must include:

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

The following risks and hazards were identified and should be taken into account:

- Machine hazards (moving machinery, machine running out of control, machine coming in contact with operator or employees' body parts, etc.)
- Energy hazards (live electricity underground, overhead, portable generators and hand tools etc.)
- Materials handling hazards (heavy loads and materials)
- Work practices hazards (working elevated positions, excavations, tripping and falling, plant and tools, noise, insects, snakes, ticks, bees and ergonomics).
- Moving vehicle hazards (vehicles generating fumes and dust, unguarded machine parts and belts, pedestrians moving, civilian vehicles etc.).
- Hazardous chemical hazards (cement, mortar, concrete and other chemicals to be used).
- Weather conditions (extreme hot and cold weather conditions).

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

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

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

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

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

2.6 Permits

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

- Use of Explosives and Blasting
- Work for which a fall prevention plan is required
- Removal of asbestos materials.
- Disposal of (old type) fire detectors with radioactive elements.
- Decanting/handling of Ammonia.

If and where applicable, the Employer will issue to the Principal Contractor, permits and log books (which log books shall thereafter be kept up to date by the Principal Contractor), for the following installations:

- Boilers
- MV switchgear and chambers/rooms
- MV switchgear outdoor yards
- Lifts

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

2.7 Specific Project Requirements

2.7.1 Formwork and Support Work

Support work in river bed could be subject to floods which could wash away/undermine the support work.

2.7.2 Excavation Work

Protection of the top of the excavations to prevent persons falling in shall be addressed. Danger tape alone is not acceptable and the minimum requirement is a 1 m high netting or shade cloth “fence”. A safety net is to be installed to catch any stones or other loose material from falling onto persons who may be working in the excavations, if required.

Trenching up to 2,0 metres deep is to be carried out in soft dune sand. Shoring or battered excavation may be required.

2.7.3 Construction Vehicles and Mobile Plant

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

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

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

2.7.4 Warning signs

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

2.7.5 Construction Welfare Facilities

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

2.7.6 General Machinery

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

2.7.7 Transport of Workers

The Principal Contractor and other Contractors shall not:

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

2.8 Financial Provision for Health and Safety

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

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

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

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

Failure by a Tenderer to submit realistic prices for the scheduled H&S items may prejudice his tender.

2.9 Guidelines for the Preparation of a Typical H&S Plan

Annex E contains certain information to give an indication as to what could be included in an H&S plan for a typical project. That information does not form part of the H&S specification for this particular project as it is just a basic outline and it must be adapted and expanded to suit the actual structure of the contractor’s organisation and also the specific nature of the project.

Enclosures:

Annex A – Notification of Construction Work

Annex B – CEO and Management Assignment

Annex C – Appointment of H&S Representative

Annex D – Recording of Incident

Annex E – Guidelines for the Preparation of a Typical H&S Plan

ANNEX A (to H&S specification)

To : The Provincial Director, Department of Labour,

ANNEXURE A

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

Regulation 4 of the Construction Regulations, 2014

NOTIFICATION OF CONSTRUCTION WORK

1. a) Name and postal address of principal contractor:

   ……

   b) Name and telephone number of principal contractor's contact person:

   ……

2. Principal contractor's compensation registration number:

3. a) Name and postal address of client:

   ……

   b) Name and telephone number of client's contact person or agent:

   ……

4. a) Name and postal address of designer(s) for the project:

   ……

   b) Name and telephone number of designer's contact person:

   ……

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulations 8(1):

   ……

6. Name/s of principal contractor's sub-ordinate supervisors on site appointed in terms of regulation 8(2):

   ……

7. Exact physical address of the construction site or site office:

   ……

8. Nature of the construction work:

   ……

   ……

   ……

9. Expected commencement date: ……

10. Expected completion date: ……..

ANNEX A – cont. (to H&S specification)

11. Estimated maximum number of persons on the construction site:

……

12. Planned number of contractors on the construction site accountable to principal contractor:

……

13. Name(s) of contractors already selected:

……

……

……

……. Principal Contractor	…… Date
……. Client's Agent (where applicable)	…… Date
……. Client	…… Date

- THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE.
- **ALL PRINCIPAL CONTRACTORS** THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

ANNEX B (to H&S specification)

CEO ASSIGNMENT IN TERMS OF SECTION 16(2) OF THE OHSA (ACT 85 of 1993)

Section 16 of the Act states:

(1) Every chief executive officer shall, as far as is reasonably practicable, ensure that the duties of his employer as contemplated in this Act, are properly discharged.
(2) Without derogating from his responsibility or liability in terms of sub-section (1), a chief executive officer may assign any duty contemplated in the said sub-section, to any person under his control, which person shall act subject to the control and directions of the chief executive officer.
(3) The provisions of sub-section (1) shall not, subject to the provisions of section 37, relieve an employer of any responsibility of liability under this Act.
(4) For the purpose of sub-section (1) the head of department of any department of State shall be deemed to be the chief executive of that department.

I, (full name of CEO) .....

do hereby assign my duties in respect of the overall management and control of .....

.....

to (full name of Appointee) .....

in his/her capacity as .....

to ensure that the duties of the employer are carried out as contemplated in the Act and the Regulations as amended

for.....

(division/area/region/premises/project(s)).

Signature: …… **Date:** …….

Designation: Chief Executive Officer

Kindly confirm your acceptance of this appointment by completing the following:

ACCEPTANCE OF ASSIGNATION

I,.....
hereby accept this assignation and confirm that I am conversant with the requirements of the OHS Act and regulations as amended and agree to carry out the duties as set out for the employer.

NOTE : Your Attention is Drawn to regulation General Administrative Regulation 5 and Sections 8, 9, 13, 17, 18, 19, 20 and 37 of the Occupational Health and Safety Act No. 85 of 1993, attached hereto.

Signature: …… **Date:** ……..…….

Designation: ……

ANNEX B – cont. (to H&S specification)

MANAGEMENT ASSIGNMENT OF DUTIES IN TERMS OF SECTION 16 (2) OF THE OHSA (ACT 85 of 1993)

Section 16 of the Act reads:

(1) Every chief executive officer shall as far as is reasonably practicable ensure that the duties of his employer as contemplated in this Act, are properly discharged.
(2) Without derogating from his responsibility or liability in terms of sub-section (1), a chief executive officer may assign any duty contemplated in the said sub-section, to any person under his control, which person shall act subject to the control and directions of the chief executive officer.
(3) The provisions of sub-section (1) shall not, subject to the provisions of section 37, relieve an employer of any responsibility of liability under this Act.
(4) For the purpose of sub-section (1) the head of department of any department of State shall be deemed to be the chief executive of that department.

I, (Appointee's full name) .....

Representing.....

in my capacity as the 16(2) assigned person being responsible for the overall management and control of

.....

do hereby assign all my duties as contemplated in Section 16(2) of the Act to.....

in his/her capacity as .....

and vested with the duty of ensuring the employer complies with the provisions of the Act subject to my control and directions in respect of.....

office/ .....

construction site(s)/all projects under his/her control.

NOTE : Your attention is drawn to Regulation General Administrative Regulations 5 and Sections 8, 9, 13, 17, 18, 19, 20 and 37 of the Occupational Health and Safety Act No. 85 of 1993

(Full name of alternate) .....
will be the Responsible Person in Charge in the Absence of the above Appointee.

Signature: …… **Date:** ……

Designation: ……

Kindly confirm your acceptance of this appointment by completing the following:

ACCEPTANCE OF ASSIGNATION

I,.....
hereby accept this assignation and confirm that I am conversant with the requirements of the OHS Act and regulations as amended and agree to carry out the duties as set out for the employer.

NOTE : Your Attention is Drawn to regulation General Administrative Regulation 5 and Sections 8, 9, 13, 17, 18, 19, 20 and 37 of the Occupational Health and Safety Act No. 85 of 1993, attached hereto.

Signature: …… **Date:** ……

Designation: ……

ANNEX C (to the H&S Specification)

APPOINTMENT OF HEALTH AND SAFETY REPRESENTATIVE IN TERMS OF SECTION 18 OF THE OHSA (ACT 85 of 1993)

(APPOINTEE'S NAME).....

I, (Appointer's full name) .....

being an employee of (name of Contractor's organisation) .....

and, having been appointed as (area of responsibility, e.g. Responsible Person for the construction of X on site Y)

.....

.....

hereby appoint you (Appointee's full name) .....

in terms of Section 17 of the OHSA as the Health and Safety Representative for (area of responsibility)
.....

.....

.....

In terms of this appointment your functions are as follows:

- To represent your employee electorate's interests in terms of occupational health and safety.
- To carry out health and safety inspections of your workplace as designated above prior to each appropriate health and safety committee meeting.
- To serve on the appropriate health and safety committee.
- To bring to the attention of your supervisor any deviations from the safe work procedures any other matters regarding health and safety that come to your attention at any time.

The dates and times of the health and safety committee meetings will be determined by the committee(s). You should attend all meetings of the health and safety committee on which you serve.

You will be required to undergo Health and Safety Representative training in order to ensure that you can complete your tasks successfully.

Your appointment is valid from (start date) ……..…….. to (end date) …..……..

…… ……
Appointer's Signature Date

<u>Kindly confirm your acceptance of this appointment by completing the following:</u>

ACCEPTANCE

I, (Appointee's full name) .....……..
understand the implications of the appointment as detailed above and confirm my acceptance.

…… ……
Appointee's Signature Date

ANNEX D (to the H&S Specification)

ANNEXURE D

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993
(Act No. 85 of 1993)

Regulation 9 of the General Administrative Regulations
Recording and Investigation of Incidents

A. RECORDING OF INCIDENT

1. Name of employer .....

.....

2. Name of affected person .....

3. Identity number of affected person .....

4. Date of incident.....

5. Time of incident .....

6. Part of body affected

Head or neck	Eye	Trunk	Finger	Hand
Arm	Foot	Leg	Internal	Multiple

7. Effect on person

Sprains or strains	Confusion or wounds	Fractures	Burns	Amputation
Electric shock	Asphyxiation	Unconscious-ness	Poisoning	Occupational Disease

8. Expected period of disablement

0 – 13 days	2 – 4 weeks	> 4 – 16 weeks	> 16 – 52 weeks	> 52 weeks or permanent disablement	Killed

9. Description of occupational disease .....

10. Machine/process involved/type of work performed/exposure[2] .....

.....

.....

.....

11. Was the incident reported to the Compensation Commissioner and the Provincial Director?

Yes	No

12. Was the incident reported to the police?[3]

Yes	No

13. SAPS office and reference .....

[2] In case of a hazardous chemical substance, indicate substance exposed to.
[3] To be completed in case of a fatal incident

ANNEX D cont. (to the H&S Specification)

B. INVESTIGATION OF THE ABOVE INCIDENT BY A PERSON DESIGNATED THERETO

1. Name of investigator.....

2. Date of investigation .....

3. Designation of investigator .....

4. Short description of incident .....

.....

.....

.....

5. Suspected cause of incident.....

.....

.....

6. Recommended steps to prevent a recurrence.....

.....

.....

…….. ……
Signature of Investigator Date

C. ACTION TAKEN BY EMPLOYER TO PREVENT THE RECURRENCE OF A SIMILAR INCIDENT

.....

.....

…….. ……
Signature of Employer Date

D. REMARKS BY HEALTH AND SAFETY COMMITTEE

Remarks: .....

.....

.....

……..... ……
Signature of Chairman of Health and Safety Committee Date

ANNEX E (to the H&S Specification)

E GUIDELINES FOR THE PREPARATION OF A TYPICAL H&S PLAN

The following information is purely a guideline and is presented in order to give an indication as to what could be included in an H&S plan for a typical project. This information does not form part of the H&S specification for this particular project as it is just a basic outline and it must be adapted and expanded to suit the actual structure of the contractor's organisation and also the specific nature of the project.

E.1 INTRODUCTION

Give any background information believed to be relevant to H&S on the project.

Give a brief description of the contents of the H&S plan.

E.2 SAFETY OBJECTIVES FOR THE PROJECT

List all goals in terms of safety that should be achieved on this project. Examples could be:

- Training of employees in respect of safety and creation of accountability.
- Creation of a working environment with high safety awareness.
- Avoidance of all accidents.
- Compliance with all legal requirements.

E.3 ADMINISTRATION

Some examples of the administration tasks to be performed in terms of the H&S plan could be:

- Notification of the Department of Labour of work to be done once the letter of acceptance has been received and before commencement of construction.
- Assignment of H&S responsibilities by the CEOs.
- Appointment of the construction supervisor for the project.
- Appointment of a safety officer(s) and safety committee(s).
- Compilation of a list of all emergency telephone numbers.
- Keeping of records of site safety statistics.
- Maintenance of an up-to-date project H&S file in which all H&S records are kept.
- Carrying out of monthly safety audits.
- Compilation of the Project H&S File and what will be in it and when and why it will be updated.

E.4 RISK ASSESSMENTS

List the various types of work activities to be carried out and set up risk assessment forms for each of these. The outcome from the risk assessment forms must be a set of safe working procedures to ensure safety and protection of health from the hazards identified. This planned set of safe working procedures will then form the basis of staff and visitors' H&S training.

Some standard risk assessment forms and safe work procedures for various construction activities have been developed by SAFCEC and SAFCEC members have access to them from their web site. Additional forms will need to be drawn up for activities not covered by the standard forms.

Details of these risk assessments and all safe work procedures must be attached as Appendices to the H&S plan, however a list of all risk assessments must be given in this section of the H&S plan.

E.5 TRAINING

Induction Training (General and job-specific)

- All employees who will work on the site, including sub-contractors' employees, and all visitors to site must undergo H&S induction training and must sign for it and must carry proof that they have received this training.
- Details of job-specific induction training to be carried out.
- Detail aspects in the plan in terms of general, as well as for job-specific training that will be given and how the training will be done.
- On-going Training
- Give details of any additional training (if any) that will be given to employees.

Some guidelines for “toolbox talks” covering various construction activities have been developed by SAFCEC and SAFCEC members have access to them from their web site. Additional procedures will need to be drawn up for activities not covered by the guidelines.

E.6 HOUSEKEEPING ON SITE

State what steps will be taken to minimise H&S risks on site through good housekeeping practice, such as:

- Lighting.
- Ventilation.
- Stacking and storage practices.
- Management of waste products and the removal thereof.
- General tidiness of site.

E.7 PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING

State what will be issued to, and worn by site staff, for example:

- Hard hats
- Steel toe safety shoes
- Overalls
- Gloves
- Eye protection

E.8 FIRST AID

State that a first aid box/es will be adequately stocked in terms of the OHSA requirements. State that an adequately trained (in first aid skills) member of staff in terms will be on site at all times. Describe details of first aid training that will be given (if any).

E.9 SAFETY AUDITS/ EVALUATIONS

State how monthly safety audits / evaluations will be done and by whom.

State that the H&S plan will be a "living" document in that it will be improved and updated as when changes occur and as the project progresses.

E.10 SAFE WORK PROCEDURES

List all safe work procedures and attach copies of them as Appendices.

E.11 PROJECT H&S FILE

Provide a list of contents.

3.7 ENVIRONMENTAL MANAGEMENT PLAN

Western Cape Provincial

Department of Environmental and Cultural Affairs and Sport

STANDARD
CONSTRUCTION PHASE ENVIRONMENTAL MANAGEMENT PLAN

For implementation on small or low impact developments approved under the Environment Conservation Act (Act 73 of 1989).

TERMS AND ABBREVIATIONS

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

Bund - enclosure under / around a storage facility to contain any spillage.

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

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

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

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

Engineer - A person who represents the client and is responsible for the technical and contractual

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

ESA - Environmental Site Agent: - Person responsible to applicant tasked with implementing and controlling the environmental requirements during construction. This title is reserved for implementation on small or low impact developments approved by an exemption under the Environment Conservation Act. **The ESA for this contract shall be the Environmental Officer of the Prince Albert Municipality**.

MANAGEMENT PLAN CONTEXT

Introduction

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

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

Environmental Site agent

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

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

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

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

Environmental Awareness Training for Site Personnel

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

Communication Procedures On Site

Site Instruction Entries

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

ESA Diary Entries

The purpose of these entries will be to record the comments of the ESA as they relate to activities on the site.

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

Method Statements

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

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

- **What** - a brief description of the work to be undertaken;
- **How** - a detailed description of the process of work, methods and materials;
- **Where** - a description/sketch map of the locality of work (if applicable); and
- **When** - the sequencing of actions with due commencement dates and completion date estimates.

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

Record Keeping

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

Photographs

The contractor shall take photographs of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with other records related to this EMP.

Environmental Completion Statement

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

STANDARD MANAGEMENT PROGRAMME

Fauna and Flora

Indigenous plants or wild animals (including reptiles, amphibians or birds etc.) may not be damaged or harmed. Vegetation removals as part of the development requirements are excluded.

All incidents of harm to any animal or natural vegetation (apart from the agreed areas) must be reported to the ESA.

Services

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

Appropriate use of Machinery

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

Demarcating and fencing

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

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

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

Anti-erosion measures

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

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

Measures can include cut off trenches, straw stabilising, brush packing etc.

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

Fuel and Service areas

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

- All vehicles, equipment, fuel and petroleum services and tanks must be maintained in a good condition that prevents leakage and possible contamination of soil or water supplies. The following recommendations should be implemented.
- Refueling areas should be bunded and lined to prevent spilled fuels and oils from contaminating the area. It is suggested that as a minimum that sandbags surround the bulk fuel supply tank, the floor of the area is to be lined with plastic and a layer of sand of approximately 50mm is placed on top of the plastic.
- The park and service area should be treated with a suitable hydrocarbon absorption or remediation product. Absorbent spill mop-up products need to be on hand - Drizzit and products from Enretech should be investigated for these purposes.
- All servicing must have a drip tray present to prevent accidental spillage of oils and fuels.
- A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be established. Fuels and oils must be safely located out of harm's way from the elements and safety and fire prevention must be strictly adhered to. No fuel may be stored within the 1: 50 year flood line level. No fuel / oil containers may be left unattended within drainage areas.
- All spills are to be recorded in the ESA diary.

Concrete works

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

- Cement contaminated water may not enter a natural or man-made (e.g. trench / sloot or dam) water system.

Preventative measures include establishing sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.

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

Blasting / drilling

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

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

No blasting may be done on Sundays. Adequate warning must be provided prior to all blasting to all site staff and neighbours. All clear signals must also be clearly given.

The Engineer and ESA must be given 24-hour notice before blasting events.

Fires

No fires may be allowed outside the construction area and adequate firefighting equipment according to the fire hazard during the construction period must be available on site in good working order (at least one type ABC (all purpose) 12.5 kg extinguisher).

Welding, gas cutting or cutting of metal will only be permitted inside the working areas.

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

Refuse

The Contractor shall be responsible for the establishment of a refuse control system that is acceptable to the ESA.

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

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

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

Toilets

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

Toilets shall be of a neat construction and shall be provided with doors and locks and shall be secured to prevent them blowing over.

Sanitation provision and servicing shall be to the satisfaction of the Engineer. The Contractor shall ensure that toilets are emptied before any builders' holidays.

Dust Control

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

Top material Removal and Stockpiling

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

Preparation of Building Material

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

Discharge of construction water

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

Care must be taken to ensure that no water from the construction site enters the agricultural land adjacent to the site, or the natural watercourses.

Site Clean Up and Rehabilitation

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

Enclosures:

Annex A – Environmental Awareness Do's and Don'ts

Annex B – Method Statement Sheet

BASIC RULES OF CONDUCT

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.
NOTE: **ALL new site personnel must** attend an environmental awareness presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ESA.

DO:
- USE THE TOILET FACILITIES PROVIDED – REPORT DIRTY OR FULL FACILITIES
- CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBISH AT THE END OF EACH DAY – use the waste bins provided and ensure that litter will not blow away.
- REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY & STOP THE SPILL CONTINUING.
- DISPOSE OF CIGARETTES AND MATCHES CAREFULLY. (Littering is an offence.)
- CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA.
- USE ALL SAFETY EQUIPMENT AND COMPLY WITH ALL SAFETY PROCEDURES.
- PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS.
- ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY "HOT WORK" IS UNDERTAKEN e.g. Welding, grinding, gas cutting etc.
- REPORT ANY INJURY OF AN ANIMAL.
- DRIVE ON DESIGNATED ROUTES ONLY.
- PREVENT EXCESSIVE DUST AND NOISE.

DO NOT:
- REMOVE OR DAMAGE VEGETATION WITHOUT DIRECT INSTRUCTION.
- MAKE ANY FIRES.
- INJURE, TRAP, FEED OR HARM ANY ANIMALS – this includes birds, frogs, snakes, lizards etc.
- ENTER ANY FENCED OFF OR MARKED AREA.
- ALLOW CEMENT OR CEMENT BAGS TO BLOW AROUND.
- SPEED OR DRIVE RECKLESSLY
- ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO THE STREAM
- SWIM IN THE DAM.
- LITTER OR LEAVE FOOD LAYING AROUND

Notes:
1. Should any animals such as tortoises, chameleons or snakes be encountered then do not harm them. The ESSO or RE should be contacted to remove these safely. The harming of any animal will result in disciplinary action.
2. Construction and heavy machine operators must be particularly sensitive to staying within access routes and prevention of unnecessary damage. Dust and noise is also of particular concern. Ensure that vehicles and machinery do not leak fuel or oils. Refueling or maintenance must be done within the maintenance camp area only.
3. Alien plant clearing and control work teams must be closely supervised.

BASIESE GEDRAGSKODES

Die volgende lys vertenwoordige die Moets en Moenies vir omgewingsbewustheid wat alle deelnemers aan hierdie projek in ag moet neem tydens die uitvoer van hul take. Hierdie lys is nie volledig nie en dien slegs as 'n vinnige verwysing.
NOTA: **ALLE nuwe terreinpersoneel** moet 'n aanbieding ten opsigte van omgewingsbewustheid bywoon. Indien u nog nie so 'n aanbieding bygewoon het nie, lig asseblief u voorman of bestuurder in of kontak die Omgewings Terreinbeampte.

MOETS:
- GEBRUIK DIE BESKIKBARE TOILET-GERIEWE – RAPPORTEER VUIL OF VOL GERIEWE.
- MAAK U WERKPLEK SKOON VAN ROMMEL OF BOUROMMEL AAN DIE EINDE VAN ELKE DAG – gebruik beskikbare vullisdromme en verseker dat rommel nie rondwaai nie.
- RAPPORTEER ALLE BRANDSTOF- EN OLIE STORTINGS ONMIDDELLIK – STOP VERDERE STORTING.
- WEES VERSIGTIG MET DIE WEGDOEN VAN SIGARETTE EN VUURHOUTJIES. (rommelstrooi is 'n oortreding.)
- BEPERK WERKAKTIWITEITE EN DIE STOOR VAN TOERUSTING TOT DIE ONMIDDELLIKE WERKAREA.
- GEBRUIK VEILIGHEIDSTOERUSTING EN VOLDOEN AAN ALLE VEILIGHEIDS-MAATREËLS.
- VOORKOM BESOEDELING VAN STROME EN WATERBANE
- VERSEKER DAT 'N BRANDBLUSSER IN WERKENDE TOESTAND BYDERHAND IS WANNEER "WARM" WERK VERRIG WORD bv. Sweis, wegslyp, gasny, ens.
- RAPPORTEER BESEERDE DIERE.
- RY SLEGS OP AANGEWESE ROETES.
- VOORKOM OORMATIGE STOF EN GERAAS.

MOENIE:
- PLANTEGROEI VERWYDER OF BESKADIG SONDER DIREKTE INSTRUKSIE NIE.
- ENIGE VURE MAAK NIE.
- ENIGE DIERE DOOD, BESEER, VANG OF VOER NIE, insluitende voëls, paddas, slange, akkedisse, ens.
- ENIGE OMHEINDE OF AFGESPERDE AREAS BINNETREE NIE.
- SEMENT OF SEMENTSAKKE LAAT RONDWAAI NIE.
- VINNIG OF ROEKELOOS BESTUUR NIE.
- ENIGE ROMMEL, AFVAL, OLIE OR ENIGE VREEMDE MATERIAAL IN STROME LAAT BELAND NIE.
- IN DIE DAM SWEM NIE.
- ROMMELSTROOI OF KOS LAAT RONDLÊ NIE.

Notas:

1. Indien enige diere soos skilpaaie, verkleurmannetjies of slange teëgekom word, moet hulle nie beseer of dood nie. Kontak die OTB of RI om hulle veilig te verwyder. Die besering van diere sal lei tot dissiplinêre optrede.
2. Operateurs van konstruksie- en swaar masjiene moet veral versigtig wees om binne toegangsroetes te bly en om enige onnodige skade te voorkom. Verseker dat voertuie en masjiene nie olie of brandstof lek nie. Brandstofaanvulling en voertuigonderhoud mag slegs binne die onderhoudsarea gedoen word.
3. Streng toesig moet gehou word oor indringerplantbeheerspanne.

EZIPPHAMBILI EKUNYANZELEKILEYO UKUBA ZENZIWE

Zonke ezi zinto zilandelayo zizinto ekufuneka zenziwe nekufuneka zingenziwanga.
Wonke umntu ofikayo kufuncka afundiswe ngemigaqo kupala. Needa yazisa iforman yakho ikuba awukhange uye kufundiswa.

IZINTO EMAZENZIWE

- SEBENZISA IZINDLU ZANGASESE, YAZISA XA KUKHO UMONAKALO.
- ZAMA UKUCOCA APHO UBUSEBENZA KHONA.
- SEBENZISA IMIGQOMO YENKUKUMA UNGAYEKI IPHAPHTIEKE.
- YAZISA XA UBONA IOIL ECHITHSKALAYO OKANYE IPETROL.
- CIMA LOZOLI CIGARETTE XA UGQIBIBILE UKUTSHAYA
- ZONKE IZIXHOBO USEBENZA ZIBUYISELE APHO ZIHLAKA KHONA XA UCGIBILE APHO ZIHLALA KHONA XA UGQIBILE UKUZISEBENZISA.
- ZISEBENZISE IZIKHUSELIXA UZINKIWE.
- SUKUGALELA IZINTO EMLANJENI.
- MASIBEKHO ISICIMA MLILO XAUSEBENZA NGOMLILO.
- YAZISA MSINYANE XA UBONE ISILWANYANA EZONZAKELEYO.
- XAUQHUBA ISITHUTHI HAMBA ENDLELENI QHA UNGAFATHULINJE.
- NAPHINA ZAMAUNGENZI THULI OKANYE INGXOLO XA USEBENZA.

EMAZINGENZIWA

- SUKUSUSA NESIPHINA ISITYALO UNGAKHANGE UXELELWE
- SUKWENZA MLILO NOKUBA SEKUBANDA
- AMAGQARA UKUBULALA IZILWANYANA NOKUZIFIDA AKUVUMELEKANGA
- SUKUNGENA XA KUVALIWE NGAPHANDLE KWE MVUME
- INGXOWA ZESAMENTE MAZINCEDWE ZINGALAHLWA NJE
- SUKUQHUBA NGESANTYA ESIPHAKAMILEYO
- SUKUGALELE NAYIPHI INTO PHAYA EMLANJENI
- SUKUQUBHA EDAMENI Q OQOSHA YONK INKUKUMA

Method Statement Sheet

ENVIRONMENTAL METHOD STATEMENT

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

WHAT:	Subject of M/Statement				
WHO:	Site Foreman/contact person:				
	Submitted to (e.g. ESA):		Approved by:		
	Date Submitted on:		Date Approved:		
WHEN:	Date works start		Date works complete		
	Rehabilitation period:		Programme restrictions (critical path, season restrictions etc.)		
	Split work Phasing:	Item		start date	end date
	Phase 1				
	Phase 2				
WHERE	Area of works – submit plan or sketch if appropriate – stockpile, detention ponds, boundaries / restriction of works, special features or mitigation works landscape specials etc.:				
HOW:	Route/site layout pegged:	Date available to inspect		Inspection persons required:	
	Landscape concerns: (Specify items not covered in EMP. Refer to EMP items if required.)				
	Existing features & services affected (e.g. paths, curbing, irrigation etc.)				
	Trees (protection or removal methods).				
	Special vegetation				
	Reinstatement methods				
	Maintenance				
	Restricted areas				

HOW	General Environmental: (specify items not covered in EMP. Refer to EMP items if required.)
(cont.)	Access:
	Machinery:
	Earthworks & dust control:
	Concrete works:
	Storm-water control:
	Stockpiles:
	Refuse/rubble:
	Water quality – pumping, source & discharge points, settlement, filtration, duration etc.:
	Hydrocarbon control measures:
	I&AP notifications:
	Fire/emergency contingencies:
Special conditions / mitigation measures (e.g. stream crossings, live sewer proximity etc.):	
Comments:	

Part C4: Site Information

C4.1 Scope

Refer to Section 3.1, Section 3.4 Part D and Bill of Quantities.

C4.2 Location of the Works

The site is situated in Prince Albert, Western Cape.

C4.3 Access to Site

Accesses to the site are via the R353 road in Prince Albert. The Contractor shall make his own arrangements with the authorities and private parties to get access and arrange for keys to gain access.

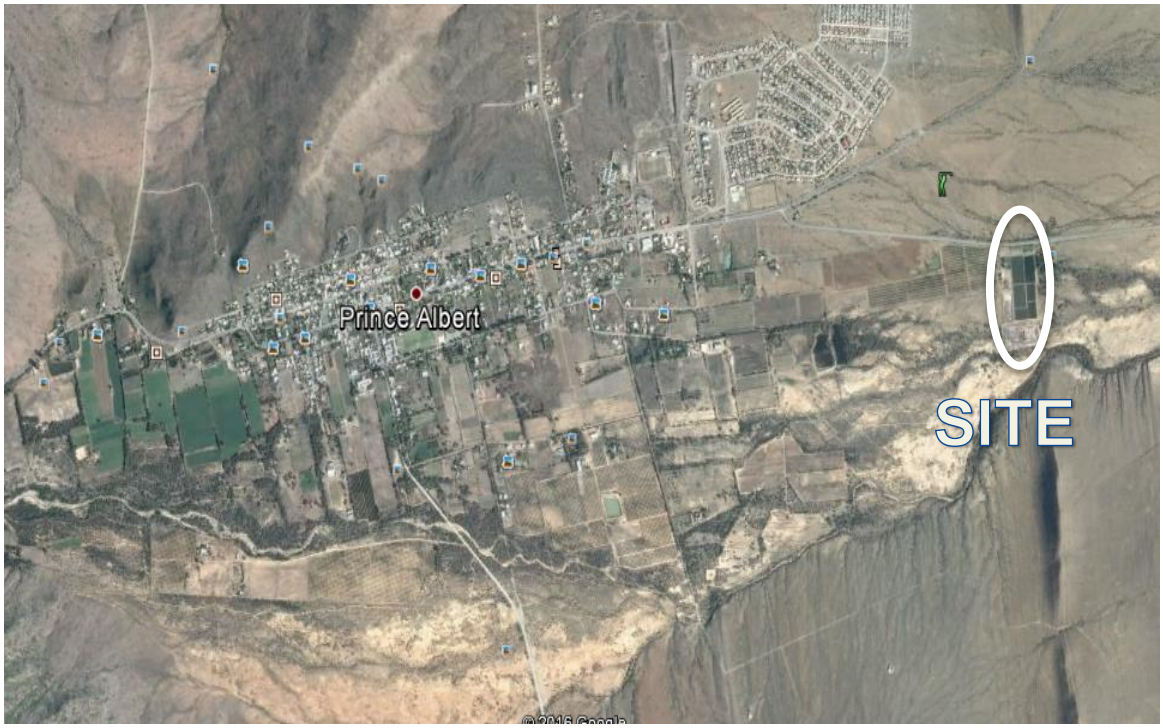
C4.4 Topography

The site has relative gradual slope and is not excessively steep.

C4.5 Climate

The general weather conditions are typical of that in the Western Cape area. Rainfall data is presented in Clause 5.12.2.2 of the Contract Data. Rainfall data was obtained from the Directorate Weather Bureau for Rainfall Station 0048043 Prince Albert TNK.

Site Locality Plan



Part C5: Drawings Attached With Tender Document

The following drawings are also applicable to the Contract and are issued with the tender document and will form part of the Contract Document.

DRAWING TITLE	DRAWING NO.
General Layout	MD2608-C-001
Aeration MCC General Arrangement and Single Line Diagram	MD2608-E-010
Typical MCC Schematic	MD2608-E-020
Typical Cable Trench Layout	MD2608-E-021
Typical E-Stop Station	MD2608-E-022
Typical MCC Door Layout	MD2608-E-023