Transnet Freight Rail

an Operating Division **TRANSNET SOC LTD**

[Registration Number 1990/000900/30]

REQUEST FOR PROPOSAL (RFP) ERACMM-KDS-45103

TO RE-INSTATE TURFGROND 25KV AC TRACTION SUBSTATION UNDER THE CONTROL OF THE DEPOT ENGINEER, KOEDOESPOORT

RFQ NUMBER	**: ERACMM-FDT-45401**
ISSUE DATE	**: 19 JUNE 2024**
COMPULSORY SITE BRIEFING DATE	**: 26 JUNE 2024**
CLOSING DATE	**: 03 JULY 2024**
CLOSING TIME	**: 10h00am**
TENDER VALIDITY PERIOD	**: 29 SEPTEMBER 2024**

Note to the bidders:

Bidders are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Transnet will not be held liable for any challenges experienced by bidders as a result of the technical challenges. Please do not wait for the last hour to submit. A Bidder can upload 30mb per upload and multiple uploads are permitted.

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T1.1 Tender Notice And Invitation To Tender

SECTION 1: NOTICE TO TENDERERS

1. INVITATION TO TENDER

Responses to this Tender [hereinafter referred to as a **Tender**] are requested from persons, companies, close corporations or enterprises [hereinafter referred to as a Tenderer].

DESCRIPTION	To re-instate Turfgrond 25kv AC Traction Substation under the control of the Depot Engineer, Koedoespoort ***(service)***
TENDER DOWNLOADING	This RFP may be downloaded directly from National Treasury's e-Tender Publication Portal at www.etenders.gov.za free of charge. To download RFP and Annexures: • Click on "Tender Opportunities"; • Select "Advertised Tenders"; • In the "Department" box, select Transnet SOC Ltd. Once the tender has been in the list, click on the 'Tender documents" tab and process to download all uploaded documents. The RFP may also be downloaded from the Transnet Portal at https://transnetetenders.azurewebsites.net (please use Google Chrome to access Transnet link/site) free of charge.
COMPULSORY BRIEFING SESSION	A **Compulsory** Tender Clarification will be at Turfgrond 25kv AC Traction Substation next to Marikana in North West Province on **the 26th June 2024** at **[10H00'clock]** for a period of ± 1) hour. (GPS Co-ordinates: S25˚41.341' E027˚31.806') For directions contact Thabiso Tsotetsi 083 208 2135 For commercial enquiries: Matete Kutumela by email to: matete.kutumela@transnet.net [Tenderers to provide own transportation and accommodation]. The Compulsory Tender Clarification Meeting will start punctually and information will not be repeated for the benefit of Tenderers arriving late.

	A Site visit/walk will take place, tenderers are to note: • Tenderers are required to wear safety shoes, goggles, long sleeve shirts, high visibility vests and hard hats. • Tenderers without the recommended PPE will not be allowed on the site walk. • Tenderers and their employees, visitors, clients and customers entering Transnet Offices, Depots, Workshops and Stores will have to undergo breathalyser testing. • All forms of firearms are prohibited on Transnet properties and premises. • The relevant persons attending the meeting must ensure that their identity documents, passports or drivers licences are on them for inspection at the access control gates. Certificate of Attendance in the form set out in the **Returnable Schedule** T2.2-1 hereto must be completed and submitted with your Tender as proof of attendance is required for a compulsory site meeting and/or tender briefing. Tenderers are required to bring this Returnable Schedule T2.2-1 to the Compulsory Tender Clarification Meeting to be signed by the *Employer's* Representative. Tenderers failing to attend the compulsory tender briefing will be disqualified.
CLOSING DATE	**10:00 am on 03 July 2024** Tenderers must ensure that tenders are uploaded timeously onto the system. **If a tender is late, it will not be accepted for consideration**

2. TENDER SUBMISSION

Transnet has implemented a new electronic tender submission system, the e-Tender Submission Portal, in line with the overall Transnet digitalization strategy where suppliers can view advertised tenders, register their information, log their intent to respond to bids and upload their bid proposals/responses on to the system.

a) The Transnet e-Tender Submission Portal can be accessed as follows:

Log on to the Transnet eTenders management platform website (https://transnetetenders.azurewebsites.net);

- Click on “ADVERTISED TENDERS” to view advertised tenders;
- Click on “SIGN IN/REGISTER – for bidder to register their information (must fill in all mandatory information);
- Click on “SIGN IN/REGISTER” - to sign in if already registered;
- Toggle (click to switch) the “Log an Intent” button to submit a bid;
- Submit bid documents by uploading them into the system against each tender selected.
- **Tenderers are required to ensure that electronic bid submissions are done at least a day before the closing date to prevent issues which they may encounter due to their internet speed, bandwidth or the size of the number of uploads they are submitting. Transnet will not be held liable for any challenges experienced by bidders as a result of the technical challenges. Please do not wait for the last hour to submit. A Tenderer can upload 30mb per upload and multiple uploads are permitted.**

b) The tender offers to this tender will be opened as soon as possible after the closing date and time. Transnet shall not, at the opening of tenders, disclose to any other company any confidential details pertaining to the Tender Offers / information received, i.e. pricing, delivery, etc. The names and locations of the Tenderers will be divulged to other Tenderers upon request.

c) Submissions must not contain documents relating to any Tender other than that shown on the submission.

3. CONFIDENTIALITY

All information related to this RFQ is to be treated with strict confidentiality. In this regard Tenderers are required to certify that they have acquainted themselves with the Non-Disclosure Agreement. All information related to a subsequent contract, both during and after completion thereof, will be treated with strict confidence. Should the need however arise to divulge any information gleaned from provision of the Works, which is either directly or indirectly related to Transnet’s business, written approval to divulge such information must be obtained from Transnet.

4. DISCLAIMERS

Tenderers are hereby advised that Transnet is not committed to any course of action as a result of its issuance of this Tender and/or its receipt of a tender offer. In particular, please note that Transnet reserves the right to:

4.1. Award the business to the highest scoring Tenderer/s unless objective criteria justify the award to another tenderer.

4.2. Not necessarily accept the lowest priced tender or an alternative Tender;

4.3. Go to the open market if the quoted rates (for award of work) are deemed unreasonable;

4.4. Should the Tenderers be awarded business on strength of information furnished by the Tenderer, which after conclusion of the contract is proved to have been incorrect, Transnet reserves the right to terminate the contract;

4.5. Request audited financial statements or other documentation for the purposes of a due diligence exercise;

4.6. Not accept any changes or purported changes by the Tenderer to the tender rates after the closing date;

4.7. Verify any information supplied by a Tenderer by submitting a tender, the Tenderer/s hereby irrevocably grant the necessary consent to the Transnet to do so;

4.8. Conduct the evaluation process in parallel. The evaluation of Tenderers at any given stage must therefore not be interpreted to mean that Tenderers have necessarily passed any previous stage(s);

4.9. Unless otherwise expressly stated, each tender lodged in response to the invitation to tender shall be deemed to be an offer by the Tenderer. The Employer has the right in its sole and unfettered discretion not to accept any offer.

4.10. Not be held liable if tenderers do not provide the correct contact details during the clarification session and do not receive the latest information regarding this RFQ with the possible consequence of being disadvantaged or disqualified as a result thereof.

4.11. Transnet reserves the right to exclude any Tenderers from the tender process who has been convicted of a serious breach of law during the preceding 5 [five] years including but not limited to breaches of the Competition Act 89 of 1998, as amended. Tenderers are required to indicate in tender returnable on T2.2-18], [**Breach of Law**] whether or not they have been found guilty of a serious breach of law during the past 5 [five] years.

4.12. Transnet reserves the right to perform a risk analysis on the preferred tenderer to ascertain if any of the following might present an unacceptable commercial risk to the employer*:*

- *unduly high or unduly low tendered rates or amounts in the tender offer;*
- *contract data of contract provided by the tenderer; or*
- *the contents of the tender returnables which are to be included in the contract.*

5. Transnet will not reimburse any Tenderer for any preparatory costs or other work performed in connection with this Tender, whether or not the Tenderer is awarded a contract.

6. NATIONAL TREASURY'S CENTRAL SUPPLIER DATABASE

Tenderer are required to self-register on National Treasury's Central Supplier Database (CSD) which has been established to centrally administer supplier information for all organs of state and facilitate the verification of certain key supplier information. The CSD can be accessed at https://secure.csd.gov.za/. Tenderer are required to provide the following to Transnet in order to enable it to verify information on the CSD:

Supplier Number…… and Unique registration reference number……(Tender Data)

Transnet urges its clients, suppliers and the general public

to report any fraud or corruption to

TIP-OFFS ANONYMOUS: 0800 003 056 OR Transnet@tip-offs.com

T1.2 : Tender Data

The conditions of tender are the Standard Conditions of Tender as contained in Annex C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts. The Standard for Uniformity in Construction Procurement was first published in Board Notice 62 of 2004 in Government Gazette No 26427 of 9 June 2004. It was subsequently amended in Board Notice 67 of 2005 in Government Gazette No 28127 of 14 October 2005, Board Notice 93 of 2006 in Government Gazette No 29138 of 18 August 2006, Board Notice No 9 of 2008 in Government Gazette No 31823 of 30 January 2009, Board Notice 86 of 2010 in Government Gazette No 33239 of 28 May 2010, Board Notice 136 of 2015 in Government Gazette 38960 of 10 July 2015 and Board Notice 423 of 2019 in Government Gazette No 42622 of 8 August 2019.

This edition incorporates the amendments made in Board Notice 423 of 2019 in Government Gazette 42622 of 8 August 2019. (see www.cidb.org.za).

The Standard Conditions of Tender make several references to Tender data for detail 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 in the left-hand column to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause		**Data**
C.1.1	The *Employer* is	**Transnet SOC Ltd** **(Reg No. 1990/000900/30)**
C.1.2	The tender documents issued by the *Employer* comprise:	
	Part T: 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
	Part C: The contract	
	Part C1: Agreements and contract data	C1.1 Form of offer and acceptance C1.2 Contract data (Part 1 & 2)
	Part C2: Pricing data	C2.1 Pricing instructions C2.2 Price List
	Part C3: Scope of work	C3.1 Service Information
	Part C4: Affected Property	C4.1 Affected Property
C.1.4	The Employer's agent is:	Regional Procurement Manager
	Name:	Yvonne Scannell

Address:	Nzasm Building Cnr of Minnaar and Paul Kruger Streets Pretoria 0001
Tel No.	(012) 315 2059
E – mail	Yvonne.scannell@transnet.net

C.2.1 Only those tenderers who satisfy the following eligibility criteria are eligible to submit tenders:

1. **Stage One - Eligibility with regards to attendance at the compulsory clarification meeting:**
   An authorised representative of the tendering entity or a representative of a tenderering entity that intends to form a Joint Venture (JV) must attend the compulsory clarification meeting in terms C2.7

2. **Stage Two - Eligibility in terms of the Construction Industry Development Board:**

a) 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, designation of **5 EP** or higher class of construction work, are eligible to have their tenders evaluated.

b) Joint Venture (JV)
Joint ventures are eligible to submit tenders subject to the following:
   1. every member of the joint venture is registered with the CIDB;
   2. the lead partner has a contractor grading designation of not lower than one level below the required class of construction works under consideration and possesses the required recognition status; and
   3. the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a **5 EP** or higher class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations
   4. The tenderer shall provide a certified copy of its signed joint venture agreement.

NB: Any tenderer that fails to meet the stipulated eligibility criteria will be regarded as an unacceptable tender.

3. **Stage Three - Functionality:**

Only those tenderers who obtain the minimum qualifying score for functionality will be evaluated further in terms of price and the applicable preference point system. The minimum qualifying for score for functionality is 70 points.

The evaluation criteria for measuring functionality and the points for each criteria and, if any, each sub-criterion are as stated in C.3.11.3 below.

C.2.7 The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. **Tenderers must complete and sign the attendance register.** Addenda

	will be issued to and tenders will only be received from those tendering entities including those entities that intends forming a joint venture appearing on the attendance register. Tenderers are also **required to bring their RFP document to the briefing session and have their returnable document T2.2-1 certificate of attendance** signed off by the Employer's authorised representative.
C.2.12	No alternative tender offers will be considered.
C.2.13.3	Each tender offer shall be in the **English Language.**
C.2.13.5 C2.15.1	The *Employer*'s details and identification details that are to be shown on each tender offer package are as follows: Identification details: The tender documents must be uploaded with: ▪ Name of Tenderer: (insert company name) ▪ Contact person and details: (insert details) ▪ The Tender Number: ▪ The Tender Description Documents must be marked for the attention of: ***Employer*'s Agent:**
C.2.13.9	Telephonic, telegraphic, facsimile or e-mailed tender offers will not be accepted.
C.2.15	The closing time for submission of tender offers is: Time: **10:00am** on the **03 July 2024** (Date) Location: The Transnet e-Tender Submission Portal: (https://transnetetenders.azurewebsites.net); **NO LATE TENDERS WILL BE ACCEPTED**
C.2.16	The tender offer validity period is **12 weeks** after the closing date. Tenderers are to note that they may be requested to extend the validity period of their tender, on the same terms and conditions, if Transnet's internal evaluation and governance approval processes has not been finalised within the validity period.
C.2.23	The tenderer is required to submit with his tender: 1. A valid Tax Clearance Certificate issued by the South African Revenue Services. **Tenderers also to provide Transnet with a TCS PIN to verify Tenderers compliance status**. 2. A **valid B-BBEE Certificate** from a Verification Agency accredited by the South African Accreditation System [**SANAS**], or a **sworn affidavit** confirming annual turnover and level of black ownership in case of all EMEs and QSEs with 51% black ownership or more together with the tender; 3. A valid CIDB CRS Number in order to confirm the correct and required designated grading 4. Proof of registration on the Central Supplier Database; 5. Letter of Good Standing with the Workmen's compensation fund by the tendering entity or separate Letters of Good Standing from all members of a newly constituted JV. **Note:** Refer to Section T2.1 for List of Returnable Documents

C3.11 The minimum number of evaluation points for functionality is: **70**

(Please see CIDB Compiler guidance note T1.2 – Tender Data).

Functionality criteria	**Maximum number of points**
T2.2.3 Availability of plant and equipment to re-instate 25kv AC Traction Substation	30
T2.2.4 Management of CV's and key personnel qualifications	30
T2.2.5 Proven experience to re-instate 25kv AC Traction Substation	40
Maximum possible score for Functionality	**100**

Functionality shall be scored independently by not less than 3 (three) evaluators and averaged in accordance with the following schedules:

T2.2.3 Availability of plant and equipment to re-instate 25kv AC Traction Substation

T2.2.4 Management of CV's and key personnel qualifications

T2.2.5 Proven experience to re-instate 25kv AC Traction Substation

Each evaluation criteria will be assessed in terms of scores of 0, 40, 70, 90, 100

The scores of each of the evaluators will be averaged, weighted and then totalled to obtain the final score for functionality, unless scored collectively. (See CIDB Inform Practice Note #9).

Note: Any tender not complying with the above mentioned requirements, will be regarded as non-responsive and will therefore <u>not</u> be considered for further evaluation. This note must be read in conjunction with Clause C.2.1.

C.3.11. Only tenders that achieve the minimum qualifying score for functionality will be evaluated in further in accordance with the 80/20 preference points systems as described in Preferential Procurement Regulations.

80 where the financial value of one or more responsive tenders received have a value equal to or below R50 million, inclusive of all applicable taxes.

Thresholds	Minimum Threshold
Functionality	70

Evaluation Criteria	Final Weighted Scores
Price	80
Specific goals	20
Total Score:	**100**

Up to 100 minus W_1 tender evaluation points will be awarded to tenderers who complete the preferencing schedule and who are found to be eligible for the preference claimed. **Should the BBBEE rating not be provided, tenderers with no verification will score zero points for preferencing.**

Note: Transnet reserves the right to carry out an independent audit of the tenderers scorecard components at any stage from the date of close of the tenders until completion of the contract.

In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, the following preference points must be awarded to a bidder who provides the relevant required evidence for claiming points

Selected Specific Goal	Number of points allocated (80/20)
B-BBEE Level of contributor – Level 1 or 2	10
Entities that are 51% Black Owned	4
At least 30% Black Women Owned Entities	3
Local Content and Local Production • Transformer oil 100% • VCB control cables 90% • Multicore control cable 90%	3
Non-Compliant and/or B-BBEE Level 3-8 contributors	0

Up to 100 minus W_1 tender evaluation points will be awarded to tenderers who complete the preferencing schedule and who are found to be eligible for the preference claimed. **Should the evidence required for any of the Specific Goals applicable in this tender not be provided, a tenderer will score zero preference points for that particular "Specific Goal".**

In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, the following preference points must be awarded to a bidder who provides the relevant required evidence for claiming points

The following Table represents the evidence to be submitted for claiming preference points for applicable specific goals in a particular tender:

Specific Goals	Acceptable Evidence
B-BBEE	B-BBEE Certificate / Sworn-Affidavit B-BBEE Certificate (in case of JV, a consolidate scorecard will be accept) as per DTIC guidelines
Entities that are 51 % Black Owned	CI B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
>50% Black Women Owned Entities	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Local Content and Local Production	Returnable Local Content and production Annexures

Note: Transnet reserves the right to carry out an independent audit of the tenderers

scorecard components at any stage from the date of close of the tenders until completion of the contract.at any stage from the date of close of the tenders until completion of the contract.

C.3.13 Tender offers will only be accepted if:

1. The tenderer or any of its directors/shareholders 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;

2. the tenderer does not appear on Transnet's list for restricted tenderers and National Treasury's list of Tender Defaulters;

3. the tenderer has fully and properly 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 and persons in the employ of the state.

4. Transnet reserves the right to award the tender to the tenderer who scores the highest number of points overall, unless there are **objective criteria** which will justify the award of the tender to another tenderer. Objective criteria include but are not limited to the outcome of a due diligence exercise to be conducted. The due diligence exercise may take the following factors into account inter alia;

   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, under Business Rescue as provided for in chapter 6 of the Companies Act, 2008, 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 option of the employer to perform the contract free of conflicts of interest.

C.3.17	The number of paper copies of the signed contract to be provided by the Employer is 1 (one).

T2.1 List of Returnable Documents

These schedules are required for eligibility purposes:

T2.2.1 Stage One - Eligibility with regards to attendance at the compulsory clarification meeting:

- **(Certificate of Attendance at Tender Clarification and Site Meeting (fully completed and signed by Transnet Official)**

T2.2.2 Stage Two - Eligibility in terms of the Construction Industry Development Board:

- A tenderer must submit valid CIDB CRS number in order to confirm the correct and required designated grading

NB: Any tenderer that fails to meet the above stipulated eligibility criteria will be regarded as an unacceptable tender.

These schedules will be utilised for evaluation purposes:

- **Evaluation Schedule:** T2.2.3 Availability of plant and equipment to re-instate 25kv AC Traction Substation
- **Evaluation Schedule:** T2.2.4 Management of CV's and key personnel qualifications
- **Evaluation Schedule:** T2.2.5 Proven experience re-instate 25kv AC Traction Substation

T2.2 List of Returnable Schedules

2.1.3 Returnable Schedules:

General:

- T2.2.6 Health and Safety Questionnaire
- T2.2.7 Health and Safety Cost Breakdown
- T2.2.8 Capability and ability to meet delivery schedule
- T2.2-9 Authority to submit tender
- T2.2-10 Record of addenda to tender documents
- T2.2-11 Letter of Good Standing
- T2.2-12 Risk Elements
- T2.2-13 Schedule of proposed Subcontractor
- T2.2-14 Affected Property Establishment requirements

Agreement and Commitment by Tenderer:

- T2.2-15 CIDB SFU ANNEX G Compulsory Enterprise Questionnaire
- T2.2-16 Non-Disclosure Agreement
- T2.2-17 RFP Declaration Form
- T2.2-18 RFP – Breach of Law
- T2.2-19 Certificate of Acquaintance with Tender Document
- T2.2-20 Service Provider Integrity Pact
- T2.2-21 POPI Act form

Bonds/Guarantees/Financial/Insurance:

- T2.2-22 Insurance provided by the *Contractor*
- T2.2-23 Three (3) years audited financial statements

Transnet Vendor Registration Form:

- T2.2-24 Transnet Vendor Registration Form

2. Contract Data

2.1 C1.1 Offer portion of Form of Offer & Acceptance

2.2 C1.2 Contract Data

2.3 C2.2 Price List

SBD 6.

T2.2-1: Eligibility Criteria Schedule: Certificate of Attendance at Tender Clarification Meeting

This is to certify that

.....

(Company Name)

Represented by: .....

(Name and Surname)

Was represented at the compulsory tender clarification meeting

Held at:		
On (date)		Starting time:

Particulars of person(s) attending the meeting:

Name .....

Signature .....

Capacity .....

Attendance of the above company at the meeting was confirmed:

Name .....

Signature .....

For and on Behalf of the *Employers Agent.*

Date .....

T2.2.2 Eligibility Criteria Schedule - CIDB Grading Designation

Note to tenderers:

Tenderers are to indicate their CIDB Grading by filling in the table below.

CRS Number	Status	Grading	Expiry Date

1. 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 **5 EP** or higher class of construction work, are eligible to have their tenders evaluated.

2. Joint Venture (JV)

Joint ventures are eligible to submit tenders subject to the following:

1. every member of the joint venture is registered with the CIDB;
2. the lead partner has a contractor grading designation of not lower than one level below the required class of construction Service under consideration and possesses the required recognition status; and
3. the combined Contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a Contractor grading designation determined in accordance with the sum tendered for a **5 EP** or higher class of construction work or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations
4. The tenderer shall provide a certified copy of its signed joint venture agreement

T2.2-3 Evaluation Schedule: Availability of equipment to re-instate 25kV AC Traction Substation

Number of Equipment	List of Plant and Equipment – Description	Hourly Rate

If the above requirements not provided, it will have a negative influence on your technical evaluation scoring.

The table below is for information purposes only to indicate the method of scoring that will be followed to evaluate the availability of plant and equipment submitted by the Tenderer:

Availability of equipment to re-instate 25kV AC Traction Substation = 30 points
0 = No Plant and Equipment submitted
40 = Contractor has listed (1 – 2) of the required) minimum equipment as specified in the service information
70 = Contractor has listed (3 – 5) of the required) minimum equipment as specified in the service information
90 = Contractor has listed (6 - 8) of the required) minimum equipment as specified in the service information
100 = Contractor has listed (9 - 10) of the required) minimum equipment as specified in the service information

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

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

Tenderer .....

T2.2-4: Evaluation Schedule: Management & CV's of Key Persons and qualifications

The tender must be able to demonstrate that the project personnel have sufficient knowledge, experience and qualifications to provide the required services and submit the following documents as a minimum with the tender:

i. The qualifications of assigned key persons in relation to the scope of service will be evaluated. The following qualifications will be required:

- Valid Electrical Trade Test Certificate
- Service Manager registered with ECSA as a Professional Engineer Pr. Eng. (Electrical)
- Crane operator should have valid Crane certificate

ii Comprehensive CV's should be attached to this schedule:

As a minimum each CV should address the following, but not limited to;

Personal particulars

a. Name
b. Place (s) of tertiary education and dates associated therewith
c. Professional awards

Iii Qualifications (degrees, diplomas, grades of membership of professional societies and professional registrations)

Name of current employer and position in enterprise

Overview of post graduate experience (year, organization and position)

Outline of recent assignments / experience that has a bearing on the Scope of Service

List of Key Persons assigned to the above disciplines

No.	Key Persons	Name and Surname	CV attached (Yes/No)
1			
2			
3			
4			
5			

NB: If the above CV's and certificate not provided, it will have a negative influence on your technical evaluation scoring

The table below is for information purposes only to indicate the method of scoring that will be followed to evaluate the management of CV's and qualifications of key personnel submitted by the Tenderer

Management & CV's of Key Persons and qualifications = 30
0 = No proof of Valid Electrical Trade Test Certificate, Project Manager not registered with ECSA and no Crane certificate submitted
40 = Certificates submitted but are not related of what is required as mentioned above on item (i)
70 = Only Crane certificate submitted, but no Valid Electrical Trade Test Certificate and no Project Manager registered as a Professional Engineer Pr. Eng. (Electrical) with ECSA
90 = Crane certificate and Valid Electrical Trade Test Certificate submitted but no Project Manager registered as a Professional Engineer Pr. Eng. (Electrical) with ECSA
100 = Crane certificate, Valid Electrical Trade Test Certificate and Project Manager registered with ECSA as a Professional Engineer Pr. Eng. (Electrical) with ECSA submitted

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

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

Tenderer .....

T2.2-5 Evaluation Schedule: Previous Experience re-instate 25kv AC Traction Substation

Note to tenderers:

Tenderers are required to demonstrate performance in comparable projects of similar size and nature by supplying the following:

- Refurbish/re-instate 25kv AC Traction Substation
- A list of past / current comparable projects (Contractor to submit only previous purchase orders ’and completion certificates as supporting documents)

Client	Client contact details	Project Description	Year of project completion	Contract Value

NB: If the above information not provided, it will have a negative influence on your technical evaluation scoring

The table below is for information purposes only to indicate the method of scoring that will be followed to evaluate the previous experience submitted by the Tenderer

Previous experience to re-instate 25kv AC Traction Substation = 40
0 = Did not submit any proof of award and completion letters of experience to re-instate 25kv AC Traction Substation
40 = Contractor has experience to re-instate 25kv AC Traction Substation and completed (0 - 2) projects and submitted previous PO's/appointment letter and/or completion certificates
70 = Contractor has experience re-instate 25kv AC Traction Substation and completed (3 - 5) projects and submitted previous PO's/appointment letter and/or completion certificates
90 = Contractor has experience re-instate 25kv AC Traction Substation and completed (6 - 8) projects and submitted previous PO's/appointment letter and/or completion certificates
100 = Contractor has experience re-instate 25kv AC Traction Substation and completed more than (8) projects and submitted previous PO's/appointment letter and/or completion certificates

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

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

Tenderer .....

2.1.3 Returnable Schedules: General:

T2.2-6: Health and Safety Questionnaire

1.	**SAFE WORK PERFORMANCE**			
1A.	Injury Experience / Historical Performance - Alberta			
Use the previous three years injury and illness records to complete the following:				
Year				
Number of medical treatment cases				
Number of restricted workday cases				
Number of lost time injury cases				
Number of fatal injuries				
Total recordable frequency				
Lost time injury frequency				
Number of worker manhours				

1 - Medical Treatment Case	Any occupational injury or illness requiring treatment provided by a physician or treatment provided under the direction of a physician
2 – Restricted Work Day Case	Any occupational injury or illness that prevents a worker from performing any of his/her craft jurisdiction duties
3 – Lost Time injury Cases	Any occupational injury that prevents the worker from performing any work for at least one day
4 – Total Recordable Frequency	Total number of Medical Treatment, Restricted Work and Lost Time Injury cases multiplied by 200,000 then divided by total manhours
5- Lost Time Injury Frequency	Total number of Lost Time Injury cases multiplied by 200,000 then divide by total manhours

1B.	Workers' Compensation Experience			
Use the previous three years injury and illness records to complete the following (if applicable):				
Industry Code:	Industry Classification:			
Year				
Industry Rate				
Contractor Rate				
% Discount or Surcharge				
Is your Workers' Compensation account in good standing? (Please provide letter of confirmation)	☐ Yes ☐ No			

2.	**CITATIONS**
2A.	Has your company been cited, charged or prosecuted under Health, Safety and/or Environmental Legislation in the last 5 years? ☐ Yes ☐ No If yes, provide details:

2B.	Has your company been cited, charged or prosecuted under the above Legislation in another Country, Region or State? ☐ Yes ☐ No If yes, provide details:

3. CERTIFICATE OF RECOGNITION

Does your company have a Certificate of Recognition?
☐ Yes ☐ No If Yes, what is the Certificate No. _____ Issue Date _____

4. SAFETY PROGRAM

Do you have a written safety program manual? ☐ Yes ☐ No
If Yes, provide a copy for review
Do you have a pocket safety booklet for field distribution? ☐ Yes ☐ No
If Yes, provide a copy for review
Does your safety program contain the following elements:

	YES	NO		YES	NO
CORPORATE SAFETY POLICY	☐	☐	EQUIPMENT MAINTENANCE	☐	☐
INCIDENT NOTIFICATION POLICY	☐	☐	EMERGENCY RESPONSE	☐	☐
RECORDKEEPING & STATISTICS	☐	☐	HAZARD ASSESSMENT	☐	☐
REFERENCE TO LEGISLATION	☐	☐	SAFE WORK PRACTICES	☐	☐
GENERAL RULES & REGULATIONS	☐	☐	SAFE WORK PROCEDURES	☐	☐
PROGRESSIVE DISCIPLINE POLICY	☐	☐	WORKPLACE INSPECTIONS	☐	☐
RESPONSIBILITIES	☐	☐	INVESTIGATION PROCESS	☐	☐
PPE STANDARDS	☐	☐	TRAINING POLICY & PROGRAM	☐	☐
ENVIRONMENTAL STANDARDS	☐	☐	COMMUNICATION PROCESSES	☐	☐
MODIFIED WORK PROGRAM	☐	☐			

5. TRAINING PROGRAM

5A. Do you have an orientation program for new hire employees? ☐ Yes ☐ No
If Yes, include a course outline. Does it include any of the following:

	YES	NO		YES	NO
GENERAL RULES & REGULATIONS	☐	☐	CONFINED SPACE ENTRY	☐	☐
EMERGENCY REPORTING	☐	☐	TRENCHING & EXCAVATION	☐	☐
INJURY REPORTING	☐	☐	SIGNS & BARRICADES	☐	☐
LEGISLATION	☐	☐	DANGEROUS HOLES & OPENINGS	☐	☐
RIGHT TO REFUSE WORK	☐	☐	RIGGING & CRANES	☐	☐
PERSONAL PROTECTIVE EQUIPMENT	☐	☐	MOBILE VEHICLES	☐	☐
EMERGENCY PROCEDURES	☐	☐	PREVENTATIVE MAINTENANCE	☐	☐
PROJECT SAFETY COMMITTEE	☐	☐	HAND & POWER TOOLS	☐	☐
HOUSEKEEPING	☐	☐	FIRE PREVENTION & PROTECTION	☐	☐
LADDERS & SCAFFOLDS	☐	☐	ELECTRICAL SAFETY	☐	☐

FALL ARREST STANDARDS	☐	☐	COMPRESSED GAS CYLINDERS	☐	☐
AERIAL WORK PLATFORMS	☐	☐	WEATHER EXTREMES	☐	☐

5B. Do you have a program for training newly hired or promoted supervisors? ☐ Yes ☐ No
(If Yes, submit an outline for evaluation. Does it include instruction on the following:

	Yes	No		Yes	No
EMPLOYER RESPONSIBILITIES	☐	☐	SAFETY COMMUNICATION	☐	☐
EMPLOYEE RESPONSIBILITIES	☐	☐	FIRST AID/MEDICAL PROCEDURES	☐	☐
DUE DILIGENCE	☐	☐	NEW WORKER TRAINING	☐	☐
SAFETY LEADERSHIP	☐	☐	ENVIRONMENTAL REQUIREMENTS	☐	☐
WORK REFUSALS	☐	☐	HAZARD ASSESSMENT	☐	☐
INSPECTION PROCESSES	☐	☐	PRE-JOB SAFETY INSTRUCTION	☐	☐
EMERGENCY PROCEDURES	☐	☐	DRUG & ALCOHOL POLICY	☐	☐
INCIDENT INVESTIGATION	☐	☐	PROGRESSIVE DISCIPLINARY POLICY	☐	☐
SAFE WORK PROCEDURES	☐	☐	SAFE WORK PRACTICES	☐	☐
SAFETY MEETINGS	☐	☐	NOTIFICATION REQUIREMENTS	☐	☐

6. SAFETY ACTIVITIES

Do you conduct safety inspections? Yes ☐ No ☐ Weekly ☐ Monthly ☐ Quarterly ☐

Describe your safety inspection process (include participation, documentation requirements, follow-up, report distribution).

Who follows up on inspection action items?

Do you hold site safety meetings for field employees? If Yes, how often?

Yes ☐ No ☐ Daily ☐ Weekly ☐ Biweekly ☐

Do you hold site meetings where safety is addressed with management and field supervisors?

Yes ☐ No ☐ Weekly ☐ Biweekly ☐ Monthly ☐

Is pre-job safety instruction provided before to each new task? ☐ Yes ☐ No

Is the process documented? ☐ Yes ☐ No

Who leads the discussion?

Do you have a hazard assessment process? ☐ Yes ☐ No

- Are hazard assessments documented? If yes, how are hazard assessments communicated and implemented on each project? Who is responsible for leading the hazard assessment process?

Does your company have policies and procedures for environmental protection, spill clean-up, reporting, waste disposal, and recycling as part of the Health & Safety Program?

☐ Yes ☐ No

How does your company measure its H&S success?

- Attach separate sheet to explain

7.	**SAFETY STEWARDSHIP**					
7A	Are incident reports and report summaries sent to the following and how often?					
		Yes	No	Monthly	Quarterly	Annually
	Project/Site Manager	☐	☐	☐	☐	☐
	Managing Director	☐	☐	☐	☐	☐
	Safety Director/Manager	☐	☐	☐	☐	☐
	/Chief Executive Officer	☐	☐	☐	☐	☐
7B	How are incident records and summaries kept? How often are they reported internally?					
		Yes	No	Monthly	Quarterly	Annually
	Incidents totaled for the entire company	☐	☐	☐	☐	☐
	Incidents totaled by project	☐	☐	☐	☐	☐
	• Subtotaled by superintendent	☐	☐	☐	☐	☐
	• Subtotaled by foreman	☐	☐	☐	☐	☐
7C	How are the costs of individual incidents kept? How often are they reported internally?					
		Yes	No	Monthly	Quarterly	Annually
	Costs totaled for the entire company	☐	☐	☐	☐	☐
	Costs totaled by project	☐	☐	☐	☐	☐
	• Subtotaled by superintendent	☐	☐	☐	☐	☐
	• 0Subtotaled by foreman/general foreman	☐	☐	☐	☐	☐
7D	Does your company track non-injury incidents?					
		Yes	No	Monthly	Quarterly	Annually
	Near Miss	☐	☐	☐	☐	☐
	Property Damage	☐	☐	☐	☐	☐
	Fire	☐	☐	☐	☐	☐
	Security	☐	☐	☐	☐	☐
	Environmental	☐	☐	☐	☐	☐
8	**PERSONNEL**					
	List key health and safety officers planned for this project. Attach resume.					
	Name	Position/Title	Designation			
	Supply name, address and phone number of your company's corporate health and safety representative. Does this individual have responsibilities other than health, safety and environment?					
	Name	Address	Telephone Number			
	Other responsibilities:					
9	**REFERENCES**					
	List the last three company's your form has worked for that could verify the quality and management commitment to your occupational Health & Safety program					
	Name and Company	Address	Phone Number			

T2.2-7 Health and Safety Cost Breakdown

Tenderer (Company)	**Responsible Person**	**Designation**	**Date**
Project/Tender Title	**Project/Tender No.**	**Project Location / Description**	

#	Cost element	Unit Cost (R)	# of Units	Total Cost (R)
1.	Human Resources			
2.	Systems Documentation			
3.	Meetings & Administration			
4.	H&S Training			
5.	PPE & Safety Equipment			
6.	Signage & Barricading			
7.	Workplace Facilities			
8.	Emergency & Rescue Measures			
9.	Hygiene Surveys & Monitoring			
10.	Medical Surveillance			
11.	Safe Transport of Workers			
12.	HazMat Management (e.g. asbestos /silica)			
13.	Substance Abuse Testing (3 kits @R500 pm)			
14.	H&S Reward & Recognition			

Total Health and Safety Estimate (R)	
Total Estimate Value (R)	
H&S Cost as % of Tender value	

T2.2-8: Capacity and Ability to meet Delivery Schedule

Note to tenderers:

The Tenderer is required to demonstrate to the *Employer* that the tenderer has sufficient current and future capacity to carry out the work as detailed in the Service Information and that the tenderer has the capacity and plans in place to meet the required delivery schedule as required. To this end, the following must be provided by the Tenderer:

The tenderer shall provide the Proposed Programme / Garnt chart showing but not limited to the following:

- Ability to execute the Service in terms of the *Employer*'s requirements and within the required timeframe indicating, in a logical sequence, the order and timing of the construction that will take place in order to Provide the Service clearly indicating the capacity & capability to achieve the dates stated in the Contract Data.

- Dates when the *Contractor* **will receive the material to execute the service** and when they will need access to any part of the affected property; submission & approval process & timing for Health & Safety Files, Environmental Files and Quality Files. In addition the Program must clearly demonstrate the **delivery lead time of material from the supplier**

- The *Contractor* indicates how he plans in achieving the following dates and clearly demonstrates them on the schedule - Start Date, Access Date, Planned Completion, Key Dates/Sectional Completion Dates & Completion Date. In addition, the Program clearly demonstrates adequate provisions for Time Risk Allowance (TRA). Time Risk Allowances are not float, are owned by the Tenderer, can be included in the activity duration and illustrated in the schedule in a code field or as an attachment.

Index of documentation attached to this schedule:
.....
.....
.....
.....
.....
.....

Note to tenderers:

Garn Chart

Tenderer must provide an electronic copy of the Gantt Chart in Ms Word or any other compatible software.

Signed	.....	Date	.....
Name	.....	Position	.....
Tenderer	.....		

T2.2-9 Authority to submit a Tender

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for his category of organisation or alternatively attach a certified copy of a company / organisation document which provides the same information for the relevant category as requested here.

A - COMPANY	B - PARTNERSHIP	C - JOINT VENTURE	D - SOLE PROPRIETOR

A. Certificate for Company

I, _____ chairperson of the board of directors _____

_____, hereby confirm that by resolution of the board taken on _____ (date),

Mr/Ms _____, acting in the capacity of _____

_____, was authorised to sign all documents in connection with this tender offer and any contract resulting from it on behalf of the company.

Signed	.....	Date	.....
Name	.....	Position	Chairman of the Board of Directors

B. Certificate for Partnership

We, the undersigned, being the **key partners** in the business trading as _____

_____ hereby authorise Mr/Ms _____ acting in the capacity of _____

_____, to sign all documents in connection with the tender offer 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 the full number of Partners necessary to commit the Partnership. Attach additional pages if more space is required.

C. Certificate for Joint Venture

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise Mr/Ms _____ _____, an authorised 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 authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

Furthermore, we attach to this Schedule a copy of the joint venture agreement which incorporates a statement that all partners are liable jointly and severally for the execution of the contract and that the lead partner is authorised to incur liabilities, receive instructions and payments and be responsible for the entire execution of the contract for and on behalf of any and all the partners.

Name of firm	**Address**	**Authorising signature, name (in caps) and capacity**

D. Certificate for Sole Proprietor

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

_____.

Signed		Date	
Name		Position	Sole Proprietor

T2.2-10: Record of Addenda to Tender Documents

This schedule as submitted confirms 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 specific tender offer:

	Date	Title or Details
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Attach additional pages if more space is required.

T2.2-11 Letter/s of Good Standing with the Workmen's Compensation Fund

Attached to this schedule is the Letter/s of Good Standing.

1.

2.

3.

4.

Name of Company/Members of Joint Venture:

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

T2.2-12: Risk Elements

Tenderers to identify and evaluate the potential risk elements associated with the Service and possible mitigation thereof. The risk elements and the mitigation as identified thereof by the Tenderer are to be submitted.

If No Risks are identified “No Risks” must be stated on this schedule.

Tenderers are also to evaluate any risk/s stated by the *Employer* in Contract Data Part C1, and provide possible mitigation thereof.

Tenders to note: Notwithstanding this information, all costs related to risk elements which are at the Contractor’s risk are deemed to be included in the tenderer’s offered total of the Prices.

T2.2-13: Schedule of Proposed Subcontractors

- The tenderer is required to provide details of all the sub-contractors that will be utilised in the execution of the *service.*

Note to tenderers: .

- **Tenderer to note that after award, any deviations from this list of proposed sub-contractors will be subject to acceptance by the *Service Manager* in terms of the Conditions of Contract.**
- 00Provide information of the Sub-contractors below:

Name of Proposed Subcontractor			Address		Nature of work	Amount of Worked	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans
	□	□	□	□	□	□	□

•

Name of Proposed Subcontractor			Address		Nature of work	Amount of Worked	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans
	□	□	□	□	□	□	□
Name of Proposed Subcontractor			Address		Nature of work	Amount of Worked	Percentage of work
% Black Owned	EME	QSE	Youth	Women	Disabilities	Rural/ Underdeveloped areas/ Townships	Military Veterans
	□	□	□	□	□	□	□

•

Name of Proposed Subcontractor	Address	Nature of work	Amount of Worked	Percentage of work

% Black Owned	**EME**	**QSE**	**Youth**	**Women**	**Disabilities**	**Rural/ Underdeveloped areas/ Townships**	**Military Veterans**
	□	□	□	□	□	□	□

T2.2-14: Affected Property Establishment Requirements

Tenderers to indicate their Affected Property establishment requirements:

T2.2-15 ANNEX G Compulsory Enterprise Questionnaire

The following particulars hereunder must be furnished.

In the case of a Joint Venture, separate enterprise questionnaires in respect of each partner/member must be completed and submitted.

Section 1: Name of enterprise: _____

Section 2: VAT registration number, if any: _____

Section 3: CIDB registration number, if any: _____

Section 4: CSD number: _____

Section 5: 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 3 partners

Section 6: Particulars of companies and close corporations

Company registration number _____

Close corporation number _____

Tax reference number: _____

•

Section 7: The attached SBD 6 must be completed for each tender and be attached as a tender requirement.
Section 8: The attached SBD 4 must be completed for each tender and be attached as a requirement.

The undersigned, who warrants that he / she is duly authorised 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 Tender 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 tendering entities submitting tender offers and have no other relationship with any of the tenderers 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			

SBD 6.1

SPECIFIC GOALS POINTS CLAIM FORM

This preference form must form part of all bids invited. It contains general information and serves as a claim for preference points for specific goals Contribution. Transnet will award preference points to companies who provide valid proof of evidence of as per the table below.

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF SPECIFIC GOALS, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000.

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1. GENERAL CONDITIONS

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

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and

1.2 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable. Despite the stipulated preference point system, Transnet shall use the lowest acceptable bid to determine the applicable preference point system in a situation where all received acceptable bids are received outside the stated preference point system.

1.3 The 80/20 preference point system will be applicable to this tender.

1.4 Preference points for this bid shall be awarded for:

(a) Price;

(b) B-BBEE Status Level of Contribution.

(c) Any other specific goal determined in Transnet preferential procurement policy.

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

	POINTS
PRICE	**80**
SPECIFIC GOALS	**20**
Total points for Price and Specific Goals must not exceed	**100**

1.6 Failure on the part of a bidder to submit proof of specific goals together with the bid will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.7 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

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

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

(c) "**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;

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

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

(f) **"EME"** means an Exempted Micro Enterprise as defines by Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(g) **"functionality"** means the ability of a bidder to provide goods or services in accordance with specification as set out in the bid documents;

(h) **"Price"** includes all applicable taxes less all unconditional discounts.

(i) **"Proof of B-BBEE Status Level of Contributor"** means:

1) B-BBBEE status level certificate issued by an unauthorised body or person;
2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;
3) Any other requirement prescribed in terms of the B-BBEE Act.

(j) **"QSE"** means a Qualifying Small EEnterprise in terms of a Codes of Good Practice under section 9 (1) of the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(k) **"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.

(l) **"Specific goals"** means targeted advancement areas or categories of persons or groups either previously disadvantaged or falling within the scope of the Reconstruction and Development Programme identified by Transnet to be given preference in allocation of procurement contracts in line with section 2(1) of the PPPFA.

3. POINTS AWARDED FOR PRICE

3.1 **THE 80/20 PREFERENCE POINT SYSTEMS**

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

80/20

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right)$$

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

In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, the following preference points must be awarded to a bidder who provides the relevant required evidence for claiming points

3.2

Selected Specific Goal	**Number of points allocated (80/20)**
B-BBEE Level of contributor – Level 1 or 2	10
Entities that are 51% Black Owned	4
At least 30% Black Women Owned Entities	3
Local Content and Local Production • Transformer oil 100% • VCB control cables 90% • Multicore control cable 90%	3
Non-Compliant and/or B-BBEE Level 3-8 contributors	0

4. EVIDENCE REQUIRED FOR CLAIMING SPECIFIC GOALS

4.1 In terms of Transnet Preferential Procurement Policy (TPPP) and Procurement Manuals, preference points must be awarded to a bidder for providing evidence in accordance with the table below:

Specific Goals	**Acceptable Evidence**
B-BBEE	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Entities that are 51% Black Owned	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
>50% Black Women Owned Entities	B-BBEE Certificate / Sworn- Affidavit / B-BBEE CIPC Certificate (in case of JV, a consolidated scorecard will be accepted) as per DTIC guideline
Local Content and Local Production	Returnable Local Content and production Annexures (Annexures C, D & E)

4.2 The table below indicates the required proof of B-BBEE status depending on the category of enterprises:

Enterprise	B-BBEE Certificate & Sworn Affidavit
Large	Certificate issued by SANAS accredited verification agency
QSE	Certificate issued by SANAS accredited verification agency Sworn-Affidavit signed by the authorised QSE representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership (only black-owned QSEs - 51% to 100% Black owned) [Sworn- affidavits must substantially comply with the format that can be obtained on the DTI's website at www.dti.gov.za/economic_empowerment/bee_codes.jsp.]
EME	Sworn-Affidavit signed by the authorised EME representative and attested by a Commissioner of Oaths confirming annual turnover and black ownership Certificate issued by CIPC (formerly CIPRO) confirming annual turnover and black ownership Certificate issued by SANAS accredited verification agency only if the EME is being measured on the QSE scorecard

4.3 A trust, consortium or joint venture (including unincorporated consortia and joint ventures) must submit a consolidated B-BBEE Status Level verification certificate for every separate bid.

4.4 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.

4.5 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.

4.6 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.

4.7 Bidders are to note that the rules pertaining to B-BBEE verification and other B-BBEE requirements may be changed from time to time by regulatory bodies such as National Treasury or the DTI. It is the Bidder's responsibility to ensure that his/her bid complies fully with all B-BBEE requirements at the time of the submission of the bid.

5. BID DECLARATION

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

6. B-BBEE STATUS LEVEL OF CONTRIBUTION CLAIMED IN TERMS OF PARAGRAPHS 6.1

6.1 B-BBEE Status Level of Contribution: . = …(based on point distribution per Table 3.2)

6.2

(Points claimed in respect of paragraph 6.1 must be in accordance with the table reflected in table 3.2 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(***Tick applicable box***)

YES		NO	

7.1.1 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 or QSE

(Tick applicable box)

YES		NO	

v) Specify, by ticking the appropriate box, if subcontracting with any of the enterprises below:

	Designated Group: An EME or QSE which is at last 51% owned by:	**EME √**	**QSE √**
	Black people		
	Black people who are youth		
	Black people who are women		
	Black people with disabilities		
	Black people living in rural or underdeveloped areas or townships		
	Cooperative owned by black people		
	Black people who are military veterans		
	OR		
	Any EME		
	Any QSE		

8. DECLARATION WITH REGARD TO COMPANY/FIRM

8.1 Name of company/firm:…….

8.2 VAT registration number:……

8.3 Company registration number:……..

8.4 **TYPE OF COMPANY/ FIRM**

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

[TICK APPLICABLE BOX]

8.5 **DESCRIBE PRINCIPAL BUSINESS ACTIVITIES**

……
……

8.6 **COMPANY CLASSIFICATION**

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

[*TICK APPLICABLE BOX*]

8.7 Total number of years the company/firm has been in business:……

8.8 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 6.1 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 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If specific goals have 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) if the successful bidder subcontracted a portion of the bid to another person without disclosing it, Transnet reserves the right to penalise the bidder up to 10 percent of the value of the contract;

(e) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury 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

(f) forward the matter for criminal prosecution.

WITNESSES 1. …….. 2. …….	…….. SIGNATURE(S) OF BIDDERS(S) DATE: …….. ADDRESS …….. …….

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest1 in the enterprise,
employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:
……
……

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

2.3.1 If so, furnish particulars:
……
……

3 DECLARATION

I, the undersigned, (name)…… in submitting the

1 the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

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

3.1 I have read and I understand the contents of this disclosure;

3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;

3.3 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 consortium2 will not be construed as collusive bidding.

3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.

3.4 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.

3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

3.6 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.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.
I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

…… ……
Signature Date

…… ……
Position Name of bidder

T2.2-16 NON-DISCLOSURE AGREEMENT

Note to tenderers: This Non-Disclosure Agreement is to be completed and signed by an authorised signatory:

2 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.

THIS AGREEMENT is made effective as of ..... day of ..... 20..... by and between:

TRANSNET SOC LTD

(Registration No. 1990/000900/30), a company incorporated and existing under the laws of South Africa, having its principal place of business at Transnet Corporate Centre 138 Eloff Street , Braamfontein , Johannesburg 2000

and

.....

(Registration No. .....),a private company incorporated and existing under the laws of South Africa having its principal place of business at

.....

.....

WHEREAS

Transnet and the Company wish to exchange Information [as defined below] and it is envisaged that each party may from time to time receive Information relating to the other in respect thereof. In consideration of each party making available to the other such Information, the parties jointly agree that any dealings between them shall be subject to the terms and conditions of this Agreement which themselves will be subject to the parameters of the Tender Document.

IT IS HEREBY AGREED

IT IS HEREBY AGREED

1. INTERPRETATION

In this Agreement:

1.1 **Agents** mean directors, officers, employees, agents, professional advisers, contractors or sub-contractors, or any Group member;

1.2 **Bid** or **Bid Document** (hereinafter Tender) means Transnet's Request for Information [**RFI**] Request for Proposal [**RFP**] or Request for Proposa [**RFP**], as the case may be;

1.3 **Confidential Information** means any information or other data relating to one party [the **Disclosing Party**] and/or the business carried on or proposed or intended to be carried on by that party and which is made available for the purposes of the Bid to the other party [the **Receiving Party**] or its Agents by the Disclosing Party or its Agents or recorded in agreed minutes following oral disclosure and any other information otherwise made available by the Disclosing Party or its Agents to the Receiving Party or its Agents, whether before, on or after the date of this Agreement, and whether in writing or otherwise, including any information, analysis or specifications derived from, containing or reflecting such information but excluding information which:

1.3.1 is publicly available at the time of its disclosure or becomes publicly available [other than as a result of disclosure by the Receiving Party or any of its Agents contrary to the terms of this Agreement]; or

1.3.2 was lawfully in the possession of the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] free of any restriction as to its use or disclosure prior to its being so disclosed; or

1.3.3 following such disclosure, becomes available to the Receiving Party or its Agents [as can be demonstrated by its written records or other reasonable evidence] from a source other than the Disclosing Party or its Agents, which source is not bound by any duty of confidentiality owed, directly or indirectly, to the Disclosing Party in relation to such information;

1.4 **Group** means any subsidiary, any holding company and any subsidiary of any holding company of either party; and

1.5 **Information** means all information in whatever form including, without limitation, any information relating to systems, operations, plans, intentions, market opportunities, know-how, trade secrets and business affairs whether in writing, conveyed orally or by machine-readable medium.

2. CONFIDENTIAL INFORMATION

2.1 All Confidential Information given by one party to this Agreement [the **Disclosing Party**] to the other party [the **Receiving Party**] will be treated by the Receiving Party as secret and confidential and will not, without the Disclosing Party's written consent, directly or indirectly communicate or disclose [whether in writing or orally or in any other manner] Confidential Information to any other person other than in accordance with the terms of this Agreement.

2.2 The Receiving Party will only use the Confidential Information for the sole purpose of technical and commercial discussions between the parties in relation to the Tender or for the subsequent performance of any contract between the parties in relation to the Tender.

2.3 Notwithstanding clause above, the Receiving Party may disclose Confidential Information:

*2.3.1 to those of its Agents who strictly need to know the Confidential Information for the sole purpose set out in clause **Error! Reference source not found.** above, provided that the Receiving Party shall ensure t hat such Agents are made aware prior to the disclosure of any part of the Confidential Information that the same is confidential and that they owe a duty of confidence to the Disclosing Party. The Receiving Party shall at all times remain liable for any actions of such Agents that would constitute a breach of this Agreement; or*

2.3.2 to the extent required by law or the rules of any applicable regulatory authority, subject to clause

2.4 In the event that the Receiving Party is required to disclose any Confidential Information in accordance with clause above, it shall promptly notify the Disclosing Party and cooperate with the Disclosing Party regarding the form, nature, content and purpose of such disclosure or any action which the Disclosing Party may reasonably take to challenge the validity of such requirement.

2.5 In the event that any Confidential Information shall be copied, disclosed or used otherwise than as permitted under this Agreement then, upon becoming aware of the same, without prejudice to any rights or remedies

of the Disclosing Party, the Receiving Party shall as soon as practicable notify the Disclosing Party of such event and if requested take such steps [including the institution of legal proceedings] as shall be necessary to remedy [if capable of remedy] the default and/or to prevent further unauthorised copying, disclosure or use.

2.6 All Confidential Information shall remain the property of the Disclosing Party and its disclosure shall not confer on the Receiving Party any rights, including intellectual property rights over the Confidential Information whatsoever, beyond those contained in this Agreement.

3. RECORDS AND RETURN OF INFORMATION

3.1 The Receiving Party agrees to ensure proper and secure storage of all Information and any copies thereof.

3.2 The Receiving Party shall keep a written record, to be supplied to the Disclosing Party upon request, of the Confidential Information provided and any copies made thereof and, so far as is reasonably practicable, of the location of such Confidential Information and any copies thereof.

3.3 The Company shall, within 7 [seven] days of receipt of a written demand from Transnet:

3.3.1 return all written Confidential Information [including all copies]; and

3.3.2 expunge or destroy any Confidential Information from any computer, word processor or other device whatsoever into which it was copied, read or programmed by the Company or on its behalf.

3.4 The Company shall on request supply a certificate signed by a director as to its full compliance with the requirements of clause **Error! Reference source not found.** above.

4. ANNOUNCEMENTS

4.1 Neither party will make or permit to be made any announcement or disclosure of its prospective interest in the Tender without the prior written consent of the other party.

4.2 Neither party shall make use of the other party's name or any information acquired through its dealings with the other party for publicity or marketing purposes without the prior written consent of the other party.

5. DURATION

The obligations of each party and its Agents under this Agreement shall survive the termination of any discussions or negotiations between the parties regarding the Tender and continue thereafter for a period of 5 [five] years.

6. PRINCIPAL

Each party confirms that it is acting as principal and not as nominee, agent or broker for any other person and that it will be responsible for any costs incurred by it or its advisers in considering or pursuing the Tender and in complying with the terms of this Agreement.

7. ADEQUACY OF DAMAGES

Nothing contained in this Agreement shall be construed as prohibiting the Disclosing Party from pursuing any other remedies available to it, either at law or in equity, for any such threatened or actual breach of this Agreement, including specific performance, recovery of damages or otherwise.

8. PRIVACY AND DATA PROTECTION

8.1 The Receiving Party undertakes to comply with South Africa's general privacy protection in terms Section 14 of the Bill of Rights in connection with this Tender and shall procure that its personnel shall observe the provisions of such Act [as applicable] or any amendments and re-enactments thereof and any regulations made pursuant thereto.

8.2 The Receiving Party warrants that it and its Agents have the appropriate technical and organisational measures in place against unauthorised or unlawful processing of data relating to the Tender and against accidental loss or destruction of, or damage to such data held or processed by them.

9. GENERAL

9.1 Neither party may assign the benefit of this Agreement, or any interest hereunder, except with the prior written consent of the other, save that Transnet may assign this Agreement at any time to any member of the Transnet Group.

9.2 No failure or delay in exercising any right, power or privilege under this Agreement will operate as a waiver of it, nor will any single or partial exercise of it preclude any further exercise or the exercise of any right, power or privilege under this Agreement or otherwise.

9.3 The provisions of this Agreement shall be severable in the event that any of its provisions are held by a court of competent jurisdiction or other applicable authority to be invalid, void or otherwise unenforceable, and the remaining provisions shall remain enforceable to the fullest extent permitted by law.

9.4 This Agreement may only be modified by a written agreement duly signed by persons authorised on behalf of each party.

9.5 Nothing in this Agreement shall constitute the creation of a partnership, joint venture or agency between the parties.

9.6 This Agreement will be governed by and construed in accordance with South African law and the parties irrevocably submit to the exclusive jurisdiction of the South African courts.

Signed		Date	
Name		Position	
Tenderer			

T2.2-17: RFP DECLARATION FORM

NAME OF COMPANY: _____

We _____ do hereby certify that:

1. Transnet has supplied and we have received appropriate tender offers to any/all questions (as applicable) which were submitted by ourselves for tender clarification purposes;
2. we have received all information we deemed necessary for the completion of this Tender;
3. at no stage have we received additional information relating to the subject matter of this tender from Transnet sources, other than information formally received from the designated Transnet contact(s) as nominated in the tender documents;
4. we are satisfied, insofar as our company is concerned, that the processes and procedures adopted by Transnet in issuing this tender and the requirements requested from tenderers in responding to this tender have been conducted in a fair and transparent manner; and
5. furthermore, we acknowledge that a direct relationship exists between a family member and/or an owner / member / director / partner / shareholder (unlisted companies) of our company and an employee or board member of the Transnet Group as indicated below: *[Respondent to indicate if this section is not applicable]*

   FULL NAME OF OWNER/MEMBER/DIRECTOR/

   PARTNER/SHAREHOLDER: ADDRESS:

   _____

   _____

   _____

   Indicate nature of relationship with Transnet:

   _____

   _____

   _____

   _____

   [Failure to furnish complete and accurate information in this regard may lead to the disqualification of your response and may preclude a Respondent from doing future business with Transnet]

We declare, to the extent that we are aware or become aware of any relationship between ourselves and Transnet (other than any existing and appropriate business relationship with Transnet) which could unfairly advantage our company in the forthcoming adjudication process, we shall notify Transnet immediately in writing of such circumstances.

6. We accept that any dispute pertaining to this tender will be resolved through the Ombudsman process and will be subject to the Terms of Reference of the Ombudsman. The Ombudsman process must first be exhausted before judicial review of a decision is sought. (Refer "Important Notice to respondents" below).

7. We further accept that Transnet reserves the right to reverse a tender award or decision based on the recommendations of the Ombudsman without having to follow a formal court process to have such award or decision set aside.

8. We have acquainted ourselves and agree with the content of T2.2-25 "Service Provider Integrity Pact".

For and on behalf of ……..…… duly authorised thereto
Name:
Signature:
Date:

IMPORTANT NOTICE TO TENDERERS

Transnet has appointed a Procurement Ombudsman to investigate any material complaint in respect of tenders exceeding R5,000,000.00 (five million S.A. Rand) in value. Should a Tenderer have any material concern regarding an tender process which meets this value threshold, a complaint may be lodged with Transnet's Procurement Ombudsman for further investigation.

It is incumbent on the Tenderer to familiarise himself/herself with the Terms of Reference for the Transnet Procurement Ombudsman, details of which are available for review at Transnet's website www.transnet.net.

An official complaint form may be downloaded from this website and submitted, together with any supporting documentation, within the prescribed period, to procurement.ombud@transnet.net

For transactions below the R5,000,000.00 (five million S.A. Rand) threshold, a complaint may be lodged with the Chief Procurement Officer of the relevant Transnet Operating Division.

All Tenderers should note that a complaint must be made in good faith. If a complaint is made in bad faith, Transnet reserves the right to place such a tenderer on its List of Excluded Bidder

T2.2-18: REQUEST FOR PROPOSAL – BREACH OF LAW

NAME OF COMPANY: _____

I / We _____ do hereby certify that ***I/we have/have not been*** found guilty during the preceding 5 (five) years of a serious breach of law, including but not limited to a breach of the Competition Act, 89 of 1998, by a court of law, tribunal or other administrative body. The type of breach that the Tenderer is required to disclose excludes relatively minor offences or misdemeanours, e.g. traffic offences.

Where found guilty of such a serious breach, please disclose:

NATURE OF BREACH:

_____
_____
_____

DATE OF BREACH:

_____

Furthermore, I/we acknowledge that Transnet SOC Ltd reserves the right to exclude any Tenderer from the tendering process, should that person or company have been found guilty of a serious breach of law, tribunal or regulatory obligation.

Signed on this _____ day of _____ 20____

_____

SIGNATURE OF TENDER

T2.2-19: Certificate of Acquaintance with Tender Documents

NAME OF TENDERING ENTITY:

_____

1. By signing this certificate I/we acknowledge that I/we have made myself/ourselves thoroughly familiar with, and agree with all the conditions governing this RFP. This includes those terms and conditions of the Contract, the Supplier Integrity Pact, Non-Disclosure Agreement etc. contained in any printed form stated to form part of the documents thereof, but not limited to those listed in this clause.

2. I/we furthermore agree that Transnet SOC Ltd shall recognise no claim from me/us for relief based on an allegation that I/we overlooked any tender/contract condition or failed to take it into account for the purpose of calculating my/our offered prices or otherwise.

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

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

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

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

   c) provides the same Services as the Tenderer and/or is in the same line of business as the Tenderer

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

6. In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

   a) prices;

   b) geographical area where Services will be rendered [market allocation]

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

   d) the intention or decision to submit or not to submit, a Tender;

   e) the submission of a tender which does not meet the specifications and conditions of the tender; or

   f) Tendering with the intention not winning the tender.

7. 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 Services to which this tender relates.

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

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

Signed on this _____ day of _____20___

_____

SIGNATURE OF TENDERER

T2.2-20: Service Provider Integrity Pact

Important Note: All potential tenderers must read this document and certify in the RFP Declaration Form that that have acquainted themselves with and agree with the content.

The contract with the successful tenderer will automatically incorporate this Integrity Pact and shall be deemed as part of the final concluded contract.

INTEGRITY PACT

Between

TRANSNET SOC LTD

Registration Number: 1990/000900/30

("Transnet")

and

The Contractor (hereinafter referred to as the "Tenderer/Service Providers/Contractor")

PREAMBLE

Transnet values full compliance with all relevant laws and regulations, ethical standards and the principles of economical use of resources, fairness and transparency in its relations with its Tenderers / Service Providers/Contractors.

In order to achieve these goals, Transnet and the Tenderer / Service Provider hereby enter into this agreement hereinafter referred to as the “Integrity Pact” which will form part of the Tenderer’s / Service Provider’s / Contractor’s application for registration with Transnet as a vendor.

The general purpose of this Integrity Pact is to agree on avoiding all forms of dishonesty, fraud and corruption by following a system that is fair, transparent and free from any undue influence prior to, during and subsequent to the currency of any procurement and / or reverse logistics event and any further contract to be entered into between the Parties, relating to such event.

All Tenderers / Service Providers / Contractor’s will be required to sign and comply with undertakings contained in this Integrity Pact, should they want to be registered as a Transnet vendor.

1 OBJECTIVES

1.1 Transnet and the Tenderer / Service Provider / Contractor agree to enter into this Integrity Pact, to avoid all forms of dishonesty, fraud and corruption including practices that are anti-competitive in nature, negotiations made in bad faith and under-pricing by following a system that is fair, transparent and free from any influence / unprejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:

a) Enable Transnet to obtain the desired contract at a reasonable and competitive price in conformity to the defined specifications of the works, goods and services; and

b) Enable Tenderers / Service Providers / Contractors to abstain from bribing or participating in any corrupt practice in order to secure the contract.

2 COMMITMENTS OF TRANSNET

Transnet commits to take all measures necessary to prevent dishonesty, fraud and corruption and to observe the following principles:

2.1 Transnet hereby undertakes that no employee of Transnet connected directly or indirectly with the sourcing event and ensuing contract, will demand, take a promise for or accept directly or through intermediaries any bribe, consideration, gift, reward, favour or any material or immaterial benefit or any other advantage from the Tenderer, either for themselves or for any person, organisation or third party related to the contract in exchange for an advantage in the tendering process, Tender evaluation, contracting or implementation process related to any contract.

2.2 Transnet will, during the registration and tendering process treat all Tenderers / Service Providers with equity, transparency and fairness. Transnet will in particular, before and during the registration process, provide to all Tenderers / Service Providers the same information and will not provide to any Tenderers / Service Providers / Contractors confidential / additional information through which the Tenderers / Service Providers / Contractors could obtain an advantage in relation to any tendering process.

2.3 Transnet further confirms that its employees will not favour any prospective Tenderer in any form that could afford an undue advantage to a particular Tenderer during the tendering stage, and will further treat all Tenderers / Service Providers / Contractors participating in the tendering process.

2.4 Transnet will exclude from the tender process such employees who have any personal interest in the Tenderers / Service Providers / Contractors participating in the tendering process.

3 OBLIGATIONS OF THE TENDERER / SERVICE PROVIDER

3.1 Transnet has a '**Zero Gifts'** Policy. No employee is allowed to accept gifts, favours or benefits.

a) Transnet officials and employees **shall not** solicit, give or accept, or from agreeing to solicit, give, accept or receive directly or indirectly, any gift, gratuity, favour, entertainment, loan, or anything of monetary value, from any person or juridical entities in the course of official duties or in connection with any operation being managed by, or any transaction which may be affected by the functions of their office.

b) Transnet officials and employees **shall not** solicit or accept gifts of any kind, from vendors, suppliers, customers, potential employees, potential vendors, and suppliers, or any other individual or organisation irrespective of the value.

c) Under **no circumstances** should gifts, business courtesies or hospitality packages be accepted from or given to prospective suppliers participating in a tender process at the respective employee's Operating Division, regardless of retail value.

d) Gratuities, bribes or kickbacks of any kind must never be solicited, accepted or offered, either directly or indirectly. This includes money, loans, equity, special privileges, personal favours, benefit or services. Such favours will be considered to constitute corruption.

3.2 The Tenderer / Service Provider / Contractor commits itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its Tender or during any ensuing contract stage in order to secure the contract or in furtherance to secure it and in particular the Tenderer / Service Provider / Contractor commits to the following:

a) The Tenderer / Service Provider / Contractor will not, directly or through any other person or firm, offer, promise or give to Transnet or to any of Transnet's employees involved in the tendering process or to any third person any material or other benefit or payment, in order to obtain in exchange an advantage during the tendering process; and

b) The Tenderer / Service Provider / Contractor will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any employee of Transnet, connected directly or indirectly with the tendering process, or to any person, organisation or third party related to the contract in exchange for any advantage in the tendering, evaluation, contracting and implementation of the contract.

3.3 The Tenderer/Service Provider/Contractor will not collude with other parties interested in the contract to preclude a competitive Tender price, impair the transparency, fairness and progress of the tendering process, Tender evaluation, contracting and implementation of the contract. The Tenderer / Service Provider further commits itself to delivering against all agreed upon conditions as stipulated within the contract.

3.4 The Tenderer/Service Provider/Contractor will not enter into any illegal or dishonest agreement or understanding, whether formal or informal with other Tenderers/Service Providers/Contractors. This applies in particular to certifications, submissions or non-submission of documents or actions that are restrictive or to introduce cartels into the tendering process.

3.5 The Tenderer/Service Provider/Contractor will not commit any criminal offence under the relevant anti-corruption laws of South Africa or any other country. Furthermore, the Tenderer/Service

Provider/Contractor will not use for illegitimate purposes or for restrictive purposes or personal gain, or pass on to others, any information provided by Transnet as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

3.6 A Tenderer/Service Provider/Contractor of foreign origin shall disclose the name and address of its agents or representatives in South Africa, if any, involved directly or indirectly in the registration or tendering process. Similarly, the Tenderer / Service Provider / Contractor of South African nationality shall furnish the name and address of the foreign principals, if any, involved directly or indirectly in the registration or tendering process.

3.7 The Tenderer/Service Provider/Contractor will not misrepresent facts or furnish false or forged documents or information in order to influence the tendering process to the advantage of the Tenderer/Service Provider/Contractor or detriment of Transnet or other competitors.

3.8 Transnet may require the Tenderer/Service Provider/Contractor to furnish Transnet with a copy of its code of conduct. Such code of conduct must address the compliance programme for the implementation of the code of conduct and reject the use of bribes and other dishonest and unethical conduct.

3.9 The Tenderer/Service Provider/Contractor will not instigate third persons to commit offences outlined above or be an accessory to such offences.

3.10 The Tenderer/Service Provider/Contractor confirms that they will uphold the ten principles of the United Nations Global Compact (UNGC) in the fields of Human Rights, Labour, Anti-Corruption and the Environment when undertaking business with Transnet as follows:

a) Human Rights

• Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and

• Principle 2: make sure that they are not complicit in human rights abuses.

b) Labour

• Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;

• Principle 4: the elimination of all forms of forced and compulsory labour;

• Principle 5: the effective abolition of child labour; and

• Principle 6: the elimination of discrimination in respect of employment and occupation.

c) Environment

• Principle 7: Businesses should support a precautionary approach to environmental challenges;

• Principle 8: undertake initiatives to promote greater environmental responsibility; and

• Principle 9: encourage the development and diffusion of environmentally friendly technologies.

d) Anti-Corruption

• Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

4 INDEPENDENT TENDERING

4.1 For the purposes of that Certificate in relation to any submitted Tender, the Tenderer declares to fully understand that the word "competitor" shall include any individual or organisation, other than the Tenderer, whether or not affiliated with the Tenderer, who:

a) has been requested to submit a Tender in response to this Tender invitation;
b) could potentially submit a Tender in response to this Tender invitation, based on their qualifications, abilities or experience; and
c) provides the same Goods and Services as the Tenderer and/or is in the same line of business as the Tenderer.

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

4.3 In particular, without limiting the generality of paragraph 5 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

a) prices;
b) geographical area where Goods or Services will be rendered [market allocation];
c) methods, factors or formulas used to calculate prices;
d) the intention or decision to submit or not to submit, a Tender;
e) the submission of a Tender which does not meet the specifications and conditions of the RFP; or
f) tendering with the intention of not winning the Tender.

4.4 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 Goods or Services to which his/her tender relates.

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

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

4.7 Should the Tenderer find any terms or conditions stipulated in any of the relevant documents quoted in the Tender unacceptable, it should indicate which conditions are unacceptable and offer alternatives by written submission on its company letterhead, attached to its submitted Tender. Any such submission shall be subject to review by Transnet's Legal Counsel who shall determine whether the proposed alternative(s) are acceptable or otherwise, as the case may be.

5 DISQUALIFICATION FROM TENDERING PROCESS

5.1 If the Tenderer / Service Provider / Contractor has committed a transgression through a violation of section 3 of this Integrity Pact or in any other form such as to put its reliability or credibility as a Tenderer / Service Provider into question, Transnet may reject the Tenderer's / Service Provider's / Contractor's application from the registration or tendering process and remove the Tenderer / Service Provider from its database, if already registered.

5.2 If the Tenderer / Service Provider / Contractor has committed a transgression through a violation of section 3, or any material violation, such as to put its reliability or credibility into question. Transnet may after following due procedures and at its own discretion also exclude the Tenderer / Service Provider / Contractor from future tendering processes. The imposition and duration of the exclusion will be determined by the severity of the transgression. The severity will be determined by the circumstances of the case, which will include amongst others the number of transgressions, the position of the transgressors within the company hierarchy of the Tenderer / Service Provider /Contractor and the amount of the damage. The exclusion will be imposed for up to a maximum of 10 (ten) years. However, Transnet reserves the right to impose a longer period of exclusion, depending on the gravity of the misconduct.

5.3 If the Tenderer / Service Provider / Contractor can prove that it has restored the damage caused by it and has installed a suitable corruption prevention system, or taken other remedial measures as the circumstances of the case may require, Transnet may at its own discretion revoke the exclusion or suspend the imposed penalty.

6 TRANSNET'S LIST OF EXCLUDED TENDERERS (BLACKLIST)

6.1 The process of restriction is used to exclude a company/person from conducting future business with Transnet and other organs of state for a specified period. No Tender shall be awarded to a Tenderer whose name (or any of its members, directors, partners or trustees) appear on the Register of Tender Defaulters kept by National Treasury, or who have been placed on National Treasury's List of Restricted Suppliers. Transnet reserves the right to withdraw an award, or cancel a contract concluded with a Tenderer should it be established, at any time, that a tenderer has been restricted with National Treasury by another government institution.

6.2 All the stipulations around Transnet's blacklisting process as laid down in Transnet's Supply Chain Policy and Procurement Procedures Manual (CPM included) are included herein by way of reference. Below follows a condensed summary of this blacklisting procedure.

6.3 On completion of the restriction procedure, Transnet will submit the restricted entity's details (including the identity number of the individuals and registration number of the entity) to National Treasury for placement on National Treasury's Database of Restricted Suppliers for the specified period of exclusion. National Treasury will make the final decision on whether to restrict an entity from doing business with any organ of state for a period not exceeding 10 years and place the entity concerned on the Database of Restricted Suppliers published on its official website.

6.4 The decision to restrict is based on one of the grounds for restriction. The standard of proof to commence the restriction process is whether a "*prima facie*" (i.e. on the face of it) case has been established.

6.5 Depending on the seriousness of the misconduct and the strategic importance of the Goods/Services, in addition to restricting a company/person from future business, Transnet may decide to terminate some or all existing contracts with the company/person as well.

6.6 A Service Provider or Contractor to Transnet may not subcontract any portion of the contract to a blacklisted company.

6.7 Grounds for blacklisting include: If any person/Enterprise which has submitted a Tender, concluded a contract, or, in the capacity of agent or subcontractor, has been associated with such Tender or contract:

a) Has, in bad faith, withdrawn such Tender after the advertised closing date and time for the receipt of Tenders;
b) has, after being notified of the acceptance of his Tender, failed or refused to sign a contract when called upon to do so in terms of any condition forming part of the Tender documents;
c) has carried out any contract resulting from such Tender in an unsatisfactory manner or has breached any condition of the contract;
d) has offered, promised or given a bribe in relation to the obtaining or execution of the contract;
e) has acted in a fraudulent or improper manner or in bad faith towards Transnet or any Government Department or towards any public body, Enterprise or person;
f) has made any incorrect statement in a certificate or other communication with regard to the Local Content of his Goods or his B-BBEE status and is unable to prove to the satisfaction of Transnet that:

(i) he made the statement in good faith honestly believing it to be correct; and

(ii) before making such statement he took all reasonable steps to satisfy himself of its correctness;

g) caused Transnet damage, or to incur costs in order to meet the contractor's requirements and which could not be recovered from the contractor;
h) has litigated against Transnet in bad faith.

6.8 Grounds for blacklisting include a company/person recorded as being a company or person prohibited from doing business with the public sector on National Treasury's database of Restricted Service Providers or Register of Tender Defaulters.

6.9 Companies associated with the person/s guilty of misconduct (i.e. entities owned, controlled or managed by such persons), any companies subsequently formed by the person(s) guilty of the misconduct and/or an existing company where such person(s) acquires a controlling stake may be considered for blacklisting. The decision to extend the blacklist to associated companies will be at the sole discretion of Transnet.

7 PREVIOUS TRANSGRESSIONS

7.1 The Tenderer / Service Provider /Contractor hereby declares that no previous transgressions resulting in a serious breach of any law, including but not limited to, corruption, fraud, theft, extortion and contraventions of the Competition Act 89 of 1998, which occurred in the last 5 (five) years with any other public sector undertaking, government department or private sector company that could justify its exclusion from its registration on the Tenderer's / Service Provider's / Contractor's database or any tendering process.

7.2 If it is found to be that the Tenderer / Service Provider /Contractor made an incorrect statement on this subject, the Tenderer / Service Provider / Contractor can be rejected from the registration process or

removed from the Tenderer / Service Provider / Contractor database, if already registered, for such reason (refer to the Breach of Law Form contained in the applicable RFX document.)

8 SANCTIONS FOR VIOLATIONS

8.1 Transnet shall also take all or any one of the following actions, wherever required to:

a) Immediately exclude the Tenderer / Service Provider / Contractor from the tendering process or call off the pre-contract negotiations without giving any compensation the Tenderer / Service Provider / Contractor. However, the proceedings with the other Tenderer / Service Provider / Contractor may continue;
b) Immediately cancel the contract, if already awarded or signed, without giving any compensation to the Tenderer / Service Provider / Contractor;
c) Recover all sums already paid by Transnet;
d) Encash the advance bank guarantee and performance bond or warranty bond, if furnished by the Tenderer / Service Provider / Contractor, in order to recover the payments, already made by Transnet, along with interest;
e) Cancel all or any other contracts with the Tenderer / Service Provider; and
f) Exclude the Tenderer / Service Provider / Contractor from entering into any Tender with Transnet in future.

9 CONFLICTS OF INTEREST

9.1 A conflict of interest includes, inter alia, a situation in which:
a) A Transnet employee has a personal financial interest in a tendering / supplying entity; and
b) A Transnet employee has private interests or personal considerations or has an affiliation or a relationship which affects, or may affect, or may be perceived to affect his / her judgment in action in the best interest of Transnet, or could affect the employee's motivations for acting in a particular manner, or which could result in, or be perceived as favouritism or nepotism.

9.2 A Transnet employee uses his / her position, or privileges or information obtained while acting in the capacity as an employee for:
a) Private gain or advancement; or
b) The expectation of private gain, or advancement, or any other advantage accruing to the employee must be declared in a prescribed form.

Thus, conflicts of interest of any Tender committee member or any person involved in the sourcing process must be declared in a prescribed form.

9.3 If a Tenderer / Service Provider / Contractor has or becomes aware of a conflict of interest i.e. a family, business and / or social relationship between its owner(s) / member(s) / director(s) / partner(s) / shareholder(s) and a Transnet employee / member of Transnet's Board of Directors in respect of a Tender which will be considered for the Tender process, the Tenderer / Service Provider / Contractor:
a) must disclose the interest and its general nature, in the Request for Proposal ("RFX") declaration form; or
b) must notify Transnet immediately in writing once the circumstances has arisen.

9.4 The Tenderer / Service Provider / Contractor shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any committee member or any person involved in the sourcing process, where this is done, Transnet shall be entitled forthwith to rescind the contract and all other contracts with the Tenderer / Service Provider / Contractor.

10 DISPUTE RESOLUTION

10.1 Transnet recognises that trust and good faith are pivotal to its relationship with its Tenderer / Service Provider / Contractor. When a dispute arises between Transnet and its Tenderer / Service Provider / Contractor, the parties should use their best endeavours to resolve the dispute in an amicable manner, whenever possible. Litigation in bad faith negates the principles of trust and good faith on which commercial relationships are based. Accordingly, following a blacklisting process as mentioned in paragraph **Error! Reference source not found.** above, Transnet will not do business with a company t hat litigates against it in bad faith or is involved in any action that reflects bad faith on its part. Litigation in bad faith includes, but is not limited to the following instances:

a) **Vexatious proceedings**: these are frivolous proceedings which have been instituted without proper grounds;
b) **Perjury:** where a Tenderer / Service Provider / Contractor make a false statement either in giving evidence or on an affidavit;
c) **Scurrilous allegations:** where a Tenderer / Service Provider / Contractor makes allegations regarding a senior Transnet employee which are without proper foundation, scandalous, abusive or defamatory; and
d) **Abuse of court process:** when a Tenderer / Service Provider / Contractor abuses the court process in order to gain a competitive advantage during a Tender process.

11 GENERAL

11.1 This Integrity Pact is governed by and interpreted in accordance with the laws of the Republic of South Africa.

11.2 The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the law relating to any civil or criminal proceedings.

11.3 The validity of this Integrity Pact shall cover all the tendering processes and will be valid for an indefinite period unless cancelled by either Party.

11.4 Should one or several provisions of this Integrity Pact turn out to be invalid the remainder of this Integrity Pact remains valid.

11.5 Should a Tenderer / Service Provider / Contractor be confronted with dishonest, fraudulent or corruptive behaviour of one or more Transnet employees, Transnet expects its Tenderer / Service Provider / Contractor to report this behaviour directly to a senior Transnet official / employee or alternatively by using Transnet's "Tip-Off Anonymous" hotline number 0800 003 056, whereby your confidentiality is guaranteed.

The Parties hereby declare that each of them has read and understood the clauses of this Integrity Pact and shall a Tenderer by it. To the best of the Parties' knowledge and belief, the information provided in this Integrity Pact is true and correct.

I …….. duly authorised by the tendering entity, hereby certify that the tendering entity are **fully acquainted** with the contents of the Integrity Pact and further **agree to abide by it** in full.

Signature ……

Date ……..

T2.2.21 PROTECTION OF PERSONAL INFORMATION (For normal contract)

1. The following terms shall bear the same meaning as contemplated in Section 1 of the Protection of Person information act, No.4 of 2013. ("POPIA"):

   consent; data subject; electronic communication; information officer; operator; person; personal information; processing; record; Regulator; responsible party; special information; as well as any terms derived from these terms.

2. Transnet will process all information by the Respondent in terms of the requirements contemplated in Section 4(1) of the POPIA:

   Accountability; Processing limitation; Purpose specification; Further processing limitation; Information quality; Openness; Security safeguards and Data subject participation.

3. The Parties acknowledge and agree that, in relation to personal information that will be processed pursuant to this RFP, the Responsible party is "Transnet" and the Data subject is the "Respondent". Transnet will process personal information only with the knowledge and authorisation of the Respondent and will treat personal information which comes to its knowledge as confidential and will not disclose it, unless so required by law or subject to the exceptions contained in the POPIA.

4. Transnet reserves all the rights afforded to it by the POPIA in the processing of any of its information as contained in this RFP and the Respondent is required to comply with all prescripts as detailed in the POPIA relating to all information concerning Transnet.

5. In responding to this bid, Transnet acknowledges that it will obtain and have access to personal information of the Respondent. Transnet agrees that it shall only process the information disclosed by Respondent in their response to this bid for the purpose of evaluating and subsequent award of business and in accordance with any applicable law.

6. Transnet further agrees that in submitting any information or documentation requested in this RFP, the Respondent is consenting to the further processing of their personal information for the purpose of, but not limited to, risk assessment, assurances, contract award, contract management, auditing, legal opinions/litigations, investigations (if applicable), document storage for the legislatively required period, destruction, de-identification and publishing of personal information by Transnet and/or its authorised appointed third parties.

7. Furthermore, Transnet will not otherwise modify, amend or alter any personal data submitted by the Respondent or disclose or permit the disclosure of any personal data to any third party without the prior written consent from the Respondent. Similarly, Transnet requires the Respondent to process any personal information disclosed by Transnet in the bidding process in the same manner.

8. Transnet shall, at all times, ensure compliance with any applicable laws put in place and maintain sufficient measures, policies and systems to manage and secure against all forms of risks to any information that may be shared or accessed pursuant to this RFP (physically, through a computer or any other form of electronic communication).

9. Transnet shall notify the Respondent in writing of any unauthorised access to information, cybercrimes or suspected cybercrimes, in its knowledge and report such crimes or suspected crimes to the relevant authorities in accordance with applicable laws, after becoming aware of such crimes or suspected crime. The Respondent must take all necessary remedial steps to mitigate the extent of the loss or compromise of personal information and to restore the integrity of the affected personal information as quickly as is possible.

10. The Respondent may, in writing, request Transnet to confirm and/or make available any personal information in its possession in relation to the Respondent and if such personal information has been accessed by third parties and the identity thereof in terms of the POPIA. The Respondent may further request that Transnet correct (excluding critical/mandatory or evaluation information), delete, destroy, withdraw consent or object to the processing of any personal information relating to the Respondent in Transnet's possession in terms of the provision of the POPIA and utilizing Form 2 of the POPIA Regulations.

11. In submitting any information or documentation requested in this RFP, the Respondent is hereby consenting to the processing of their personal information for the purpose of this RFP and further confirming that they are aware of their rights in terms of Section 5 of POPIA.

    Respondents are required to provide consent below:

YES		**NO**	

12. Further, the Respondent declares that they have obtained all consents pertaining to other data subject's personal information included in its submission and thereby indemnifying Transnet against any civil or criminal action, administrative fines or other penalty or loss that may arise as a result of the processing of any personal information that the Respondent submitted.

13. The Respondent declares that the personal information submitted for the purpose of this RFP is complete, accurate, not misleading, is up to date and may be updated where applicable.

    Signature of Respondent's authorised representative: _____

    Should a Respondent have any complaints or objections to processing of its personal information, by Transnet, the Respondent can submit a complaint to the Information Regulator on https://www.justice.gov.za/inforeg/, click on contact us, click on complaints.IR@justice.gov.za

T2.2-22: Insurance provided by the *Contractor*

Clause 83.1 in NEC3 Term Service Contract (June 2005) (amended June 2006 and April 2013) requires that the *Contractor* provides the insurance stated in the insurance table except any insurance which the *Employer* is to provide as stated in the Contract Data.

Please provide the following details for insurance which the *Contractor* is still to provide. Notwithstanding this information all costs related to insurance are deemed included in the tenderer's rates and prices.

Insurance against (See clause 83.1 of the TSC)	**Name of Insurance Company**	**Cover**	**Premium**
Liability for death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract			
Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R5 000 000.00			
Insurance in respect of loss of or damage to own property and equipment.			

T2.2-23: Three (3) years audited financial statements

Attached to this schedule is the last three (3) years audited financial statements of the single tenderer/members of the Joint Venture.

NAME OF COMPANY/IES and INDEX OF ATTACHMENTS:

.....

.....

.....

.....

.....

T2.2-24 SUPPLIER DECLARATION FORM

VENDOR REGISTRATION

1.	**Proof of Banking Details**	Stamped/Certified by the Bank, Dated and Less than 3 months old	
		Confirmation of Bank Letter must contains the Name and Signature of Bank Official.	
		If online verification is possible (e.g. FNB) – printout of online verification	
2.	**TAX Certificate and VAT Registration**	Current SARS TAX Compliance Status Verification PIN document (obtainable from SARS eFiling) (TAX Status Must Be "Compliant/Active" when verified with SARS)	
		Copy of "SARS VAT 103" form / SARS confirmation for proof of VAT registration	
		If No VAT; Affidavit or Solemn Declaration on VAT Registration Status to be submitted	
3.	**Proof of registration**	**Company registered before 1 May 2011:** CM1 – Incorporation of a Company **Company registered after 1 May 2011:** CoR 14.3 – Company Registration Certificate	
4.	**Proof of Ownership / Management**	**Company registered before 1 May 2011** • CM29 – Contents of Register of Directors, Auditors and Officers **Company registered after 1 May 2011** • CoR 15.1 Memorandum of Incorporation -MOI • CoR 39 – Contents of Register of Directors, Auditors and Officers Clear certified copy of Identity Document/s of Directors. If company has >5 directors, only 5 IDs are required	
5.	**BBBEE**	**EME (Turnover below R10m)**	
		• EME Affidavit signed by EME • NO certificates by SANAS accredited BBBEE verification agency accepted • NO accountant letters are accepted	
		QSE (Turnover between R10m and R50m)	
		IF >51% black owned • QSE Affidavit signed by QSE or Certificate by SANAS accredited verification agency • NO accountant letters are accepted	
		IF < 51% black owned, certificate by SANAS accredited BBBEE verification agency	
		Large enterprise (Turnover above R50m)	
		• Certificate by SANAS accredited BBBEE verification agency	
		Non-compliant (No certificate / In process of certification / Level 9 certificate) • Confirmation that supplier is not BBBEE compliant. An email is sufficient.	
6.	**Proof of CSD registration**	MAAA number	

ANNEXURE A: SUPPLIER DECLARATION FORM

Important Notice: all organisations, institutions and individuals who wish to provide goods and/or services to organs of the State must be registered on the National Treasury Central Supplier Database (CSD). This needs to be done via their portal at https://secure.csd.gov.za/ **before applying to Transnet**.						
CSD Number (MAAA xxxxxxx):						
Company Trading Name						
Company Registered Name						
Company Registration No Or ID No If a Sole Proprietor						
Company Income Tax Number						
Form of Entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
	Non-profit (NPO's or NPC)	Personal Liability Co	State Owned Co	National Govt	Provincial Govt	Local Govt
	Educational Institution	Specialized Profession	Financial Institution	Joint Venture	Foreign International	Foreign Branch Office
Did your company previously operate under another name? (If **YES** state the previous details below)					Yes	No
Trading Name						
Registered Name						
Company Registration No Or ID No If a Sole Proprietor						
Form of Entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
	Non-profit (NPO's or NPC)	Personal Liability Co	State Owned Co	National Govt	Provincial Govt	Local Govt
	Educational Institution	Specialised Profession	Financial Institution	Joint Venture	Foreign International	Foreign Branch Office
Your Current Company's VAT Registration Status (*please attach relevant supporting document for VAT*)			VAT Registered		Not VAT Registered	
VAT Registration Number						
If **Exempted from VAT registration,** state reason and submit proof from SARS in confirming the exemption status						
If your business entity is not VAT Registered, please submit a current original sworn affidavit (see example in Appendix I). Your "Non VAT Registration Status" must be renewed and confirmed annually.						

Company Banking Details			
Account Holder Name			
Bank Account Number		Universal Branch Code	
Company Physical Address			
		Code	
Company Postal Address			
		Code	
Telephone Number		FAX Number	
E-Mail Address			
Company Website Address			

Company Contact Person	
Designation	
Telephone Number	

Main Product / Service Supplied e.g. Stationery / Consulting /Labour etc.				
Is your company a Labour Broker?	YES		NO	
How many personnel does the business employ? (*please state number*)	Full Time		Part Time	

Please Note: Should your business employ **more than 2 full time employees** who are not connected persons as defined in the Income Tax Act, please submit a sworn affidavit, as per Appendix II.

Most Recent Financial Year's Annual Turnover	<R10 Million **EME**		>R10 Million <R50 Million **QSE**		>R50 Million **Large Enterprise**	
Does your company have a valid Proof of B-BBEE Status?			YES		NO	

Please indicate your Broad Based BEE status (Level 1 to 9)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Majority Race of Ownership *(please selected correct Majority Ownership for your company)*	Black		White

BBBEE Score	% Black Ownership		% Black Women Ownership		% Black Disabled person(s) Ownership	
% Black Youth Ownership		% Black Unemployed		% Black People Living in Rural Areas		% Black Military Veterans	

Please Note: Please provide proof of B-BBEE status as per Appendix III and IV:

- Large Enterprise and QSEs with less than 51% Black Ownership need to obtain a B-BBEE certificate and detailed scorecard from an accredited rating agency;
- EMEs and QSEs with at least 51% black ownership may provide an affidavit using the templates provided in Appendix III and IV respectively;
- Black Disabled person(s) Ownership will only be accepted if accompanied with a certified letter signed by a physician on the physician's letterhead confirming the disability;
- A certified South African identification document will be required for all Black Youth Ownership.

Supplier Development Information Required

EMPOWERING SUPPLIER	**YES**	○	**NO**	○
FIRST TIME SUPPLIER	**YES**	○	**NO**	○
SUPPLIER DEVELOPMENT PLAN	**YES**	○	**NO**	○
DEVELOPMENT PLAN DOCUMENT	If Yes - Attach supporting documents			
ENTERPRISE DEVELOPMENT BENEFICIARY	**YES**	○	**NO**	○
SUPPLIER DEVELOPMENT BENEFICIARY	**YES**	○	**NO**	○
GRADUATION FROM ED TO SD BENEFICIARY	**YES**	○	**NO**	○
ENTERPRISE DEVELOPMENT RECIPIENT	**YES**	○	**NO**	○

By signing below, I hereby verify that I am duly authorised to sign for and on behalf of firm / organisation and that all information contained herein and attached herewith are true and correct

Name and Surname		Designation	
Signature		Date	

Affidavit or Solemn Declaration

I,_____solemnly swear/declare that; _____ is not a registered **VAT vendor** and is not required to register as a VAT vendor because the combinedvalue of taxable supplies made by the provider in any 12 month period **has not exceeded or is notexpected to exceed R1 million threshold**, as required in terms of the Value Added Tax Act.

Signature:

Designation:

Date:

Commissioner of Oaths

Thus signed and sworn to before me at_____on this the _____ day of _____20_____,

the Deponent having knowledge that he/she knows and understands the contents of this Affidavit, and that he/she has no objection to taking the prescribed oath, which he/she regards binding on his/her conscience and that the allegations herein contained are all true and correct.

Commissioner of Oaths (Signature & Stamp)

Appendix II

Example of an Affidavit or Solemn Declaration as to number of employees

Affidavit or Solemn Declaration

I,_____solemnly swear/declare

that; _____

employs **Three or more full time employees**, which employees are engaged in the business of rendering the services of the organisation and are not connected persons as defined in the IncomeTax Act.

Signature:

Designation:

Date:

Commissioner of Oaths

Thus signed and sworn to before me at_____on this the _____ day of

_____20_____,

the Deponent having knowledge that he/she knows and understands the contents of this Affidavit, and that he/she has no objection to taking the prescribed oath, which he/she regards binding on his/her conscience and that the allegations herein contained are all true and correct.

_____

Commissioner of Oaths (Signature & Stamp)

Appendix III

SWORN AFFIDAVIT: B-BBEE for EXEMPTED MICRO ENTERPRISE

I, the undersigned, _____

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.
2. I am a Member / Director / Owner of the following enterprise and am duly authorized to act on its behalf:
3.

Enterprise Name:	
Trading Name (If Applicable):	
Registration Number:	
Enterprise Physical Address:	
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):	
Nature of Business:	
Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians –) Who are citizens of the Republic of South Africa by birth or descent; or) Who became citizens of the Republic of South Africa by naturalization- i. Before 27 April 1994; or i. On or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date

4. I hereby declare under Oath that:

- The Enterprise is_____% **Black Owned** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 asAmended by Act No 46 of 2013;
- The Enterprise is_____% **Black Woman Owned** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013;
- The enterprise is_____**%Black youth owned;** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013;

- **The enterprise is_____% black disabled owned;** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003as Amended by Act No 46 of 2013;

- **The enterprise is_____% by Black people living in rural and under developed areas** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013;
- **The enterprise is_____% by military veterans** as per Amended Code Series 100of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013;
- Based on the management accounts and other information available for the _____financial year, **the income did not exceed R10, 000,000.00 (ten million rand**).

Please confirm on the table below the B-BBEE level contributor, **by ticking the applicable box.**

100% black owned	**Level One** (135% B-BBEE procurement recognition)	
More than 51% blackowned	**Level Two** (125% B-BBEE procurement recognition)	
Less than 51% blackowned	**Level Four** (100% B-BBEE procurement recognition)	

5. I know and understand the contents of this affidavit and I have no objection to take the prescribed oathand consider the oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.

6. The sworn affidavit will be valid for a period of **12 months** from the date signed by commissioner.

Deponent Signature ……

Date ……..

Commissioner of Oaths

……
Name & Surname

Signature & Stamp

APPENDIX IV

SWORN AFFIDAVIT: B-BBEE for QUALIFYING SMALL ENTERPRISE (Generic)

I, the undersigned, _____

Full name & Surname	
Identity number	

Hereby declare under oath as follows:

1. The contents of this statement are to the best of my knowledge a true reflection of the facts.
2. I am a Member / Director / Owner of the following enterprise and am duly authorized to act on itsbehalf:

Enterprise Name:	
Trading Name (If Applicable):	
Registration Number:	
Enterprise Physical Address:	
Type of Entity (CC, (Pty) Ltd, Sole Proprietor etc.)	
Nature of Business:	
Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians –) Who are citizens of the Republic of South Africa by birth or descent; or) Who became citizens of the Republic of South Africa by naturalization- i. Before 27 April 1994; or i. On or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date

3. I hereby declare under Oath that:

- The Enterprise is_____% **Black Owned** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 asAmended by Act No 46 of 2013,
- The Enterprise is_____% **Black Woman Owned** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- The enterprise is_____**% Black Youth owned;** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- **The enterprise is_____% black disabled owned;** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- **The enterprise is_____% by Black people living in rural and under developed areas** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1)of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- **The enterprise is_____% by military veterans** as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,
- Based on the Financial Statements/Management Accounts and other information available on thelatest financial year-end of_____, the annual **Total Revenue was between R10,000,000.00 (Ten Million Rands) and R50,000,000.00 (Fifty Million Rands),**

Please Confirm on the below table the B-BBEE Level Contributor, by ticking the applicable box.

100% Black Owned	**Level One** (135% B-BBEE procurement recognition level)	
At least 51% Black Owned	**Level Two** (125% B-BBEE procurement recognition level)	

4. I know and understand the contents of this affidavit and I have no objection to take the prescribed oath andconsider the oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.

5. The sworn affidavit will be valid for a period of **12 months** from the date signed by commissioner.

Deponent Signature ……

Date ……..

Commissioner of Oaths

…….. **Name and Surname**

C1.1 Form of Offer & Acceptance

Offer

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

To Re-instate Turfgrond 25KV AC Traction Substation under the control of the Depot Engineer, Koedoespoort

The tenderer, identified in the Offer signature block, has

either	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.
or	examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

By the representative of the tenderer, deemed to be duly authorised, 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 exclusive of VAT is	
Value Added Tax @ 15% is	
The offered total of the Prices inclusive of VAT is	
(in words)	

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, 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: .....

(Insert name and address of organisation)

Name & signature of witness .....

Date .....

Tenderer's CIDB registration number: .....

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 Form of Offer and Acceptance)
Part C2	Pricing Data
Part C3	Scope of Work: Service Information

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable 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 Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of 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 securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date of award.

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

.....

(Insert name and address of organisation)

Name & signature of witness .....

Date .....

.

Schedule of Deviations

Note:

1. To be completed by the Employer prior to award of contract. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

No.	Subject	Details
1		
2		
3		
4		
5		
6		
7		

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any 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 Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

	For the tenderer:	**For the Employer**
Signature	.....	.....
Name	.....	.....
Capacity	.....	.....
On behalf of	..... *(Insert name and address of organisation)*	..... *(Insert name and address of organisation)*
Name & signature of witness	.....	.....
Date	.....	.....

C1.2 Contract Data

Part one - Data provided by the *Employer*

Clause	Statement	Data
1	**General**	
	The *conditions of contract* are the core clauses and the clauses for main Option:	
	dispute resolution Option	**A:** **Priced contract with price list** **W1:** **Dispute resolution procedure** **X2** **Changes in the law** **X18:** **Limitation of liability** **Z:** ***Additional conditions of contract***
	of the NEC3 Term Service Contract (June 2005) (and amended June 2006 and April 2013)	
10.1	**Transnet SOC Ltd**	**Transnet SOC Ltd** **Transnet Corporate Centre** **138 Eloff Street** **Braamfontein** **Johannesburg** **2000** **Transnet Freight Rail** **Supply Chain Services- Pretoria** **Nzasm Building** **Corner Minaar and Paul Kruger Street** **Pretoria** **0001** **012 315 2059** **012 315 2125**
	Transnet SOC Ltd	**Transnet SOC Ltd**
10.1	The *Service Manager* is (name):	**Thabiso Tsotetsi**
	Address	**No 8 Trans Road, Silverton, 0127**
	Tel	**012 842 5040**

	e-mail	Thabiso.Tsotetsi@transnet.net
11.2(2)	The Affected Property is	**Turfgrond 25KV AC Traction Substation**
11.2(13)	The *service* is	**To Re-instate Turfgrond 25KV AC Traction Substation under the control of the Depot Engineer, Koedoespoort**
11.2(14)	The following matters will be included in the Risk Register	**A. Delivery period** **B. Project scope** **C. Cost** **D. Quality (Experience)** **E. Project schedule** **F. Resources** **G. Communication** **H. Project Stakeholders** **I. Project Milestone**
11.2(15)	The Service Information is in	**The Scope of Services**
12.2	The *law of the contract* is the law of	**the Republic of South Africa subject to the jurisdiction of the Courts of South Africa.**
13.1	The *language of this contract* is	**English**
13.3	The *period for reply* is	**2 weeks**
2	**The *Contractor*'s main responsibilities**	(If the optional statement for this section is not used, no data will be required for this section)
21.1	The *Contractor* submits a first plan for acceptance within	**2 weeks of the Contract Date**
3	**Time**	
30.1	The *starting date* is.	**To Be Advised**
30.1	The *service period* is	**Three months**
4	**Testing and defects**	**No additional data is required for this section of the *conditions of contract*.**
5	**Payment**	
50.1	The *assessment interval* is	**25th of each month (for 3 months)**
51.1	The *currency of this contract* is the	**South African Rand.**
51.2	The period within which payments are made is	**Payment will be effected on or before the last day of the month following the month during which a valid Tax Invoice and Statement were received.**
51.4	The *interest rate* is	**The prime lending rate of the Standard Bank South Africa.**
6	**Compensation events**	**Not applicable**

7	**Use of Equipment Plant and Materials**	**No additional data is required for this section of the *conditions of contract*.**
8	**Risks and insurance**	
80.1	These are additional *Employers* risks	
83.1	The minimum limit of indemnity for insurance in respect of loss and damage to property (except goods, plant and materials and equipment) and liability for bodily injury or death of a person (not an employee of the *Service Provider)* caused by activity in connection with this contract for any one event is:	**Whatever *Contractor* deems necessary as the *Employer* is not carrying this indemnity.**
83.1	The minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the *Contractor* arising out of and in the course of their employment in connection with this contract for any one event is:	**As prescribed by the Compensation for Occupational Injuries and Diseases Act No. 130 of 1993 and the *Contractor's* common law liability for people falling outside the scope of the Act.**
83.1	Motor Vehicle Liability Insurance comprising (as a minimum) "Balance of Third Party" Risks including Passenger and Unauthorised Passenger Liability indemnity with a minimum indemnity limit of R 5 000 000	
83.1	The *Contractor* liability to the *Employer* for indirect or consequential loss including loss of profit, revenue and goodwill, is limited to:	**The Total of the Prices.**
83.1	For any one event, the *Contractor* liability to the *Employer* for loss of or damage to the *Employers* property is limited to:	**The Total of the Prices.**
83.1	The *Contractor* total liability to the *Employer* for all matters arising under or in connection with this contract, other than the excluded matters, is limited to:	**The Total of the Prices.**
9	**Termination**	**There is no Contract Data required for this section of the *conditions of contract*.**
10	**Data for main Option clause**	
A	**Priced contract with price list**	
20.5	The *Contractor* prepares forecasts of the final total of the Prices for the whole of the *service* at intervals no longer than	**4 weeks.**

20.4	The *Contractor* prepares forecasts of the total Defined Cost for the whole of the *service* at intervals no longer than	**4 weeks.**
11	**Data for Option W1**	
W1.1	The *Adjudicator* is (Name)	**Both parties will agree as and when a dispute arises. If the parties cannot reach an agreement on the *Adjudicator*, the chairman of the Association of Arbitrators will appoint an *Adjudicator.***
W1.2(3)	The *Adjudicator nominating body* is: If no *Adjudicator nominating body* is entered, it is	 **The Association of Arbitrators (Southern Africa)**
W1.4(2)	The *tribunal* is:	**Arbitration**
W1.4(5)	The *arbitration procedure* is	**The Rules for the Conduct of Arbitrations of the Association of Arbitrators (Southern Africa)**
	The place where arbitration is to be held is	**Pretoria**
	The person or organisation who will choose an arbitrator - if the Parties cannot agree a choice or - if the arbitration procedure does not state who selects an arbitrator, is	 **The Chairman of the Association of Arbitrators (Southern Africa)**
12	**Data for secondary Option clauses**	
X2	**Changes in the law**	**No additional data is required for this Option**
X18	**Limitation of liability**	
X18.1	The *Contractor*'s liability to the *Employer* for indirect or consequential loss is limited to	**Nil.**
X18.2	For any one event, the *Contractor*'s liability to the *Employer* for loss of or damage to the *Employer*'s property is limited to	**The deductible of the relevant insurance policy**
X18.3	The *Contractor*'s liability for Defects due to his design of an item of Equipment is limited to	**The cost of correcting the defect.**
X18.4	The *Contractor*'s total liability to the *Employer*, for all matters arising under or in connection with this contract, other than the excluded matters, is limited to	**Total of the Prices.**

X18.5	The *end of liability date* is	**3 years after the end of the *service period*.**

Z *Additional conditions of contract*

Z1 Obligations in respect of Termination

Z1.1		The following will be included under core clause 91.1: In the second main bullet, after the word 'partnership' add 'joint venture whether incorporated or otherwise (including any constituent of the joint venture)'; and Under the second main bullet, insert the following additional bullets after the last sub-bullet: • commenced business rescue proceedings (R22) • repudiated this Contract (R23)
Z1.2	Termination Table	The following will be included under core clause 90.2 Termination Table as follows: Amend "A reason other than R1 – R21" to "A reason other than R1 – R23"
Z1.3		Amend "R1 – R15 or R18" to "R1 – R15, R18, R22 or R23."

Z2 Right Reserved by Transnet to Conduct Vetting through SSA

Z2.1		Transnet reserves the right to conduct vetting through State Security Agency (SSA) for security clearances of any Contractor who has access to National Key Points for the following without limitations: 1. Confidential – this clearance is based on any information which may be used by malicious, opposing or hostile elements to harm the objectives and functions of an organ of state. 2. Secret – clearance is based on any information which may be used by malicious, opposing or hostile elements to disrupt the objectives and functions of an organ of state. 3. Top Secret – this clearance is based on information which may be used by malicious, opposing or hostile elements to neutralise the objectives and functions of an organ of state.
Z3	**Additional clause relating to Collusion in the Construction Industry**	
Z3.1		The contract award is made without prejudice to any rights Transnet may have to take appropriate action later with regard to any declared bid rigging including blacklisting.
Z4	**Protection of Personal Information Act**	
Z4.1		The *Employer* and the *Contractor* are required to process information obtained for the duration of the Agreement in a manner that is aligned to the Protection of Personal Information Act

C1.2 Contract Data

Part two - Data provided by the *Contractor*

The tendering contractor is advised to read both the NEC3 Term Service Contract (June 2005) and the relevant parts of its Guidance Notes (TSC3-GN) in order to understand the implications of this Data which the tenderer is required to complete.

Completion of the data in full, according to Options chosen, is essential to create a complete contract.

Clause	Statement	Data
10.1	The *Contractor* is (Name): Address Tel No. Fax No.	
11.2(8)	The *direct fee percentage* is The *subcontracted fee percentage* is	**.....%** **.....%**
11.2(14)	The following matters will be included in the Risk Register	**.....**
11.2(15)	The Service Information for the *Contractor*'s plan is in:	**.....**
21.1	The plan identified in the Contract Data is contained in:	**.....**
24.1	The key persons are: 1 Name: Job: Responsibilities: Qualifications: Experience: 2 Name: Job Responsibilities: Qualifications: Experience:	 **.....** **.....** **.....** **.....** **.....** **.....** **.....** **.....** **.....** **.....** **.....** **CV's (and further key person's data including CVs) are in .....**

A	**Priced contract with price list**	
11.2(12)	The *price list* is in	**.....**
11.2(19)	The tendered total of the Prices is	**R.....**

PART C2: PRICING DATA

Document reference	Title	No of pages
C2.1	Pricing instructions: Option A	1
C2.2	Price List	2

C2.1 Pricing instructions: Option A

1.1 The *conditions of contract*

1.2 How the contract prices work and assesses it for progress payments

Clause 11 in NEC3 Term Services Contract (TSC), June 2005 (with amendments June 2006 and April 2013) Option A states:

Identified and defined terms 11 11.2 (17) The Price for Services Provided to Date is the total of

- the Price for each lump sum item in the Price List which the *Contractor* has completed and
- where a quantity is stated for an item in the Price List, an amount calculated by multiplying the quantity which the *Contractor* has completed by the rate.

(19) The Prices are the amounts stated in the Price column of the Price List, where a quantity is stated for an item in the Price List, the Price is calculated by multiplying the quantity by the rate.

1.3 Measurement and Payment

1.3.1 The Price List provides the basis of all valuations of the Price for Services Provided to Date, payments in multiple currencies and general progress monitoring.

1.3.2 The amount due at each assessment date is based on activities and/or milestones completed as indicated on the Price List.

1.3.3 The Price List work breakdown structure provided by the *Contractor* is based on the activity/milestone provided by the Employer. The activities listed by the *Employer* are the minimum activities acceptable and identify the specific activities which are required to achieve Completion. T**he Price List work breakdown structure is compiled to the satisfaction of the *Employer* with any additions and/or amendments deemed necessary.**

1.3.4 The *Contractor's* detailed Price List summates back to the activity/milestone provided by the *Employer* and is sufficient detail to monitor completion of activities related to the operations on the Accepted Plan in order that payment of completed activities may be assessed.

1.3.5 The Prices are obtained from the Price List. The Prices includes for all direct and indirect costs, overheads, profits, risks, liabilities, obligations, etc. relative to the contract.

C2.2 Price List

Item No	Description	Unit of measure	Quantity	Unit Rate	Total Price
1	**Supply and install multicore control cables for the substation.**				
1.1	2.5mm² 4 core armoured cable	m	200		
1.2	2.5mm² 2 core armoured cable	m	200		
1.3	2.5mm² 7 core armoured cable	m	500		
1.4	2.5mm² 11 core armoured cable	m	200		
1.5	2.5mm² 19 core armoured cable	m	200		
1.6	97mm² galvanised steel bonding cable for earthing	m	100		
1.7	50mm² XLPE single core cable	m	50		
2	Supply and install HT yard gate 1.2 x 1m	ea	1		
3	Supply and install 25kV Isolator 500m² Alu cable	m	3		
4	Open 60M trench covered with concrete and lay control cables. After laying of all control cables, fill All trenches with sand cover with 60cm width x 100cm thick concrete topping. Open a new 30M trench to lay cables from Telecontrol room and outdoor VCB structure to PCB room. After laying of all control cables, fill All trenches with sand cover with 50cm width x 50cm thick concrete topping.	sum	1		
5	Supply and install 800mm thick steel rectangular channels for PCB control cable protection.	sum	1		
6	Supply and install steel pipes for the protection of CT control cables	m	10		
7	Supply and Install CT junction box	ea	1		
8	Design, supply and install steel cable cover cabling to Telecontrol room (1.2 length, 1.1 height and 500 width) NB: Cover to be bolted from inside during installation	sum	1		
9	Supply and install 100W LED outdoor lighting	ea	3		
10	Supply and Install 25KV AC outdoor VCB (Two breakers and one Incomer) with complete with 3 CT and one VT. Operating voltage 110V	set	1		
11	Supply and install the safe door, equipped with an internal lock (2.8m by1,57m) with 8 keys	sum	1		
12	Modify the existing VCB's structure to accommodate the new VCB's.	sum	1		

13	Supply and Refill traction transformer virgin oil (Fill up the oil under vacuum- to remove any air bubbles in the oil)	ltr	16 000		
14	Rehabilitate the soil and the crusher stones contaminated with oil	sum	1		
15	Supply and Install 20Ah battery charger complete with batteries 110V. batteries (cells to be rated at 1.2 V, 29Ah each)	Sum	1		
16	Supply and install complete telecontrol cubicle	sum	1		
17	Rewire the PCB/ Transformer protection, Incomer and Feeder control panels. And supply and install a two protecta relays, two incomer relays and one transformer differential protection relay Simens 7SR22 series or similar	Sum	1		
18	Refurbish main traction transformer (repair leaks, new gaskets, paint, cabling, silica gel, winding and oil temperature gauges, Oil sampling and testing)	sum	1		
20	Supply and install 88kv primary circuit breaker	sum	1		
21	Supply and install 16KVa 25Kv/230V AC transformer	sum	1		
22	Supply and install 800mm² flying busbar	m	30		
23	Supply and Install 323mm² flying busbar for PCB	m	20		
24	Outdoor substation Earthing	Sum	1		
25	Supply and Install 33kV Fuse carrier	sum	1		
26	Supply and Install 2A fuse link	sum	1		
27	Supply and Install 2A fuse link	sum	1		
28	Supply and install Telecontrol Room door	sum	1		
29	Supply and install a new distribution board, indoor lightning, and re-do wiring (Telecontrol room and PCB room)	sum	2		
30	Supply checker plates (1m x 500mm)	ea	5		
31	Paint PCB room (floor and wall)	sum	1		
32	Generator provision for the duration of the project	sum	1		
B1	Test and commissioning of the substation	sum	1		
B2	Security (only for duration of Installation)	sum	1		
B3	P's and G's	sum	1		
	Sub-Total excluding VAT				
	VAT @15%				
	Gross Total including VAT				

C3: Service Information

1. Description of the *service*

1.1 The *Contractor* shall supply all control cables and outdoor VCB's control boxes at Turfgrond 25KV AC Traction substation in accordance with Transnet Freight Rail specification CEE.0111.99, clause 33.0.

1.2 Supply and install all control and power cables. Cabling and wiring shall be in accordance with CEE0023, clause 33.14 of specification CEE0111 and SANS 10142-1.

1.3 The *Contractor* shall supply the multi core cable and reconnect the tele-control to the control panel. The substation shall not be switched on unless the tele-control is fully operational.

1.4 All armoured cables shall terminate in compression type glands with an ingress protection of IP66. These glands shall be fitted with neoprene shrouds. 7.6.6.3 Cables and earthing conductors connected to equipment installed on steel support structures shall be supported on the steel structure vertically and horizontally by means of a cable tray. This cable tray shall be of the O-Line GS50 Grid span Wire Mesh type or similar with the wire mesh having a diameter of 4mm and a hot dip galvanised finish.

1.5 The cable trays shall be attached to the support steel in accordance with drawing No. CEE-TDC-10. The cables shall be fixed to the cable trays using UV stabilised cable ties.

1.6 All dissimilar metal connections (e.g., Cu to Al) shall be made using bi-metallic clamps that are specifically designed and manufactured to make that connection (ad hoc fabricated clamps are not acceptable).

1.7 All copper connections to steel (galvanised) shall be tinned.

1.8 Cabling and wiring shall be in accordance with CEE0023, clause 33.14 of specification CEE0111 and SANS 10142-1.

1.9 In doing any cabling, the ballast stone shall be removed, trenching, and laying of cables done, the soil compacted back and fill the trenches with concrete.

1.10 Supply and install steel pipes to house cables from CT's.

1.11 The *Contractor* shall supply new conductor (flying busbar) between outdoor VCB's structure and the main transformer bushings.

1.12 Supply and install outdoor earthing in accordance with TFR installation specification BBB 5452 clause 30.0 and refer to drawing No. CEE – TBD - 0008.

1.13 All equipment and work shall comply to Drawing BBB 3620 Version 3, CEE TBD – 8 and CEE-P-0026: Earthing arrangement: of Traction substation (16mm dia. Cu. Clad steel).

1.14 Prior to commencement of the Service , the *Contractor* in consultation with the *Service Manager / Technical Officer*, shall perform a survey to determine the type of main Earthing systems that are required and the best possible position of the Earthing system within the limits of Transnet's boundaries.

1.15 Armoring of cables shall not be used for earthing purposes or any return circuit but shall be bonded to an earthed metal by means of a suitable gland. An earth conductor shall be provided in each cable for earthing purposes.

1.16 Before the *Contractor* starts laying cables in the trenches, the *Supervisor* or his deputy shall verify the dimensions of the trench and inspect the bedding in the trench before and after the BBF3988 Page 12 laying of the cables. The quality control document shall be signed after every task has been completed to give a pass or no pass.

1.17 The *Contractor* shall provide his security on site for the duration of the contract.

1.18 The *Contractor* shall install, test and commission the substation in the presence of Transnet freight rail representatives. The *contractor* shall provide his own testing officer for this purpose.

1.19 The method of evaluation is method 4 as per conditions of tender per the CIDB regulations.

1.20 Transnet freight rail reserves the right to award the tender to *Contractor* with shortest delivery period.

1.21 The *Contractor* shall supply and install controls cables as per the following spec and quantities.

1.22 Open 60M trench covered with concrete and lay control cables. After laying of all control cables, fill All trenches with sand cover with 60cm width x 100cm thick concrete topping. Open a new 30M trench to lay cables from Telecontrol room and outdoor VCB structure to PCB room. After laying of all control cables, fill All trenches with sand cover with 50cm width x 50cm thick concrete topping.

Ourdoor Vcb's Control Box

a.	2.5mm² 4 core armoured cable	m	200
b.	2.5mm² 2 core armoured cable	m	200
c.	2.5mm² 7 core armoured cable	m	500
d.	2.5mm² 11 core armoured cable	m	200
e.	2.5mm² 19 core armoured cable	m	200
f.	97mm² galvanised steel bonding cable for earthing	m	100
h.	50mm² XLPE cable	m	50

1.23 Open 60M trench covered with concrete and lay control cables. After laying of all control cables, fill All trenches with sand cover with 60cm width x 100cm thick concrete topping. Open a new 30M trench to lay cables from Telecontrol room and outdoor VCB structure to PCB room. After laying of all control cables, fill All trenches with sand cover with 50cm width x 50cm thick concrete topping.

Outdoor VCB'S Control Box

1.23 The disconnect switches shall be supplied according to specification CEE0040 and be continuously rated for 1000 Amperes.

1.24 The control box should comply with the attached spec: CEE-0111_ISS_2019

1.25 The switch shall be supplied in accordance with SANS 62271-102.

1.26 The motor drive shall be connected to the operating rod by means of gears. The open and close operations of the switch shall be achieved by means of the reversal of the motor drive.

1.27 The motor driven mechanism shall be capable of completing the full stroke for the opening. and closing operation of the AC Disconnect.

1.28 Limit switches shall be fitted so that they operate at the end of the stroke.

1.29. A clutch or similar mechanism shall be fitted to protect the driving motor should the limit switches fail to operate.

1.30. Auxiliary contacts shall be provided on the operating mechanism of the AC disconnector and earthing switch for alarm and indication inputs to the control panel and telecontrol to monitor the 'open' and 'close' of the AC disconnector and the earth 'on' or 'off' operations of the earthing switch.

1.31 The AC disconnecting switch shall be mechanically and electrically interlocked with the earth switch to prevent the earth switch closing while the disconnecting switch is closed.

1.32 Both AC disconnecting switches shall be electrically interlocked with the bus coupler such that none will close while the bus coupler is closed.

1.33 The disconnect switch shall be motor controlled from 110V DC supply.

1.34 The switch operating mechanism shall be housed in vermin and waterproof cabinet. The degree of protection of the cabinet shall be IP55.

1.35 The cabinet shall be made of die-cast aluminium or stainless steel.

1.36 The cabinet shall be lockable with a padlock.

1.37 The cabinet shall be fitted with a thermostatically controlled 230V AC anti-condensation heater.

Concrete

1.38 If Ready Mix Concrete Is Used, The *Contractor* Shall Submit Certificates Confirming The Strength Of Concrete To The *Supervisor*.

1.39 The *Contractor* Shall Arrange For Sampling And Testing Of All Concrete Used And Shall Submit Full Records To The Supervisor. The Method Of Sampling Shall Comply With Specification S420.

Drawings And Manuals

1.40 Supply three sets of A3 schematic wiring diagrams in hard copy format and electronic format for approval.

1.41 The *Contractor* shall present Transnet Freight Rail with the drawings for approval before manufacturing starts.

1.43 The *Contractor* shall be responsible for as built drawings on completion of the work.

Quality And Inspection

1.44 Transnet Freight Rail shall inspect the support steel structure on the premises of the manufacturer.

1.45 The *Contractor* shall notify Transnet Freight Rail 14 days in advance of such an inspection date.

1.46 Test certificates of the surge arrestors shall be sent to Transnet Freight Rail before commissioning of the equipment.

1.47 The *Contractor* shall apply 30 days in advance for the date of energizing.

1.48 The *Contractor* shall be responsible to issue a compliance certificate in terms of SANS 0142 for each site before energizing of the equipment shall take place.

1.49 Minimum equipment relevant to execute the service

a. Truck with crane
b. Generator
c. Transformer Oil purification plant
d. Excavator
e. Soil compactor
f. Truck with crane
g. Generator
h. Transformer Oil purification plant
i. Excavator
j. Soil compactor

2. Drawings

Drawing number	Revision	Title
CEE – TBD - 0008		Supply and installation of cables and earthing system
CEE-TDC-10		Cable trays

3. Specifications

Specification	Revision	Title
CEE.0111.99		Requirements for design, manufacturing, and installation of 25 KV AC substation equipment
SANS 10142-1.		SOUTH AFRICAN NATIONAL STANDARD The wiring and Low-voltage installations
CEE0023		Specifications for Installation of cables
BBB5452		Transnet Freight Rail's requirements for the installation of electrical equipment
BBB		Requirements for design, manufacturing, and installation of alternating current (AC) circuit breakers
SANS 62271-102		High-voltage switchgear and control gear Part 102: Alternating current disconnectors and earthing switches

BBF 3988		This specification covers the design, supply, installation / casting, and testing of 25kV AC outdoor voltage and current transformers, foundations and support steelwork, cabling and conductors.

4. Constraints on how the *Contractor* Provides the Service

4.1 *Contractors* shall submit qualifications of the staff that will be performing the Service . Only qualified technical personnel shall perform the Service on the electrical equipment or installations. During the duration of the contract the successful Contractor will be required to inform the Technical Officer of any staff changes and provide the qualifications of the replacement staff for approval.

4.2 *Contractors* shall indicate clause-by-clause compliance with the specification. This shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance. This document can be used by Contractors to elaborate on their clause.

4.3 *Contractors* shall motivate a statement of non-compliance.

4.4 Where equipment offered does not comply with standards or publications referred to in the specification, Contractors shall state which standards apply and submit a copy in English or certified translation.

4.5 *Contractors* shall submit descriptive literature consisting of detailed technical specifications, general constructional details and principal dimensions, together with clear illustrations of the equipment offered. During the duration of the contract period, the successful Contractor will be required to inform the Service Manager / Technical Officer of changes to equipment offered and submit detailed information on replacement equipment for approval prior to it being used on this contract.

4.6 *Contractors* shall submit equipment type test certificates as specified with the Tender. These shall be in English or certified translation

5. Requirements for the programme

5.1 Programme of work : To be submitted by successful *Contractor.*
5.2 Format : Bar chart
5.3 Information : How work is going to be executed and commissioned
5.4 Site diary : Successful Contractor to supply in triplicates carbon copies.

5.5. Personnel Qualification : Valid Electrical Trade Test Certificate, Service Manager should have a registered with ECSA as a Professional Engineer Pr. Eng. (Electrical) and Crane operator should have valid crane certificate.

6 Services and other things provided by the *Employer*

6.1 Transnet Freight Rail shall have an electrician/technical assistant available for isolation and the erection of barriers to live electrical equipment and issuing of work permits.

6.2 Upon successful completion of the Service to the satisfaction of Transnet Freight Rail, Transnet Freight Rail shall perform necessary protection tests and commission the equipment.

6.3 The Contractor shall make necessary arrangements for sanitation, water, and electricity at these relevant sites during the installation of the equipment.

6.4 Transnet Freight Rail will arrange for the reconnecting of telecontrol equipment in the substation and no final energising shall take place without this.

6.5 The Service shall be performed at Turfgrond 25kV AC Substation (North west Province next to Marikana).

7 The *Contractor's* Invoices

7.1 When the *Service Manager* certifies payment following an assessment date, the *Contractor* complies with the *Employer's* procedure for invoice submission.

7.2 The invoice must correspond to the *Service Manager's* assessment of the amount due to the *Contractor* as stated in the payment certificate.

7.3 The invoice states the following:

- Invoice addressed to Transnet Limited;
- Transnet Limited's VAT No: 4720103177;
- Invoice number;
- The *Contractor's* VAT Number; and
- The Contract number

7.4 The invoice contains the supporting detail

7.5 The invoice is presented either by post or by hand delivery.

7.6 Invoices submitted by post are addressed to:

For the attention of:
Service Manager: Thabiso Tsotetsi
Infra Electrical Department
No.8 Trans road
Silverton
0127

7.7 Invoices submitted by hand are presented to:

Transnet Freight Rail
Infra Electrical Department

7.8 The invoice is presented as an original.

PART 4: Affected Property

Core clause 11.2(2) states

"Affected Property is property which

- Is affected by the work of the *Contractor* or used by the *Contractor* in Providing the Service
- is in the documents which the Contract Data states it is in."

In Contract Data, reference has been made to this Part 4 of the contract for the location of the Affected Property.

Re-instate Turfgrond 25KV AC Traction Substation (GPS Co-ordinates; S25˚41.341' E027˚31.806')

1. Description of the Affected Property and its surroundings

1.1. General description

Turfgrond 25KV AC traction substation

1.2. Existing buildings, structures, and plant & machinery on the Site

Building and Electrical equipment and structures.

1.3 Subsoil information

The soil and the crusher stones contaminated with oil

1.4 Hidden services

Not applicable

1.5. Other reports and publicly available information

Not applicable

Annex C

Local Content Declaration - Summary Schedule

(C1)	**Tender No.**	ERACMM-KDS-45103
(C2)	**Tender description:**	RFP To re-instate Turfgrond 25kv AC Traction Substation under the control of the Depot Engineer, Koedoespoort
(C3)	**Designated product(s)**	Transformer oil (Transformers,shunt reactors and associated equipment sector)
(C4)	**Tender Authority:**	Transnet Freight Rail
(C5)	**Tendering Entity name:**	
(C6)	**Tender Exchange Rate:**	Pula EU GBP
(C7)	**Specified local content %**	**100%**

		Calculation of local content					
Tender item no's	**List of items**	**Tender price - each (excl VAT)**	**Exempted imported value**	**Tender value net of exempted imported content**	**Imported value**	**Local value**	**Local content % (per item)**
(C8)	*(C9)*	*(C10)*	*(C11)*	*(C12)*	*(C13)*	*(C14)*	*(C15)*
	Transformer oil						

Signature of tenderer

Date:

Annex C

Local Content Declaration - Summary Schedule

(C1)	**Tender No.**	ERACMM-KDS-45103
(C2)	**Tender description:**	RFP To re-instate Turfgrond 25kv AC Traction Substation under the control of the Depot Engineer, Koedoespoort
(C3)	**Designated product(s)**	VCB control cables (Electrical Cable Products) Sector Multicore Control Cable
(C4)	**Tender Authority:**	Transnet Freight Rail
(C5)	**Tendering Entity name:**	
(C6)	**Tender Exchange Rate:**	Pula [ ] EU [ ] GBP [ ]
(C7)	**Specified local content %**	90%

		Calculation of local content					
Tender item no's	**List of items**	**Tender price - each (excl VAT)**	**Exempted imported value**	**Tender value net of exempted imported content**	**Imported value**	**Local value**	**Local content % (per item)**
(C8)	*(C9)*	*(C10)*	*(C11)*	*(C12)*	*(C13)*	*(C14)*	*(C15)*
	☒CB control cables						
	Multicore Control Cable						

Signature of tenderer

Date: _____

Annex D

Imported Content Declaration - Supporting Schedule to Annex C

(D1)	**Tender No.**	ERACMM-KDS-45103	**Note:** **VAT to be excluded from all calculations**
(D2)	**Tender description:**	RFP To re-instate Turfgrond 25kv AC Traction Substation under the control of the Depot Engineer, Koedoespoort	
(D3)	**Designated Products:**		
(D4)	**Tender Authority:**	Transnet Freight Rail	
(D5)	**Tendering Entity name:**		
(D6)	**Tender Exchange Rate:**	Pula	EU R 9.00 GBP R 12.00

A. Exempted imported content

				Calculation of imported content					
Tender item no's	**Description of imported content**	**Local supplier**	**Overseas Supplier**	**Forign currency value as per Commercial Invoice**	**Tender Exchange Rate**	**Local value of imports**	**Freight costs to port of entry**	**All locally incurred landing costs & duties**	**Total landed cost excl VAT**
(D7)	*(D8)*	*(D9)*	*(D10)*	*(D11)*	*(D12)*	*(D13)*	*(D14)*	*(D15)*	*(D16)*

B. Imported directly by the Tenderer

				Calculation of imported content					
Tender item no's	**Description of imported content**	**Unit of measure**	**Overseas Supplier**	**Forign currency value as per Commercial Invoice**	**Tender Rate of Exchange**	**Local value of imports**	**Freight costs to port of entry**	**All locally incurred landing costs & duties**	**Total landed cost excl VAT**
(D20)	*(D21)*	*(D22)*	*(D23)*	*(D24)*	*(D25)*	*(D26)*	*(D27)*	*(D28)*	*(D29)*
	`								

C. Imported by a 3rd party and supplied to the Tenderer

				Calculation of imported content					
Description of imported content	**Unit of measure**	**Local supplier**	**Overseas Supplier**	**Forign currency value as per Commercial Invoice**	**Tender Rate of Exchange**	**Local value of imports**	**Freight costs to port of entry**	**All locally incurred landing costs & duties**	**Total landed cost excl VAT**
(D33)	*(D34)*	*(D35)*	*(D36)*	*(D37)*	*(D38)*	*(D39)*	*(D40)*	*(D41)*	*(D42)*
`									

D. Other foreign currency payments

			Calculation of foreign currency payments	
Type of payment	**Local supplier making the payment**	**Overseas beneficiary**	**Foreign currency value paid**	**Tender Rate of Exchange**
(D46)	*(D47)*	*(D48)*	*(D49)*	*(D50)*

Signature of tenderer

Date:

Annex E

Local Content Declaration - Supporting Schedule to Annex C

(E1)	**Tender No.**	ERACMM-KDS-45103
(E2)	**Tender description:**	RFP To re-instate Turfgrond 25kv AC Traction Substation under the control of the Depot Engineer, Koedoespoort
(E3)	**Designated products:**	
(E4)	**Tender Authority:**	
(E5)	**Tendering Entity name:**	

Note: **VAT to be excluded from all calculations**

Local Products (Goods, Services and Works)	**Description of items purchased**	**Local suppliers**	**Value**
	(E6)	*(E7)*	*(E8)*

(E9) **Total local products (Goods, Services and Works)** R 0

(E10) **Manpower costs** (Tenderer's manpower cost) R 0

(E11) **Factory overheads** (Rental, depreciation & amortisation, utility costs, consumables etc.) R 0

(E12) **Administration overheads and mark-up** (Marketing, insurance, financing, interest etc.) R 0

(E13) **Total local content** R 0

This total must correspond with Annex C - C24

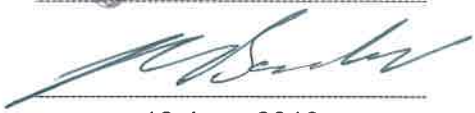
Date: _____

TRANSNET
freight rail

A Division of Transnet SOC Limited

TECHNOLOGY MANAGEMENT SPECIFICATION

25KV AC TRACTION SUBSTATIONS

Author:	Chief Engineering Technician Technology Management	B.L. Ngobeni	
Approved:	Senior Engineer Technology Management	S. Smit	
Authorised:	Senior Engineer Technology Management	L.O. Borchard	

Date: 18 June 2019

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Transnet Freight Rail

Transnet and Relevant Third Parties

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SECTION 1: SUBSTATION DESIGN INFORMATION

1.0 SCOPE

1.1 This specification covers Transnet Freight Rail's requirements for the design, manufacture, testing, installation and commissioning of 25kV 50Hertz AC single phase traction substations. Traction substations are required for feeding the overhead track equipment of the Transnet Freight Rail's AC traction system. Adjoining the Transnet Freight Rail substation yard will be an Eskom yard. The equipment in the Eskom yard, including the earth mat will be provided and installed by others.

2.0 APPENDICES

2.1 The following appendices form an integral part of this specification:

APPENDIX 1: Substation sites (names and locations) and degree of pollution.

APPENDIX 2: Schedule of requirements for AC traction substations.

APPENDIX 3: Schedule of drawings supplied by Transnet Freight Rail.

3.0 STANDARDS

3.1 Unless otherwise specified all materials and equipment supplied shall comply with the current edition of the relevant BS / IEC, SANS or Transnet Freight Rail's publications where applicable.

The following publications are referred to in this specification:

3.2 BRITISH STANDARDS INSTITUTION

BS 159:	High Voltage Busbars and Busbar Connections.
BS 50522:	Earthing of power installations exceeding 1kV A.C.
BS EN 10029:	Hot-rolled steel Plates 3mm thick or above Tolerances on Dimensions and Shape.

3.3 INTERNATIONAL ELECTROTECHNICAL COMMISIION

IEC 60051-1:	Direct acting indicating analogue electrical measuring instruments and their accessories - Part 1: Definitions and general requirements common to all parts.

3.4 SOUTH AFRICAN NATIONAL STANDARDS

SANS 121:	Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods.
SANS 32:	Internal and/or external protective coatings for steel tubes - Specification for hot dip galvanized coatings applied in automatic plants.
SANS 156:	Moulded Case Circuit Breakers.
SANS 555:	Insulating Oil for Transformers and Switchgear.
SANS 780:	Distribution Transformers.
SANS 1019:	Standard Voltages, Currents and Insulation Levels for Electricity Supply.
SANS 1091:	National Colour Standards for Paint.

SANS 1507:	Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V).
SANS 1574:	Electric flexible cables with solid extruded dielectric insulation.
SANS 10142:	The Wiring of Premises. Part 1: low–voltage installations.
SANS 10313:	Protection against lightning - Physical damage to structures and life hazard.
SANS 60099-4:	Surge arresters part 4: Metal oxide surge arresters without gaps for AC systems.
SANS 60137:	Insulated Bushings for Alternating Voltages above 1000 Volts.
SANS 60282-1:	High Voltage Fuses. Part 1: Current Limiting Fuses.
SANS 60529:	Degrees of protection provided by enclosures. (IP Code).
SANS 60730-2-6:	Automatic electrical controls for household and similar use Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements.
SANS 61936-1:	Power installation exceeding 1kV AC – Part 1: Common rules.
SANS 62271-100:	High voltage switchgear and control gear. Part 100 - High Voltage Alternating Current Circuit Breakers.
SANS 62271-102:	High voltage switchgear and control gear. Part 102- Alternating Current Disconnectors and Earthing Switches.
SANS 62271-200:	AC metal enclosed switchgear and control gear for rated voltages above 1kV and up to and including 52kV.

3.5 TRANSNET FREIGHT RAIL

BBB0845:	Requirements for metal oxide surge arresters in accordance with SANS 60099-4.
BBB0937:	Requirements for Post Type Current Transformers for Traction and Distribution Substations.
BBB1267:	Specification for Outdoor High Voltage Alternating Current Circuit Breaker in Accordance with SANS 62271-100.
BBB4182:	Indoor, Medium voltage metal enclosed switchgear and control gear in accordance with IEC 62271 – 200.
BBB7842:	Outdoor, High Voltage, Alternating Current Disconnectors combined with earthing switch.
BBB8204:	Medium Voltage Distribution and Supply Transformers in accordance with SANS 780.
BBG2415:	25kV AC single phase 20MVA transformer.
BBG5003:	Distance protection relay for single phase AC systems.
BBG5882:	Voltage Transformers used for protection and metering.
CEE0040:	Manual or Motor Operated 25kV Track Sectioning Switches.
CEE0045:	Painting of Steel Components of Electrical Equipment.
CEE0085:	Self Contained Battery and Battery Charger Units.
CEE0224:	Drawings, Catalogues, Instruction Manuals and Spares.

4.0 DEFINITIONS

4.1 "Single unit substation" refers to a substation to be provided with one traction transformer.

4.2 "Double unit substation" refers to a substation to be provided with two traction transformers, a busbar coupler and associated equipment.

4.3 "Substation" refers to a traction substation.

4.4 "Local" operation refers to a condition in which a circuit breaker can only be switched by operating the breaker controls provided in the substation.

4.5 "Remote" operation refers to a condition in which a circuit breaker can only be switched by operation of a control system from a location remote from the substation.

4.6 Breaker "remain open" refers to a breaker that trips and stays in the open position and can be closed from local or remote.

4.7 A circuit breaker that is open and has an "operational inhibit" refers to a condition in which the breaker cannot be closed until certain conditions return to normal. (Thermal protection, under-voltage protection etc.)

4.8 "Lockout" of a circuit breaker refers to a condition where local manual reset of the control circuit is required before any attempt to close the circuit breaker can be made.

4.9 "Senior Engineer" is the person appointed by Transnet Freight Rail to manage and administer the contract works.

5.0 TENDERING PROCEDURE

5.1 Tenderers shall indicate clause by clause compliance or non-compliance with the specification. This shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance. This document can be used by tenderers to elaborate on their response to a clause.

5.2 A statement of non-compliance shall be motivated by the tenderer.

5.3 Equipment type test certificates shall be submitted with the tender. These shall be in English.

5.4 Tenderers shall submit descriptive literature consisting of detailed technical specifications, general constructional details and principal dimensions, together with clear illustrations of the equipment offered.

5.5 Failure to comply with clauses 5.1, 5.2, 5.3 and 5.4 could preclude a tender from consideration.

6.0 SERVICE CONDITIONS

6.1 The equipment shall be designed and rated for operation under the following service conditions:

6.1.1	Altitude:	0 to 1800m above sea level
6.1.2	Relative humidity:	10% to 90%
6.1.3	Ambient temperature range:	- 10°C to + 55°C
6.1.4	Level of pollution:	Heavily salted laden or polluted with smoke from industrial sources
6.1.5	Lightning conditions:	20 ground flashes/km^2/annum

7.0 GENERAL REQUIREMENTS

7.1 The primary supply voltage shall be as specified in the schedule of requirements (Appendix 2).

7.2 The locations of the substations to be provided, as well as the differing requirements to suit any particular substation is given in Appendices 1 and 2.

7.3 Equipment specification deviations require a written approval from Transnet Freight Rail's Technology Management.

7.4 Transnet Freight Rail reserves the right to subject material and equipment offered to test or inspection to check compliance with the clauses of this specification prior to adjudication or at any stage during manufacture.

7.5 The onus to prove compliance to the specification shall rest with the tenderer during the tender stage and with the successful tenderer once the contract has been awarded.

7.6 The successful tenderer will be responsible for all costs caused by modifying or replacing equipment accepted by Transnet Freight Rail on the grounds of his statement of compliance and found by Transnet Freight Rail – Technology Management not to comply.

7.7 Acceptance by the Transnet Freight Rail – Senior Engineer of the equipment / installation offered in no way relieves the successful tenderer of his obligation to fulfil his statement of compliance with the specification.

7.8 All equipment shall be adequately earthed, insulated, enclosed and interlocked to ensure the safety of staff (operators) as well as equipment.

7.9 Any portion of the equipment which may be likely to cause injury to staff or fire by being overloaded or failing, or by an arc set up by the equipment in operation, shall be so arranged as to prevent the possibility of injury to staff as well as preventing damage to other equipment.

7.10 All electrical and electronic equipment shall have a fail to safety feature.

8.0 INSULATION LEVELS

8.1 Insulation levels for high voltage equipment shall be in accordance with the recommendations of SANS 1019.

8.2 Secondary equipment at 25 kV (phase to earth) shall have a rated insulation level based on an equivalent 3 phase system with a highest voltage for equipment of 52 kV r.m.s, i.e., a rated lightning impulse withstand voltage of 250 kV peak, and a rated power frequency withstand voltage of 95 kV r.m.s.

8.3 Primary equipment (voltages phase to phase r.m.s) shall have a rated insulation level based on an equivalent 3 phase system as indicated in table 1:

Table 1: Insulation Levels.

Nominal system voltage	66 kV	88 kV	132 kV	220 kV
Highest voltage for equipment	72,5 kV	100 kV	145 kV	245 kV
Rated lightning impulse withstand voltage	350 kV	450 kV	550 kV	850 kV
Rated power-frequency withstand voltage	140 kV	185 kV	230 kV	360 kV

9.0 CLEARANCES

9.1 Table 2 indicates the minimum earth clearances which shall be maintained between any conductor or metal normally alive and earthed metal.

Table 2: Earth Clearances

Nominal System Voltage	25 kV	66 kV	88 kV	132 kV	220 kV
Outdoor	540mm	770mm	1000mm	1450mm	1850mm
Indoor	300mm	-	-	-	-

9.2 Table 3 indicates minimum safety clearances which shall be maintained between any conductor or metal normally alive and ground surface level.

Table 3: Minimum Safety Clearances

Nominal system voltage	25 kV	66 kV	88 kV	132 kV	220 kV
Within security fence	3400mm	3270mm	3500mm	3950mm	4350mm
Outside security fence but within Transnet Freight Rail's reserve	5400mm	5700mm	5900mm	6300mm	6700mm
Outside Transnet Freight Rail's reserve	5400mm	5700mm	5900mm	6300mm	6700mm

10.0 CREEPAGE DISTANCES

10.1 The insulators or bushings provided on all high voltage AC disconnecting switches, circuit breakers and transformers shall comply with the requirements of SANS 60137.

10.2 Secondary equipment at 25 kV (phase to earth) shall have Creepage distances based on an equivalent 3 phase system with a highest voltage of the system of 52 kV r.m.s, i.e. 1200mm and 1 488mm for normal (25mm) and heavy polluted (31mm) areas respectively.

10.3 Primary equipment (voltages phase to phase) shall have Creepage distances based on an equivalent 3 phase system in accordance with table 4.

Table 4: Creepage Distances

Nominal system voltage	66 kV	88 kV	132 kV	220 kV
Highest voltage for equipment	72,5 kV	100 kV	145 kV	245 kV
Normal or light pollution	1160mm	1600mm	2320mm	3920mm
Heavy Pollution	1812mm	2500mm	3625mm	6125mm

10.4 Unless an equipment specification specifies a Creepage distance, table 4 shall be used with the information provided in Appendix 1.

11.0 PREVENTION OF CORROSION

11.1 PREPARATION OF OUTDOOR STRUCTURAL STEELWORK.

11.1.1 Steelwork for outdoor installation in inland areas, i.e., at a distance greater than 20km from the coast, shall be hot-dip galvanised according to SANS 121 and SANS 32.

11.1.2 Steelwork for outdoor installation in coastal areas, i.e., within 20km of the sea, shall first be hot-dip galvanised to SANS 121, followed immediately at the galvanising plant by the application of the Sterling paint system in accordance with specification CEE0045.

11.2 PREPARATION OF STEEL BUILDINGS.

Where it is impractical to galvanise large areas of sheet steel, surfaces for outdoor exposure in both inland and coastal areas shall be prepared in accordance with specification CEE0045.

11.3 HANDLING AND FINAL TREATMENT OF PAINTED STEELWORK.

11.3.1 Painted steel shall be handled with care and/or suitably packed to avoid damage during transport and installation.

11.3.2 Any damage to painted surfaces shall be repaired, after installation after which a final finish coat of the paint specified in specification CEE0045 shall be applied.

11.3.3 The following table specifies the colours in accordance with SANS 1091 to be used:

♦ Coastal structural support steel	Tower Grey
♦ Traction transformer tank	Navy light Grey (G35)
♦ Traction transformer conservator tank	White
♦ Substation building	White
♦ Interior of building and all outdoor enclosures	White
♦ Indoor equipment/control panels	Navy light Grey (G35)

12.0 SUBSTATION OPERATIONAL PROTOCOLS

12.1 All traction substation circuit breakers shall trip and remain open (operational inhibit) should the circuit breakers tripping power supply (110V DC) be lost completely or fall below 70% of nominal battery voltage. It shall only be possible to close the circuit breakers when the supply voltage reaches 85% of the nominal value.

12.2 PRIMARY DISCONNECTOR

12.2.1 It shall not be possible to operate the primary disconnector unless the primary circuit breaker is open.

12.2.2 It shall not be possible to earth the load side of the primary disconnector before the isolator blades are completely open.

12.2.3 With the disconnector in the open position it shall be possible to operate the primary circuit breaker for test purposes.

12.3 PRIMARY CIRCUIT BREAKERS

12.3.1 The primary circuit breaker shall trip and remain open for the following events:

12.3.1.1 Inverse Definite Minimum time operation (Primary).

12.3.1.2 Instantaneous overcurrent operation.

12.3.1.3 Transformer winding and oil temperature (85^0C and 95^0C).

12.3.1.4 Phase Under voltage and Overvoltage.

12.3.1.5 Utility No-Volt protection.

12.3.2 The primary circuit breaker shall trip and lockout for the following events:

12.3.2.1 When the SF6 gas pressure falls to the first warning pressure value (before it reaches the safe operational threshold) and circuit breaker or Circuit breaker health operation.

12.3.2.2 Transformer Buccholz first operation.

12.3.2.3 Transformer restricted earth fault.

12.3.2.4 Transformer biased differential.

12.4 SECONDARY DISCONNECTOR (25kV)

12.4.1 It shall not be possible to operate the secondary disconnector unless the 25kV Incomer circuit breaker is open.

12.4.2 With the disconnector in the open position it shall be possible to operate 25kV Incomer circuit breaker for test purposes.

12.5 SECONDARY CIRCUIT BREAKERS (25kV)

12.5.1 **INCOMER CIRCUIT BREAKER**

12.5.2 The 25kV Incomer shall trip and remain open for the following events:

12.5.2.1 Circuit breaker health failure.

12.5.2.2 Inverse Definite Minimum time operation (Secondary overcurrent).

12.5.2.3 Intertripping with the primary circuit breaker. If the primary circuit breaker is tripped by any of the transformer protection relays, then the incomer circuit breaker shall trip and shall not be able to close until the primary circuit breaker is closed.

12.5.2.4 The incomer will trip and remain open, in the event of reverse current flow operation.

12.5.3 It shall not be possible to parallel incoming 25kV supplies through a substation busbar coupler in double unit substations. (It must not be possible to close both Incomer circuit breakers with the Busbar coupler in the closed position) Where a busbar coupler is required in a single unit substation, this feature shall be provided for future use when the incoming supply is doubled.

12.5.4 The operation of the Busbar coupler (opening or closing) shall only be possible if all the Secondary Circuit Breakers (Incomers and Track feeders) are in the open position.

12.5.5 **TRACK FEEDER CIRCUIT BREAKERS**

12.5.6 The track feeder circuit breakers shall trip and remain open for the following events:

12.5.6.1 Circuit breaker health failure.

12.5.6.2 Operation of the thermal overload relay. The breaker shall trip and remain open (operational inhibit) until the relay resets.

12.5.6.3 Impedance distance protection operation. The breaker shall trip and the two shots auto reclose sequence will be initiated. Should the breaker trip again after the auto reclose sequence, it shall remain open. (No lockout or auto reclose)

12.5.6.4 When local operation of a circuit breaker is selected any auto reclose feature provided shall be rendered inoperative.

12.5.6.5 The health of the feeder protection relay shall trip and lockout the circuit breaker.

SECTION 2: TRACTION SUBSTATION EQUIPMENT

13.0 STEELWORK

13.1 The design, supply and installation of all steel structures for the support of equipment and tensioning of conductors shall be the responsibility of the successful tenderer.

13.2 Structural steel shall comply with BS EN 10029.

13.3 All welded joints shall be seal welded with no gaps or blow holes.

13.4 All steelwork shall be hot-dip Galvanised to SANS 121.

13.5 A lattice type steel gantry (25 kV gantry) shall be provided on which for secondary circuit breakers of the outdoor structure mounted type the following items of equipment shall be mounted:

- 25 kV disconnector
- 25 kV Busbar
- Lightning arrestors (for each feeder circuit)
- Auxiliary transformer
- Voltage transformer
- All Secondary Circuit Breakers (Incomer as well as the track feeders)
- All track feeder overhead feeders (500mm^2 Aluminium) shall be made off on this structure with the span length being the distance to the overhead track equipment switch structure which will be provided by others.

13.6 A typical layout of the above arrangement is shown in drawing CEE TBB 109 (Appendix 3).

13.7 Support steel structures for the following equipment shall be provided:

- High voltage double pole disconnector.
- High voltage lightning arrestors.
- Primary circuit breaker.
- High voltage Current Transformer.

13.8 The manufacture of any steelwork shall not take place prior to the approval by the Technical Officer of the design drawings. All steelwork shall be approved by a structural Engineer.

13.9 Transnet Freight Rail shall inspect the steelwork at the manufacturers works prior to dispatch.

14.0 PRIMARY AND SECONDARY DISCONNECTORS

14.1 Disconnectors and earthing switches shall comply with the requirements of Transnet Freight Rail's specification BBB7842.

14.2 Disconnectors and earthing switches shall be of the air break type suitable for outdoor installation and be designed for manual operation from ground level.

14.3 The primary disconnector shall be of the double pole type.

14.4 The secondary disconnector shall be of the single pole type.

14.5 Interlocking shall be provided on the primary disconnector to ensure that the disconnector can only be opened with the primary circuit breaker in the open position.

14.6 Interlocking shall be provided on the secondary disconnector to ensure that the disconnector can only be opened with the incomer circuit breaker in the open position.

14.7 The primary disconnector shall be provided with means to earth the load side of the disconnector when in the open position.

14.8 The disconnector shall be rated to suit the associated equipment.

14.9 Tenderers shall provide details of the disconnector offered and the proposed method of interlocking.

15.0 SURGE ARRESTERS

15.1 All surge arresters shall be of the substation class and shall comply with the requirements of Transnet Freight Rail's specification no. BBB0845.

15.2 All surge arresters shall have a long duration discharge, which shall be class 2.

15.3 Surge arresters shall be connected to each phase of the incoming primary supply. The supply system may be considered to be effectively earthed.

15.4 Surge arresters rated for 44kV r.m.s shall be provided for connection to each 25 kV circuit feeding the overhead track equipment.

15.5 All surge arresters earth lug shall be connected to the substation main earth mat by means of the specified conductor.

16.0 PRIMARY CIRCUIT BREAKERS

16.1 Primary circuit breakers shall be of the SF6, gas filled type. Circuit breakers shall comply with Transnet Freight Rail's specification no. BBB1267.

16.2 The circuit breaker shall be of the double pole type for outdoor operation.

16.3 The circuit breaker shall be suitably rated for electrical substation equipment.

16.4 The rated short-circuit breaking current shall be at least 16 kA.

16.5 The operating mechanism shall be provided with shunt release for both opening and closing.

16.6 The circuit breakers shall be designed for electrical operation at 110V DC from the substation battery supply.

16.7 Tension springs shall not be used for either closing or tripping mechanisms.

16.8 The circuit breaker shall be of the trip-free type.

16.9 A visual mechanical indicating device shall be provided to show whether the circuit breaker is closed or open.

16.10 The operating mechanism shall be constructed of non-ferrous material.

16.11 Auxiliary contacts shall be provided for operation in conjunction with the protection and other auxiliary circuits specified. At least one spare pair of normally open and one spare pair of normally closed contacts shall be provided.

16.12 The circuit breaker shall be provided with a control panel in the substation building on which are mounted the protection relays, control switches and associated equipment.

16.13 Circuit breaker control switches shall be provided on the control panel as well as on the circuit breaker mechanism. They shall return automatically to the neutral position when the handle is released after being turned to either the "close" or "trip" positions.

16.14 Local/Remote selector switches shall be provided on the control panel in the substation building as well as on the circuit breaker mechanism and shall be of the two-position type (no "off" or "neutral" position).

16.14.1 Provision shall be made that when the circuit breaker is switched to the local position, the protection trip circuitry from the control panels to the circuit breaker shall not in any way be disconnected

16.15 Mechanical operation shall be provided on the circuit breaker for any closing or trip release which is normally electrical operated.

16.16 The circuit breaker shall be provided with a no volt coil which will trip and lock out the breaker when the coil is de-energised. Drawing no. CEE-TBK-27 forming part of this specification, details control circuitry.

16.17 It shall be possible to close the circuit breaker only when the control voltage is above 85% of the nominal value, and the circuit breaker shall trip automatically when the control voltage falls below 70% of the nominal value.

16.18 A counter shall be provided on the control panel to indicate the number of operations initiated by the protection scheme. In the event of Vacuum Circuit Breakers (VCB) the counter maybe part of the outdoor control equipment.

16.19 Tenderers shall advise the number of circuit breaker operations under full load and fault conditions, after which maintenance and/or measurement of contact wear is recommended.

17.0 TRACTION TRANSFORMER

17.1 GENERAL

17.1.1 The transformer design shall be in accordance with Transnet Freight Rail's specification BBG2415.

17.1.2 Tenderers must comment on the ability of transformers offered to meet these requirements and provide this comment and the following details of transformers previously built for traction supplies with the tender: -

- User.
- Where installed.
- Date installed.
- Quantity supplied.
- MVA rating.
- Voltage ratio.
- BIL of Primary and secondary windings.
- Range of tapings.
- Location of tapings.
- In addition to the above any information relating to reliability and in-service performance should be submitted in support of the above.

18.0 CURRENT TRANSFORMERS

18.1 Current transformers shall be of the bar-primary type and comply with Transnet Freight Rail's specification no. BBB0937. Ratings, ratios and class of accuracy shall be determined by the protection scheme as shown on drawing No. CEE-TBB-109. Current transformer shall have a protection and metering coils. A margin of 5 VA shall be provided for testing purposes.

18.2 If the primary supply voltage is 88 kV and below, then the current transformers for main transformer protection maybe installed in the transformer bushings. If the primary supply voltage exceeds 88 kV then only the current transformers on the secondary side of the main transformer shall be mounted in the transformer bushings, with the primary side's current transformers being of the post type.

18.3 Secondary protection current transformers shall be mounted in the transformer bushings.

18.4 Current transformers shall be installed on the load side of the associated circuit breaker. It shall be possible to remove the current transformers with the minimum of disturbance to other equipment.

18.5 Separate current transformers shall be provided for main and back-up protection on all 25 kV track feeder circuit breakers.

18.6 Since the accurate measurement of harmonics in the traction supply will be necessary from time to time, current transformers offered shall be suitable for these purposes.

19.0 VOLTAGE TRANSFORMERS

19.1 Voltage transformers shall be single phase and have a ratio of 26,4kV/110V. They shall be in accordance with Transnet freight rail's specification BBG5882. Voltage transformer shall be suitable for the measuring and protection purposes.

19.2 Voltage transformers shall be outdoor structure mounted, oil filled type.

19.3 The return side of the primary winding shall have a bushing insulated for 3,3kV and must not be connected to the Voltage Transformer's tank.

19.4 The secondary winding shall be terminated in a cable box.

20.0 AUXILIARY POWER TRANSFORMERS

20.1 Unless otherwise stated two 16kVA, 27500V/240V single phase transformers mounted on the substation portal structure shall be provided by the successful tenderer.

20.2 The transformers shall comply with Transnet Freight Rail's specification no. BBB8204.

20.3 The transformers and the connected equipment shall be capable of operating satisfactorily for a supply voltage varying between 27,5kV and 22,5kV. Main transformer secondary voltage under traction no-load conditions will normally be 27,5kV and auxiliary equipment shall be capable of operating continuously at this voltage.

20.4 Each transformer shall be provided with a suitably rated drop-out fuse link provided in the high voltage supply conductor.

21.0 BUSBAR COUPLER

21.1 The 25 kV busbars of each unit at all double unit traction substations shall be connected together by means of a busbar coupler. A busbar coupler shall be provided in single unit substations where specified in the Schedule of Requirements – Appendix 2.

21.2 For secondary circuit breakers of the outdoor structure mounted type, the busbar coupler shall be a motor operated 25 kV AC track sectioning switch supplied in accordance with specification CEE.0040.

21.3 The track sectioning switch shall be rated at 1500 A and the operating voltage of the switch mechanism shall be 110 V DC.

22.0 SECONDARY CIRCUIT BREAKERS

GENERAL REQUIREMENTS

22.1 Secondary Circuit breakers shall be of the vacuum type. Circuit breakers shall comply with Transnet Freight Rail's specification no. BBB4182.

22.2 Circuit breakers of a service proven design are required and full-supporting details in this respect shall be furnished with tenders. The circuit breakers shall be single pole.

22.3 Circuit breakers shall be of the outdoor structure mounted type and shall be mounted on a suitably designed structure, in the manner indicated on drawing No's CEE-TDB-41 sht's 1 & 2

22.4 The mounting method of the circuit breaker and the operating mechanism shall be adjustable to allow for alignment.

22.5 The circuit breakers shall have a rated voltage of 44 kV, and the system frequency is 50Hz.

22.6 The rated continuous current shall be at least 1200 A.

22.7 The rated short-circuited breaking current shall be 12 kA at a nominal voltage of 25 kV. In addition the circuit breaker shall be capable of interrupting 6 kA at a recovery voltage of 44 kV in the case where a short circuit between phases occurs.

22.8 Fault making current shall be 30 kA peak and at least 12 kA for 3 seconds.

22.9 Opening time on low impedance track faults including relay operating time shall not exceed 0,1 second, for track feeder circuit breakers.

22.10 Tenderers shall advise the capability of circuit breakers offered to interrupt:-

- Capacitive currents.
- Currents with a high harmonic content.

22.11 Tenderers shall advise the chopping current levels of the circuit breaker offered and what steps are taken to keep these values to a minimum.

22.12 Tenderers shall also advise whether special precautions are required to limit the effects of chopped current and to give details.

22.13 The operating mechanism shall be constructed of non-ferrous material or cadmium plated steel.

22.14 The operating voltage shall be 110 V DC.

22.15 The circuit breaker operating mechanism shall be housed in a weatherproof enclosure, and shall be accessible by means of a lockable door.

22.16 The following shall be provided within the enclosure:

- A thermostatically controlled anti-condensation heater.
- A fluorescent light operated by a door switch.
- A 15 A, 220 V AC socket outlet in accordance with SANS 10142.

22.17 The circuit breaker mechanism shall be of the spring operated type with shunt release for both opening and closing. The closing operation shall charge the tripping spring.

22.18 It shall not be possible for the circuit breakers to close while the spring is being charged.

22.19 The spring shall be fully charged before it can be released to close the circuit breaker.

22.20 It shall be possible to charge the spring when the circuit breaker is closed and if the spring can be, and is released, the circuit breaker shall not open.

22.21 There shall not be any danger of a fully charged spring being released by vibration caused by the opening of the circuit breaker under any condition.

22.22 A visual mechanical indicating device shall be provided to indicate the state of the spring and shall be inscribed "Spring Charged" when the mechanism is in the condition to close the circuit breaker and "Spring Free" when it is in any other condition.

22.23 Means shall be provided for charging the spring by hand.

22.24 Means shall be provided for discharging the spring when the circuit breaker is in the "open" position without the circuit breaker attempting to close.

22.25 Facilities shall be provided for locking of the local manual release of the closing spring mechanism.

22.26 The closing springs shall recharge automatically after the completion of a closing operation.

22.27 Tension spring shall not be used for either closing or tripping mechanisms.

22.28 Facilities shall be provided to permit manual slow closing of the circuit breaker for maintenance purposes

22.29 The mechanism shall be trip-free. The contacts shall make before the breaker starts to open.

22.30 If the circuit breaker fails to latch on closing it shall trip before any significant damage can occur.

22.31 A visual mechanical indicating device shall be provided to indicate whether the circuit breaker is closed or open.

22.32 Unless the design of the circuit breaker mechanism is such that compensation for interrupter contact wear is provided automatically, a visible indication shall be provided to show when adjustment is needed. In the case of circuit breakers incorporating more than one interrupter it shall be possible to make such adjustments individually to suit the requirements of each interrupter.

22.33 Auxiliary contacts shall be provided for operation in conjunction with the protection and other auxiliary circuits specified. At least one spare pair of normally open and one spare pair of normally closed contacts shall be provided.

22.34 Local/Remote selector switches on the circuit breaker equipment shall be of the two-position type (no "off" or "neutral" position).

22.35 Circuit breaker control switches shall be arranged to return automatically to the neutral position when the handle is released after being turned to either the "close" or "trip" positions.

22.36 A counter shall be provided on each circuit breaker to indicate the total number of operations of the breaker.

22.37 Tenderers shall advise the number of circuit breaker operations under the following conditions, after which maintenance and/or measurement of contact wear is recommended:-

- Rated breaking capacity.
- Breaking 6 kA.
- Breaking 1500 A.

23.0 TRACTION SUBSTATION BUILDING

23.1 The building to be provided shall be of the prefabricated steel modular type. It shall be robust, waterproof, vermin proof and of sufficiently strong construction to resist all weather conditions encountered in South Africa.

23.2 Details of a suggested design are shown on Drawing No. CEE-TEC-28. This design or variations thereof may be used but tenderers are free to offer alternatives that comply with this specifications requirement.

23.3 When a single unit substation is required, the building design shall facilitate extension to accommodate equipment for a double unit substation in the future.

23.4 Steelwork shall be treated in accordance with the prevention of corrosion requirements specified in clause 11.

23.5 The building shall have a "double-skinned" roof construction to allow a free circulation of air between the skins.

23.6 The outer skin shall be of flat sheet steel of the same thickness as the building.

23.7 The inside walls shall be thermally insulated to the equivalent of 40mm of glass-fibre. The tenderer shall give full details of the material he intends to use as well as the fixing method of the material to the walls (Glue is not acceptable). Protection against mechanical damage to the insulation shall be provided.

23.8 The building shall be large enough to accommodate all equipment that will be contained within the building with enough space for comfortable maintenance of the equipment. The following major items of equipment as called for in this specification must be accommodated within the building:

- An aluminium self-supporting ladder with a height of 1.2m.
- A wall mounted metal key box with a lid and provision for at least 20 keys as shown on Drawing CEE-TCA-92.
- Suitable brackets and/or storage for ladder, special tools and earthing apparatus.
- Suitable bracket on the wall immediately adjacent to the annex door for mounting of a fire extinguisher. (Fire extinguisher will be provided by others).
- Suitable brackets for mounting of a control selector telephone and telecommunications distribution board.
- A complete set of wiring and circuit diagrams for the substation.
- A steel cabinet / desk combination approximately 1150mm wide, 600mm deep and 1 000mm high.
- Tele-control cabinets (provided by others).
- Battery tripping unit.
- Primary Circuit Breaker control panels.
- Secondary Circuit Breaker control panels.
- Low voltage distribution board.

23.9 One door is required for entrance into the building. The door shall be situated in the narrow wall opposite that which contains the ventilation fan. Another door is required at the end of the building which shall only be opened from inside the building. It must be located at the left end of the building from the main entrance door. This door will be used for maintenance purposes.

23.10 It shall be possible to remove, without dismantling, any equipment contained within the building through the door provided.

23.11 The door shall be fitted with a robust locking mechanism capable of being locked by means of a stout padlock provided by Transnet Freight Rail.

23.12 Door hinges shall be robust with hardened steel pins. Doors shall be fitted with a suitable stay to hold them in the open position.

23.13 A foundation and plinth of concrete for the support of the building and its equipment and for the maintenance and handling of all indoor equipment shall be provided.

23.14 The plinth shall be so designed as to eliminate the possibility of water standing in contact with the base of the building.

23.15 Tenderers shall give details of the measures they propose taking to seal the base of the building to the concrete plinth.

23.16 The finished level of the plinth shall not be less than 250mm above ground level .

23.17 The floor surfaces shall be durable non-slip and of pleasing appearance and shall not be subject to damage or marking by normal maintenance activities. In the case of a concrete floor it shall be coated with "Solidkote" or similar.

23.18 Provision shall be made for the entry of cables from the outdoor yard into the building.

23.19 The building design shall be such as to provide the necessary trunking for cable entry to all equipment which will be top entry. (No under floor trunking)

23.20 HEATING AND VENTILATION

23.20.1 A ventilation fan shall be provided in the substation control equipment building. The fan shall be capable of providing 20 air changes per hour.

23.20.2 Ventilators shall not be installed on the roof of the building.

23.20.3 The fan shall draw air from inside the building and blow to the outside through automatically closing shutter louvers.

23.20.4 Thermostatically controlled heaters shall be provided to prevent condensation within the building. Thermostats shall comply with SANS 60730-2-6.

23.20.5 Heaters shall be robust with elements completely enclosed in a metal tube.

23.20.6 Heaters shall be positioned and mounted in such a manner that they are not subject to damage during normal maintenance activities.

23.20.7 Details of the type and rating of heaters must be supplied by tenderers.

24.0 AUXILIARY POWER SUPPLIES

24.1 All low voltage power and lighting circuits shall comply with the requirements of SANS 10142.

24.2 Under traction load conditions the substation supply voltage will have a high harmonic content and equipment supplied from the auxiliary transformer shall be capable of satisfactory operation under these conditions.

24.3 A low voltage distribution board shall be provided in the substation building. The output of the auxiliary transformers shall be connected to two 80A double pole miniature circuit breakers (MCB's) on the distribution board. The MCB's shall be withdrawal or lockable.

24.4 The output from the auxiliary transformers shall be connected to an automatic change-over contactor which must not allow the supplies to be paralleled under any circumstances.

24.5 Where only one auxiliary transformer is called for Transnet Freight Rail will arrange for the supply from a second auxiliary transformer to be connected to one of the 80A MCB'S.

24.6 The distribution board shall be provided with MCB'S to protect and control all lighting, heating, ventilation, socket outlets, control circuits, and supplies to the Eskom equipment. MCB'S shall comply with SANS 156.

24.7 Provision shall be made for six single MCB spare cut-outs for future additions.

24.8 The distribution board must provide for a 110V, 10A DC supply and a 220V, 20A AC supply to be cabled to the Eskom equipment in the Eskom yard. AC and DC circuits shall be physically separated either by means of a partition or separate distribution boards.

24.9 At least two 15A, 220V 3 pin socket outlets shall be provided in the building as well as one outlet mounted in the control panels.

24.10 LIGHTING – Eco Friendly Lighting

24.10.1 Lighting points shall be provided in each building to provide a general level of illumination of 20 lux. Light fittings shall be of the Eco friendly fluorescent type e.g. LEDs.

24.10.2 Two outdoor Eco friendly fluorescent lights shall be provided on the outside of the control equipment building. One shall be mounted above the buildings door and the other shall be mounted on the long side of the building facing the track. These lights shall be controlled by light sensitive switch.

24.10.3 Outdoor Eco friendly fluorescent lighting shall be provided in at least two positions to provide a general level of illumination of 20 lux in the substation yard. These lights shall be controlled from within the control equipment building. Care shall be taken to avoid glare in the eyes of train drivers and the layout must be approved by the Senior Engineer.

25.0 REQUIREMENTS FOR TELECONTROL

25.1 Tele-control and telemetering equipment will be provided by Transnet Freight Rail.

25.2 The Tele-control equipment cabinet, the size of which is approx. 1600x800x800 (hwd), will be housed in the substation control equipment building. Transnet Freight Rail will deliver this cabinet to site, with the installation thereof being the responsibility of the successful tenderer.

25.3 A "Klippon" or similar terminal strip with 250 terminals shall be provided to act as the interface between the substation equipment and the Tele-control equipment. This terminal strip can be housed in one of the switchgear control panels (space permitting) or housed in a dedicated enclosure. The successful tenderer shall terminate all conductors for the Tele-control functions required on one side of this terminal strip. The successful tenderer shall supply and install the cable required to connect the Tele-control equipment cabinet (supplied by Transnet Freight Rail) to the terminal strip. One side of this cable will be connected to the terminal strip with the other side being made off in the Tele-control equipment cabinet for connection by others.

25.4 The relay contacts provided in the Tele-control cabinet for remote operation of switchgear will have a maximum rating of 0.5 A at 110 V DC.

25.5 Indication for Tele-control purposes shall be provided by means of voltage free open and closed contacts on the switchgear.

25.6 Provision shall be made for the following principal Tele-control operations indications and alarms: -

- Open and close command function for all circuit breakers.
- Open and close indication for all circuit breakers.
- Lockout indication for all circuit breakers.
- Indication of failure of voltage transformer output (protection reference voltage).
- Indication of failure of distance protection relay supply voltage. Detection must take place at each relay.
- Indication of charger failure for DC control batteries.
- Indication of transformer pressure relief device operation.

- Indication of low gas (SF6 breakers, Primary and Secondary).

25.7 The following transducers capable of measuring true RMS values of distorted waveforms shall be provided:-

25.7.1 A current transducer to monitor each main transformer secondary current.

25.7.2 A voltage transducer to monitor each secondary busbar voltage.

25.8 The output of these transducers shall be wired to the Tele-control terminal strip.

25.9 Tenderers shall state the type and suppliers of the transducers they intend using.

25.10 Any additional Tele-control functions that might be necessary due to the supply and installation of any specialised equipment offered shall be provided.

25.11 A detailed list of Tele-control commands, indications and alarms shall be submitted for approval by the Senior Engineer.

26.0 CONTROL PANELS

A control panel shall be provided for each Primary and Secondary circuit breaker provided in the substation. These control panels shall contain all the protective relays and circuit control equipment required for the operation of the associated breaker.

26.1 PANEL CONSTRUCTION

26.1.1 The panels shall be constructed of steel sheeting of not less than 2mm thickness. The panel shall be of rigid construction with facilities for lifting.

26.1.2 The panels shall of the swing frame type (access to the panel being via the front swing frame and having no rear access).

26.1.3 The panels shall be fitted with dummy interior covers so as to ensure that when components are mounted, no bolts or screws are visible on the exterior of the panel.

26.1.4 The panel shall be supplied with a gland plate which allows for cable entry from the top. The installation contractor shall punch all required holes into the gland plate on site.

26.2 EQUIPMENT INSTALLED IN THE PANELS

26.2.1 All contactors and relays shall be of liberal rating and design and of the sturdiest construction; they shall not be affected by vibration and shall be silent when energised. Contacts shall be made of silver or other approved metal to minimise damage through oxidation and shall be designed to maintain good contact under all operating conditions.

26.2.2 Relays shall be completely sealed against the ingress of dust and dirt by means of non-inflammable covers which are easily removable. The relays shall have a protection rating of IP34 as defined in SANS 60529.

26.2.3 All protection relays shall be housed in withdrawable pattern cases and shall be so designed and mounted as to make them free from equipment vibration problems.

26.2.4 All relays, contactors, links, MCB's and test terminals shall be readily accessible so that routine examination, maintenance and testing may be carried out without the need to remove bolted panels.

26.2.5 The control equipment provided shall be capable of correct operation within the voltage limits specified in SANS 62271-100. In addition the coils of all devices operated from the substation auxiliary transformer AC supply shall be capable of satisfactorily operating under the harmonic voltage conditions encountered in an AC traction system.

26.2.6 All low voltage circuits in the panel which require protection shall be suitably protected by miniature moulded case circuit breakers which comply with SANS 156. The circuit breakers shall be B-curve design.

26.2.7 All electrical conductors shall be routed in plastic channel trunking with a removable cover. This trunking must be of sufficient size to easily hold the conductors. Should trunking not be feasible, a metal rod can be brazed onto the panel onto which the conductor bundle can be attached by cable ties or some other suitable method. Conductor's supports that are attached by adhesive are not acceptable.

26.2.8 Panel bus wires shall be fully insulated and shall be run separately along the panel. MCB's shall be provided to enable independent circuits to be isolated from the bus wires. Separate troughs or ducts shall be provided for the building wiring and control wiring.

26.2.9 Protection circuits shall be provided with PK2 type test blocks to enable the temporary connection of instruments, meters or test equipment without interfering with fixed wiring.

26.2.10 All wires shall be provided with identification tags at terminals and shall be marked as reflected on the panel wiring diagrams. The diagram markings and wire markings shall be the same.

26.2.11 All cables shall be marked at both ends with markings the same as that which appears on the wiring schematics and diagrams.

26.2.12 All relays, cables, terminal strips, switches, lamps, push buttons etc. which are mounted on panels, shall be labelled to clearly indicate their function.

26.2.13 An annunciator indicating panel giving visual (LED display) indication of the reason for the circuit breaker's trip shall be provided on the circuit breaker control panel.

26.2.14 A counter shall be provided on the control panel of each circuit breaker to indicate the number of trips initiated by the protection scheme.

26.2.15 Each protective element that causes the circuit breakers to trip shall be catered for (Buchholz, overload, SF6 low gas, distance protection etc.). The visual alarm shall continue until the indication alarm is accepted and reset.

26.2.16 No anti condensation heaters are required inside the panels.

26.2.17 Each panel shall have and interior fluorescent lamp which will be switched by a door switch.

26.3 INDICATING INSTRUMENTS

26.3.1 All indicating instruments shall be designed, manufactured and tested in accordance with IEC 60051-1 and shall be flush mounted.

26.3.2 The dials of instruments shall be marked with the ratio of the associated instrument transformers.

26.3.3 The full-scale deflection of instruments shall be not less than 85mm and the scales shall be:

- Voltmeters 0 – 30 kV
- Ammeters 0 - 1 500 A

26.3.4 A voltmeter shall be provided to indicate the voltage of each section of the 25 kV busbar.

26.3.5 An ammeter shall be provided to indicate the primary and secondary current.

27.0 DC BATTERY AND CHARGER

27.1 The DC control battery and charger shall comply with specification No.CEE.0085 except where special arrangements are necessary to suit the design of equipment offered. The Tenderer shall complete appendix No.2 of that specification.

27.2 The rating of the battery and charger to be installed in each substation shall be based on the burden of the equipment to be supplied.

27.3 The nominal voltage of the battery shall be 110 V.

27.4 The batteries shall be of the nickel cadmium sealed type. The capacity should therefore not be less than 10 Ampere hours.

28.0 PROTECTION

Drawing no. CEE-TBB-109 shows the principle protection requirements for a substation and must be read in conjunction with the following specific requirements.

28.1 Separate current transformers shall be provided for main and back-up protection on all 25 kV track feeder circuit breakers.

28.2 PRIMARY CIRCUIT BREAKER TRIPPING

28.2.1 The following protection relays shall be provided and when operated shall cause the primary circuit breaker to trip and lockout: -

28.2.1.1 Buchholz.

28.2.1.2 Restricted earth fault on both primary and secondary windings.

28.2.1.3 Transformer percentage biased differential.

28.2.1.4 Primary circuit breakers SF6 low gas.

28.2.1.5 Traction transformer pressure relief valve.

28.2.2 The following protection relays shall be provided and when operated shall cause the primary circuit breaker to trip only, allowing re-closure from remote.

28.2.2.1 Transformer winding and oil temperature.

28.2.2.2 Inverse Definite Minimum Time (IDMT) operated from transformer primary current.

28.2.2.3 Circuit breaker tripping supply under voltage and overvoltage detection.

28.2.2.4 Instantaneous overcurrent.

28.2.2.5 Utility No-Volt protection.

28.3 SECONDARY CIRCUIT BREAKER TRIPPING

28.3.1 Secondary circuit breaker protection relays shall be circuit specific:

28.3.2 The following protection relays shall be provided and when operated shall cause the secondary circuit breaker to trip only, allowing re-closure from remote.

28.3.3 Incomer circuit breaker

28.3.3.1 Inverse Definite Minimum Time (IDMT) overcurrent relay.

28.3.3.2 Instantaneous overcurrent.

28.3.3.3 All units shall be equipped with a reverse power relay.

28.3.4 Track feeder circuit breaker

28.3.4.1 Single phase Distance Impedance relay shall be in accordance with TFR specification BBG 5003. A track feeder circuit breaker will normally be the only feed into a section of railway line and will therefore not be required to discriminate with other track feeder circuit breakers.

28.3.4.2 The thermal overload relay shall be as specified in BBG5003.

28.3.4.3 Auto reclose relay with dead time and reclaim time independently adjustable as per relay operation. An operations counter shall be provided. The auto reclose sequence shall only be initiated by the impedance distance protection relay as per BBG5003.

28.3.4.4 Circuit breaker health detection.

28.4 AUXILIARY TRANSFORMER PROTECTION

28.4.1 Each 16 KVA auxiliary transformer shall be provided with a 1 Amp dropout fuse in the primary supply conductor.

28.5 RELAYS AND CIRCUITRY PROTECTION

28.5.1 All circuits supplied by the auxiliary transformers shall be protected by an earth leakage relay.

28.5.2 All circuits, regardless of source of supply shall be protected by suitably rated miniature circuit breakers. (MCB's)

28.5.3 Due to the susceptibility of protection relays to damage due to poor quality of supply as well as lightning surges, the tenderer must state what measures will be implemented to safeguard this equipment.

29.0 CONDUCTORS, CABLES, AND SMALL WIRING

29.1 The following electrical conductors shall be used in the construction of a substation.

Table 5: Electrical conductors

Primary (HT) Flying jumper	160 mm^2 Al (stranding 19/3.35)
Secondary (25kV) overhead conductors/jumpers	500 mm^2 Al (stranding 37/4.25)
Earth Mat	3x30 mm Cu strap (90 mm^2)
Steelwork earth mat connections cast in concrete foundations	95 mm^2 Cu equivalent ERICO cadstrap earth tails or Copper weld.
Earth connections from isolator earth blade to earth mat	95 mm^2 Cu equivalent ERICO cadstrap earth tails or Copper weld
Earth connections from all lightning arrestors to earth mat	150 mm^2 Al stranded insulated cable
Neutral return overhead conductor	500 mm^2 Al (stranded 37/4.25)
Auxiliary transformer and VT's neutral conductors	70 mm^2 stranded Cu unarmoured cable insulated for 3.3kV
Auxiliary transformer positive conductor	50 mm^2 stranded annealed Cu
Earthing harness	95 mm^2 stranded annealed insulated conductor

29.2 The 25 kV busbar shall be Aluminium and shall have a continuous rating of 1500 A. Busbars shall comply with BS 159.

29.3 Outdoor high voltage conductors shall be of all aluminium composition. ACSR conductors are not acceptable.

29.4 All low voltage cables shall be 600/1 000 Volt PVC insulated sheathed in terms of specification SANS 1507.

29.5 Cables for indoor use only may be unarmoured. Cables for outdoor use shall be armoured, and suitable for laying direct in the ground.

29.6 Small wiring and terminations shall comply with SANS 10142 and SANS 61936-1. The current ratings for the various sizes of conductors shall not be exceeded.

29.7 All instrument and control wiring shall be a minimum size of 2.5 mm^2 cross-section with stranded copper conductors. Wires connected to the current transformers shall have a minimum cross-section of 4 mm^2.

SECTION 3: - INSTALLATION OF EQUIPMENT

30.0 SUBSTATION SITES

Details of substation site sizes and positions (orientation to track) are shown on substation layout drawings listed in appendix 1.

30.1 SITE PREPARATION

All substation sites will be cleared i.e. shrubs, bush, stumps and debris shall be completely removed from the site. Trees shall be uprooted and removed.

30.2 SITE LEVELS

30.2.1 The site level shall be raised 500 mm above the natural ground level.

30.2.2 The final level of the earthworks on site shall be at a cross fall of not less than 2% parallel to the shortest rectangular dimension of the site. The fall must be in the same direction as the prevailing fall of the natural ground level parallel to the shortest rectangular dimension.

30.2.3 The site must be flat.

30.3 MATERIAL

30.3.1 The in situ material may be used for the bottom layer in a cut to fill operation if the material can be compacted as per compaction requirements. Should this not be the case the material may not be used.

30.3.2 Material of quality G5 must be used for earthworks in accordance with SAPEM – standards chapter 4.

30.4 COMPACTION

30.4.1 The material shall be deposited in layers, not exceeding 300mm prior to compaction. Material shall be compacted to 95% Mod. AASHTO at OMC.

30.4.2 All substation sites shall be inspected and signed off by the Senior Engineer prior to any construction taking place.

30.4.3 Each substation site shall be fenced by a stock/boundary fence as well as by a security fence in accordance with the fence lines shown on the substation layout drawings listed in Appendix No. 1

30.4.4 The extent of kerbing to be installed at each substation site is shown on the substation layout drawings listed in Appendix No. 1.

30.4.5 The security fence and kerbing shall be installed in accordance with the drawing specified in Appendix 2 and shall not be installed prior to the installation of all steelwork and equipment and the making off of all overhead conductors. The Senior Engineer shall authorise the installation of the fencing and kerbing.

30.4.6 The stock/boundary fence shall be installed in accordance with Drawing No CCE Type 1-45. This installation shall occur simultaneously with the security fencing.

30.4.7 After completion of construction a suitable weed killer to be approved by the Senior Engineer shall be applied throughout the site within the boundaries of the small stock/boundary fence, in accordance with the manufacturers' instructions. The successful tenderer shall exercise the greatest care to avoid contaminating private property.

30.4.8 After treatment with the weed killer, a 100mm layer of 25mm crusher stone shall be laid over the whole area of the Transnet Freight Rail yard (within the kerbing).

30.4.9 Access to the sites shall be by means of Transnet Freight Rail maintenance roads. Should the tenderer feel that these roads are not adequate, a separate quotation for any work deemed necessary shall be submitted with the tender.

31.0 FOUNDATIONS

31.1 The successful tenderer shall be responsible for the design and installation of foundations for all the structures, equipment and buildings within the substation yard.

31.2 The successful tenderer shall carry out his/her own survey in regard to soil types and their load bearing capabilities.

31.3 Tenderers must ensure that provision (financial as well as time) for excavations in a range of soil types is allowed for in their tenders.

31.4 Equipment support foundations shall be finished off 200mm above the finished earth level of the yard. The design must be such as to prevent standing water.

31.5 All foundations edges shall be bevelled and the surfaces must be float finished.

31.6 All support foundations shall be at the same level.

31.7 An earth mat conductor shall be cast in the concrete foundation for the connection of support steelwork to the earth mat. This shall be done in accordance with Drawing No. CEE-TEE-173 sht's 1-3.

31.8 This earth conductor shall be electrically connected to the foundation bolt group such that in the event of the visible earth connection being removed, an earth connection via the bolt group is maintained. This shall be done in accordance with Drawing No CEE-TEE-173 sht's 1 - 3.

31.9 A plastic pipe shall be cast into all concrete foundations for earth/control cabling to be taken up the structure and shall be done in accordance with Drawing No CEE-TEE-173 sht's 1-3.

31.10 If the foundation for the main traction transformer is larger than the transformer base plate, then a portion of the foundation the exact size of the base plate must be raised at least 50mm to prevent the possibility of standing water against the transformers base plate.

32.0 CONCRETE

32.1 The 28-day strength of all concrete used shall be a minimum of 20Mpa.

32.2 The successful tenderer shall arrange for sampling and testing of all concrete used, and shall submit full records to the Senior Engineer. Transnet Freight Rail reserves the right to undertake testing of concrete samples and the successful tenderer shall furnish test cubes if requested by the Senior Engineer.

32.3 Hand mixed concrete is not acceptable, it must be mechanically mixed.

32.4 The addition of water to a concrete mix reduces the strength of that concrete very significantly and on no account shall water be added to a mix after test cubes have been taken.

32.5 There shall be a minimum of 100 mm concrete cover for all steel reinforcing.

33.0 INSTALLATION OF SUBSTATION EQUIPMENT

33.1 The installation of the equipment required for the construction of the required substations will be carried out in accordance with the substation layout drawings listed in Appendix 1. These drawings will indicate the particular requirements for each substation.

33.3 All fasteners (nuts & bolts) shall be secured using flat as well as lock washers.

Requirements for the installation of substation equipment are as follows:

33.4 PRIMARY ISOLATOR

33.4.1 The primary supply conductors will be made off by the supply authority on a terminal structure which shall be supplied and installed by the successful tenderer. Tails and clamps for the connection of the primary supply to the primary isolator will be provided by the successful tenderer. These tails will probably be Wolf conductors, which must be confirmed by the Senior Engineer.

33.4.2 The earth connection of the earthing blades shall be connected to the substation earth mat.

33.5 MAIN TRANSFORMER

33.5.1 The interface between the traction transformer plinth and the steel tank must be sealed using an outdoor UV resistant silicone sealer.

33.5.2 A 150mm diameter PVC pipe shall be cast into the transformer plinth to allow for the routing of control and protection cables. This pipe shall be installed based on the principles indicated on Drawing No. CEE-TEE-174 sht's 1-3. This pipe shall be positioned such that the cables enter the transformer control cable terminal box vertically.

33.5.3 The earth conductors connecting the transformer tank to the earth mat at two places shall be cast into the transformer plinth such that a minimum of the conductor is exposed based on the principles indicated on Drawing No. CEE-TEE-174 sht's 1-3. This conductor must be cast into the plinth in such a manner as to prevent the conductor being damaged during the installation of the transformer.

33.5.4 The secondary transformer bushing that will be designated as the positive (25 kV) bushing is the bushing on the left side of the transformer looking at the transformer from the secondary side.

33.5.5 The negative secondary bushing shall be connected directly to the substation earth mat. The lightning arrester must be mounted on the transformer tank in close proximity to the negative bushing. The conductor to be used for this connection to the earth mat shall be similar to that specified for the earth connection of the primary isolator.

33.6 VOLTAGE TRANSFORMER

33.6.1 For secondary circuit breakers of the outdoor structure mounted type, the voltage transformers shall be mounted outdoors on the secondary switchgear gantry. (25 kV gantry)

33.6.2 The live side of the primary winding shall be connected to the 25 kV busbar.

33.6.3 The neutral side of the primary winding of each voltage transformer shall be connected to the overhead neutral return current conductor.

33.6.4 The secondary winding shall be connected to the appropriate circuits through MCB's.

33.7 AUXILIARY TRANSFORMER

33.7.1 The primary positive pole of the auxiliary transformer shall be connected on the traction transformer side of the secondary isolator and should a second auxiliary transformer connected to the 25 kV supply be required, its primary positive pole shall be connected to the overhead track equipment on the load side of the track feeder switch (see drawing No. CEE - TBB -109).

33.7.2 The auxiliary transformer connected to the main transformer side of the disconnector shall be mounted on the 25 kV gantry. It shall be mounted in such a manner as to allow space for the drop out fuse to be mounted and to function safely, above the auxiliary transformer.

33.7.3 The second 25 kV auxiliary transformer (see schedule of requirements) shall be mounted on one leg of the overhead track equipment track switch structure. (see drawing No. CEE-PFB-30 for typical mounting details)

33.7.4 The neutral of the primary winding of each 25 kV Auxiliary transformer shall be connected to the overhead neutral return current conductor.

33.7.6 The secondary output of the auxiliary transformers shall be cabled to a distribution board in the substation building.

33.8 SECONDARY ISOLATOR

33.8.1 The secondary isolator shall be mounted on the 25 kV gantry structure.

33.9 SECONDARY CIRCUIT BREAKERS

33.9.1 Secondary circuit breakers of the outdoor structure mounted type shall be mounted on the 25 kV gantry structure.

33.9.2 The outdoor switchgear shall be mounted on suitably designed horizontal steel beams forming part of the 25 kV gantry structure (see Drawing No's CEE-TDB-41 sht's 1 & 2)

33.9.3 The outdoor switchgear mounting arrangement shall allow for lateral and vertical adjustment to enable proper alignment of switchgear to take place.

33.9.4 The switchgear shall be mounted in such a manner as to allow an isolating gap of not less than 300 mm between the circuit breaker terminals and the 25 kV busbar should the jumper be removed.

33.10 SECONDARY LIGHTNING ARRESTORS

33.10.1 All secondary lightning arrestors shall be mounted on the 25 kV gantry and shall be connected in the circuit in accordance with Drawing No. CEE-TBB-109.

33.10.2 The earth connection of all the secondary lightning arrestors shall be connected to the substation earth mat by means of the specified earthing conductor.

33.11 25 kV BUSBAR

33.11.1 For secondary circuit breakers of the outdoor structure mounted type, the 25 kV aluminium busbar shall be mounted between the two vertical legs of the 25 kV gantry in such a manner as to allow for a isolating gap of 300 mm between the busbar and the terminals of the secondary circuit breakers should the jumper be removed.

33.12 BUSBAR COUPLER (DOUBLE UNIT TRACTION SUBSTATIONS)

33.12.1 For secondary circuit breakers of the outdoor structure mounted type the busbar coupler shall be mounted on the 25 kV gantry structure as per drawing no. CEE-TDB-41 sht 1. The two additional isolation MOD's on a bus coupler shall be interlocked.

33.12.2 The installation of the busbar coupler shall be done in accordance with specification CEE.0040.

33.12.3 The jumpers used to connect the busbar coupler switch to the two busbars shall be rated at 1500 A.

33.13 SUBSTATION BUILDING

33.13.1 The substation steel building shall be bolted to the foundation plinth and sealed to prevent the ingress of vermin.

33.13.2 The orientation of the building to the site will be shown on the substation layout drawings.

33.14 EQUIPMENT INSTALLED IN THE SUBSTATION BUILDING

33.14.1 The layout of the equipment installed within the building shall be in accordance with Drawing No. CEE-TEC-28.

33.14.2 All equipment installed within the substation building shall be attached to either the floor or the walls.

33.15 CABLES

33.15.1 Cable trenches shall have a minimum depth of 500mm measured from ground level. All trenches shall be backfilled and compacted in layers to the compaction of the surrounding yard.

33.15.2 The exact position and size of each cable in the yard shall be shown on the cable layout plan. These drawings shall be submitted for approval prior to installation.

33.15.3 Asbestos free-cement cable pipes shall be installed beneath any roadway, where the crossing of a roadway by cables is required. These pipes shall be not less than 150mm in diameter and shall protrude at least 500mm on either side of the roadway. The pipes shall be graded 1:400 for water drainage.

33.15.4 All cables entering the control equipment building shall be block jointed (50mm of armouring to be removed) above the ground. The block jointing shall be done before the cables are installed into the control equipment building. The block joint shall be covered by a heatshrink sleeve.

33.15.5 All cables shall terminate in compression type glands. These glands shall be fitted with neoprene shrouds.

33.15.6 Armoured cables terminating on outdoor equipment shall have their armouring connected to earthed metal by means of a suitable gland.

33.15.7 Cables and earthing conductors connected to equipment installed on steel support structures shall be supported on the steel structure vertically and horizontally by means of a cable tray. This cable tray shall be of the O-Line GS50 Gridspan Wire Mesh type or similar with the wire mesh having a diameter of 4mm and a hot dip galvanised finish.

33.15.8 The cable trays shall be attached to the support steel in accordance with drawing No. CEE - TDC-10.

33.15.9 Should the cable termination box of an item of equipment overhang the vertical steel support structure, the cable can be installed directly from the cable trench to the terminal box provided a hot dip galvanised steel cable support is provided. This support must either be securely attached to the terminal box or be concreted into the ground. (see drawing No. CEE-TDC-10)

33.15.10 Cable trays for indoor installation shall be galvanised type O-line PT38 or similar.

33.15.11 The cables shall be fixed to the cable trays using UV stabilised cable ties.

33.16 INTERCONNECTION OF EQUIPMENT

33.16.1 Conductors between separately mounted outdoor equipment shall incorporate a degree of flexibility to avoid any stressing of these connections due to foundation movement or conductor expansion/contraction and to facilitate alignment of equipment.

33.16.2 All connections to the overhead conductors shall be made using clamps that are specifically designed and manufactured to make that particular connection (ad hoc fabricated clamps are not acceptable).

33.16.3 High conductive silicon grease shall be liberally applied to all connections.

33.16.4 All dissimilar metal connections (Cu to Al) shall be made using bi-metallic clamps that are specifically designed and manufactured to make that particular connection (ad hoc fabricated clamps are not acceptable).

33.16.5 All copper connections to steel (galvanised) shall be tinned.

33.16.6 The overhead neutral return conductor shall be insulated using disc insulators for 3,3 kV.

33.16.7 The overhead track feeder conductors shall be provided between the 25 kV gantry and the overhead track equipment portal structure.

33.16.8 The overhead track feeder conductors complete with insulation and fitted with suitable bi-metallic clamps for the connection of two 160mm^2 Cu conductors (provided by others), shall be supplied and made off on the track switch portal by the contractor. Others shall do the connection of these conductors to the track switches. This forms the substation/overhead track equipment contract boundary.

33.17 FENCING AND KERBING

33.17.1 The boundary/stock fence, security fence and concrete kerbing shall only be installed once all major items of equipment and steelwork have been delivered and installed and all overhead conductors stringing is complete.

33.17.2 The extent of Boundary/stock fencing, security fencing as well as kerbing for each substation site is shown on the substation layout drawings listed in Appendix No. 1.

33.17.3 The security fence required shall be in accordance with the drawing as specified in Appendix 2.

33.17.4 Kerbing shall be installed in accordance with Drawing No. CEE-TEA-1.

33.18 "RETURN" CURRENT AND SUBSTATION EARTHING

33.18.1 RETURN CURRENT

33.18.1.1 It is required that the return current from the traction system shall not return to the main transformer via the substation earth. Therefore the principles set out below and indicated on Drawing No.CEE-TBD-8 shall be adhered to and adapted to suit the particular equipment offered.

33.18.1.2 An overhead return conductor shall be provided between one terminal of the main transformer secondary winding (negative bushing) and the overhead track equipment switch structure, where it will be connected to the overhead track equipment's return circuit by others. This conductor shall be insulated for at least 3,3 kV.

33.18.2 SUBSTATION EARTH

33.18.2.1 A main earth mat shall be installed in Transnet Freight Rail's substation yard in accordance with Drawing No. CEE-TBD-8.

33.18.2.2 The earth mat shall be a trench earth system consisting of copper conductor with a cross sectional area of 90 mm^2 buried in trenches at a depth of 700mm.

33.18.2.3 Should soil conditions be such that this depth cannot practically be achieved, the reduced depth shall be approved by the Senior Engineer. If the trench depth is below 600mm, precast concrete slabs shall be placed 100mm above the copper earth conductor in the trench and backfilled.

33.18.2.4 All earth mat joints shall be brazed or exothermically welded.

33.18.2.5 The earth mat connections to structural support steel as called for on drawing No. CEE-TBD - 8 shall be made via the copper earth connection cast into the associated foundations.

The earth mat shall be brazed to the tails protruding from the support foundations at a depth of 600mm.

33.18.2.6 The earth resistivity of the earth mat shall be less than 5 Ω (ohms).

33.18.2.7 A ring earth, not forming part of the floor, with a 90mm^2 copper cross-sectional area shall be provided in the substation building. This ring earth shall electrically connect all steel modules, which the building consists of.

33.18.2.8 The fences bordering the Transnet Freight Rail substation yard shall be bonded to the substation main earth mat as shown on Drawing No. CEE-TBD-8.

33.18.2.9 Substation equipment shall be connected to the earth mat in accordance with the requirements shown on Drawing No. CEE-TBD-8. The following connections shall also be connected to earth mat: -

- The earth connection of all lightning arresters
- The earth connections of the earth blades on the high voltage isolator.
- A suitable terminal to allow for the connection of the secondary switchgear earthing harness's to the earth mat.

33.18.3 EARTHING DEVICES

33.18.3.1 Any device provided for earthing of equipment shall comprise PVC covered 65mm^2 Cu conductors, link stick clamps to fit 500mm^2 Al. Conductors similar to that at one end, and a clamp for clamping to the earth mat terminal at the other.

33.18.3.2 The clamps for the connection of the overhead feeder to the load side of the secondary switchgear shall be designed such that a suitable attachment for the earthing harness is provided.

33.18.3.3 Portable earth connections adequately designed for safety in application shall be supplied. All portable earth harnesses shall be approved by the Senior Engineer.

33.18.3.4 In a single unit substation a portable earthing harness shall be provided for connecting all secondary switchgear outdoor bushing terminals simultaneously to the substation main earth mat.

33.18.3.5 In double unit substations two portable earthing harnesses as per the previous clause shall be provided.

33.19 NAMEPLATES AND LABELS

33.19.1 A substation nameplate shall be provided. The names of the substations shall be as specified in Appendix No. 1. The nameplate shall be manufactured in accordance with Drawing No. CEE-TEA-2.

33.19.2 Danger warning notices as per Drawing CEE TA-196 shall be supplied and fitted to the substation building access door, on each half of the substation gate, one notice on the narrow side substation fence and two notices on the long side substation fence.

33.19.3 All nameplates and labels shall be in English.

33.19.4 Labels shall be attached by screws or rivets or by a method approved by the Senior Engineer.

33.19.5 All labels shall be made of composite sandwich type plastic material of the following colour combinations: -

33.19.6 Identification labels: White lettering on black background. Letters must be of sufficient size to be clearly legible.

33.19.7 Danger labels: White lettering on red background. Letters must be of sufficient size to be clearly legible.

- On (I)
- Off (O)
- Open (Verb.)
- Close (Verb.)
- Closed
- Open
- Trip
- Local
- Remote
- Do not operate link under load
- Open and earthed

33.19.9 Each circuit breaker and circuit breaker control panel shall be provided with labels to indicate the breaker designation and tele-control code. Transnet Freight Rail (Senior Engineer) will supply these designations and tele-control codes

33.19.10 The proposed labelling scheme must be submitted to the Senior Engineer for approval prior to the manufacture of the labels.

SECTION 4: TESTING AND COMMISSIONING

34.0 TYPE AND ROUTINE TESTING REQUIREMENTS

34.1 Type and routine tests shall be conducted on the equipment to be supplied. These tests shall be carried out at the successful tenderers expense.

34.2 Test certificates in respect of type tests conducted on identical equipment may be accepted in lieu of type tests at the discretion of Transnet Freight Rail.

34.3 Delivery of equipment shall not commence before acceptance of type test certificates has been obtained from the Senior Engineer.

34.4 Primary circuit breakers shall be tested in accordance with SANS 62271-100.

34.5 Secondary circuit breakers shall be tested in accordance with SANS 62271-200.

34.6 Primary and secondary disconnects and earthing switches shall be tested in accordance with SANS 62271-102.

34.7 High voltage fuses for protection of auxiliary transformers shall be tested in accordance with SANS 60282-1.

34.8 Voltage transformers shall be tested in accordance with SANS 60186.

34.9 Auxiliary transformers shall be tested in accordance with SANS 780.

34.10 The transformer shall be tested in accordance with SANS 60076-4, including a test with lightning impulse chopped on the tail.

34.11 Transnet Freight Rail staff will conduct an out of tank inspection of the transformer prior to the transformer being tanked as well as witnessing all the routine manufacturers tests carried out at the works. The co-ordination of manufacturers testing shall be the responsibility of the successful tenderer.

34.12 Type test certificates of the transformer design offered shall be submitted with the tender. Should type test certificates not be available, the required tests shall be carried out, the cost of which must be included in the tender price quoted as a separate item.

34.13 Should the transformer offered not have a short circuit type test certificate available, a simulated computer model of this test may be submitted for Transnet Freight Rail's approval, but should this model be unacceptable short circuit tests will be required and shall be conducted in accordance with Transnet specification BBG2415. An out of tank inspection shall be carried out after completion of the tests. The tests shall comprise two short circuits on each of the extreme and centre tapings. The short circuits on each tapping shall be of opposite asymmetry. Short circuit duration shall not be less than 0,5 seconds. Short circuit current shall not be less than that calculated for a fault on the secondary terminals of the transformer with rated voltage on the primary terminals from a supply of not less than 2 500 MVA.

34.14 The successful tenderer shall test all concrete used for the construction of the works and the results submitted to the Senior Engineer for approval.

34.15 The following equipment shall be inspected by Transnet Freight Rail staff at the place of manufacture prior to delivery to the successful tenderers works or to site:

- All structural steelwork
- The substation building
- Battery tripping unit
- All control panels

35.0 SITE TESTS AND COMMISSIONING

The successful tenderer shall be responsible for carrying out on-site tests and commissioning of all equipment supplied and installed in terms of this specification and the contractual agreement.

35.1 ON-SITE TESTS

35.1.1 Functional on-site tests shall be conducted on all items of equipment and circuitry to prove the proper functioning and installation thereof.

35.1.2 The successful tenderer shall submit a detailed list of on-site tests for the approval of the Senior Engineer at least six weeks before tests are due to commence at the first substation.

35.1.3 The successful tenderer shall arrange for the Senior Engineer or his representative to be present to witness the on-site tests at each substation.

35.1.4 The on-site tests and subsequent commissioning will not commence until all construction work has been completed. Construction staff, material and equipment shall be removed from site prior to the commencement of testing. Testing and commissioning of the substation equipment will not be allowed to take place in a construction site environment.

35.1.5 On-site tests shall include the following;

- Polarity tests on all VT's and CT's
- Ratio tests on all VT's and CT's
- Magnetising current of all CT's
- Secondary injection of all relays
- Trip testing, all relays must be checked for correct operation.
- The functionality of all electrical circuitry must be tested.
- A power frequency voltage test on all 25 kV equipment at 57 kV for one minute.

- A power frequency voltage test on all small wiring at 2 kV for one minute.
- Millivolt-drop test on 25 kV circuits with a current of not less than 200 A.
- A proof of vacuum test on vacuum circuit breakers.
- Tests on primary circuit breakers and other primary equipment in accordance with manufacturer's instructions.

35.1.6 At the completion of the on-site tests the Senior Engineer or his representative, shall either sign the test sheets (supplied by the successful tenderer) as having witnessed the satisfactory completion thereof, or hand to the successful tenderer a list of defects requiring rectification.

35.1.7 Upon rectification of defects the successful tenderer shall arrange for the Senior Engineer or his representative to certify satisfactory completion of on-site tests for that particular substation.

35.1.8 Acceptance by the Senior Engineer of satisfactory completion of on-site tests in no way relieves the contractor of his obligation to rectify defects which may have been overlooked or become evident at a later stage.

35.2 COMMISSIONING OF EQUIPMENT

35.2.1 Commissioning will include the energising of equipment from the primary isolator to the track feeder circuits. The successful tenderer must prove the satisfactory operation of all equipment under live conditions.

35.2.2 On completion of commissioning the successful tenderer will hand the substation over to the Senior Engineer in terms of the relevant instructions.

35.2.3 Tenderers shall allow a period of at least three days per substation between satisfactory completion of on-site tests and commissioning of equipment.

35.2.4 During this period the Transnet Freight Rail's Test staff will test the operation of all protective relays and circuits and set the protection relays at each substation.

35.2.5 The successful tenderer installation staff shall be present during the testing and setting of the protection to rectify any faults found.

35.2.6 On-site testing of the first substation must therefore commence ahead of the contract completion date, by a period not shorter than a total of three days per substation.

35.2.7 The commissioning of the protection equipment by Transnet Freight Rail will in no way absolve the successful tenderer from any of his responsibilities during the guarantee period. It is the successful tenderers responsibility to satisfy himself/herself that the commissioning of the protection equipment has been carried out in a satisfactory manner and in no way compromises the proper operation of the equipment supplied in terms of the contract.

35.2.8 The commissioning dates for the substations will be dependent on the availability of power supplies from the supply utility as well as Transnet Freight Rail's electrification program and will be defined by the Transnet Freight Rail Senior Engineer.

36.0 DRAWINGS, INSTRUCTION MANUALS AND SPARES LISTS

Drawings, instruction manuals and spare parts catalogues shall be supplied in accordance with Transnet Freight Rail specification CEE0224

36.1 DRAWINGS

36.1.1 All drawings shall be supplied in electronic format (Microstation/CAD)

36.1.2 All drawings (paper prints) shall be submitted to Transnet Freight Rail Senior Engineer for approval. No construction or manufacturing activity will be allowed prior to the associated drawings having been approved by the Senior Engineer.

36.1.3 The following drawings are required for approval prior to construction and submission in as built form at the completion of the works:

- Electrical schematic diagrams
- Detailed electrical wiring diagrams
- Foundation design drawings (for all foundations)
- Structural support steelwork design drawings
- Site equipment layout plan showing equipment and conductor profiles.
- Earth mat layout plan showing position of buried conductors.
- Buried cable layout plan showing position of buried cables.
- Substation control equipment building plans.

36.1.4 A complete set (paper copies bound in book form) of the electrical schematic and detailed wiring diagrams shall be provided for each substation and shall be in the substation at the commissioning stage.

36.2 INSTRUCTION MANUALS

The tenderer shall supply three copies of an instruction/maintenance manual for each unique installation. (if a number of substations are of the same design only three copies of the manual will be required with the names of all the substations to which the manual applies to clearly indicated on the cover)

36.3 SPARES LISTS

36.3.1 The successful tenderer shall submit details of spares required in accordance with specification No. CEE.0224.

36.3.2 All spares recommended for normal maintenance purposes that are not available locally (requires importation) must be highlighted

36.3.3 Tenderers shall however include in their offers, separate quotes for the supply of certain major items of equipment as strategic spares. Individual prices shall be given for one of each of the following items:

- 20MVA traction transformer complete
- HT traction transformer bushing
- LT traction transformer bushing
- HT primary circuit breaker complete with operating mechanism
- 25 kV secondary circuit breaker complete with operating mechanism
- 27,5 kV/240 V, 16 kVA auxiliary transformer
- 26,4 kV/110 V Voltage Transformer

37.0 SPECIAL TOOLS AND/OR SERVICING AIDS

37.1 Special tools or servicing aids necessary for the efficient maintenance, repair or calibration of the equipment shall be quoted for separately.

37.2 The tenderer shall quote for the supply of SF6 gas filling equipment as well as a distance impedance relay test set.

37.3 Tenderers shall submit detailed offers for special tools and servicing aids including all specialised equipment required for the servicing and maintenance of SF6 and vacuum circuit breakers, distance impedance relay calibration and testing equipment.

38.0 TRAINING

The tenderer shall submit details with the tender of the training courses, which will be conducted by the successful tenderer for the training of Transnet Freight Rail maintenance staff in the operation and maintenance of the substation equipment with emphasis on the protection scheme. The courses shall include theoretical as well as practical tuition. The dates and venue of these training courses shall be arranged with the Senior Engineer.

39.0 GUARANTEE AND DEFECTS

39.1 The successful tenderer shall guarantee the satisfactory operation of the complete electrical installation supplied and erected by him and accept liability for makers defects, which may appear in design, materials and workmanship.

39.2 The guarantee period for all substations shall expire after: -

39.2.1 A period of 12 months commencing on the date of completion of the contract or the date the substation is handed over to Transnet Freight Rail whichever is the later, or

39.2.2 A period of 12 months commencing on the date of commissioning of the last substation, whichever is the later date.

39.3 Any specific type of fault occurring three times within the guarantee period and which cannot be proven to be due to other faulty equipment not forming part of this contract e.g., faulty locomotive or overhead track equipment, etc., shall automatically be deemed an inherent defect. Such inherent defect shall be fully rectified to the satisfaction of the Senior Engineer and at the cost of the successful tenderer.

39.4 If urgent repairs have to be carried out by Transnet Freight Rail staff to maintain supply during the guarantee period the successful tenderer shall inspect such repairs to ensure that the guarantee period is not affected and should such repairs be covered by the guarantee, reimburse Transnet Freight Rail the cost of material and labour.

40.0 APPENDIX 1

40.1 SUBSTATION SITES (NAMES AND LOCATIONS) AND DEGREE OF POLLUTION

Substation Site No.	Substation Name	X-Axis KM Position	Layout Plan Drawing No.
1	Antra	2.543km	CEE-TEB-177

40.1.1 Degree of pollution – specify the pollution level applicable to each site. Most sites will have the same degree of pollution (Average polluted area), with traction substations at the coast or in industrial areas being defined as severely polluted areas.

40.1.2 The X-axis km position is the position on the track to which the X-axis indicated on the layout drawing for a traction substation site must be aligned to.

40.1.3 GPS coordinates – specify the position of where the substation will be located.

41.0 APPENDIX 2

SCHEDULE OF REQUIREMENTS FOR AC TRACTION SUBSTATIONS

41.1 Number of substations required and their primary voltage must be specified.

41.1.1 The specific requirements for each traction substation must be specified e.g. number of breakers, what type of security fence is required, extent of security fencing and kerbing, any special design considerations etc.

41.1.2 The following table must be completed quantifying the major items of equipment required at each traction substation:

P.I	P.C.B	M.T	S.I	I.F	T.F	B.C	A.T	V.T
1	1	1	1	1	2	0	1	1

Table 1: Substation equipment

Note:
- P.I Primary isolator
- P.C.B Primary Circuit Breaker
- M.T Main Transformer
- S.I Secondary Isolator
- I.F Incoming Feeder
- T.F Track Feeder
- B.C Bus Coupler
- A.T Auxiliary Transformer
- V.T Voltage Transformer

42.0 APPENDIX 3

SCHEDULE OF DRAWINGS SUPPLIED BY TRANSNET FREIGHT RAIL

DRAWING NO.	TITLE
CEE-TA-196:	Sign warning, electric shock hazard 25kV AC traction substation
CEE-TBB-109:	Single line diagram and protection requirements 25kV AC traction substation
CEE-TBD-8:	Earthing arrangement 25kV AC traction Substation
CEE-TBK-27:	No volt coil for circuit breakers
CEE-TCA-92:	Key box 25kV AC traction substation
CEE-TDB-41 sht 1	Double unit switch gantry 25kV AC traction substation
CEE-TDB-41 sht 2	Single unit switch gantry 25kV AC traction substation
CEE-TDC-10	Cable tray details in yard 25kV AC traction substation
CEE-TDF-15 sht 1	Substation security fence detail 25kV AC traction substation
CEE-TDF-15 sht 2	Gate detail for security fence 25kV AC traction substation
CEE-TDF-16	Substation Palisade fencing detail 25kV AC traction substation
CEE-TEA-1:	Kerbing for substation 25kV AC traction substation
CEE-TEA-2:	Traction substation nameboard
CEE-TEB-177:	Antra substation yard layout 25kV AC traction substation
CEE-TEB-178:	Intshamanzi substation yard layout 25kV AC traction substation
CEE-TEB-179:	Nseleni substation yard layout 25kV AC traction substation
CEE-TEB-180:	Ekupheleni substation yard layout 25kV traction substation
CEE-TEE-173 sht 1:	Pipe and earth details in small foundation 25kV AC traction substation
CEE-TEE-173 sht 2:	Pipe and earth details in large foundation 25kV AC traction substation
CEE-TEE-173 sht 3:	Pipe and earth details for transformer plinth 25kV AC traction substation
CEE-TEC-28:	Substation building detail and layout 25kV AC traction substation
CEE-PFB-30:	Typical mounting arrangement for Auxiliary transformer on track structures
CCE-FG-263:	Details of cables in Transnet Freight Rail's formation
CCE-TYPE 1-45:	Boundary / stock fencing.

TRANSNET freight rail

TECHNOLOGY MANAGEMENT.

SPECIFICATION.

REQUIREMENTS FOR OUTDOOR ALTERNATING-CURRENT CIRCUIT BREAKERS FOR TRACTION AND DISTRIBUTION SUBSTATIONS

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- Technology Management

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1.0 SCOPE

1.1 This specification covers Transnet freight rail requirements for the design, manufacture, testing and supply of outdoor Alternating Current (AC) circuit breakers in accordance to SANS 62271-100.

1.2 The alternating current circuit breakers shall be suitable rated for nominal phase to phase r.m.s voltages ranging from 22 kV to 220 kV.

2.0 STANDARDS, PUBLICATIONS AND DRAWINGS

2.1 Unless otherwise specified all materials and equipment supplied shall comply with the applicable and latest editions of SANS or Transnet freight rail publication.

2.2 The following publications are referred to in this specification:

2.2.1 SOUTH AFRICAN NATIONAL STANDARDS

SANS 121:	-	Hot-dip Galvanized coatings for fabricated iron or steel articles.
SANS 1431:	-	Weldable structural steels.
SANS 60529:	-	Degrees of protection provided by enclosures (IP code).
SANS 60694:	-	Common Specifications for high-voltage switchgear and controlgear standards.
SANS 60815	-	Guide for the selection of insulators in respect of polluted conditions
SANS 62271-100:	-	High Voltage Alternating Current Circuit Breakers.

2.2.2 TRANSNET FREIGHT RAIL SPECIFICATIONS.

CEE.0045:	Painting of Steel Components of Electrical Equipment.
CEE.0224:	Drawings, Catalogues, Instruction Manuals and Spares.

2.2.3 Occupational Health and Safety Act No 85 of 1993.

2.2.4 TRANSNET FREIGHT RAIL DRAWINGS

CEE-TBK-0027:	-	Control circuit diagram. No-volt coil protection.

2.3 Any items offered in accordance with other standards will be considered at the sole discretion of Transnet freight rail. The tenderer shall supply full details stating where the item differs from these specifications as well as supplying a copy (in English) of the recognised standard specification(s) with which it complies.

3.0 TENDERING PROCEDURE

3.1 Tenderers shall indicate clause-by-clause compliance with this specification as well as the relevant equipment specifications. This shall take the form of a separate document listing all the specifications clause numbers indicating on individual statement of compliance or non-compliance.

3.2 The tenderer shall motivate a statement of non-compliance.

3.3 Tenderers shall complete Appendix 2. " Information to be provided by tenderers".

3.4 Tenderers shall submit detailed technical literature of the current transformers offered together with drawings showing, general constructional details and principal dimensions.

3.5 Any items offered in accordance with other standards will be considered at the sole discretion of Transnet freight rail. The tenderer shall supply full details stating where the item differs from these specifications as well as supplying a copy (in English) of the recognised specification(s) with which it complies.

3.6 Failure to comply with clauses 3.1, 3.2, 3.3, 3.4 and 3.5 could preclude a tenderer from consideration.

4.0 APPENDICES

The following appendices form an integral part of this specification and shall be read in conjunction with it.

4.1 Appendix 1 -"Schedule of Requirements".

This appendix details the specific requirements for this application.

4.2 Appendix 2 - " Information to be provided by tenderers".

This appendix calls for specific technical information to be furnished by tenderers.

5.0 SERVICE CONDITIONS.

The current circuit breaker shall be designed to operate under the following conditions.

5.1 ATMOSPHERIC CONDITIONS

5.1.1	Altitude:	0 to 1800m above sea level.
	Ambient temperature:	-5°C to +45 °C.
	Relative humidity:	10% to 90%
	Lightning Conditions:	12 ground flashes per square kilometre per annum.
	Pollution:	Heavily salt laden or polluted with smoke from industrial sources.

5.2 ELECTRICAL CONDITIONS

5.2.1	Supply voltage:	The incoming AC voltage can vary ± 5% of the nominal system r.m.s voltage.
5.2.2	Frequency:	Frequency of the supply voltage is 50 ± 2.5 Hz.

6.0 REQUIREMENTS FOR ALTERNATING CURRENT CIRCUIT BREAKERS.

6.1 The AC circuit breakers shall be designed, manufactured and tested in accordance with the requirements of specifications SANS 62271-100 and SANS 60694.

6.2 The circuit breakers shall be of the outdoor type suitable for operation under the nominal phase to phase voltages or phase to neutral voltages specified in Appendix 1.

6.3 The insulating medium of the primary circuit breakers shall be SF6 gas or vacuum, depending on the supply voltage. (Refer to Appendix 1)

6.3.1 Vacuum circuit breakers may be used for voltages ranging from 22 kV up to 33 kV

6.4 The AC circuit breakers used on Transnet freight rail may the single, double or triple pole type.

6.4.1 Double or triple pole type circuit breakers shall be ganged operated.

6.5 The circuit breakers shall be rated at the highest r.m.s. voltage for equipment operating at the nominal system voltage specified in Appendix 1.

6.6 The minimum rupturing capacities for the respective voltages and current ratings for the circuit breakers shall be in accordance to the SANS 62271-100. The rated short–circuit breaking current shall be at least 20kA.

6.7 The circuit breakers shall be rated for a continuous current of at least 1250 Ampere

6.8 The circuit breakers shall have a first pole to clear factor of 1.5.

6.9 The circuit breakers shall have a making time not greater than 1 second.

6.10 The circuit breakers shall be capable of twice rupturing the specified fault current at the specified voltages, with a one minute interval between operations and then shall be in a condition to be closed and carry the rated current without it being necessary to inspect or make adjustments.

6.11 The circuit breaker shall be electrically operated from a nominal 110 Volt DC control voltage unless otherwise specified in Appendix 1.

6.12 It shall be possible to close the circuit breaker only when the control voltage is above 85% of the nominal voltage. The circuit breaker shall trip automatically when the control voltage falls below 70% of the nominal voltage.

6.13 The circuit breaker shall have a motor wound spring operating mechanism.

6.14 The operating mechanism shall be provided with shunt release for both opening and closing.

6.15 Pneumatic, hydraulic or gas control for tripping and closing the primary circuit breakers are not acceptable.

6.16 The operating mechanism shall be so designed so that the breaker may be closed manually from ground level by means of a suitable detachable handle.

6.17 The operating mechanism shall be constructed of non-ferrous material.

6.18 The operating springs shall recharge automatically after the completion of a closing operation.

6.19 The circuit breaker shall be of the trip-free type.

6.20 A visual mechanical indicating device shall be provided to indicate the state of the spring and shall be inscribed "Spring Charged" when the mechanism is in the condition to close the circuit breaker and "Spring Free" when it is in any other condition.

6.20.1 One pair of normally open and normally closed contacts shall be provided for the indication circuitry to the substation control panel for indication of the "Spring Charged" and "Spring Discharged" conditions.

6.21 Auxiliary contacts shall be provided for operation in conjunction with the protection and other auxiliary circuits specified. At least one spare pair of normally open and one spare pair of normally closed contacts shall be provided.

6.22 Circuit breaker control switches shall be provided on the circuit breaker mechanism. They shall return automatically to the neutral position when the handle is released after being turned to either the "close" or "trip" positions.

6.23 Local/Remote selector switches shall be provided on the circuit breaker mechanism and shall be of the two-position type. The switch shall have no "off" or "neutral" position.

6.23.1 Provision shall be made that when the circuit breaker is switched to the local position, the protection and trip circuitry to the circuit breaker shall not in any way be by-passed.

6.24 Mechanical operation shall be provided on the circuit breaker for any closing or trip release, which is normally electrically operated.

6.25 The circuit breaker shall be provided with a no volt coil with a mechanical latching mechanism, which will trip, lockout and inhibit the circuit breaker from closing when the no volt coil is de-energised. Refer to Transnet Freight Rail's drawing No. CEE-TBK-27 which forms part of this specification, for details of the control circuitry for the no volt protection.

6.25.1 The no volt coil circuitry with its associated mechanical latching mechanism shall operate separately from the trip coil circuitry.

6.26 A counter shall be provided on the circuit breaker to indicate the total number of operations of the breaker.

6.27 Tenderers shall advise the number of circuit breaker operations under full load and fault conditions, after which maintenance and/or measurement of contact wear is recommended.

6.28 The circuit breaker operating mechanism including its controls and relays shall be housed in a metal enclosure.

6.29 The enclosure housing shall be manufactured from stainless steel or hot dipped galvanised steel.

6.30 The coating of the enclosure if galvanised shall comply with the requirements of Transnet freight rail's specification CEE.0045.

6.31 The degree of protection of the enclosure shall be in accordance with SANS 60529 and shall be IP 55.

6.32 Provision shall be made for the enclosure to be pad-lockable.

6.33 The enclosure shall be provided with a gland plate for bottom entry of the control cables.

6.34 VACUUM CIRCUIT BREAKERS.

6.34.1 Vacuum switching devices shall be evacuated and sealed in accordance with the latest technology and accepted practice.

6.34.2 The pre striking and chopping current shall be kept below 5 amperes. Tenderers shall give full details regarding these characteristics.

6.34.3 Where vacuum circuit breakers are specified in Appendix 1 they shall be either of the motor wound spring operating mechanism or magnetic actuator operating mechanism type.

6. 35 SULPHUR HEXAFLOURIDE CIRCUIT BREAKERS. (SF6)

6.35.1 The SF6 circuit breaker shall be fitted with a pressure gauge/densiometer to monitor the gas pressure.

6.35.2 The pressure gauge/densiometer circuit shall be provided with a minimum of two sets of contacts for alarm and indication for the substation's annunciator or flag circuit.

6.35.3 The supplier shall wire the SF6 circuit breaker local control circuit, such that in the event of a gas leakage or drop in gas pressure, the SF6 circuit breaker will trip and lockout.

6.35.4 A set of normally closed contacts shall be provided in the circuit breaker mechanism control box for the low gas trip circuitry.

6.35.5 The SF6 circuit breaker shall trip and lockout before the minimum safe SF6 gas pressure is reached.

6.35.6 In terms of the Occupational Health and Safety Act No 85 of 1993. Code 1704 (pressure vessels) the successful tenderer shall furnish a certificate of manufacture complying with the terms of the Act for the circuit breakers.

6.36 INSULATION LEVELS, CREEPAGE DISTANCES AND CLEARANCES

6.36.1 INSULATION LEVELS

The rated insulation levels of the AC circuit breakers shall comply with the requirements specified in Table 1.

6.36.1.1 Table 1 lists the nominal system voltages present on Transnet freight rail and the required insulation levels as specified in accordance with SANS 1019.

Highest phase-to-phase r.m.s voltage for equipment. (Um)	Nominal system phase-to-phase r.m.s. voltage	Rated lightning impulse withstand voltage peak.	Rated short duration power- frequency withstand r.m.s voltage.
24 kV	22 kV	150kV	50 kV
36 kV	33 kV	200 kV	70 kV
52 kV	44 kV	250 kV	95 kV
72,5 kV	66 kV	350 kV	140 kV
100 kV	88kV	380 kV 450 kV	150 kV 185 kV
145 kV	132 kV	550 kV 650kV	230 kV 275 kV
245 kV	220 kV	850 kV 950 kV	360 kV 395 kV
Insulation levels for highest voltage for equipment U_m < 100 kV are based on an earth fault factor equal to $\sqrt{3}$ and for U_m > 100 kV an earth fault factor equal to $0,8\sqrt{3}$. Where more than one insulation level is given per voltage system, the higher level is appropriate for equipment where the earth fault factor is greater than 1,4			

TABLE 1: Standard Voltages and insulation levels in accordance with SANS 1019:2008 [1]

6.36.1.2. For the 25 kV and 50kV single phase ac traction systems the ac high voltage circuit breakers shall be designed to the following nominal system phase to phase r.m.s voltages and withstand insulation levels:

- For the 25 kV (phase to earth) ac traction systems the ac high voltage circuit breakers current transformer shall be rated for a nominal system phase to phase r.m.s voltage of at least 44 kV and designed to withstand the required insulation level for that nominal system voltage.
- For the 50 kV (phase to earth) ac traction systems the ac high voltage circuit breakers shall be rated for a nominal system phase to phase r.m.s voltage of at least 88 kV and designed to withstand the required insulation level for that nominal system voltage.

6.36.2 CREEPAGE DISTANCES

6.36.2.1 The standard creepage distance between phase and earth shall be in accordance with table ii of SANS 60815.

6.36.2.2 For coastal areas and very heavy polluted inland areas the standard creepage distance shall be the very heavy polluted level, i.e. 31mm/kV of the highest r.m.s phase to phase voltage U_m for equipment.

6.36.2.3 For inland areas the standard creepage distance shall be the heavy polluted level, i.e. 25mm/kV of the highest r.m.s phase to phase voltage U_m for equipment.

6.36.3 CLEARANCES

6.36.3.1 The following minimum safety outdoor earth clearances shall be maintained between any live conductor or metal and earthed metal: -

Highest phase to phase r.m.s voltage for equipment.	24kV	36kV	48kV	72kV	100kV	145kV	245kV
Outdoor distance	320mm	430mm	540mm	770mm	1000mm	1450mm	1850mm

6.36.3.2 The following minimum safety clearances shall be maintained between any live conductor or metal and ground surface level: -

Highest phase to phase r.m.s voltage for equipment.	24kV	36kV	48kV	72.5kV	100kV	145kV	245kV
Nominal phase to phase r.m.s system voltage	22kV	33kV	44kV	66kV	88Kv	132kV	220kV
Within security fence. (Restricted access way)	2820mm	2930mm	3040mm	3270mm	3500mm	3950mm	4350mm
Outside security fence but within Transnet freight rail's reserve	5200mm	5300mm	5400mm	5700mm	5900mm	6300mm	6700mm
Outside Transnet freight rail's reserve	5500mm	5500mm	5500mm	5700mm	5900mm	6300mm	6700mm

6.37 SUPPORT STEELWORK.

6.37.1 The circuit breaker shall be provided with its own support steelwork, which shall be hot- dip galvanised in accordance with specification SANS 121 and shall comply to requirements of SANS 1431: for weldable structural steels.

6.37.2 Support steelwork exposed to a high pollution/corrosive atmosphere shall be painted in accordance with specification CEE.0045.

7.0 SPECIAL TOOLS, SERVICING AIDS AND MANUALS AND SPARES LISTS.

7.1 The tenderers shall submit a separate offer for special tools and servicing aids necessary for the servicing and maintenance of SF6 circuit breakers.

7.2 Three copies of instruction/maintenance manuals, spares list's and wiring diagrams of the circuit breakers in accordance with Transnet freight rail's specification CEE.0224. shall be supplied upon delivery.

8.0 TRAINING.

8.1 The tenderer shall submit details with the tender of the training courses, which will be conducted by the supplier for the training of Transnet freight rail maintenance staff in the operation and maintenance of the circuit breaker. The courses shall include theoretical as well as practical tuition. The date and venue of this training course shall be arranged with the maintenance manager of the depot. The cost of the training shall be quoted for separately.

9.0 TEST CERTIFICATES.

9.1 The manufacture shall make available type test certificates for the equipment (as specified in SANS 62271-100 when required. Routine test certificates shall be supplied with each circuit breaker.

10.0 GUARANTEE AND DEFECTS.

10.1 The contractor shall guarantee the satisfactory operation of the circuit breaker supplied and accept liability for maker's defects, which may appear in design, materials and workmanship.

10.2 The guarantee period shall expire after: -

A period of 12 months commencing on the date of energising of the circuit breaker.

10.3 Any specific type of fault occurring three times within the guarantee period and which cannot be proven to be due to other faulty equipment not forming part of this contract, shall automatically be deemed an inherent defect. Such inherent defect shall be fully rectified to the satisfaction of the maintenance manager of the depot and at the cost of the Supplier.If urgent repairs have to be carried out by Transnet freight rail staff to maintain supply during the guarantee period the supplier shall inspect such repairs to ensure that the guarantee period is not affected and should they be covered by the guarantee, reimburse Transnet freight rail the cost of material and labour.

11.0 INSPECTION.

11.1 Transnet freight rail reserves the right to carry out inspection and any tests on the equipment at the works of the supplier/ manufacture.

11.2 Arrangements must be made timeously for such inspections to be carried out before delivery of the equipment to the client.

12.0 PACKAGING AND TRANSPORT.

12.1 The tenderer shall ensure that the equipment be packed in such a manner that it will be protected during handling and transport.

12.2 The tenderer shall provide transport for the delivery of the equipment to the site where required.

13.0 BIBLIOGRAPHY

[1] SANS 1019: 2008. Edition 2.5

END

SCHEDULE OF REQUIREMENTS
(To be completed by client)

1.0 SYSTEM DETAIL

1.1 AC Circuit Breakers: _____ substation/location.

1.2 Pollution level: Heavy_____ Very Heavy _____

1.2 Quantity of AC Circuit Breakers. _____

1.1 Nominal phase to phase voltage for 3 phase system: _____ kV.

1.2 Nominal phase to neutral voltage for single phase systems: _____ kV.

1.3 Frequency: _____ Hz

1.4 Circuit breaker control DC voltage: _____ V

1.5 Circuit breakers to be used for the following:

- 3 kV DC Traction substations. Yes/No
- Distribution substations. Yes/No
- 25 kV AC Traction substations. Yes/No
- 50 kV AC Traction substation. Yes/No

DETAIL OF AC CIRCUIT BREAKERS.

2.0 Type of circuit breakers required:

Vacuum: Yes / No

Gas (SF6): Yes / No _____

2.2 Number of circuit breakers required: _____

2.3 Number of poles: _____

2.4 Rated Voltage: _____ kV

2.5 Rated short-circuit breaking current: _____kA

2.6 Rated normal current: _____ Ampere.

END

TECHNICAL DATA SHEET
(To be completed by tenderer)

DETAIL OF CIRCUIT BREAKER

1.1 Make and manufacturer _____

1.2 Rated Voltage _____ kV.
(Highest rated voltage for equipment)

1.3 Rated Insulation level _____ kV.
(Rated lightning withstand Voltage)

1.4 Number of Poles: _____

1.6 Rated short circuit breaking current _____ kA.

1.7 Rated normal current: _____ Ampere.

1.6 Breaker operating time:

1.6.1 Closing: _____ ms.

1.6.2 Opening: _____ ms.

1.7 Number of operations after which breaker contact maintenance / measurement is required:

1.7.1 Under full load conditions_____

1.7.2 Under fault conditions _____

1.8 First Pole to Clear Factor_____

1.9 DC control voltage: _____ V

SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)

SPECIFICATION No. CEE.0023.90

THIS ISSUE CANCELS
SPECIFICATION NO.:
CEE.0023.86

SPECIFICATION FOR THE INSTALLATION OF CABLES

This specification covers Spoornet's requirements for the installation, laying, terminating, jointing, testing and commissioning of the high and low voltage cables.

SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)

SPECIFICATION No. CEE.0023.90

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SPOORNET
(INFRASTRUCTURE) (POWER SUPPLIES)

SPECIFICATION No. CEE.0023.90

1.0 SCOPE

1.1 This specification covers Spoornet's requirements for the installation, laying, terminating, jointing, testing and commissioning of high and low voltage cables.

2.0 REFERENCE LIST

The following publications, drawings and documents (latest edition) are referred to herein.

2.1 South African Bureau of Standards

SABS 97 - Impregnated paper insulated electric cables.

SABS 0142 - Code of practice for the wiring of premises.

SABS 150 - Polyvinylchloride (PVC) insulated electric cables and flexible cords.

SABS 763 - Hot-dip (galvanised) zinc coating.

SABS 1339 - Cross-linked polyethylene insulation of electric cables.

SABS 1299 - Direct-acting indicating electrical measuring instruments and their accessories.

2.2 British Standard Institution

BS 5467 - Armoured cables with thermosetting insulation for electricity supply.

BS 6480 - Impregnated paper-insulated cables.

2.3 Machinery and Occupational Safety Act, Act No. 6, 1983

2.4 Spoornet

CEE.0012 - Method of Tendering

CEE.0045 - Painting of steel components of electrical equipment.

CEE.0089 - Drawings of electrical equipment supplied under electric light and power contracts.

Safety Instructions - High Voltage Electrical Equipment

3.0 APPENDICES

The following appendices form an integral part of this specification.

3.1 Appendix 1 - "Scope of Work"

3.1.1 This appendix specifies the extent of the work required and the order of priorities.

3.2 Appendix 2 - "Drawings".

3.2.1 This appendix lists Spoornets drawings applicable to the installation.

3.2.2 Cable routes indicated on these drawings shall only be a general guide to the contractor.

3.3 Appendix 3 - "Schedule of Items, Estimated Quantities, Unit Rates and Prices".

3.3.1 To ensure a uniform basis for tendering purposes, tenders shall be based on the estimated quantities given in this schedule which shall be completed in full and returned as part of the tender.

3.3.2 The importance of full completion of this schedule cannot be overstressed as this will constitute the tenderer's quotation.

3.3.3 Rates specified in this schedule will be applicable if any adjustments to requirements become necessary.

3.3.4 Any additional items considered to be necessary by the tenderer for the satisfactory completion of the installation and fulfilment of his guarantee shall be added by the tenderer on a similar unit price basis to this schedule and included in his total tendered price.

3.3.5 Actual quantities required will be based on the final survey by the successful contractor, and payment will be based on the actual measurements.

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4.0 DRAWINGS AND INSTRUCTIONS

4.1 All drawings submitted by the tenderer shall be in accordance with Spoornets Specification No. CEE.0089

4.2 Where joints and terminations are to be done by others, the contractor shall submit detailed instructions regarding the procedure recommended by the cable manufacturer.

5.0 STANDARD OF WORK

5.1 The electrical installation shall conform to the requirements of SABS Code of Practice 0142 and shall be to the satisfaction of Spoornet.

5.2 Galvanising, where specified, shall be in accordance with SABS 763.

6.0 SAFETY INSTRUCTIONS

6.1 Work on the high voltage equipment shall be carried out in accordance with the Safety Instructions High Voltage Electrical Equipment of Spoornet.

6.2 All work done must comply with the requirements of the MACHINERY AND OCCUPATIONAL SAFETY ACT, Act No. 6, 1983.

7.0 SURVEYS

7.1 Pre-installation Route Surveys.

7.1.1 The Contractor shall within 30 days after being awarded the contract, carry out a pre-installation route survey which shall include digging test holes and, guided by the drawings contained in appendix 2, determine a suitable route.

7.1.2 The contractor shall determine where cables are liable to be subjected to chemical, electrolytic, mechanical or other damage and shall submit his recommendation to the Engineer for approval.

7.1.3 The Contractor shall submit in triplicate plans of the cable routes selected to the Engineer for approval. Plans may be submitted in sections as the survey progresses.

7.1.4 No excavation of any section of the cable route shall commence before the Contractor is in possession of the relevant approved plans and the Engineer has authorised the commencement of work on the section concerned.

7.2 Post Installation Surveys

7.2.1 After completion of all cable laying and jointing and before commissioning of any cable the Contractor shall carry out a final "as laid" survey of the cable routes and submit plans on transparencies suitable for reproduction.

7.2.2 The cable route plans shall include the following information :

7.2.2.1 Overall length, type, size and voltage of each cable.

7.2.2.2 Accurate indication of the position of each cable joint by indicating two distances to each joint from permanent structures.

7.2.2.3 Pipes and chambers provided.

8.0 EXCAVATIONS

8.1 Excavations shall be carried out in strict compliance with the specification No. E.7 for works on, over, under or adjacent to a railway line.

8.2 Trenching procedure shall be programmed in advance, approved by the Engineer and shall not be departed from except with the consent of the Engineer.

8.3 The Contractor will be advised of any known buried services such as cables, pipes, etc. in the vicinity of the cable route.

8.3.1 When trenching the contractor shall take all necessary precautions to prevent damage to underground services.

8.3.2 On encountering any uncharted service, the Contractor shall promptly advise the Engineer who will give the necessary instructions. Additional excavations shall be paid for at scheduled rates.

8.4 Should any underground service, water mains, road pavement, drainage system, building or any other structure be damaged by the Contractor's staff, it shall be reported immediately to the Engineer, who shall arrange for the necessary repairs. The Contractor shall be responsible for the cost of repairs.

8.5 The removal of obstructions along the cable routes shall be subject to the approval of the Engineer and shall be paid for at the agreed rates.

8.6 The Contractor shall not trench beneath any railway line without departmental supervision. Should the contractor wish to carry out such work, a minimum of 14 working days notice is required by the Engineer to arrange for the necessary supervision. The cost of such supervision shall not be charged to the Contractor.

8.7 Excavations crossing oil pipe lines shall not commence until an authorised representative is present on site. The Engineer shall be advised 14 days in advance when such excavations will take place.

8.7.1 Cable crossings of oil pipe lines shall only be at right angles.

8.8 Trenches across roads, access ways or foot-paths shall not be left open. If trenching, cable laying and backfilling cannot be done during the same shift, the portion of trench across the full width of the road, etc., must be temporarily backfilled and consolidated sufficiently to carry the traffic concerned without subsidence. Alternatively, adequately strong cover plates shall be laid across the trench.

8.9 Power driven mechanical excavators may be used for trenching operations. Spoornet shall not be responsible for any damage to other Services in close proximity when using mechanical excavators.

8.10 The Contractor shall provide shuttering in places where the danger exists of the trench collapsing, and causing damage to formations or other nearby structures.

8.10.1 Shuttering shall be paid for at scheduled rates.

8.11 Trenches shall be as straight as possible and the bottom of each cable trench shall be firm and of smooth contour without sharp dips or rises which may cause tensile forces in the cable during backfilling.

8.11.1 Trenches shall have no sharp objects which may cause damage to the cable during laying or backfilling.

8.12 The unfinished depth of trenches unless otherwise stated shall be as follows :

8.12.1 HV cables and associated pilot cables = 1 000 mm

8.12.2 LV cables and separate pilot cables = 750 mm

8.13 The width of the trench unless otherwise stated shall be 500 mm for one or two HV cables and associated pilot cables, and shall increase by 300 mm for each additional HV cable and its associated pilot cable.

8.13.1 The width of the trench at any bend or places where cable slack is required, shall be such that the bending radius of the cables shall not be less than that specified for the particular cable as per specifications SABS 150, SABS 97 and SABS 1339.

8.13.2 Trenching in railway formations shall be in accordance with Spoornet's Chief Civil Engineer's drawing FG 263.

8.14 The material excavated from each trench shall be placed in such a manner as to prevent nuisance or damage to adjacent ditches, railway lines, drains, gateways and other properties and shall not interfere with traffic.

8.14.1 Where, owing to certain considerations, this is not possible the excavated materials shall be removed from site and be returned for refilling the trench on completion of laying.

8.15 When excavating close to railway tracks, the ballast must be covered by tarpaulins or other sheeting to prevent soiling.

8.16 Removal of accumulated water or other liquid from trenches shall be done by the Contractor at his expense. The Contractor shall provide all pumps and appliances required to carry out this operation. Water or any other liquid removed shall be disposed of without creating any nuisance or hazard.

8.17 Spoornet reserves the right to alter any cable route or portion thereof prior to cable laying. Payment in respect of any additional work involved shall be at scheduled rates.

9.0 CABLE LAYING

9.1 General

9.1.1 All possible care shall be exercised in handling cables on site.

9.1.2 Any drum of cable showing signs of damage shall not be used.

9.1.3 The outer covering of cables shall not be damaged in any way and cables shall not be bent at radii less than allowed by the manufacturer.

9.1.4 When cable is supplied by the contractor, the drums thereof remain the property of the Contractor and shall be removed from the site and disposed of by him.

9.1.5 Cable pulling and laying shall be done manually unless otherwise approved by the Engineer. No cable shall be subjected to a tension exceeding that stipulated by the cable manufacturer.

9.2 IN TRENCHES

9.2.1 High Voltage cables shall be spaced at a minimum of 300 mm apart (centre to centre).

9.2.2 Low Voltage cables shall be spaced at a minimum of 150 mm apart (centre to centre).

9.2.3 Pilot cables shall be laid beside the associated power cables.

9.2.4 High Voltage and Low Voltage cables (and pilot cables not associated with High Voltage cable) shall be spaced at a minimum of 300 mm apart.

9.2.5 Pilot cables, when they are routed separately from their associated power cables, may be run next to one another.

9.2.6 Cables shall not be buried on top of each other except where cable runs cross.

9.2.7 Where the cable cannot be laid down at the specified depth, prior authority shall be obtained from the Engineer by the Contractor to protect the cable by means of 150 mm diameter half round concrete pipes with 50 mm concrete slab coverings, or other approved methods.

9.2.8 Where cables have to be drawn around corners well lubricated skid plates shall be used. The skid plates shall be securely fixed and constantly examined during cable laying operations.

9.2.9 Suitable rollers may be used during the laying of cables.

9.2.10 Cables shall be visually inspected for damage during and after laying. Any damage shall be reported immediately to the Engineer who will issue the necessary instructions.

9.3 IN SLEEVE PIPES

9.3.1 All cables crossing beneath roads and pavements shall be enclosed in asbestos cement pipes with a minimum internal diameter of 150mm. The Engineer shall be advised timeously of the locations and quantity of pipes to be laid and chambers to be provided by others. Separate lengths of pipe shall be properly jointed.

9.3.2 Pipes shall maintain or exceed the specified cable spacing.

9.3.3 Only one High Voltage cable shall be laid per pipe.

9.3.4 Pipes shall extend at least 1 m on either side of the road- or pavement formations and shall maintain the specified cable depth. All pipes shall be graded for water drainage : the required grade is 1:400.

9.3.5 All cables crossings underneath railway tracks shall be in pipes in accordance with Chief Civil Engineer's drawing FG 263.

9.4 IN DUCTS AND BUILDINGS

9.4.1 Concrete ducts and pipes within buildings will be provided by others.

9.4.2 Before installing cables, the ducts are to be inspected to ensure that they are suitable and clean as not to damage the cables.

9.4.3 The cables are to be neatly positioned and cross overs are to be avoided.

9.4.4 Steel checker plates over ducts will be supplied by others. The tenderer will however be required to cut all the slots for emerging cables. These slots are to be neatly cut and smoothed to avoid damage to the cable.

9.4.5 The Contractor shall supply all cable trays, racks, wooden cleats or other supports required to adequately support cables not laid in ducts.

9.4.6 Cable trays or racks shall be of reinforced glass fibre or steel suitably treated to prevent corrosion, Steel trays, racks and other supports shall be galvanised in accordance with SABS 763 when used within 50 km of the sea or inland exposed conditions.

9.5 UNDER BRIDGES AND IN TUNNELS

9.5.1 Where a cable route can only be against the concrete wall of a bridge or tunnel the cable shall be supported on :

9.5.1.1 suitable brackets at 750 mm intervals.

or

9.5.1.2 straining wire secured at maximum 1 200 mm intervals.

9.5.2 Brackets shall be of robust design and shall be galvanised and painted in accordance with specification CEE.0045

9.5.3 The height of the cable route on the brackets or strain wire shall be determined and agreed upon on site.

9.5.4 The brackets or strain wire shall be supplied and installed by the contractor.

9.6 CROSSING OF PIPELINES AND OTHER CABLES

9.6.1 Cables shall pass beneath pipelines with a 300 mm minimum clearance between the top of any cable and the bottom of any oil pipe.

9.6.1.1 The level of any cable at an oil pipeline crossing shall be maintained for not less than 3 m on either side of the centre line of the pipeline or on either side of the centre line of the outermost pipelines where there is more than one pipeline on the same route.

9.6.2 Where cables cross communication or signal cables, at least 300 mm of fill shall be provided between the two cables. In addition a concrete slab in accordance with Spoornets drawing No. CEE 55/027367 shall be placed between the two cables parallel to the lower cable.

9.7 IN RAILWAY FORMATIONS

9.7.1 Cables to be accommodated in railway formations shall be laid in accordance with Chief Civil Engineer's drawing No. FG 263.

9.8 SECURED TO POLES

9.8.1 Cables to be terminated at disconnectors (isolators) mounted on wood, concrete or steel poles, shall be clamped onto such structures by means of stainless steel straps applied at such a tension that the cable or cable sheath is not damaged. Straps shall be located at intervals of not more than 1,2 m.

9.8.2 Cables shall be protected by a pipe or boxed section of galvanised steel or other approved material for a distance of 250 mm below and 600 mm above ground level, strapped or screwed to the pole at a minimum of two points and connected to the earth connection, if of steel construction.

9.8.3 Straps and pipes shall be supplied and installed by the Contractor.

9.9 EXPOSED CONDITIONS

9.9.1 Whenever cables enter buildings or tunnels, or where excavations are not permitted down banks or cuts, the exposed portion shall be suitably protected by means of concrete slabs, or suitable steel pipes or boxed sections which shall be galvanised in accordance with SABS 763.

9.9.2 These pipes or boxed sections shall be firmly secured to the bank or cut, at regular intervals.

9.9.3 All such material shall be supplied and installed by the Contractor.

9.9.4 Stake routes shall only be supplied when specifically called for in Appendix 1.

10.0 CABLE TERMINATIONS

10.1 General

10.1.1 All cables shall be terminated and connected to the respective equipment, whether provided by the Contractor or by others.

10.1.2 Jumpers between cable end boxes and disconnectors shall either be short enough to be rigidly self supporting, or shall be supported on suitably placed pin insulators.

10.1.3 Termination of cables on outdoor equipment shall not be done during inclement weather conditions.

10.1.4 Both ends of each cable shall be identified by means of embossed stainless steel strips clamped around the cables. The characters shall have a minimum height of 6 mm.

10.1.5 All materials necessary for cable termination shall be provided by the Contractor.

10.1.6 The contractor shall ensure that correct phase rotation is maintained throughout.

10.1.7 Glands of cables terminating on equipment provided with frame leakage protection shall be insulated from the frame by high grade non-deteriorating, non-hygroscopic insulation, at least 2 mm thick, capable of withstanding a test voltage of 4 kV DC for one minute.

10.2 HV Cables

10.2.1 The cable armouring shall be bonded with an approved copper bond to the cable end box at one end of the cable only as directed by the Engineer. This bond shall be easily removable for testing purposes.

10.2.2 Where for any reason a cable cannot be terminated, sufficient length of cable shall be left to reach the cable end box position. The cable shall be coiled and buried or otherwise protected, The cable end of paper insulated cables shall be capped immediately with a plumbed lead seal. Other cables shall be sealed with suitable tape.

10.3 LV Cables (and Pilot Cables)

10.3.1 All cut ends of cables are to be sealed with suitable tape, or other approved means until they are ready to be terminated.

10.3.2 The cables shall terminate in compression type glands, brass or bronze, suitable for PVC SWA ECC cables.

10.3.2.1 The glands shall be fitted with neoprene shrouds.

11.0 CABLE JOINTS

11.1 General

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11.1.1 Jointing shall be carried out strictly in accordance with the manufacturer's jointing instructions and by artisans thoroughly experienced and competent in jointing the classes of cables used. They shall be adequately supervised to ensure the highest quality of workmanship.

11.1.2 Jointing shall not be carried out during inclement weather.

11.1.3 The cores of cables shall be jointed number to number or colour to colour.

11.1.4 The joints shall not impair the anti-electrolysis characteristics of the cables.

11.1.5 The conductor bridging the armouring shall be adequate to carry the prospective earth fault current.

11.1.6 A through joint shall only be permitted after every full drum length of cable.

11.1.7 Each cable joint shall be identified by a non-corrodible label fixed securely to the top of the joint. Each label shall have stamped on it, in characters having a minimum height of 10 mm, the identification of equipment at each end of the cable concerned.

11.1.8 Spoornet reserves the right to be present during jointing operations to familiarise themselves with any special techniques.

11.1.9 No joint shall be situated inside a cable pipe.

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12.0 COVERING, BACKFILLING AND REINSTATEMENT

12.1 Filling of trenches shall not commence before the Engineer or his authorised representative has inspected and approved the cables and cable joints in situ in the section of trench concerned.

12.2 Trenches in railway formations shall be backfilled and reinstated in accordance with Spoornet's Chief Civil Engineer's drawing No. FG 263.

12.3 All other trenches shall be backfilled and reinstated as follows:

12.3.1 Two 75 mm thick layers of soil sifted through a 6 mm mesh shall be laid directly under and over the cables respectively and consolidated by hand ramming only.

12.3.1.1 Only soil with a thermal resistivity of 1,5 degrees C.m/watt, or lower may be used for this purpose.

12.3.1.2 When necessary imported fill shall be arranged by the Contractor and paid for at scheduled rates.

12.3.2 HV cables shall, where likely to be mechanically damaged as decided by the engineer, be protected by concrete slabs (to Drawing No. CEE 55/027367) to be supplied and laid by the Contractor on top of the sifted soil. These slabs shall be laid close-butted, convex end to concave end, directly above each HV cable throughout the underground portion except where otherwise protected as by pipes, etc. Only unbroken cable protection slabs may be used, and only slabs actually laid will be paid for.

12.3.3 The minimum dry densities of backfilling after compaction shall be not less than 1 600 kg/cubic metre.

12.3.4 All excavations made (whether for the purpose of cable laying, joint bays or trial holes) shall be back-filled in 150 mm layers, the earth in each layer being well rammed and consolidated and sufficient allowance being made for settlement. The back-filling shall be completed to the satisfaction of the Engineer. If necessary, water shall be used to obtain the specified compacted density. Any cable damaged during backfilling shall be replaced by the Contractor at his own expense.

12.3.4.1 Backfilling at pipe entries shall be such as not to stress or damage the cable during compaction from the top.

12.3.5 A continuous plastic cable warning tape, to drawing No. CEE-MA-307 shall be laid directly above each HV cable, 150 mm below the normal surface level and run for the full length of the cable before completing the back-filling.

12.4 The back filled trench shall be maintained in a thoroughly safe condition by the contractor for the duration of the contract.

12.5 All back filling of road crossings shall be mechanically rammed.

12.6 Final surfacing of roads shall be restored by others unless called for under "Scope of Work", Appendix 1.

12.7 Concrete cable route markers shall be provided and installed by the contractor in accordance with drawing CEE-PK-14.

12.8 Pipes shall be filled with a sand/water mixture to also have a thermal resistivity of 1,5 degrees C.m/watt or lower when dry. The sand used in the mixture shall be chemically tested not to be harmful to the cable outer sheath.

13.0 MEASUREMENTS

13.1 All measurements for payment purposes shall be made jointly by representatives of the Contractor and Spoornet and shall be agreed upon by both parties. The Contractor shall be responsible for obtaining the Engineer's signed approval of such measurements.

13.2 Measurements of cable length shall be made from centre to centre of cable joints and to the cable ends and will exclude any wastage due to jointing and terminating.

13.3 When cable is drawn through pipes, only the portion remaining in the pipe will be paid for at the rates quoted for "as installed in pipes".

13.4 Determination of trench volume for measurement purposes shall be based on measured length and specified width and depth. No allowance shall be made where trenches have to be widened at the bottom to accommodate cables, cable joints and protection slabs.

13.5 The classification of different types of ground for measurement purposes shall be as follows:

13.5.1 Soft rock will be taken as broken or friable rock which can be removed by pick or mechanical excavator or paving breaker. This includes hard clay.

13.5.2 Hard rock will be taken as rock which cannot be removed by a mechanical excavator and requires drilling and blasting or splitting. This includes reinforced or plain concrete.

14.0 TESTS

14.1 The costs of all post-installation tests shall be borne by the Contractor.

14.2 The Contractor shall be responsible for remedial work necessary due to damages caused during tests.

14.3 Spoornet reserves the right to carry out any further tests deemed necessary, using either the Contractor's instruments and equipment or its own, or both. The costs of such tests will not be charged to the Contractor.

14.4 Test instruments shall be of the accuracy class 1.0 or better in accordance with SABS 1229. Calibration certificates from a recognised testing authority shall be available for inspection and shall not be older than one year.

14.5 Time measurements shall be carried out using an approved digital timer.

14.6 The final commissioning site tests will be carried out by Spoornet.

14.6.1 A suitably qualified staff member of the Contractor shall assist Spoornet during the tests and shall carry out any remedial work where necessary.

14.7 The contractor shall notify the Engineer in writing 4 weeks before the commissioning date and shall have carried out the following site tests before such date :

14.7.1 Prove the continuity and insulation resistance of the multicore pilot cables.

14.7.2 Verify that the insulation level between frame and earth of switchboards fitted with frame leakage protection is not reduced by the installation of the cables.

14.7.3 The following voltage withstand tests on each completed cable run:

14.7.3.1 Paper insulated cables:

(i) rating up to 12,7/22 kV : test specified in paragraph D-3 of SABS 97.

(ii) rating 19/33 kV : test specified in paragraph B-3 of BS 6480, Part 1.

The extruded PVC impermeable serving shall withstand a test voltage of 10 kV DC between armouring and earth for 1 minute.

The insulation between armouring and lead sheath shall withstand a test v for 1 minute.

14.7.3.2 XLPE Insulated Cables:

All cables rated up to 19/33 kV shall be tested as specified in appendix E, clause 1.4, of SABS 1339, and cables rated up to 1,9/3,3 kV shall be tested as specified in appendix B, clause B.6, of BS 5467.

Note :

Where a new XLPE cable is to be joined to an existing XLPE Cable, the test shall differ, in that a 4 kV DC test voltage shall be applied for one minute between the brass screens of the cores and the armouring. The outer sheath shall withstand a test voltage of 10 kV DC for 1 minute between the armouring and earth.

14.7.4 PVC insulated cables shall be tested as specified in paragraph D-3 of SABS 150.

14.7.5 The Contractor shall submit three copies of certified test reports to the Engineer within three weeks after completion of the tests.

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15.0 GUARANTEE

15.1 All work undertaken by the Contractor shall be subject to a guarantee for a period of one year against faulty and/or inferior workmanship and material.

15.2 The guarantee period shall commence the day the installation is formally handed over to and accepted by Spoornet.

15.3 The Contractor shall undertake to repair all faults or defects due to bad workmanship and/or faulty materials, and to replace all defective equipment or materials during the guarantee period.

15.4 Any defects that may become apparent during the guarantee period shall be rectified to the satisfaction of, and free of cost to Spoornet.

15.5 The Contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7 days of his being notified by Spoornet of such defects.

15.6 Should the Contractor fail to comply with the requirements stipulated above, Spoornet shall be entitled to undertake the necessary repair work or effect replacement of defective apparatus or materials, and the Contract shall reimburse Spoornet the total cost of such repair or replacement, including the labour costs incurred in replacing defective material.

TENDERER'S SIGNATURE .....

DATE .....

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

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APPENDIX 1

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SCOPE OF WORK

1.0 Site inspection required/not required.

Date : .....

Time : .....

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

REFERENCE :

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APPENDIX 2

DRAWINGS

DRAWING NO.	TITLE
CEE 55/027367	Concrete slab, cable protection
CEE-PK-14	Route marker, cable, electrical.
CEE-MA-307	Tape, cable warning, underground
FG 263	Accommodation of cables in Railway formations.

CHIEF ENGINEER (POWER SUPPLIES)
(INFRASTRUCTURE)

REFERENCE :

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APPENDIX 3

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
1.0	Route surveys (clause 7.0)		complete		
2.0	Excavations in				
a)	Hard rock		/cubic metre		
b)	Soft rock		/cubic metre		
c)	Soil		/cubic metre		
3.0	Transportation of soil		/cubic metre		
4.0	Shuttering (clause 8.10)		/m		
5.0	Concrete slabs supplied and installed (clause 12.3.2)		each		
6.0	Plastic cable warning tape supplied and installed (clause 12.3.5)		/m		
7.0	150 mm dia. half round concrete pipes supplied and installed (clause 9.2.7.)		/m		
8.0	150 mm dia. asbestos cement pipes supplied and installed		/m		
9.0	Cutting of checker plates (clause 9.4.4)		/m cut		
10.0	Backfilling of trenches with soil (clause 12.3)		/cubic metre		
11.0	Backfilling of trenches with 10:1 soil/cement mix (clause 12.2)		/cubic metre		

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
12.0	Importation of soil		/cubic metre		
13.0	Concrete cable route markers		each		
14.0	Reinstate tarred surface		/cubic metre		
15.0	Reinstate concrete surface		/cubic metre		
16.0	Installation of cables				
16.1	Installed in trenches (Clause 9.2)				
16.1.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
16.1.2	Low Voltage Cables		/m		
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
16.2	Installed in sleeve pipes (clause 9.3)				
16.2.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

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SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
16.2.2	Low Voltage Cables		/m		
	..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq				
16.3	Installed in ducts (clause 9.4)				
16.3.1	High Voltage Cables		/m		
	240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes				
16.3.2	Low Voltage Cables		/m		
	..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq				
17.0	Installation of cables (Special conditions)				
17.1	Cable supports (clause 9.4.5 and 9.4.6)				
17.1.1	High Voltage Cables		/m		
	240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes				

SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
17.1.2	Low Voltage Cables		/m		
	..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq				
17.2	Securing cables to poles (clause 9.8)				
17.2.1	High Voltage Cables		/m		
	240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes				
17.2.2	Low Voltage Cables		/m		
	..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq ..... core ..... mm sq				
17.3	Securing cables to concrete/tunnel walls				
17.3.1	High Voltage Cables		/m		
	240 mm sq 185 mm sq 120 mm sq 95 mm sq 16 mm sq Other sizes				

SPOORNET
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SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
17.3.2	Low Voltage Cables		/m		
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
17.4	Installation of cables in track formations				
17.4.1	High Voltage Cables		/m		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
17.4.2	Low Voltage Cables		/m		
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
18.0	Cable terminations complete (Supply material, terminate and connect up).				
18.1	XLPE cable				
18.1.1	High Voltage terminations		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

SPOORNET
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SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
18.1.2	Low Voltage terminations		each		
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
18.2	PILC SWA cable				
18.2.1	High Voltage terminations		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
18.2.2	Low Voltage terminations		each		
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
	..... core ..... mm sq				
19.0	Cable joints complete (Supply material, terminate and connect up)				
19.1	PVC to PVC		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

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SCHEDULE OF ESTIMATED QUANTITIES AND UNIT RATES

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT RATE	TOTAL
19.2	XLPE to XLPE		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
19.3	PILC to PILC		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				
19.4	XLPE to PILC		each		
	240 mm sq				
	185 mm sq				
	120 mm sq				
	95 mm sq				
	16 mm sq				
	Other sizes				

TENDERER'S SIGNATURE .....

DATE .....

CHIEF ENGINEER (ELECTRICAL)
(INFRASTRUCTURE)

SPOORNET

A division of Transnet limited

TECHNICAL
RAILWAY ENGINEERING
SPECIFICATION

PAINTING OF STEEL COMPONENTS OF ELECTRICAL EQUIPMENT

Circulation restricted to:
Technical: Maintenance (Infrastructure)
Technical: Maintenance

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1.0 SCOPE

This specification covers the surface preparation, paint systems and painting of steel components of electrical equipment.

2.0 REFERENCES AND GLOSSARY

The following standards and specifications are referred to herein:

2.1 South African Bureau of Standards: -

SABS 064 : Code of Practice for the Preparation of Steel Surfaces for Coating.

SABS 1091 : National Colour Standards for Paint.

2.2 Trade names :

OptiDegreaser

OptiPrime^{Aqua}

Noxyde

2.3 Classification of level of surface degradation:

RE1 – 0.05% of surface rusted

RE2 – 0.5% of surface rusted

RE3 – 1.0% of surface rusted

RE4 – 3.0% of surface rusted

RE5 – 8.0% of surface rusted

3.0 METHOD OF TENDERING

3.1 Tenderers shall indicate clause by clause compliance or non-compliance with the specification. This shall take the form of a separate document listing all the specification clause numbers indicating the individual statement of compliance or non-compliance. Tenderers to elaborate on their response to a clause can use this document.

4.0 SURFACE PREPARATION

4.1 NON-GALVANISED STEELWORK

4.1.1 New Steelwork

SURFACE PREPARATION (Read: NOTES and SPECIAL INSTRUCTIONS)	PRODUCT REQUIREMENTS & APPLICATION (See Variations for Specific Environmental Conditions)
➢ Sandblast to a standard of Sa2 to remove mill scale and/or flash rust ➢ Remove dust with clean compressed air (Check air for oil contamination)	➢ Apply a stripe coat to edges, bolts, crevices, nuts and rivets. ➢ Apply one thick coat of Noxyde to the entire structure with contrasting color. ➢ Apply a final thick coat of Noxyde at a consumption rate of minimum 400g/m^2

4.1.2 Previously Coated Steelwork

4.1.2.1 COATING START FAILING TO A LEVEL OF RE 2

➢ Test for adhesion (refer to supplier) ➢ Degrease thoroughly with OptiDegreaser ➢ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle	➢ Apply a stripe coat to edges, bolts, nuts and rivets and fill crevices. ➢ Apply one coat of Noxyde to entire substrate in a contrasting color

4.1.2.2 COATING FAILURE AND RUSTING TO A LEVEL OF RE 4

➢ Remove all visible traces of rust by mechanical means ST2 (chip/grind/sand) OR shotblasting /spotblasting) ➢ Degrease thoroughly with OptiDegreaser ➢ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle.	➢ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➢ Apply one coat of Noxyde at a consumption rate of minimum 400g/m^2 to the entire substrate using a contrasting color.

4.1.2.3 BITUMEN COATED

➢ Remove all visible rust and loosely adhering bitumen coating by means of chipping and scraping (ST2) ➢ Degrease thoroughly with OptiDegreaser ➢ Hydro Blast complete substrate using a rotating nozzle and minimum 250 bar at the nozzle.	➢ .Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➢ Apply two coats of Noxyde at a consumption rate of minimum 400g/m^2 per coat to the complete substrate using contrasting colors

4.1.2.4 BADLY RUSTED STEEL WITH PITTING & CRUST FORMATION TO RE 5

➢ 1.Degrease thoroughly with OptiDegreaser ➢ 2.Hydro Blast complete substrate using a spinner tip and minimum 250 bar at the nozzle ➢ Shotblast/sandblast complete substrate giving particular attention to bolts nuts rivets and crevices. Sa2 ➢ 4.Dedust	➢ Apply a first thick coat of Noxyde to the entire substrate ➢ Apply a stripe coat to edges, bolts, nuts and rivets and fill crevices using a contrasting color ➢ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m^2

4.2 GALVANISED STEELWORK

4.2.1 NEW AND WEATHERED GALVANISING WITH A SMOOTH GLOSSY FINISH

➢ Degrease thoroughly with OptiDegreaser ➢ Rinse down with copious quantities of potable water	➢ Apply one thin coat of OptiPrime^{Aqua} (100 micron wet/35 micron dry) ➢ Apply a stripe coat of Noxyde to edges, bolts, nuts and rivets and fill crevices ➢ Apply two coats of Noxyde at a consumption rate of minimum 400g/m^2 per coat to the complete substrate using contrasting colors

4.2.2 WEATHERED GALVANISING

4.2.2.1 White rust (zinc oxide)

➢ Degrease thoroughly using OptiDegreaser – ensure that all traces of "white rust" are removed ➢ Rinse down with copious quantities of potable water	➢ Apply one thin coat Noxyde ➢ Apply a stripe coat of Noxyde to edges, bolts, nuts and rivets and fill crevices ➢ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m^2 per coat to the complete substrate using a contrasting color

4.2.2.2 Combination of red rust (iron oxide) and white rust (zinc oxide)

➢ Remove all traces of red rust ➢ Degrease thoroughly using OptiDegreaser – ensure that all traces of "white rust" are removed ➢ Rinse down with copious quantities of potable water	➢ Apply a thick coat of Noxyde to the de-rusted areas, edges, bolts, nuts and rivets and fill crevices ➢ Apply a final coat of Noxyde at a consumption rate of minimum 400g/m^2 per coat to the complete substrate using a contrasting color

NOTES and SPECIAL INSTRUCTIONS:		
1 Sand or Grit-blasting a) Always use clean, non-recycled grit b) Always use fine or extra fine grit c) Always use oil free air d) Always use a moisture trap e) Dedust	2 Degreasing: a) Use only OptiDegreaser b) Dilute according to instructions – see data sheet c) Always follow up with hydro-blasting to remove all chemical residues	3 Hydro-blasting: a) Always use clean potable water b) Use a rotating nozzle and ensure a pressure of minimum 250 bar at the nozzle c) Remove ALL traces of dirt and any form of salt contamination and residues of the degreasing agent d) Concentrate in crevices and other similar "collection" areas

5. PRODUCT APPLICATION

5.1 METHOD OF APPLICATION

OptiPrime^{Aqua}	Noxyde
Temperature-Min 5 °C Relative humidity-Max 80% R.H. ➢ Apply by brush, lacquer roller or airless spray using a no. 11 nozzle ➢ Apply one thin coat only - 100 micron wet = 35 micron dry (DFT) ➢ Small parts can be dipped - dilute with 10% water for dipping	Temperature-Min. 8 °C, Max. 55 °C Relative Humidity-Max 80% R.H. ➢ Apply by brush, roller or airless spray ➢ For airless spray applications refer to "Tips for airless spraying of Noxyde"

5.2DRYING TIME AND OVERCOAT PERIODS

➢ Do not overcoat within 12 hours ➢ Wash down with clean potable water (100 bar) before over coating to remove dust or any other form of intermediate contamination	➢ Drying time is dependant on ambient conditions and can vary from a few minutes (in dry windy conditions) to a few hours (in humid shaded conditions) ➢ Overcoat as soon as possible to avoid contamination of previous coat ➢ Wash down with clean potable water (100 - 150 bar) before over coating if danger of contamination exists or if left more than 4 hours before over coating

5.3 CURING TIME

n/a	➢ 7 - 14 days to "full cure". During this period the product is prone to mechanical damage - the longer time it is allowed to cure, the tougher it becomes

5.4 DRY FILM THICKNESS (DFT) READINGS

35 micron	➢ Severe coastal & marine environments (in the spray zone) – TWO stripe coats & overall minimum DFT of 400 micron ➢ Normal coastal environment (1 5 km from the coast line) - a single stripe coat & overall minimum DFT of 400 micron ➢ Non coastal high rainfall areas, in the immediate vaccinate of rivers, dams, lakes, etc., and in industrial areas with high levels of chemical pollution - a single stripe coat & overall minimum DFT of 400 micron ➢ Dry non aggressive environments - a single stripe coat & overall minimum DFT of 250 micron NOTE: DFT readings can only be taken after 72 hours

5.5 Notwithstanding the above requirements, all surfaces shall be cleaned according to the appropriate method described in SABS 064 for the particular surface to be cleaned, the contamination to be removed and the primer to be applied.

5.6 Blast cleaning of components shall be in accordance with clause 4.3 of SABS 064 to a degree of cleanliness of at least Sa 2 for inland exposure components and Sa 2 ½ for coastal exposure components. See Table 1 of SABS 064 for the appropriate profile.

5.7 Sheet metal that cannot be blast cleaned shall be cleaned by pickling according to clause 4.6 of SABS 064.

5.8 Components that will be powder coated shall be cleaned and prepared by the surface conversion process according to clause 5 of SABS 064 to a medium weight classification of table 2 of that specification.

5.9 Oil and accumulated dirt on steel components where no rusting is present shall be removed according to clause 3 of SABS 064.

6.0 PAINT SYSTEM

A choice of two systems is available to suit the contractors equipment.

6.1 Noxyde paint system

1st coat: OptiPrime^{Aqua}

Wet film thickness: 100 micrometers. Dry film thickness: 35 micrometers.

2nd coat: Noxyde Topcoat

Dry film thickness: 165 micrometers @ 400g/m^2.

6.1.1 Paint application:

6.1.1.1 The primer and paint is normally applied by brush at supply viscosity (no reducer required).

6.1.1.2 The practical spreading rate of the primer and paint is a function of the ambient temperature, wind velocity and the application technique, but will generally fall in the range of 400g/m^2 in low to mild corrosive areas, and 500g/m^2 in severely corrosive areas.

6.1.1.3 Once the applied coat of primer/paint is touch dry, the next coat of paint may be applied.

6.1.1.4 If painted steelwork is to be bolted onto structures, it is imperative that the paint has been allowed to hard dry before the steelwork is bolted onto structures. This is to prevent the soft paint being damaged when tightening the bolts securing the steelwork to the structures.

6.2 Powder Coating System.
The powder-coating process shall be in accordance with SABS 1274 type 4: Corrosion-resistant coatings for interior use and using the thermosetting type high gloss coatings.

7.0 COATINGS AND WORKMANSHIP

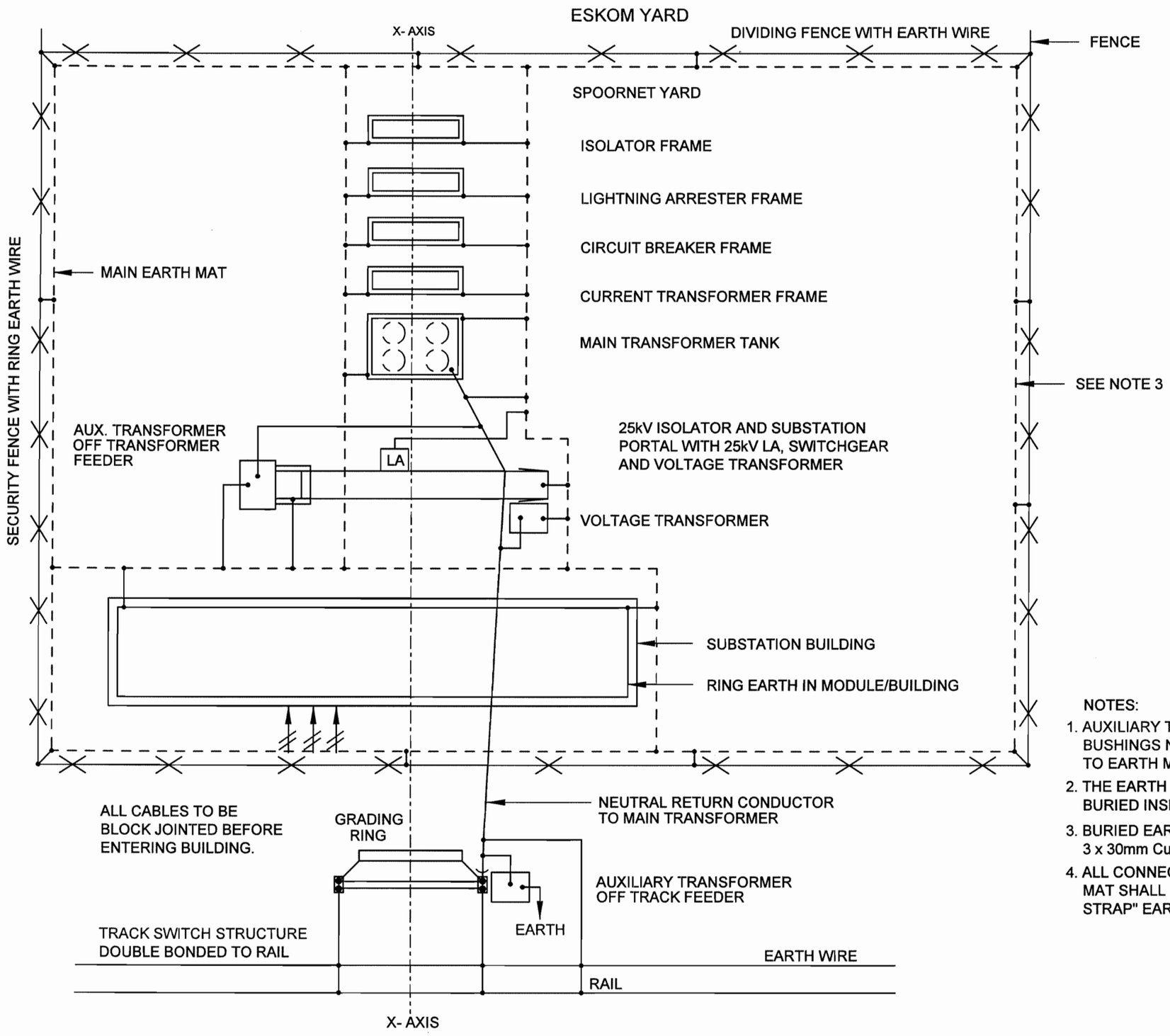
7.1 All specified coatings shall be applied according to the relevant specification and the manufacturer's instructions shall be followed.

7.2 Coatings shall not be applied under conditions that may be detrimental to the effectiveness of the coating or the appearance of the painted surface.

7.3 When examined visually, the finished products shall have a uniform appearance and shall show no sign of damage. Damaged areas shall be repaired coat for coat to obtain the desired finish.

TENDERER'S SIGNATURE.....

DATE.....



NOTES:

1. AUXILIARY TRANSFORMERS RETURN BUSHINGS NOT TO BE CONNECTED TO EARTH MAT.
2. THE EARTH MAT CONDUCTOR SHALL BE BURIED INSIDE THE SECURITY FENCE.
3. BURIED EARTH CONDUCTORS SHALL BE 3 x 30mm Cu STRAP.
4. ALL CONNECTIONS TO THE BURIED EARTH MAT SHALL BE MADE WITH "ERICO CAD-STRAP" EARTH TAILS (95mm² Cu. EQUIVALENT).

AMENDMENTS		
NO	NAME	DATE
2	A MACPHERSON	98-07-08
REDRAWN AND REVISED DO REF: T98/030		
3	LO BORCHARD	98-10-30
DRAWING REVISED DO REF: T98/054		
4	LO BORCHARD	2003-02-26
LIGHTNING ARRESTER BETWEEN TRANSFORMER AND EARTH MAT REMOVED. NOTES REVISED. ECP REF: 2003-031 DO REF: CDO/2392		
5	LO BORCHARD	2003-03-25
MOVED MAIN EARTH MAT TO INSIDE OF SECURITY FENCE. NOTE 2 REVISED. ECP REF: 2003-040 DO REF: CDO/2552		
6	J Burkett	2003-08-29
TWO LIGHTNING ARRESTERS REMOVED. EARTH STRAPS ADDED TO BOTH AUX. TRANSFORMERS AND VOLTAGE TRANSFORMER. ECP REF: 2003-067 DO REF: CDO/2914		

DIMENSIONS: mm
SCALE: NTS

A3

DO REF: T80/49	GEN TOL: LIN± -	ANG± -
DRN: B STEWART	CKD: H E MANTHE	DATE: 80-08-14
ENG: ———	R S MANN	for CHIEF ENG

CENTRAL DRAWING OFFICE SPOORNET

EARTHING ARRANGEMENT: 25kV AC TRACTION SUBSTATION

DRAWING NO CEE-TBD - 8

SHEET - OF -