TRANSNET

TRANSNET SOC LIMITED
(REGISTRATION NO.1990/000300/30)
TRADING AS
TRANSNET FREIGHT RAIL

NEC3 Engineering & Construction Short Contract (ECSC)

RFQ No. MMC-ERAC-WGO-014266 CIDB

TRANSFORMER REFURBISHMENT AT KLIENDAM, ERTS, NITTENS, AND FAIRVIEW 3KV DC SUBSTATIONS UNDER THE CONTROL OF THE DEPOT ENGINEER, WITBANK.

Opens on:	10 June 2014
Closing date:	26 June 2014 (at 10h00)
Validity date:	25 September 2014

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Part T1: Tendering Procedures

T1.1 TENDER NOTICE AND INVITATION TO TENDER

RFQ No MMC-ERAC-WGO-014266 CIDB

Transnet SOC Limited trading as Transnet Freight Rail invites renderers for Transformer refurbishment at Kliendam, Erts, Nittens, and Fairview 3kV DC substations under the control of the Depot Engineer, Witbank

Tenderers should have a CIDB contractor grading designation of **2 EP** or higher.

Queries relating to the administrative issues of these documents may be addressed to:
Ms. Matete Madisha
Tel. No. 013 656 4254
Fax. No. 013 656 4259
E-mail: Matete.Madisha

A compulsory clarification meeting with representatives of the Employer will take place on **Thursday, 19 June 2014,10H00 at 28 Plein Street, Middleburg Infra Electrical Depot and thereafter proceed to the entire substations for physical site briefing..**

(For direction please contact Linda Nkosi on Tel. 013 248 1246 or Abel Malete on 083 284 7435).

[Respondent to provide own PPE, transportation and accommodation].

Tenderers without a valid tender document in their possession will not be allowed to attend this compulsory clarification meeting/site inspections.

Tenderers shall be responsible for their own travel arrangements and cost regarding the site meeting and site inspections.

Tenderers without a valid tender document in their possession will not be allowed to attend this compulsory clarification meeting/site inspections. Tenderers shall be responsible for their own travel arrangements and cost regarding the site meeting and site inspections.

Transnet reserves the right to accept the whole or any part of a tender. Transnet also reserves the right to negotiate terms and conditions with all, or a short-listed group of contenders, or the preferred tenderer, should it be deemed necessary.

This tender closes punctually at 10h00 on Thursday, 26 June 2014.

Tenders may only be submitted on the tender documentation that is issued. Telegraphic, telephonic, facsimile and late tenders will not be accepted. Tenderers are warned that a tender will be liable to disqualification should any attempt be made by a Tenderer either directly or indirectly to canvass any officer(s) or employees of Transnet Limited in respect of a tender between the date the tender is submitted and the date of the award. A Tenderer may, however, at any time communicate with the Chairperson of the Transnet Freight Rail Acquisition Council, at telephone no. 011 5449486 on any matter relating to his tender.

Envelopes must not contain documents relating to any tender other than that shown on the envelope. *No slips are to be attached to the tender documents. Any additional conditions must be embodied in an accompanying letter. Alterations, additions or deletions must not be made by the Tenderer to the actual tender documents*. Tenders submitted by Tenderers must be neatly bound and the inclusion of loose documents must be avoided.

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

Compliance of tender(s) with Transnet's requirements is the sole responsibility of the Tenderer and any costs incurred in subsequent modifications to or replacement of equipment accepted by Transnet Limited in good faith on the grounds of certified compliance with specified standards by the contractor and in fact found to be inadequate in such respects, will be to the relevant Tenderer's account.

BROAD-BASED BLACK ECONOMIC EMPOWERMENT ("BBBEE")

TRANSNET fully endorses and supports the South African Government's Broad-Based Black Economic Empowerment Programme and it is strongly of the opinion that all business enterprises have an equal obligation to redress the imbalances of the past.

TRANSNET would therefore prefer to do business with business enterprises who share these same values and who are prepared to contribute to meaningful BBBEE initiatives (including and not limited to enterprise development, subcontracting and Joint Ventures) as part of their tender response.

Transnet would accordingly allow a "preference" in accordance with the 10% preference system, as per the Preferential Procurement Policy Framework Act 5 of 2000 (as amended) to companies who provide a BBBEE accreditation Certificate. All procurement and disposal transactions in excess of R30000 (Thirty thousand ZAR) will be evaluated accordingly. All transactions below R30000 will, as far as possible, be earmarked for Exempted Micro Enterprises (EME's).

TRANSNET consequently urges Respondents (Large enterprises and QSE's – see below) to have themselves duly accredited by any one of the Accreditation Agencies **approved** by SANAS (South African National Accreditation System, under the auspices of the DTI).

In terms of Government Gazette No. 32467, Notice No. 810 dated 31 July 2009, as from 1 February 2010 only BBBEE certificates issued by Accredited Verification Agencies of Verification Agencies that are in possession of a valid pre-assessment letter from South African National Accreditation System will be valid.

However accreditation certificates issued by non-accredited verification agencies before 01 February 2010 and which are still within their one (1) year validity period will still be acceptable, until their expiry date provided that the accreditation was done in accordance with the latest codes (i.e. those promulgated on 9 February 2007).

BBBEE Accreditation Certificates issued after the published date i.e. 01 February 2010, by a Verification Agency not approved by SANAS, will NOT be acceptable as from 01 February 2010.

Enterprises will be rated by such Accreditation Agencies based on the following:

(a) **Large Enterprises (i.e. annual turnover >R35 million):**

- Rating level based on all 7 (seven) elements of the BBBEE scorecard
- Enterprises to provide BBBEE certificate and detailed scorecard (to be renewed annually)

(b) **Qualifying Small Enterprises – QSE (i.e. annual turnover >R5 million but <R35 million):**

- Rating based on any 4 (four) of the elements of the BBBEE scorecard
- Enterprises to provide BBBEE certificate and detailed scorecard (to be renewed annually)

(c) **Exempted Micro Enterprises – EME (i.e. annual turnover <R5m are exempted from being rated or verified):**

- Automatic BBBEE Level 4 rating irrespective of race ownership, i.e. 100% BBBEE recognition
- Black ownership >50% or Black Women ownership >30% automatically qualify as Level 3 BBBEE rating, i.e. 110% BBBEE recognition
- EME's should provide documentary proof of annual turnover (i.e. audited financials) plus proof of Black ownership if Black ownership >50% or Black Women ownership >30% (to be renewed annually) from their Auditors / Accounting Officers

In addition to the above, Respondents who wish to enter into a Joint Venture (JV) or subcontract portions of the contract to BBBEE companies must state in their Tenders / Proposals the percentage of the total contract value which would be allocated to such BBBEE companies, should they be successful in being awarded any business. A rating certificate in respect of such BBBEE JV-partners and/or sub-contractors, as well as a breakdown of the distribution of the aforementioned percentage allocation must also be furnished with the tender response to enable Transnet to evaluate / adjudicate on all tenders received on a fair basis.

Each Respondent is required to furnish proof of its BBBEE status (Certificate and Detailed Scorecard) and ensure that the documentation is valid at the date of Tender Submission as stipulated above to TRANSNET.

Failure to submit your BBBEE Certificate and Detailed Scorecard will result in a score of zero being allocated for BBBEE evaluation.

Turnover: Indicate your company's most recent annual turnover: R.....

- If annual turnover <R5m, please attach auditors / accounting officers letter confirming annual turnover and percentage black ownership as well as Black Women ownership
- If annual turnover >R5m please attach BBBEE certificate and detailed scorecard from an accredited rating agency.

The DTI has created an online **B-BBEE Registry** (http://www.dti.gov.za) in order to provide a central and standardized source of the B-BBEE status of all entities, and to facilitate the flow of this information amongst entities by providing a Unique Profile Number (UPN) per each listing. Existing and prospective suppliers are therefore urged to list their B-BBEE status on the DTI Registry. Hence, entities verified by DTI, will receive the following benefits:

- Their BBBEE status will be verified and confirmed by the DTI, before listing on the Registry
- Listing on the Registry will provide suppliers the option to market themselves on the DTI B-BBEE Opportunities Network. This is a search engine that is designed to help businesses find B-BBEE compliant entities who match specific requirements in terms of the nature of services/goods provided, region, B-BBEE status or other search criteria.

Transnet supports this DTI initiative and will use the DTI Registry to verify prospective and existing suppliers' BBBEE credentials.

Kindly provide Transnet with your DTI B-BBEE UNIQUE PROFILE NUMBER with all tender submissions.

DTI BBBEE UNIQUE PROFILE NUMBER:

.....

Failure to submit your BBBEE information in terms of the above-mentioned clauses will result in a score of zero being allocated for BBBEE evaluation.

Suppliers and Tenderers are requested to duly complete the Supplier Declaration Form (SDF) and provide all the relevant supporting attachments as requested. Failure to provide the following may disqualify your tender submission:-

1. Duly completed SDF
2. BBBEE Certificate and detailed scorecard
3. Current tax clearance certificate

The Supplier and Tenderer shall furnish proof of the above to Transnet.

Transnet at its sole discretion may decide to allow certain price preferences in order to uplift the historically disadvantaged in terms of the PPPFA (Act 5 of 2000).

Transnet insists on honesty and integrity beyond reproach at all times and will not tolerate any form of improper influencing, bribery, corruption, fraud, or any other unethical conduct on the part of bidders/ Transnet employees. If, in the opinion of Transnet's Chief Operating Officer, a tenderer/contractor/ supplier has or has caused to be promised, offered or given to any Transnet employee, any bribe, commission, gift, loan, advantage or other consideration, Transnet shall be entitled to revoke the tender / contract by following its internal policies that govern the Exclusion process. In such an event Transnet will be entitled to place any Tenderer/Contractor/Supplier who has contravened the provisions of Transnet's business ethics on its List of Excluded Tenderers. This List will also be distributed to all other State Owned Enterprises and Government Departments.

Transnet invites its valued suppliers to report any allegations of fraud, corruption or other unethical activities to Transnet Tip-offs Anonymous, at any of the following addresses/contract numbers :-

- **Toll free anonymous hotline – 0800 003 056**
- **Email – Transnet@tip-offs.com**
- **Fax number – 0800 007 788**
- **Freepost DN 298, Umhlanga Rocks, 4320**

CONFIDENTIALITY IS GUARANTEED.

Part T1.2: Tender Data

T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annexure F of the CIDB Standard for Uniformity in Construction Procurement. (See www.cidb.org.za) The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the standard conditions of tender. Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

F.1.1 The employer is **Transnet Limited trading as Transnet Freight Rail.**

F.1.2 The tender documents issued by the employer comprise:

Part T1: Tendering procedure
T1.1 Tender notice and invitation to tender
- Suppliers Code of Conduct

T1.2 Tender data

Part T2: Returnable documents
T2.1 List of returnable documents
T2.2 Returnable Schedules

Part C1: Agreements and contract data
C1.1 Contract Data: General
C1.2 Contract data: The contractor's Offer and Acceptance
C1.3 Contract Data: Works Information

Part C2: Pricing data
C2.1 Pricing instructions
C2.2 Price list

Part C3: Scope of work
C3.1 Works Information
C3.2 Secondary specifications
C3.3 General specifications

Part C4: Site information
C4 Site information
- Principal Controlled insurance

F.1.4 The employer's agent is:

Name: **Ms. Linda Nkosi**
Address: **Infra Electrical Department**
Middleburg
Tel: **013 248 1246**
E-mail: **Linda.Nkosi@transnet.net**

F.2.11 The following 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 for a **2 EP** class of construction work, are eligible to submit tenders.

a) contractors who have a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **2 EP** class of construction work; and

F.2.11(b) The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list.

F.2.12 If a Tenderer wishes to submit an alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements, the details of which may be obtained from the Employer's Agent.

Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal.

Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the Tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements.

The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer's costs of confirming the acceptability of the detailed design before it is constructedNo alternative tender offers will be considered.

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

F.2.13.3 Parts of the tender offer communicated on paper shall be submitted as an original, plus one copy.

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

If posted, the envelope must be addressed to:

The Chairperson
Transnet Freight Rail Acquisition Council
P.O. Box 4244
JOHANNESBURG
2000

and must be dispatched in time for sorting by the Post Office to reach the Post Office Box indicated above, before the closing time of the tender.

If delivered by hand, to be deposited to the Transnet Freight Rail Acquisition Councilltender box which is located in the foyer, and to be addressed as follows:

The Chairperson
Transnet Freight Rail Acquisition Council
Ground Floor, Inyanda House
21 Wellington Road
ParkTown
JOHANNESBURG
2001

It should also be noted that the above tender box is accessible to the public 24 hours per day, 7 days a week.

The measurements of the "tender slot" are 500mm wide x 100mm high, and Tenderers must please ensure that tender documents/files are not larger than the above dimensions. Tenders, which are too bulky (i.e. more than 100mm thick) must be split into two or more files and placed in separate envelopes.

Identification details

Tenders must be submitted before the closing hour on the date as shown in F.2.15 below, and must be enclosed in a sealed envelope which must have inscribed on the outside:

(a) Tender No
(b) Description of work
(c) Closing date of tender

F.2.13.6 A two-envelope procedure will not be followed.

F.2.15 The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender.

F.2.15 Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted.

F.2.16 The tender offer validity period is **(25 September 2014)**

F.2.19 Access shall be provided for the following inspections, tests and analysis:

Inspection of current arrangement foundation and steelwork condition and measurements in substation yards during the tender period after the site meeting and prior to the closing date of tender.

F.2.23 The Tenderer is required to submit with his tender:
Either a Certificate of Registration issued by the Construction Industry Development Board or a copy of the application Form for registration in terms of the construction Industry Development Board Act (Form F006) and an original valid Tax Clearance Certificate issued by the South African Revenue Services.

F.3.4 The time and location for opening of the tender offers are:
Time: **10:00** on the closing date of tender.
Location: **Transnet Freight Rail Acquisition Council,**
Ground Floor,
Inyanda House,
21 Wellington Road,
Park Town,
JOHANNESBURG

F.3.11.1 The procedure for the evaluation of responsive tenders is

The score for quality is to be calculated using the following formula:
$W_Q = W_2 \times S_O/M_S$

Where: W_2 is the percentage score given to quality and equals **60**
S_O is the score for quality allocated to the submission under consideration
M_S is the maximum possible score for quality in respect of a submission

The score for financial offer is calculated using Formula **2** (option 1) of SANS294

Formula	Comparison aimed at achieving	Option 1	Option 2
1	Highest price or discount	$A = (1+ \frac{(P - Pm)}{Pm}$	A = P / Pm
2	Lowest price or percentage commission / fee	$A = (1 - \frac{(P - Pm)}{Pm}$	A = Pm / P

where:
Pm = the comparative offer of the most favourable tender offer.
P = the comparative offer of tender offer under consideration

Where: W_1 is the percentage score given to financial offer and equals 100 minus W_2.

The score for quality and financial offer is to be combined, before the addition of the score for preference, as follows:

$W_C = W_3 \times (1+\frac{(S-S_m)}{S_m})$

Where W_3 is the number of tender evaluation points for quality and financial offer and equals:

1) 90 where the financial value, VAT inclusive, of all responsive tenders received have a value in excess of R1,000,000; or

2) 80 where the financial value, VAT inclusive, of one or more responsive tender offers equals or is less than R1,000,000.

S is the sum of score for quality and financial offer of the submission under consideration.

S_m is sum of the score for quality and financial offer of the submission scoring the highest number of points

Up to 100 minus W_3 tender evaluation points will be awarded to Tenderers who complete the preference schedule and who are found to be eligible for the preference claimed. Tenderers shall submit BBBEE rating certificates with detailed scorecards that will be issued by the verification agencies that do their BBBEE ratings in accordance with the latest Department of Trade and Industry codes of Good Practice.

F.3.11.3 Only those Tenderers who score a minimum score of **60** points in respect of the following quality criteria are eligible to submit tenders.

As prescribed in terms of the Preferential Procurement Policy Framework Act (PPPFA), Act 5 of 2000 and its Regulations, Respondents are to note the following:

- Functionality is included at a pre-qualification stage with a prescribed percentage threshold of 60
- Proposals will be evaluated on price which will be allocated **80 or 90 points** and preference which will be allocated **20 or 10 points**, dependent on the value of the Services.
- The 80/20 preference point system applies where the acquisition of the Goods or Services will be less than R1 000 000.00.
- If the 80/20 preference point system is stipulated and all Bids received exceed R1 000 000.00, the RFQ will be cancelled.
- The 90/10 preference point system applies where acquisition of the Goods or Services will exceed R1 000 000.00
- If the 90/10 preference point system is stipulated and all Bids received are equal to or below R1 000 000.00, the RFQ will be cancelled.
- **In this RFQ, Transnet will apply 80/20 preference point system prescribed in the PPPFA.**

In compliance with the Government Gazette No 34612, Notice No. 754 dated 23 September 2011, as from 1 October 2011 valid B-BBEE Verification Certificates must be issued by:

- Verification Agencies accredited by the South African National Accreditation System [SANAS]; or
- Registered Auditors approved by the Independent Regulatory Board of Auditors [**IRBA**], in accordance with the approval granted by the Department of Trade and Industry.

Enterprises will be rated by such agencies based on the following:

a) Large Enterprises [i.e. annual turnover greater than R35 million]:

Rating level based on all seven elements of the B-BBEE scorecard

b) Qualifying Small Enterprises – QSE [i.e. annual turnover between R5 million and R35 million]:

Rating based on any four of the elements of the B-BBEE scorecard

c) Exempted Micro Enterprises – EME [i.e. annual turnover less than R5 million]:

In accordance with B-BBEE Codes of Good Practice [Statement 000, Section 4], any enterprise with an annual total revenue of R 5 million or less qualifies as an EME.

- Automatic rating of B-BBEE Level 4 irrespective of race or ownership
- Black ownership greater than 50% or Black Women ownership greater than 50% automatically qualify as B-BBEE Level 3

Sufficient evidence to qualify as an EME would be a certificate (which may be in the form of a letter) from an auditor or accounting officer or a certificate from a Verification Agency accredited by SANAS. The certificate must confirm the company's turnover, black ownership / black female ownership, B-BBEE status level and validity date.

Respondents are required to furnish proof of the above to Transnet. [i.e. a valid detailed scorecard as stipulated above in respect of Large Enterprises and QSEs, or a valid certificate in respect of EMEs].

Transnet will accordingly allocate a maximum of **20 [twenty] points** in accordance with the **80/20** preference point system prescribed in the Preferential Procurement Policy Framework Act (PPPFA), Act 5 of 2000 and its Regulations to the Respondent's

final score based on an entity's B-BBEE scorecard rating. *[Refer **Annexure A- B-BBEE Preference Points Claim Form** for further details].*

N.B. Failure to submit a B-BBEE certificate, which is valid as at the Closing Date of this RFP, will result in a score of zero being allocated for B-BBEE.

Transnet will utilise the following criteria in choosing a Supplier/Service Provider, if so required:

Stage One - Administrative responsiveness

- Completeness of response and valid returnable documents

Stage Two - Substantive responsiveness (Mandatory requirements)

- All respondents must be graded on a **2 EP CIDB** grading.
- Valid Letter of Good Standing from Department of Labour

The test for Administrative responsiveness and Substantive responsiveness must be passed for a Respondent's Quotations to progress to Stage Three for further evaluation.

Stage Three - Minimum Qualifying score is 60 % for Technical Criteria

The test for the Technical and Functional threshold will include the following:

FUNCTIONAL EVALUATION	RATING					WEIGHT	TOTAL
	1	2	3	4	5		
Clause by clause compliance to specification						20%	
Submitted Risk/Safety Plan for the project						20%	
Technical Capacity/Resources						20%	
Delivery period for the project						40%	

	TOTAL	**100**	

The following applicable values will be utilised when scoring each criterion mentioned above:

Poor	=	20
Satisfactory	=	40
Good	=	60
Very good	=	80
Excellent	=	100

Stage Four – Pricing/BBB-EE scoring

The bidders that have successfully progressed through to Phase 2 will be evaluated in accordance with the **80/20 preference point system** contemplated in the Preferential Procurement Policy Framework Act (Act 5 of 2011)

Weighted evaluation based on 80/20 preference point system:

Pricing

- Pricing will be calculated using the lowest price quoted as the baseline, thus the lowest price quoted will achieve full marks, while all other quotes will achieve a weighted average mark based on the lowest price.
- Pricing and price basis [firm] - whilst not the sole factor for consideration, competitive pricing and overall level of unconditional discounts[1] will be critical

  Transnet will utilise the following formula in its evaluation of Price:

  $PS = 90\left(1 - \frac{Pt - Pmin}{Pmin}\right)$ Where:

Ps	=	Score for the Bid under consideration
Pt	=	Price of Bid under consideration
Pmin	=	Price of lowest acceptable Bid

- B-BBEE status of company

[1] *Only unconditional discounts will be taken into account during evaluation. A discount which has been offered conditionally will, despite not being taken into account for evaluation purposes, be implemented when payment is effected.*

Preference points will be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	8	16
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

Description	Total	Total
Price	90	80
BBBEE	10	20
Total	**100**	**100**

F.3.13.1 Tender offers will only be accepted if:

a) The Tenderer has in his or her possession an original valid Tax Clearance Certificate issued by the South African Revenue Services or has made arrangements to meet outstanding tax obligations.
b) The Tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation;
c) The Tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector.
d) The Tenderer has not:
   i) abused the Employer's Supply Chain Management System; or

ii) failed to perform on any previous contract and has been given a written notice to this effect; and

e) has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the Tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process.

F.3.18 The number of paper copies of the signed contract to be provided by the employer is one.

The additional conditions of tender are:

1. The Tenderer is deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the *works* and of the prices stated in the priced Activity Schedule for the *works* Information. The rates and prices (except in so far as otherwise provided in the Tender) collectively cover full payment for the discharge of all his obligations under the Contract and all matters and things necessary for the proper completion of the *works*.

2. ***The tenders shall be completed in black ink only.***

3. ADDITIONAL TENDER CONDITIONS

3.1 Tenderers shall submit qualifications of staff that will be performing the works. Only qualified technical personnel shall perform the works on the electrical equipment or installations thereof.

3.2 During the duration of the contract, the successful Tenderer shall be required to inform the Deputy of any staff changes and provide the qualifications of the replacement staff for approval.

3.3 **Clause by clause statement of compliance to General conditions of Contract and technical specifications**

3.3.1 *Tenderers shall indicate clause-by-clause compliance with the specifications.*

3.3.2 *This shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance.*

3.3.3 *Tenderers shall motivate a statement of non-compliance.*

3.3.4 *Number the specifications according to the original tender document.*

3.3.5 *The head and sub-headings must be listed next to the specification number.*

3.3.6 *Indicate statement of compliance and motivate (give reasons for not complying).*

3.3.7 *Indicate other statements which don't require compliance.*

Note: The committee will take decision to give an average score to companies who indicated their compliance but with short comings.

3.4 The Tenderer shall provide a Gantt or a similar bar chart showing how long it will take to complete the works and be energised. This chart shall be submitted with the tender submission on the closing date of the tender. Should a Tenderer be successful in winning a tender, a final bar chart shall be submitted within 14 days after the award of the contract to the employer by the successful Tenderer.

3.5 The Tenderer shall submit the programme/schedule in a bar chart format for the project.

3.6 The Tenderer shall indicate how the work will be executed and commissioned. (Approach paper)

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

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

3.9 During the duration of the contract period, the successful Tenderer shall be required to inform the Employer / Deputy of any changes to equipment offered and submit detailed information on replacement equipment for approval prior to it being used on this contract.

3.10 Tenderer shall submit equipment type test certificates as specified on the contract. These shall be in English or certified translation.

3.11 The Tenderer shall supply a site diary and site instruction books, both books shall be of triplicates carbon copies.

3.12 During the duration of the contract, the successful Tenderer shall be required to inform the Supervisor of any staff changes and provide the qualifications of the replacement staff for approval.

4 Evaluation criteria of the tender to be met are:

4.1 **Phase 1:** Will be a disqualifying phase and those that comply will progress to be competitively evaluated in **phase 2**. (Refer to clause F.3.11.3)

Minimum criteria for progressing from phase 1 to phase 2 is detailed below:

- Letter of Good Standing from Department of Labour.
- CIDB grading of **2 EP** or higher to be met.

- A clause by clause statement of compliance to the following documents:
  - NEC ECSC General Conditions of Contract.
  - All secondary specifications
  - All general specifications

4.2 **Phase 2:** Refer to clause F.3.11.3 as mentioned above.

4.3 **Phase 3:** Will be evaluated in respect of Price and BBBEE at 90/10 ratio.

5. DISCLAIMERS

Transnet is not committed to any course of action as a result of its issuance of this RFQ and/or its receipt of a quotation in response to it. Please note that Transnet reserves the right to:

- modify the RFQ's goods / service(s) and request Respondents to re-bid on any changes;
- reject any Quotation which does not conform to instructions and specifications which are detailed herein;
- disqualify Quotations submitted after the stated submission deadline;
- not necessarily accept the lowest priced Quotation;
- reject all Quotations, if it so decides;
- place an order in connection with this Quotation at any time after the RFQ's closing date;
- award only a portion of the proposed goods / service/s which are reflected in the scope of this RFQ;
- split the award of the order/s between more than one Supplier/Service Provider; or
- make no award at all.

Risk/ Safety Plan:

5.1 A detailed plan indicating how risks and safety will be managed in a site must have the following key points depending on project requirements:

a) Safe working procedures.
- Construction Work supervisor
- Subordinate construction work supervisor
- Construction Safety officer
- List of Tenderers already appointed – list to be updated at least monthly.
- Health and safety representative

b) SHE Organisation
- Health and safety committees
- Composition
- Frequency of meetings
- Minutes of meetings
- Legal compliance audits
- Audit report
- Frequency of audits
- Finding and analysis
- Corrective action

c) Risk Assessment/Management
- Task descriptions
- Risk identification, analysis, mitigating steps, monitoring steps and review plan.
- Risk assessment

d) Education and training
- Induction training
- Site specific training
- Certificate of competence

e) Emergency planning (Evacuation plan)
- Client procedure
- Site procedure

f) SHE communications
- Safety/toolbox talks
- Incident recall

g) Safe working Procedures and Methods
- Method statements.
- Safe operating procedures
- Task/job observations

h) Personal Protective Equipment and Clothing
- PPE required after all controls have been considered
- PPE proof of issue

i) Project security
- Security risks identified
- Access control

j) Incident management
k) Fall protection plan
l) Substance abuse testing
m) Logbooks and registers
n) Health and Safety Costs

6 Environmental Management Plan

6.1 A detailed plan indicating how environmental safety will be managed in a site must have the following key points depending on projects requirements:

a) Control of dust
b) Noise and pollution control
c) Waste management
d) Environment Incident Management
e) Contamination of surface and underground water
f) Soil contamination
g) Storm water drainage
h) Environmental clean-up and rehabilitation
i) Environment monitoring
j) Environment training and awareness
k) Provision for environmental clean-up and rehabilitation cost (Budget)

7 Technical Capacity/Resources

7.1 A detailed summary indicating technical capacity/resources to execute the work must have the following key points depending on projects requirements:

a Availability of transport to site.
b Number of skilled and unskilled labour who will perform work execution.
c Certificate for personnel with technical responsibilities
d Loading capacity of a truck, cranes and other machinery.
e Availability of tool(s) relevant to the project execution.

Note: The committee will take decision to give an average score to companies who indicated their compliance but with short comings.

Part T2: Returnable Documents

PART T2: RETURNABLE DOCUMENTS / SCHEDULES

T2.1 LIST OF RETURNABLE DOCUMENTS

The tenderer must complete the following returnable documents:

1.0 Returnable documents required for tender evaluation purposes

No	Returnable Documents
1	Letter of Good Standing with the Compensation Commissioner
2	Safety Plan and Fall Protection Plan in accordance with the Construction Regulations of 2003 and Transnet's E4E
3	Quality Assurance/control Plan
4	Environmental Management Plan
5	Certified copy of CIDB certification
6	Proposed Organization and Staffing
7	Certified Copy of Share Certificates CK1 & CK2
8	Certified Copy of Certificate of Incorporation and CM29 and CM9
9	Certified Copy of Identity Documents of Shareholders / Directors / Members (where applicable)
10	Original or certified cancelled cheque **OR** original or certified letter from the bank verifying banking details (with bank stamp and signature)
11	Current and original or certified Tax Clearance Certificate
12	Certified VAT registration certificate
13	A signed letter from the Accountant/Auditor confirming most recent annual turnover and percentage black ownership in the company **AND/OR** certified BBBEE certificate and scorecard from an accredited rating agency
14	Programme and method statement
15	Statement of compliance or non-compliance with all clauses of the Scope of Works and all the technical specifications. The clause-by-clause statement of compliance shall take the form of a separate document listing all the clause numbers of all the above specifications indicating the individual statement of compliance or non-compliance. Tenderers shall motivate a statement of non-compliance.

T2.2 RETURNABLE SCHEDULES

The tenderer must complete the following returnable schedules:

2.0 Returnable Schedules required for tender evaluation purposes

No	Returnable schedules
1	Certificate of Attendance of Information Briefing Session or site inspection
2	Certificate of Authority for Signatory (Resolution by Board)
3	Schedule of Tenderers experience
4	Schedule of Subcontractors (where applicable)
5	Certificate of authority for joint ventures (where applicable)
6	Schedule of Plant and Equipment (Tools and Machinery)
7	Foreign Exchange Rate Information (where applicable)
8	Record of Addenda to Tender Document
9	Supplier declaration form Duly completed SDF (Supplier declaration form)
10	Compulsory enterprise Questionnaire
11	Approach paper which responds to the proposed scope of works.
12	Experience of Key Staff in the form of Curriculum Vitae
13	Transnet SOC limited contractual safety clauses which will form part of any resulting contract.
14	Proposed amendments and qualifications
15	Labour Payment Schedule

3.0 Returnable Schedules that will be incorporated into the contract

3.1 Certificate of attendance of information briefing session/site inspection
3.2 Certificate of Authority for Signatory (Resolution by Board)
3.3 Schedule of Tenderers experience
3.4 Schedule of Sub-contractors
3.5 Certificate of authority for joint ventures (where applicable)
3.6 Schedule of Plant and equipment
3.7 Foreign Exchange Rate Information (where applicable)
3.8 Record of Addenda to Tender Document
3.9 Supplier declaration form duly completed (SDF)
3.10 Compulsory Enterprise Questionnaire
3.11 Approach paper, which responds to the proposed scope of works.
3.12 Experience of key staff in the form of Curriculum Vitae
3.13 Transnet SOC Limited contractual safety clauses which will form part of any resulting contract
3.14 Proposed amendments and qualifications.
3.15 Labour Payment Schedule.

Part T2: Returnable Schedules

CERTIFICATE OF ATTENDANCE AT INFORMATION BRIEFING SESSION/SITE INSPECTION

This is to certify that

_____ (Tenderer)
of
_____ (address)

_____

was represented by the person(s) named below at the compulsory site meeting held for all tenderers at _____ (location) on _____ (date), starting at_____ We acknowledge that the purpose of the meeting was to acquaint ourselves with the Site of the Works and/or matters incidental to doing the work specified in the tender documents in order for us to take account of everything necessary when compiling our rates and prices included in the tender.

Particulars of person(s) attending the meeting/site inspections:

Name: _____ Signature _____

Capacity: _____

Name: _____ Signature _____

Capacity _____

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

Name: _____ Signature _____

Capacity: _____ Date and time _____

RESOLUTION OF BOARD OF DIRECTORS

Name of firm _____

It was resolved at a meeting of the Board of Directors held on _____ that

FULL NAME(S)	**SIGNATURE**
_____	_____
_____	_____
_____	_____

in his capacity of _____ is/are hereby authorised to enter into, sign and execute and complete any documents relating to Tenders and/or Contracts for the supply of goods and services.

Confirm: Date_____

FULL NAME _____ _____
CHAIRMAN

FULL NAME _____ _____
SECRETARY

Certified true copy:

SIGNED AT _____ ON THIS _____ DAY OF _____ 20_____

SCHEDULE OF THE TENDERER'S EXPERIENCE

The following is a statement of similar work successfully executed by myself/ourselves:

Employer, contact person and telephone number	Description of contract	Value of work inclusive of VAT (Rand)	Date completed

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

SCHEDULE OF PROPOSED SUBCONTRACTORS

We notify you that it is our intention to employ the following Subcontractors for work in this contract.

If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of proposed Subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

We confirm that all subcontractors who are contracted to construct a house are registered as home builders with the National Home Builders Registration Council.

	Name and address of proposed Subcontractor	Nature and extent of work	Previous experience with Subcontractor.
1.			
2.			
3.			
4.			
5.			

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

SCHEDULE OF PLANT AND EQUIPMENT

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

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

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

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

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

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

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

Tenderer .....

FOREIGN EXCHANGE RATE INFORMATION REQUIRED TO BE FURNISHED BY TENDERERS.

1. Particulars of the exchange rate on which prices are based:

_____ (Foreign currency) equals R_____(South African currency)

Note: Tenderers who offer imported material shall base their tenders on the selling rate of exchange that ruling on the last working day of the month prior to the closing date of tenders.

2. The percentage of the tender prices which is to be remitted by the Tenderers from South Africa to another country is _____% of the f.o.b./c. and f.r.o.r. in bond price (delete those not applicable).

Note: (1) The percentage quoted above will be deemed to apply even though a portion only of the item(s) tendered for is accepted.

(2) Adjustment in respect of variation in exchange rate will be allowed only on the percentage of the tendered price quoted above.

3. The tendered price shall be computed at the rate of exchange stated by the Tenderer in paragraphs **1** and **2** above as applied to the percentage of the tendered price quoted.

4. Transnet Freight Rail will accept for its account, in respect of such percentage of the tendered price as will be affected by the rate of exchange, any variation between the rate mentioned in paragraph **1** above, and the rate ruling at the date when payment for the goods is made by Transnet Freight Rail; provided that if the Contractor is required to remit the whole or portion of the contract price to another country in payment for goods or portion thereof prior to receiving payment from Transnet Freight Rail, the date(s) of such remittance(s) shall be deemed to be the date(s) of payment by Transnet Freight Rail for the purposes of this paragraph.

5. In the absence of a specific indication by the Contractor at the time of tendering that the proviso to paragraph **3** will apply, it will be assumed that the Contractor desires the adjustment to be effected by reference to the date on which actual payment is made by Transnet Freight Rail.

6. (a) The Contractor shall, if so required, furnish documentary proof to establish that the percentage of the contract price specified by him in paragraph **2** has actually been remitted to another country and the rate of exchange at which that was done.

(b) Whenever the Contractor is required to remit the whole or portion of the contract price, to another country as contemplated in the proviso to paragraph **2** above, he shall notify Transnet Freight Rail forthwith and furnish documentary evidence of such remittance and of the rate of exchange at which that was done.

7. Invoices in respect of goods supplied must reflect the amount remitted or to be remitted to another country and the amount to be retained in South Africa.

8. **The Contractor shall take out forward cover for all imported materials and services within 14 days of award of the contract. Proof shall be submitted to the Project Manager of the contract. The cost of forward cover shall be invoiced separate from the contract invoices and shall not be included in the tender price.**

_____

SIGNATURE OF TENDERER

DATE:_____

WITNESSES:

1._____

2._____

ADDRESS: _____

_____

_____

_____

RECORD OF ADDENDA TO TENDER DOCUMENTS

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

in this tender offer:		
	Date	**Title or Details**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

TRANSNET SUPPLIER DECLARATION/APPLICATION

The Financial Director or Company Secretary

Transnet Vendor Management has received a request to load your company on to the Transnet vendor database. Please furnish us with the following to enable us to process this request:

2. Complete the "Supplier Declaration Form" **(SDF)** on page 2 of this letter
3. **Original** cancelled cheque **OR** letter from the bank verifying banking details (**with bank stamp)**
4. **Certified** copy of Identity document of Shareholders/Directors/Members (where applicable)
5. **Certified** copy of certificate of incorporation, CM29 / CM9 (name change)
6. **Certified** copy of share Certificates of Shareholders, CK1 / CK2 (if CC)
7. A letter with the company's letterhead confirming physical and postal addresses
8. **Original** or **certified** copy of SARS Tax Clearance certificate and Vat registration certificate
9. A signed letter from the Auditor / Accountant confirming most recent annual turnover and percentage black ownership in the company **AND/OR** BBBEE certificate and detailed scorecard from an accredited rating agency (SANAS member).

NB: ▪ ***Failure to submit the above documentation will delay the vendor creation process.***

▪ ***Where applicable, the respective Transnet business unit processing your application may request further information from you. E.g. proof of an existence of a Service/Business contract between your business and the respective Transnet business unit etc.***

IMPORTANT NOTES:

a) **If your annual turnover is less than R5 million,** then in terms of the DTI codes, you are classified as an Exempted Micro Enterprise (EME). If your company is classified as an EME, please include in your submission, a signed letter from your Auditor / Accountant confirming your company's most recent annual turnover is less than R5 million and percentage of black ownership and black female ownership in the company AND/OR BBBEE certificate and detailed scorecard from an accredited rating agency (e.g. permanent SANAS Member), should you feel you will be able to attain a better BBBEE score.

b) **If your annual turnover is between R5 million and R35million**, then in terms of the DTI codes, you are classified as a Qualifying Small Enterprise (QSE) and you claim a specific BBBEE level based on any 4 of the 7 elements of the BBBEE score-card, please include your BEE certificate in your submission as confirmation of your status.
NB: BBBEE certificate and detailed scorecard should be obtained from an accredited rating agency e.g. permanent SANASMember).

c) **If your annual turnover is in excess of R35million**, then in terms of the DTI codes, you are classified as a Large Enterprise and you claim a specific BEE level based on all seven elements of the BBBEE generic score-card. Please include your BEE certificate in your submission as confirmation of your status.
NB: BBBEE certificate and detailed scorecard should be obtained from an accredited rating agency (permanent SANASMember).

d) **To avoid PAYE tax being automatically deducted from any invoices received from you,** you must also contact the Transnet person who lodged this request on your behalf, so as to be correctly classified in terms of Tax legislation.

e) Unfortunately, **No payments can be made to a vendor** until the vendor has been registered, and no vendor can be registered until the vendor application form, together with its supporting documentation, has been received and processed.

f) **Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents mentioned above to the Transnet Official who is intending to procure your company's services/products in order that he/she should complete and Internal Transnet Departmental Questionnaire before referring the matter to the appropriate Transnet Vendor Master Office.**

Regards,

Transnet Vendor/Supplier Management *[please substitute this with your relevant Transnet department before sending this document out]*

Supplier Declaration Form

Company Trading Name						
Company RegisteredName						
Company Registration Number Or ID Number If A Sole Proprietor						
Form of entity	CC	Trust	Pty Ltd	Limited	Partnership	Sole Proprietor
VAT number (if registered)						
Company Telephone Number						
Company Fax Number						
Company E-Mail Address						
Company Website Address						
Bank Name		Bank Account Number				
Postal Address				Code		
Physical Address				Code		
Contact Person						
Designation						
Telephone						
Email						
AnnualTurnoverRange (Last Financial Year)	< R5 Million		R5-35 million		> R35 million	
Does Your Company Provide	Products		Services		Both	
Area Of Delivery	National		Provincial		Local	
Is Your Company A Public Or Private Entity			Public		Private	
Does Your Company Have A Tax Directive Or IRP30 Certificate			Yes		No	
Main Product Or Service Supplied (E.G.: Stationery/Consulting)						
BEE Ownership Details						
% Black Ownership		% Black women ownership		% Disabled person/s ownership		
Does your company have a BEE certificate	Yes		No			
What is your broad based BEE status (Level 1 to 9 / Unknown)						
How many personnel does the firm employ	Permanent		Part time			
Transnet Contact Person						
Contact number						
Transnet operating division						
Duly Authorised To Sign For And On Behalf Of Firm / Organisation						
Name		Designation				

Signature		Date	
Stamp And Signature Of Commissioner Of Oath			
Name		Date	
Signature		Telephone No.	

NB: Please return the completed Supplier Declaration Form (SDF) together with the required supporting documents mentioned above to the Transnet Official who is intending to procure your company's services/products.

2. VENDOR TYPE OF BUSINESS

(Please tick as applicable) **(* - Minimum requirements)**

2.1	Indicate the business sector in which your company is involved/operating:				
Agriculture		Mining and Quarrying			
Manufacturing		Construction			
Electricity, Gas and Water		Finance and Business Services			
Retail, Motor Trade and Repair Services		Wholesale Trade, Commercial Agents and Allied Services			
Catering, accommodation and Other Trade		Transport, Storage and Communications			
Community, Social and Personal Services		Other (Specify)			
Principal Business Activity *					
Types of Services Provided					
Since when has the firm been in business?					

2.2	What is your company's annual turnover (excluding VAT)? *								
<R20k	>R20k <R0.3m	>R0.3m <R1m	>R1m <R5m	>R6m <R10m	>R11m <R15m	>R16m <R25m	>R26m <R30m	>R31m <R34m	>R35 m

2.3	Where are your operating/distribution centres situated *	

3. VENDOR OWNERSHIP DETAIL

(Please tick as applicable) **(* - Minimum requirements)**

3.1	Did the firm previously operate under another name? *		
YES		NO	

3.2	If Yes state its previous name:*
Registered Name	
Trading Name	

3.3	Who were its previous owners / partners / directors?*

SURNAME & INITIALS	ID NUMBERS

3.4	List Details of current partners, proprietors and shareholders by name, identity number, citizenship, status and ownership as relevant: *

SURNAME & INITIALS	IDENTITY NUMBER	CITI-ZENSHIP	HDI	DIS-ABLED	GENDER	DATE OF OWNERSHIP	% OWNED	% VOTING

3.5	List details of current directors, officers, chairman, secretary etc. of the firm: *

SURNAME & INITIALS	IDENTITY NUMBER	TITLE	DIS - ABLED	GENDER	% OF TIME DEVOTED TO THE FIRM	CONTACT NUMBER

3.6	List details of firms personnel who have an ownership interest in another firm: *

SURNAME & INITIALS	IDENTITY NUMBER	NAME & ADDRESS OF OTHER FIRM	TITLE IN OTHER FIRM	% OWNED	TYPE OF BUSINESS OF OTHER FIRM

4. VENDOR DETAIL

(Please tick as applicable) **(* - Minimum requirements)**

4.1	How many personnel does the firm employ? *					
	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Permanent						
Part Time						

4.1.1	In terms of above kindly provide numbers on women and disabled personnel? *					
	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Women						
Disabled						

4.2	Provide Details of Contact Person/s Responsible for Broad Based Black Economic Empowerment (BBBEE) in the Company *		
SURNAME	INITIALS	DESIGNATION	TELEPHONE NO.

4.2.1	Is your company a value adding supplier (i.e. registered as a vendor under the VAT Act of 1991, where NPAT + total labour cost > 25% of total revenue)?		
YES		NO	

4.2.2	Is your company a recipient of Enterprise Development Contributions?*		
YES		NO	

4.2.3	May the above mentioned information be shared and included in Transnet Supp Database for future reference? *		
YES		NO	

4.2.4	If you are successful in the tender/contract (where applicable) and this is awarded to your company / organisation, will this have a positive impact on your employment plans? *		
YES		NO	

4.2.5	If yes (above) kindly provide the following information:					
	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Permanent						
Part Time						

4.2.6	In terms of above kindly provide numbers on woman and disabled personnel:					
	BLACK	WHITE	COLOURED	INDIAN	OTHER	TOTAL
Women						
Disabled						

4.2.7	Are any of your members/shareholders/directors ex employees of Transnet		
YES		NO	

4.2.8	Are any of your family members employees of Transnet?		
YES		NO	

4.2.9	If Yes to points 4.2.7 & 4.2.8, list details of employees/ex-employees

SURNAME & INITIALS	IDENTITY NUMBER	NAME & ADDRESS OF OTHER FIRM	TITLE IN OTHER FIRM	% OWNED	TYPE OF BUSINESS OF OTHER FIRM

Internal Transnet Departmental Questionnaire (for office use only)

Section 1: To be completed by the Transnet Requesting / Sourcing Department											
TFR		TRE		TPT		TPL		TNPA		TRN	
Creat		Amen		Block		Unbloc		Once-Off / Emergency			
Exten		Delete		Undel							

Supplier's trading name				
Supplier's registered name				
Please indicate if the Supplier has a contract with sourcing Transnet OD	Yes		No	
If yes please submit a copy of the letter of award				

a) What is being procured from the supplier?				
i. Products only	Yes		No	
ii. Services only	Yes		No	
iii. Labour only	Yes		No	
iv. Mix of services and products	Yes		No	
v. Mix of services and labour	Yes		No	

b) If your answer is **YES** to questions II, III, IV or V in paragraph **a)** above, please indicate whether the relevant **PAYE questionnaires** have been forwarded to the appropriate **Transnet Operational Divisions'** decision making bodies/ **Strategic Supply Management** team for a directive /decision on tax withholding from payments to this supplier.

Yes		No	

c) If your reply to (**b**) is "**NO**", please furnish

d) Certification and Approval of proposed Vendor Creation/Unblocking/Other Changes by Transnet Official with Appropriate Delegated Authority :

I HEREBY CERTIFY THAT THE TRANSNET DETAILED PROCUREMENT PROCESS (DPP) / PROCUREMENT MECHANISM HAS IN ALL RESPECTS BEEN ADHERED TO AND I THEREFORE APPROVE THE PROPOSED VENDOR CREATION/APPROVAL/OTHER CHANGES TO BE EFFECTED ON THE VENDOR MASTER

	Grade	Date	Signature

		Y	Y	Y	Y	M	M	D	D		
Tel No:		**Fax**									

Section 2: To be completed by the BEE Department (this section is for											
NARROW BASED (NB)				BROADBASED (BBBEE)							
BEE O	BWBE	DPBE	MR	CONTB. LEVEL	EME: <R5m	QSE: >R5m <R35m	LARGE: >R35m	VALIDITY DATE			

	Grade	**Date**								**Signature**
		Y	Y	Y	Y	M	M	D	D	
		Y	Y	Y	Y	M	M	D	D	

COMPULSORY ENTERPRISE QUESTIONNAIRE

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

Section 1: Name of enterprise: . . . . . .

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

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

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number . . . . . .

Close corporation number . . . . . .

Tax reference number . . . . . .

Section 6: Record in the service of the state

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

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

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

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

*insert separate page if necessary

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

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

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

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

*insert separate page if necessary

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

i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;

ii) confirms that the neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of 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

iv) 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 _____

EVALUATION SCHEDULE: APPROACH PAPER

The approach paper must respond to the scope of work and outline the proposed approach / methodology including that relating to health and safety. The approach paper should articulate what value add the tenderer will provide in achieving the stated objectives for the project.

The tenderer must as such explain his / her understanding of the objectives of the assignment and the Employer's stated and implied requirements, highlight the issues of importance, and explain the technical approach they would adopt to address them. The approach paper should explain the methodologies which are to be adopted, demonstrate the compatibility of those methodologies with the proposed approach. The approach should also include a quality plan which outlines processes, procedures and associated resources, applied by whom and when, to meet the requirements and indicate how risks will be managed and what contribution can be made regarding value management.

The tenderer must attach his / her approach paper to this page. The approach paper should not be longer than 8 pages.

The scoring of the approach paper will be as follows:

	Technical approach and methodology
Poor (score 40)	The technical approach and / or methodology is poor / is unlikely to satisfy project objectives or requirements. The tenderer has misunderstood certain aspects of the scope of work and does not deal with the critical aspects of the project.
Satisfactory (score 70)	The approach is generic and not tailored to address the specific project objectives and methodology. The approach does not adequately deal with the critical characteristics of the project. The quality plan, manner in which risk is to be managed etc is too generic.
Good (score 90)	The approach is specifically tailored to address the specific project objectives and methodology and is sufficiently flexible to accommodate changes that may occur during execution. The quality plan and approach to managing risk etc is specifically tailored to the critical characteristics of the project.
Very good (score 100)	Besides meeting the "good" rating, the important issues are approached in an innovative and efficient way, indicating that the tenderer has outstanding knowledge of state-of-the- art approaches. The approach paper details ways to improve the project outcomes and the quality of the outputs

The undersigned, who warrants that he / she is duly authorised to do so on behalf of the enterprise, confirms that the contents of this schedule are within my personal knowledge and are to the best of my belief both true and correct.

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

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

Tenderer .....

CURRICULUM VITAE OF KEY PERSONNEL

Name:	**Date of birth:**
Profession:	**Nationality:**
Qualifications:	
Professional registration number:	
Name of employer (firm):	
Current Position:	**Years with the firm:**
Employment record: (list in chronological order starting with earliest work experience)	
Experience record pertinent to required service	
Certification: I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. _____ _____ *[Signature of person named in schedule]* Date	

TRANSNET SOC LIMITED / CONTRACTORS / SUB-CONTRACTORS

CONTRACTUAL SAFETY CLAUSES WHICH WILL FORM PART OF ANY RESULTING CONTRACT

The parties agree on the following arrangements according to section 37 (2) of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) to ensure compliance by the mandatory with provisions of the Act.

1) That the Contractor is an "employer" in his own right as defined in section 1 of Act 85 of 1993 and that he must fulfil all his obligations as an employer in terms of the Act.

2) The Contractor shall comply with the requirements of Act 85 of 1993 in its entirety.

3) Where special permits are required, such as electrical switching, hot work permits, etc. the Contractor shall obtain them from a person designated by Transnet SOC Limited for this purpose, and all requirements of the Contractor must rigidly comply with the permit.

4) The Contractor shall conduct a risk assessment of the work to be performed by a competent person prior to the commencement of work, to identify risks and hazards that persons may be exposed to, analyse and evaluate identified hazards.

5) The Contractor shall have a documented Health and Safety Plan based on the risks and hazards identified before commencement of work.

6) The Health and Safety Plan shall include the following:

   6.1 The safety management structure to be instituted with all appointments in terms of the Act and Regulations
   6.2 The safe working methods and procedures to be implemented to ensure work are performed in compliance to the Act.
   6.3 The safety equipment, devices and clothing to be made available by the Contractor to his employees.
   6.4 The site access control measures pertaining to health and safety to be implemented.
   6.5 Control measures for ensuring that the Health and Safety Plan is maintained and monitored for the duration of the contract.

7) The Contractor shall ensure that all work is performed under the close supervision of a person trained to understand the hazards associated with the work performed and who has authority to ensure that the necessary precautionary measures are implemented.

8) The Contractor must appoint a Health and Safety Co-ordinator to liaise with Transnet SOC Limited on matters pertaining to occupational health and safety.

9) The appointed Safety Co-ordinator must liaise at least once a week with the* Health and Safety Section / Risk Manager /Occupational Risk Manager of Transnet SOC Limited.

10) The Contractor shall furnish the* Health and Safety Section/ Risk Manager/ Occupational Risk Manager of Transnet SOC Limited immediately with full particulars of any sub-Contractor which he may involve in the contract in order that the sub-Contractor himself can be made aware of all the clauses in this contract pertaining to health and safety.

11) The Contractor shall stop any sub-contractor from executing work which is not in accordance with the Health and Safety Plan or which poses a threat to health and safety of persons.

12) The Contractor shall ensure that all his employees and visitors undergoes health and safety induction pertaining to the hazards prevalent, proof of such training must be kept on file.

13) In the event where the risk assessment reveals the risk relating to working from an elevated position the Contractor shall cause the designation of a competent person, responsible for the preparation of a Fall Protection Plan.

14) The Fall Protection Plan shall include:

14.1 A risk assessment of all work carried out from an elevated position
14.2 Procedures and methods to address all the identified risks per location
14.3 Evaluation of employee's physical and psychological fitness necessary to work at elevated position.
14.4 The training of employees working from an elevated position.
14.5 Procedure addressing the inspection, testing and maintenance of all fall protection equipment.

15) The Contractor shall advise the * Health and Safety Section / Risk Manager/ Occupational Risk Manager of Transnet SOC Limited of any hazardous situations which may arise from work being performed either by the Contractor or his sub-Contractor.

16) Copies of all appointments required by the act must be given to * Health and Safety Section / Risk Manager / Occupational Risk Manager of Transnet SOC Limited.

17) The Contractor shall ensure that a Health and Safety File is available which shall include all documentation as required by the Act, copy of his and his Sub-Contractors Risk Assessment and Health and Safety Plan.

18) All incidents referred to in Section 24 of the Act involving the Contractor and his Sub-Contractor on Transnet Ltd premises, shall be reported as prescribed. Transnet Ltd hereby obtains an interest in the issue of any investigation, formal inquiry conducted in terms of Section 31 and 32 of the Act into any incident involving the Contractor, his Sub-Contractor, any person or machinery under his control on Transnet Ltd premises.

19) No alcohol or any other intoxicating substance shall be allowed on Transnet Ltd premises. The Contractor shall not allow anyone under or suspected to be under the influence of alcohol or any other intoxicating substance on Transnet Ltd premises.

20) Contractor to ensure its employees undergo medical surveillance as required by legislation

21) Contractor will be required to provide monthly safety performance reports and statistics

22) A letter of good standing in terms of Section 80 (Employer to register with the Compensation Commissioner) of the Compensation for Occupational Injuries and Disease Act 1993 (Act 130 of 1993) must also be furnished.

23) All clauses in the contract pertaining health and safety form an integral part of the contract and if not complied with may be construed as breach of contract.

*As applicable

Tenderer OH & S Management System Questionnaire

This questionnaire forms part of TFR tender evaluation process and is to be completed by all Tenderer's and submitted with their tender offer. The objective of the questionnaire is to provide an overview of the status of the Tenderer's OH&S management system. Tenderers will be required to verify their responses noted in their questionnaire by providing evidence of their ability and capacity in relevant matters. **TFR will verify accuracy of this information during the physical visit as part of the tender evaluation**.

The information provided in this questionnaire is an accurate summary of the company's occupational health and safety management system.		
Company Name:		
Signed:	Name:	
Position:	Date:	
Tender Description:		
Tender Number:		
Tenderer OH&S Management System Questionnaire	**Yes**	**No**
1. OH&S Policy and Management		
- Is there a written company health and safety policy? - If yes provide a copy of the policy		
- Does the company have an OH&S Management system e.g NOSA, OHSAS, IRCA System etc - If yes provide details		
- Is there a company OH&S Management System, procedures manual or plan? - If yes provide a copy of the content page(s)		
- Are health and safety responsibilities clearly identified for all levels of Management and employees? - If yes provide details		
2. Safe Work Practices and Procedures		
- Are safe operating procedures or specific safety instructions relevant to its operations available? - If yes provide a summary listing of procedures or instructions		
- Is there a register of injury document? If yes provide a copy		

- Are Risk Assessments conducted and appropriate techniques used? - If yes provide details		
3. OH&S Training		
Describe briefly how health and safety training is conducted in your company:		
- Is a record maintained of all training and induction programs undertaken for employees in your company? - If yes provide examples of safety training records		
4. Health and Safety Workplace Inspection		
- Are regular health and safety inspections at worksites undertaken? -If yes provide details		
- Is there a procedure by which employees can report hazards at workplaces? - If yes provide details		
5. Health and Safety Consultation		
- Is there a workplace health and safety committee?		
- Are employees involved in decision making over OH&S matters? - If yes provide details		
- Are there employee elected health and safety representatives? - Comments		
6. OH&S Performance Monitoring		
- Is there a system for recording and analysing health and safety performance statistics including injuries and incidents? - If yes provide details		
- Are employees regularly provided with information on company health and safety performance? - If yes provide details		
Is company registered with workmen's compensation and up to date? - If yes provide proof of letter of good standing		

- **Has the company ever been convicted of an occupational health and safety offence?** - If yes provide details		

Safety Performance Report
Monthly DIFR for previous months

Previous Year	No of Disabling Injuries	Total Number of employees	DIFR per month
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

DIFR = Number of Disabling injuries x 200000 divided by number of man hours worked for the period

_____
Signed
(Tenderer)

PROPOSED AMENDMENTS AND QUALIFICATIONS

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

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

Page	Clause or item	Proposal

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

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

Tenderer .....

TRANSNET SOC LIMITED
(REGISTRATION No. 1990/000900/06)
TRADING AS
TRANSNET FREIGHT RAIL

LABOUR PAYMENT SCHEDULE

TENDERERS ARE REQUIRED TO COMPLETE THE FOLLOWING SCHEDULE:

DAY LABOUR (IF REQUIRED)

Skilled	Hour _____
Unskilled	Hour _____
Labourer	Hour _____
Driver/Operator	Hour _____
% Profit on Material	_____

TRANSPORT AND MACHINERY	RUNNING	STANDING
1. Light vehicle up to 1 ton	_____	_____
2. 5 Ton vehicle	_____	_____
3. 10 Ton vehicle with crane	_____	_____
4. Crane	_____	_____
5. Scaffolding	_____	_____
6. Generator	_____	_____

7. Other equipment:

_____

_____

8. Full details of any other charges:

_____

_____

TENDERER: _____

DATE: _____

nec3

Contract Data

The Employer is

Name	**Transnet SOC Limited, Trading as Transnet Freight Rail**
Address	**Pavillion Building, Room 19-21**
	Cnr Botha Avenue & Rhodes Streets
	Witbank 1035
Telephone	**(013) 656 4296** **Fax No. (013) 656 4259**
E-mail	**Nhlanhla.Vilakazi@transnet.net**

The works is	**Transformer refurbishment at Kliendam, Erts, Nittens, and Fairview 3kV DC substations under the control of the Depot Engineer, Witbank**
The site is	**Kliendam, Erts, Nittens, and Fairview 3kV DC substations**
The starting date is	.....
The completion date is	.....
The reply period is	**2 (two) weeks.**
The defects date is	**52 (FiftyTwo) weeks after completion**
The defect correction period is	within **one week** after defects date
The delay damages are	**R5,000** per day (penalties)
The assessment day is the	**13th (thirteenth)** of each month
The retention is	**0% (ten percent)**

Does the United Kingdom Housing Grants, Construction and Regeneration Act (1996) apply? **No**

The Adjudicator is

Name	**To be advised if disputes arise.....**
Address	.....
Telephone	..... **Fax No.** .....
E-mail	.....

Contract Data

The interest rate on late payment is …….. % per complete week of delay.

The *Contractor* is not liable to the *Employer* for loss of or damage to the *Employer*'s property in excess of…….. for any one event.

The *Employer* provides this: **Insurance Transnet Principal Control Insurance**

The minimum amount of cover for the third insurance stated in the Insurance Table is: **>R25, 000.00 (Limited to R10, 000,000.00. for any one event)**

The minimum amount of cover for the fourth insurance stated in the Insurance Table is: **Not applicable**……

The adjudicator nominating body is: **The Chairman of the Association of Arbitrators (Southern Africa)**

The tribunal is: **Arbitration**

If the tribunal is arbitration, the arbitration procedure is: **The rules for the Conduct of Arbitrators of the Association of Arbitrators (Southern Africa)** ……

The *conditions of contract* are the NEC3 Engineering and Construction Short Contract (June 2005) and the following additional conditions:

As mentioned in paragraph 1.0 (Contractual obligations)

1.0 CONTRACTUAL OBLIGATIONS

1.1 This project specification covers Transnet freight rail's requirements for the Refurbishment of Main Traction and Auxiliary Transformers at various substations.

A compulsory clarification meeting with representatives of the Employer will take place on **Thursday,19 June 2014,10H00 at 28 Plein Street, Middleburg Infra Electrical Depot and thereafter proceed to the entire substations for physical site briefing.**

(For direction please contact: Linda Nkosi on Tel. 081 098 8731 or Abel Malete on 083 284 7435).

[Respondent to provide own PPE, transportation and accommodation].

Tenders must be deposited to the Tender Box, which will be located in the foyer of INYANDA HOUSE, Transnet freight rail and shall be addressed as follows : Chairperson, Transnet Freight Rail Acquisition Council, Inyanda House, 21 Wellington Road, Parktown.

1Tenders must be enclosed in a sealed envelope bearing the tender number "MMC-WGO-12053 on the outside.

Please note that this tender closes punctually at **26 June 2014** at 1**0H00**.

1.1 The Contractor shall not make use of any sub-Contractor to perform the works or parts thereof without prior permission from the Project Manager.

1.2 The Contractor shall ensure that a safety representative is at site at all times. All safety measures prescribed by Transnet Freight Rail – Electrical Safety Instructions and the "Occupational Health and Safety Act 1993 (Act 85 of 1993)" associated with working on a project of this nature shall be adhered to.

1.3 The Contractor shall supply a **site diary** (with triplicate pages). This book shall be used to record any unusual events during the period of the work. Any delays to the work shall also be recorded such as delays caused by poor weather conditions, delays caused by permits being cancelled etc. The appointed Project Manager or Technical Officer must countersign such delays. Other delays such as non-availability of equipment from 3rd party suppliers must be communicated to the Project Manager or Technical Officer in writing.

1.4 The Contractor shall supply a **site instruction book** (with triplicate pages). This book shall be used to record any instructions to the Contractor regarding problems encountered on site – for example the quality of work or the placement of equipment. This book shall be filled in by the Project Manager or Technical Officer and must be countersigned by the Contractor.

1.5 Both books mentioned in 1.3 and 1.4 shall be the property of Transnet Freight Rail and shall be handed over to the Project Manager or Technical Officer on the day of energising or handing over.

1.6 A penalty charge of R5, 000.00 per day of the total contract value will be levied for late completion.

1.7 10% retention money will be retained and will be released 12 months after the completion date of the contract.

1.8 The successful Contractor shall provide a Gantt or a similar chart showing when the works will be done and energised. A final chart should be submitted to the Project Manager or Supervisor within 14 days after the award has been made to the successful Contractor.

1.9 All processes or the manufacture and assembly of the product components must be subjected to a quality assurance system.

1.10 The Contractor will assume full responsibility for assuring that the products purchased meet the requirements of Transnet Freight Rail for function, performance, and reliability, including purchased products from 3rd part suppliers.

1.11 The onus is on the repairer to prove the effectiveness of their system to Transnet Freight Rail during the production of the prototype.

1.12 ISO.9000 to 9004 inclusive (SABS 0157 parts 1 to 4) must be regarded as a guideline, where applicable.

1.13 The Contractor will remain liable for contractual delivery dates irrespective of deficiencies discovered during workshop inspections.

2.0 SITE ESTABLISHMENT

2.1 The Contractor shall be responsible to transport material to site, off-loading, handling, storage and security of all material required for the construction/execution of the works.

2.2 Transportation insurance must be arranged by successful contractor to ensure their handling responsibility while material are in transit to site and during off loading as agreed upon.

2.3 The Contractor shall be responsible for all necessary (as decided by the Transnet Freight Rail Project Manager or Technical Officer) connections between the equipment as found before site establishment and other components in the substation including connections to the earth-mat.

3.0 TRANSFORMER REFURBISHMENT

3.1 Oil sampling shall be taken by the contractor prior and after the transformer has been refurbished.

3.1.1 The following oil sampling and testing shall be conducted:

- Dielectric Strength
- Acidity
- Dissolved Gas Analysis
- PCB (Optional test if unavailable and out dated)

3.2 It is required for the contractor to present PCB certificate to Transnet Freight Rail for his/her oil circulating plant, tanker or rubber bags to be used for the project.

3.3 Oil samples report shall be submitted to Project Manager for analysis prior and after work execution.

3.4 Proper precaution should be exercised to ensure control of loose material/equipment during repairs e.g. (Falling spanners, nuts and bolts into the transformer)

3.5 Contractor is liable to protect the transformer during rainy and moist weather condition.

3.6 It is recommended by Transnet Freight Rail that transformers should be regasketed making use of nebar material. Type material (gasket) sample should be presented to Project Manager prior project commencement.

3.7 Transformer shall be topped up with virgin oil.

3.8 Transformer oil shall be filtered making use of proper calibrated and PCB-free tested plant to meet Transnet recommended transformer oil regenerated standards.

3.9 Soil contamination due to oil spillages shall be rehabilitated to ensure oil free environment.

3.10 Contractor shall be liable to re-torque re-gasketed areas after 3 month from work completion during maintenance period without any additional costs.

3.11 Supply and install GOB bushings complete in accordance with SANS 60137. The Contractor shall make provision for any adaptors, modifications required to install the

bushings on the existing transformer. All the gaskets that have been opened shall be replaced.

3.12 Pack the existing bushings in suitable crates and transport them to the respective Depot.

4.0 TENDERING PROCEDURE

4.1 An addendum reflecting changes to the project specification and 'Bill of Quantities' shall be forwarded to Contractors after the site meeting and Contractors should quote accordingly.

4.2 Contractors shall duly fill in the attached 'Bill of Quantities'. The prices shall be fixed for the duration of the contract (12 months) and no escalation will be allowed. Items not reflected in this Schedule, but covered in the project specification or agreed at site meetings, shall be added to the 'Bill of Quantities' by the Contractor and quoted for accordingly.

4.3 Contractors shall submit qualifications of the staff that will be performing the works. Only qualified technical personnel shall perform the works 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.

4.4 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.

4.5 Contractors shall motivate a statement of non-compliance.

4.6 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.

4.7 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 Project 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.

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

5.0 SITE TESTS

5.1 The Contractor shall be responsible for carrying out of transformer on-site tests before commissioning in terms of this specification and the contractual agreement.

5.2 Functional on-site tests shall be conducted on all items of equipment and circuitry to prove the proper functioning of transformer protection thereof.

5.3 The Contractor shall submit a detailed list of on-site tests for the approval of the Project Manager or Technical Officer.

5.4 The Contractor shall arrange for the Technical Officer or his representative to be present to witness the on-site tests.

5.5 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.

5.6 The on-site tests shall include the following:

5.6.1 Trip tests of buchholz relay.
5.6.2 Temperature gauge functionality test
5.6.3 Transformer earth leakage protection test.

5.7 At the completion of the on-site tests, the Project Manager or Technical Officer or his representative shall either sign the tests sheets (supplied by the Contractor) as having witnessed the satisfactory completion thereof, or hand to the Contractor a list of defects requiring rectification.

5.8 Upon rectification of defects, the Contractor shall arrange for the Project Manager or Technical Officer or his representative to certify satisfactory completion of on-site tests.

5.9 Acceptance by the Project Manager or Technical Officer 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.

6.0 COMMISSIONING OF EQUIPMENT

6.1 Commissioning will only take place after all defects have been rectified to the satisfaction of the Project Manager or Technical Officer.

6.2 Commissioning will include energising of equipment from the primary isolator to the track feeder circuits. The Contractor must prove the satisfactory operation of all equipment under live conditions.

6.3 On completion of commissioning, the Contractor will hand the equipment over to the Project Manager or Technical Officer in terms of the relevant instruction.

6.4 The commissioning of protection equipment by Transnet Freight Rail will in no way absolve the Contractor from any of his responsibilities during the guarantee period. It is the Contractor's responsibility to satisfy himself or 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.

6.5 The Contractor shall be present during the testing and setting of the protection to rectify any faults found.

7.0 GUARANTEE AND DEFECTS

7.1 The Contractor shall guarantee the satisfactory operation of the complete electrical installation supplied and erected by him and accept liability for maker's defects that may appear in design, materials and workmanship.

7.2 The Contractor shall be issued with a completion certificate with the list of all defects to be repaired within 14 working days after commissioning.

7.3 The guarantee period for these substations shall expire after:

A period of 12 months commencing on the date of completion of the contract / sub-order or the date the substation is handed over to Transnet Freight Rail whichever is the earliest.

7.4 Any defects that may become apparent during the guarantee period shall be rectified to the satisfaction of Transnet Freight Rail, and to the account of the Contractor.

7.5 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 Transnet Freight Rail of such defects.

7.6 Should the Contractor fail to comply with the requirements stipulated above, Transnet Freight Rail shall be entitled to undertake the necessary repair work or effect replacement of defective apparatus or materials, and the Contractor shall reimburse Transnet Freight Rail the total cost of such repair or replacements, including the labour costs incurred in replacing defective material.

7.7 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 Project Manager or Technical Officer and at the cost of the Contractor.

7.8 If urgent repairs have to be carried out by Transnet Freight Rail staff to maintain supply during the guarantee period, the Contractor 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.

nec 3

Part C1:
Agreement and Contract Data

nec3

Contract Data

The *Contractor*'s Offer

The Contractor is

Name .....

Address .....

.....

Telephone ..... **Fax No.** .....

E-mail .....

The percentage for overheads and profit added to the Defined Cost for people is.....%.

The percentage for overheads and profit added to other Defined Cost is..... %.

The *Contractor* offers to Provide the Works in accordance with the *conditions of contract* for an amount to be determined in accordance with the *conditions of contract.*

The offered total of the Prices is .....(amount in words and amount in numbers)

Signed on behalf of the Contractor

Name .....

Position .....

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

The *Employer*'s Acceptance

The *Employer* accepts the *Contractor*'s Offer to Provide the Works

Signed on behalf of the *Employer*

Name .....

Position .....

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

2.0 PRICING INSTRUCTIONS

1. The agreement is based on the NEC Engineering and Construction Short Contract 3. The contract specific variables are as stated in the contract data. Only the headings and clause numbers for which allowance must be made in the Price list are recited.

2. Preliminary and General Requirements are based on part 1 of SANS 1921, 'Construction and Management Requirements for Works Contracts'. The additions, deletions and alterations to SANS 1921 as well as the contract specific variables are as stated in the contract data. Only the headings and clause numbers for which allowance must be made in the Price list are recited.

3. It will be assumed that prices included in the Price list are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders.

4. Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted.

5. The Price list is not intended for the ordering of materials. Any ordering of materials, based only on the Price list, is at the Contractor's risk.

6. The amount of the Preliminaries to be included in each monthly payment certificate shall be assessed as an amount prorated to the value of the work duly executed in the same ratio as the preliminaries bears to the total of prices excluding any contingency sum, the amount of the Preliminaries and any amount in respect of contract price adjustment provided for in the contract.

7. The amount or items of the Preliminaries shall be adjusted to take account of the theoretical financial effect which changes in time or value (or both) have on this section. Such adjustments shall be based on adjustments in the following categories as recorded in the Price list:

   a) an amount which is not to be varied, namely Fixed (F).
   b) an amount which is to be varied in proportion to the contract value, namely Value Related (V).
   c) an amount which is to be varied in proportion to the contract period as compared to the initial construction period, excluding revisions to the construction period for which no adjustment the contractor is entitled to in terms of the contract, namely Time Related (T).

8. The following abbreviations are used in the Price list:

Hr	=	Hour
Ea	=	Each
OCB	=	Oil Circuit Breaker
GCB	=	Gas Circuit Breaker
PCB	=	Polychlorinated Biphenyl
Quant.	=	Quantity

9 The prices and rates in these Price list are fully inclusive prices for the work described under the items. Such prices and rates cover all costs and expenses that may be required in and for the execution of the work described in accordance with the provisions of the scope of work and shall cover liabilities and obligations set forth or implied in the Contract data, as well as profit.

10 Where the scope of work requires detailed drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amount tendered for such items.

11 Where no quantity has been provided against an item in the Price list, the Contractor shall use their discretion and provide the quantity.

12 The quantities set out in these Price list are approximate and do not necessarily represent the actual amount of work to be done. The quantities of work accepted and certified for payment will be used for determining payments due and not the quantities given in these Price list.

13 The short descriptions of the items of payment given in these Price list are only for purposes of identifying the items. More details regarding the extent of the work entailed under each item appear in the Scope of Work.

14 Tenderers shall ensure that provision (financial as well as time) for excavations in a range of soil types is made for in their tenders.

15 For each item in the Price list, including Preliminaries, the Contractor shall provide in the appropriate column the portion of the tendered sum (inclusive of labour and material) which has been sourced locally (Republic of South Africa).

16 The Contractor shall also arrange forward cover within two weeks after contract award on all imported items.

17 The Contractor shall provide information related to imported content, i.e. equipment to be imported, value and applicable exchange rates. This information shall be provided as an Annexure to the Price list.

18 The total in the Price list shall be exclusive of VAT.

nec3

Part C2:
Pricing Data

Contract Data
Price List

Item	Description	Unit	Qty	Rate	Price
	Nittens 3KV DC Substation				
A1	**Main Transformer**	sum	1		
1	Oil sampling before and after purification	sum	1		
2	Re-gasket top cover, primary, secondary and tertiary bushings	sum	1		
3	Re-gasket main transformer tap-switch, inspection covers and buccholz relay	sum	1		
4	Re-gasket and repair temperature and testing probes pockets	sum	1		
5	Supply & install breather complete with silica gel	sum	1		
6	Replace conservator sight glass	ea	1		
7	Re-gasket conservator & main tank pipe	sum	1		
8	Re-habilitate contaminated soil and stones paint plinth with red paint	sum	1		
9	Clean, treat, spray main transformer tank, radiators with grey paint, conservator tank white paint	sum	1		
A2	**Auxiliary Transformer**				
10	Complete transformer refurbishment	sum	1		
11	Replace Breather complete with silica gel.	ea	1		
12	Top up auxiliary transformer with virgin oil	sum	1		
13	Test and Commissioning	sum	1		
14	Security	sum	1		
15	Ps & G's	sum	1		
A	**Total Price for Nittens =**		**R**		
B	**VAT (14 % of A) =**		**R**		
C	**10% Contingency=**		**R**		
D	**Gross Total (A + B) =**		**R**		

Contract Data
Price List

Item	Description	Unit	Qty	Rate	Price
	Kleindam 3KV DC Substation				
A1	**Main Transformer**	sum	1		
1	Oil sampling before and after purification	sum	1		
2	Re-gasket top cover, primary, secondary and tertiary bushings	sum	1		
3	Re-gasket main transformer tap-switch, inspection covers and buccholz relay	sum	1		
4	Re-gasket and repair temperature and testing probes pockets	sum	1		
5	Supply & install breather complete with silica gel	sum	1		
6	Replace conservator sight glass	ea	1		
7	Re-gasket conservator & main tank pipe	sum	1		
8	Re-habilitate contaminated soil and stones paint plinth with red paint	sum	1		
9	Clean, treat, spray main transformer tank, radiators with grey paint, conservator tank white paint	sum	1		
A2	**Auxiliary Transformer**				
10	Complete transformer refurbishment	sum	1		
11	Replace Breather complete with silica gel.	ea	1		
12	Top up auxiliary transformer with virgin oil	sum	1		
13	Test and Commissioning	sum	1		
14	Security	sum	1		
15	Ps & G's	sum	1		
A	**Total Price for Kleindam =**		**R**		
B	**VAT (14 % of A) =**		**R**		
C	**10% contingency=**		**R**		
D	**Gross Total (A + B) =**		**R**		

Contract Data
Price List

Item	Description	Unit	Qty	Rate	Price
	Erts 3KV DC Substation				
A1	**Main Transformer**	sum	1		
1	Oil sampling before and after purification.	sum	1		
3	Re-gasket top cover, primary, secondary and tertiary bushings	sum	1		
4	Re-gasket main transformer tap-switch, buccholz relay, and clean inspection sight glass	sum	1		
5	Re-gasket and repair temperature and testing probes pockets	sum	1		
6	Supply & install temperature gauges	ea	2		
7	Clean, treat , paint main transformer tank and radiators grey and conservator tank white	sum	1		
8	Re-habilitate contaminated soil and stones	sum	1		
A2	**Auxiliary Transformer**				
9	Complete transformer refurbishment	sum	1		
10	Top-up transformer with Virgin oil	sum	1		
11	Replace Breather complete with silica gel.	ea	1		
12	Test and commission	sum	1		
13	Security	sum	1		
14	P's & G's	sum	1		
A	**Total Price for Erts =**		**R**		
B	**VAT (14 % of A) =**		**R**		
C	**10% Contigency=**		**R**		
D	**Gross Total (A + B) =**		**R**		

Contract Data
Price List

Item	Description	Unit	Qty	Rate	Price
	Belfast 3KV DC Substation				
A1	**Main Transformer**	sum	1		
1	Oil sampling before and after purification	sum	1		
2	Re-gasket top cover, primary, secondary and tertiary bushings	sum	1		
3	Re-gasket main transformer tap-switch, inspection covers and buccholz relay	sum	1		
5	Supply & install breather complete with silica gel	sum	1		
6	Replace conservator sight glass	ea	1		
7	Re-gasket conservator & main tank pipe	sum	1		
8	Re-habilitate contaminated soil and stones paint plinth with red paint	sum	1		
9	Clean, treat, spray main transformer tank, radiators with grey paint, conservator tank white paint	sum	1		
10	Re-gasket all the valves and the earth core bushing				
A2	**Auxiliary Transformer**				
11	Complete transformer refurbishment	sum	1		
12	Top up auxiliary transformer with virgin oil	sum	1		
13	Replace Breather complete with silica gel.	ea	1		
14	Test and Commissioning	sum	1		
15	Security	sum	1		
16	Ps & G's	sum	1		
A	**Total Price for Belfast =**		**R**		
B	**VAT (14 % of A) =**		**R**		
C	**10% Contingency =**		**R**		
D	**Gross Total (A + B) =**		**R**		

nec3

Part C3:
Scope of Work

8.0 Description of work

The contractor shall perform the following:

8.1 Main Transformer

8.1.1 Re-gasket main transformer completely.

8.1.2 Remove, store, purify, vacuum and test the oil as specified in Spoornet's specification CEE. 0229.95.

8.1.3 Top up transformer with virgin oil which complies with the requirements specified in SABS 555. 1995;

8.1.4 Paint and treat corrosion in accordance with the practice recommended in SABS 064. 1979 and as specified in Spoornet's specification CEE.0045.90. Paint colours are as follows: -

- transformers grey;
- conservator tank white, and
- plinth red;

8.1.5 Clean and treat oil polluted ballast and plinth

8.1.6 Remove oil contaminated soil (500mm deep) and replace it with the new soil

Auxiliary Transformer

8.1.7 Re-gasket auxiliary transformer completely.

8.1.8 Remove, store, purify, vacuum and test the oil as specified in Spoornet's specification CEE. 0229.95.

8.1.9 Top up transformer with virgin oil which complies with the requirements specified in SABS 555. 1995;

8.1.10 Paint and treat corrosion in accordance with the practice recommended in SABS 064. 1979 and as specified in Spoornet's specification CEE.0045.90. Paint colours are as follows: -

- transformers grey;
- conservator tank white, and
- plinth red;

8.1.11 Clean and treat oil polluted ballast and plinth.

Part C3:
Works Information

The following standard specifications will be applicable to this contract

8.2	Drawings	
8.2.1	CEE-TBD-0007	Earthing arrangement for traction substations.
8.3	**Specifications**	
8.3.1	South African National Standards:	
8.3.1.1	SANS 1091	National colour standard.
8.3.1.2	SANS 763	Hot dip galvanised zinc coating.
8.3.1.3	SANS 121	Hot Dip Galvanised Coating for Fabricated Iron or Steel Article.
8.3.1.4	SANS 0555. 2007	Unused and reclaimed mineral insulating oil for transformer and switchgear.
8.3.1.5	SANS 8528	Reciprocating internal combustion engine driven alternating current generating set.
8.3.1.6	SANS 10064. 2005	Code of Practice for the preparation of steel surfaces for coating.
8.3.1.7	BSS 171. 1987	Power Transformers.
8.3.1.8	SANS 10142	Wiring Code.
8.7.1.9	SANS 60137	Insulated bushings for alternating voltages above 1 000 V.
8.3.2	**Transnet Freight Rail:**	
8.3.2.1	BBB 5452 version 4	Transnet freight rail requirements for installation of electrical equipment for 3 kV DC substations.
8.3.2.2	CEE. 0229.95	Dry-out and Regeneration of insulating oil and Reclaiming and de-sludging of transformers.
8.3.2.3	CEE.0045.2002/1	Painting of steel Components of Electrical equipment.

NOTE: Any other specifications referenced in the above mentioned specification, will be for information purposes and may be provided on request.

8.4 Occupational Health and Safety Act No. 85 of 1993 (Available at depot for referral)

8.5 **Constraints on how the Contractor Provides the Works**

8.5.1 The constrains shall be as specified in the specifications of the particular equipment.

8.6 Requirements for the programme

8.6.1	Programme of work	: To be submitted by successful Contractor
8.6.2	Format	: Gantt chart
8.6.3	Information	: How work is going to be executed and commissioned
8.6.4	Submission	: 3 weeks after the award of contract

8.6.5 copies	Site Diary	: Successful Contractor to supply in triplecate carbon
8.6.6	Site instruction book	: Successful Contractor to supply in triplecate carbon Copies
8.8.7	CIDB	: 2EP

8.7 Services and other things provided by the Employer

8.7.1 Transnet Freight Rail shall inspect all equipment before dispatching the equipment to site.

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

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

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

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

Contract Data
Site Information

The works shall be performed at **Kliendam, Erts, Nittens, and Fairview 3KV DC Traction Substation.**

TRANSNET SOC LIMITED

(Registration no. 1990/000900/30)

SAFETY ARRANGEMENTS AND PROCEDURAL COMPLIANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993) AND APPLICABLE REGULATIONS

1. General

1.1 The Contractor and Transnet SOC Limited (hereinafter referred to as "Transnet") are individual employers, each in its own right, with their respective duties and obligations set out in the Occupational Health and Safety Act, Act 85 of 1993 (the Act) and applicable Regulations.

1.2 The Contractor accepts, in terms of the General Conditions of Contract and in terms of the Act, his obligations as an employer in respect of all persons in his employ, other persons on the premises or the Site or place of work or on the work to be executed by him, and under his control. He shall, before commencement with the execution of the contract work, comply with the provisions set out in the Act, and shall implement and maintain a Health and Safety Plan as described in the Construction Regulations, 2003 and as approved by Transnet, on the Site and place of work for the duration of the Contract.

1.3 The Contractor accepts his obligation to complying fully with the Act and applicable Regulations notwithstanding the omission of some of the provisions of the Act and the Regulations from this document.

1.4 Transnet accepts, in terms of the Act, its obligations as an employer of its own employees working on or associated with the site or place of work, and the Contractor and Project Manager or his deputy shall at all times, co-operate in respect of the health and safety management of the site, and shall agree on the practical arrangements and procedures to be implemented and maintained during execution of the Works.

1.5 In the event of any discrepancies between any legislation and this specification, the applicable legislation will take precedence.

2. Definitions

2.1 In this Specification any word or expression to which a meaning has been assigned in the Construction Regulations, shall have the meaning so assigned to it, unless the context otherwise indicates: -

2.2 The work included in this Contract shall for the purposes of compliance with the Act be deemed to be "**Construction Work**", which, in terms of the Construction Regulations, 2003 means any work in connection with: -

(a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;

(b) the installation, erection, dismantling or maintenance of fixed plant where such work includes the risk of a person falling;

(c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or

(d) the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work;

2.3 **"competent person"** in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered as per the South African Qualifications Authority Act, 1995 these qualifications and training shall be deemed to be the required qualifications and training;

2.4 **"contractor"** means principal contractor and "subcontractor" means contractor as defined by the Construction Regulations, 2003.

2.5 **"fall protection plan"** means a documented plan, of all risks relating to working from an elevated position, considering the nature of work undertaken, and setting out the procedures and methods applied to eliminate the risk;

2.6 **"health and safety file"** means a file, or other record in permanent form, containing the information required to be kept on site in accordance with the Act and applicable Regulations;

2.7 **"Health and Safety Plan"** means a documented plan which addresses the hazards identified and include safe work procedures to mitigate, reduce or control the hazards identified;

2.8 **"Risk Assessment"** means a programme to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard;

2.9 "**the Act"** means the Occupational Health and Safety Act No. 85 of 1993.

3. Procedural Compliance

3.1 The Contractor who intends to carry out any construction work shall, before carrying out such work, notify the Provincial Director in writing if the construction work:-

(a) includes the demolition of a structure exceeding a height of 3 metres; or

(b) includes the use of explosives to perform construction work; or

(c) includes the dismantling of fixed plant at a height greater than 3m,

and shall also notify the Provincial Director in writing when the construction work exceeds 30 days or will involve more than 300 person days of construction work and if the construction work:-

(a) includes excavation work deeper than 1m; or

(b) includes working at a height greater than 3 metres above ground or a landing.

3.2 The notification to the Provincial Director shall be on a form similar to Annexure A of the Construction Regulations, 2003, also shown in Annexure 1 of this Specification. The Contractor shall ensure that a copy of the completed notification form is kept on site for inspection by an inspector, Project Manager or employee.

3.3 The Contractor shall, in accordance with the Act and applicable Regulations, make all the necessary appointments of competent persons in writing on a form similar to Annexure 2 of this Specification and deliver copies thereof to the Project Manager. Copies should also be retained on the health and safety file.

3.4 Subcontractors shall also make the above written appointments and the Contractor shall deliver copies thereof to the Project Manager.

3.5 In the case of a self-employed Contractor or any subcontractor who has the appropriate competencies and supervises the work himself, the appointment of a construction supervisor in terms of regulation 6.1 of the Construction Regulations, 2003 will not be necessary. The Contractor shall in such a case execute and sign a declaration, as in Annexure 3, by which he personally undertakes the duties and obligations of the "Chief Executive Officer" in terms of section 16(1) of the Act.

3.6 The Contractor shall, before commencing any work, obtain from the Project Manager an access certificate as in Annexure 4 executed and signed by him, permitting and limiting access to the designated site or place of work by the Contractor and any subcontractors under his control.

3.7 Procedural compliance with Act and Regulations, as above, shall also apply to any subcontractors as employers in their own right. The Contractor shall furnish the Project Manager with full particulars of such subcontractors and shall ensure that they comply with the Act and Regulations and Transnet's safety requirements and procedures.

4. Special Permits

Where special permits are required before work may be carried out such as for hotwork, isolation permits, work permits and occupations, the Contractor shall apply to the Project Manager or the relevant authority for such permits to be issued. The Contractor shall strictly comply with the conditions and requirements pertaining to the issue of such permits.

5. Health and Safety Programme

5.1 The Tenderer shall, with his tender, submit a Health and Safety Programme setting out the practical arrangements and procedures to be implemented by him to ensure compliance by him with the Act and Regulations and particularly in respect of: -

(i) The provision, as far as is reasonably practical, of a working environment that is safe and without risk to the health of his employees and subcontractors in terms of section 8 of the Act;

(ii) the execution of the contract work in such a manner as to ensure in terms of section 9 of the Act that persons other than those in the Contractor's employment, who may be directly affected by the contract work are not thereby exposed to hazards to their health and safety;

(iii) ensuring, as far as is reasonably practical, in terms of section 37 of the Act that no employee or subcontractor of the Contractor does or omits to do any act which would be an offence for the Contractor to do or omit to do.

5.2 The Contractor's Health and Safety Programme shall be based on a risk assessment in respect of the hazards to health and safety of his employees and other persons under his control that are associated with or directly affected by the Contractor's activities in performing the contract work and shall establish precautionary measures as are reasonable and practical in protecting the safety and health of such employees and persons.

5.3 The Contractor shall cause a risk assessment contemplated in clause 5.2 above to be performed by a competent person, appointed in writing, before commencement of any Construction Work and reviewed during construction. The Risk Assessments shall form part of the Health and Safety programme to be applied on the site and shall include at least the following:

(a) The identification of the risks and hazards that persons may be exposed to;

(b) the analysis and evaluation of the hazards identified;

(c) a documented Health and Safety Plan, including safe work procedures to mitigate, reduce or control the risks identified;

(d) a monitoring and review plan.

5.4 The Health and Safety Plan shall include full particulars in respect of: -

(a) The safety management structure to be instituted on site or place of work and the names of the Contractor's health and safety representatives and members of safety committees where applicable;

(b) the safe working methods and procedures to be implemented to ensure the work is performed in compliance with the Act and Regulations;

(c) the safety equipment, devices and clothing to be made available by the Contractor to his employees;

(d) the site access control measures pertaining to health and safety to be implemented;

(e) the arrangements in respect of communication of health and safety related matters and incidents between the Contractor, his employees, subcontractors and the Project Manager with particular reference to the reporting of incidents in compliance with Section 24 and General Administrative Regulation 8 of the Act and with the pertinent clause of the General Conditions of Contract forming part of the Contract and

(f) the introduction of control measures for ensuring that the Safety Plan is maintained and monitored for the duration of the Contract.

5.4 The Health and Safety programme shall be subject to the Project Manager's approval and he may, in consultation with the Contractor, order that additional and/or supplementary practical arrangements and procedures be implemented and maintained by the Contractor or that different working methods or safety equipment be used or safety clothes be issued which, in the Project Manager's opinion, are necessary to ensure full compliance by the Contractor with his obligations as an employer in terms of the Act and Regulations. The Project Manager or his deputy shall be allowed to attend meetings of the Contractor's safety committee as an observer.

5.5 The Contractor shall take reasonable steps to ensure that each subcontractor's Health and Safety Plan is implemented and maintained on the construction site: Provided that the steps taken, shall include periodic audits at intervals mutually agreed to between the them, but at least once every month.

5.6 The Contractor shall stop any subcontractor from executing any construction work, which is not in accordance with the Contractor's and/or subcontractor's Health and Safety Plan for the site or which poses a threat to the health and safety of persons.

5.7 The Contractor shall ensure that a copy of the Health and Safety Plan is available on site for inspection by an inspector, Project Manager, agent, subcontractor, employee, registered employee organisation, health and safety representative or any member of the health and safety committee.

5.8 The Contractor shall consult with the health and safety committee or, if no health and safety committee exists, with a representative group of employees, on the development, monitoring and review of the Risk Assessment.

5.9 The Contractor shall ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the Risk Assessment.

5.10 The Contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the Risk Assessment before any work commences, and thereafter at such times as may be determined in the Risk Assessment.

5.11 The Contractor shall ensure that all visitors to a construction site undergoes health and safety induction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal protective equipment.

6. Fall Protection Plan

6.1 In the event of the risk and hazard identification, as required in terms of clause 5.3 of this Specification, revealing risks relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan;

6.2 The Contractor shall implement, maintain and monitor the fall protection plan for the duration of Contract. The Contractor shall also take such steps to ensure the continued adherence to the fall protection plan.

6.3 The fall protection plan shall include:-

(a) A Risk Assessment of all work carried out from an elevated position;

(b) the procedures and methods to address all the identified risks per location;

(c) the evaluation of the employees physical and psychological fitness necessary to work at elevated positions;

(d) the training of employees working from elevated positions; and

(e) the procedure addressing the inspection, testing and maintenance of all fall protection equipment.

7. Hazards and Potential Hazardous Situations

The Contractor and the Project Manager shall immediately notify one another of any hazardous or potentially hazardous situations which may arise during performance of the Contract by the Contractor or any subcontractor and, in particular, of such hazards as may be caused by the design, execution and/or location and any other aspect pertaining to the contract work.

8. Health and Safety File

8.1 The Contractor shall ensure that a health and safety file is opened and kept on site and shall include all documentation required as per the Act and applicable regulations, and made available to an inspector, the Project Manager, or subcontractor upon request.

8.2 The Contractor shall ensure that a copy of the both his Health and Safety Plan as well as any subcontractor's Health and Safety Plan is available on request to an employee, inspector, contractor or the Project Manager.

8.3 The Contractor shall hand over a consolidated health and safety file to the Project Manager upon completion of the Construction Work and shall in addition to documentation mentioned in the Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

ANNEXURE 1

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

Regulation 3(1) of the Construction Regulations

NOTIFICATION OF CONSTRUCTION WORK

1(a) Name and postal address of principal contractor:

_____

(b) Name and tel. no of principal contractor's contact person:

_____

2. Principal contractor's compensation registration number:

_____

3.(a) Name and postal address of client:

_____

(b) Name and tel no of client's contact person or agent:

_____

4.(a) Name and postal address of designer(s) for the project:

_____

(b) Name and tel. no of designer(s) contact person:

_____

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 6(1).

_____

6. Name/s of principal contractor's construction sub-ordinate supervisors on site appointed in terms of regulation 6(2).

_____

7. Exact physical address of the construction site or site office:

_____

8. Nature of the construction work:

_____

_____

_____

_____

_____

9. Expected commencement date: _____

10. Expected completion date: _____

11. Estimated maximum number of persons on the construction site:

_____

12. Planned number of contractors on the construction site accountable to the principle contractor:

_____

13. Name(s) of contractors already chosen.

_____
_____
_____
_____
_____
_____
_____

_____ _____

Principal Contractor **Date**

_____ _____

Client **Date**

* THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR **PRIOR TO COMMENCEMENT** OF WORK ON SITE.

* **ALL PRINCIPAL CONTRACTORS** THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

ANNEXURE 2

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

SECTION/REGULATION: _____

REQUIRED COMPETENCY: _____

In terms of _____ I, _____ representing the Employer) do hereby appoint _____

As the Competent Person on the premises at _____

(physical address) to assist in compliance with the Act and the applicable Regulations.

Your designated area/s is/are as follows :-

_____

_____

_____

Date : _____

Signature :- _____

Designation :- _____

ACCEPTANCE OF DESIGNATION

I, _____ ***do hereby accept this Designation and acknowledge that I understand the requirements of this appointment.***

Date : _____

Signature :- _____

Designation :- _____

ANNEXURE 3

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

DECLARATION

In terms of the above Act I, _____ am personally assuming the duties and obligations as Chief Executive Officer, defined in Section 1 of the Act and in terms of Section 16(1), I will, as far as is reasonably practicable, ensure that the duties and obligations of the Employer as contemplated in the above Act are properly discharged.

Signature :- _____

Date : _____

ANNEXURE 4

(LETTER HEAD OF BUSINESS DIVISION OR UNIT OF TRANSNET SOC LIMITED)

SITE ACCESS CERTIFICATE

Access to : _____ (Area)
Name of Contractor/Builder :- _____
Contract/Order No.: _____

The contract works site/area described above are made available to you for the carrying out of associated works
In terms of your contract/order with (company) _____

Kindly note that you are at all times responsible for the control and safety of the Works Site, and for persons under your control having access to the site.

As from the date hereof you will be responsible for compliance with the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended, and all conditions of the Contract pertaining to the site of the works as defined and demarcated in the contract documents including the plans of the site or work areas forming part thereof.

Signed : _____ ***Date :*** _____

_____
PROJECT MANAGER

ACKNOWLEDGEMENT OF RECEIPT

Name of Contractor/Builder :- _____ ***I,***
_____ ***do hereby acknowledge and accept the duties and obligations in respect of the Safety of the site/area of Work in terms of the Occupational Health and Safety Act; Act 85 of 1993.***

Name : _____ ***Designation :*** _____

Signature : _____ ***Date :*** _____

freight rail

MINIMUM COMMUNAL HEALTH REQUIREMENTS IN AREAS OUTSIDE THE JURISDICTION OF A LOCAL AUTHORITY: TEMPORARY FACILITIES FOR CONTRACTOR'S PERSONNEL

1. CAMPS

1.1 Prior to the erection of any camp, the Contractor shall submit to the Employer's Deputy, for his approval, details of his proposals as to the site, water supply, sanitation, and size and type of buildings. Where the site is on private land, the Contractor shall submit the written approval for the use of the site of the relevant statutory authority and of the owner and occupier of the land (as applicable).

1.2 Camps must not be erected on land infested with field rodents.

1.3 Adequate drainage shall be provided to carry off storm and waste water.

1.4 Buildings shall be built to a neat and orderly pattern.

1.5 All buildings shall have smooth, hard, impervious floors, graded to provide effective drainage and to permit washing.

1.6 Camps shall be maintained by the Contractor at his own expense in a clean and tidy condition. The Contractor shall take such steps as the Employer's Deputy and landowner/occupier may demand to prevent the creation of a nuisance.

1.7 When so instructed by the Employer's Deputy, the Contractor shall, at his own expense, erect suitable screens between the camp and any public road, thoroughfare or railway line.

1.8 After removal of a camp, the Contractor shall, at his own expense, restore the site to its original condition to the satisfaction of the Employer's Deputy and of the landowner and occupier where the site is on private land.

2. HOUSING

2.1 Every living room shall have cross ventilation, both constant and occasional. Where only one window is provided, it shall not be in the same wall as the door.

2.2 Dimensions of living rooms shall be sufficient to allow 3.5 square metres of floor area and 11 cubic metres of air space for each person over the age of 10 years. The floor area of any living room shall not be less than 7,8 square metres.

2.3 Flat-roofed quarters shall have a minimum roof height of 3 metres above floor level. For quarters with pitched roofs, the wall height shall be not less than 2,6 metres above the floor with a minimum height above floor of 3 metres at the top of the pitch.

2.4 Doors shall not be less than 2m x 0,75m and must be halved.

2.5 Windows of each living room shall have an area not less than one twelfth of the floor area and shall be capable of opening to at least half their full area.

2.6 In areas where malaria is prevalent, doors and windows must be fitted with gauze screens.

2.7 Cooking shelters shall comprise roofed structures, three sides of which shall be enclosed by a weatherproof material, approved by the Employer's Deputy to a height of at least **1m** above ground level.

2.7.1 Sleeping quarters shall not accommodate more than 8 persons per room.

2.7.2 Pegboards shall be carried on metal or concrete supports and shall be separated by partitions not less than 0,4 metres high extending to within 150mm of the end of the bunk. Pegboards shall be removable for cleaning.

3. WATER SUPPLY AND ABLUTION FACILITIES

3.1 The Contractor shall ensure that an adequate and conveniently situated supply of potable water is provided.

3.2 Separate buildings for ablution facilities shall be provided. Where approval has been obtained for the housing of both males and females, separate facilities for each sex shall be provided. The proportion shall be 1 cubicle for 20 persons.

3.3 Waste water shall be hygienically disposed of.

4. SANITATION

4.1 Separate buildings for latrine facilities shall be provided. Where housing are provided for both males and females, separate facilities for each sex shall be provided. The proportions shall be at least one squatting seat for every 15 persons or less in the case of pit latrines, or one for every 10 persons or less in case of pail latrines.

Latrines shall be fly proof and sited at least 10 metres from any other building, and shall not face on any public road, thoroughfare, railway line or residential property. Pits shall not be less than 2,5 metres deep and sited not less than 120 metres from nearest underground water source.

4.2 Latrines shall be so constructed, situated and maintained, and night soil so disposed of as to prevent access by animals, breeding of flies, pollution of streams and domestic water supplies, and other nuisances. Where a night soil removal service is operated by a competent authority, use of such service shall be obligatory, and the use of pit latrines and atria pits will not be permitted.

4.3 At least one refuse bin of adequate size with close fitting lid shall be provided for each building. Refuse bins shall be emptied and cleaned out daily.

4.4 Labour shall be employed on camp sanitation duties on the following basis:-

4.4.1 Where the number of persons living at the camp is 20 or less - one unit.

4.4.2 For additional numbers over 20 living at the camp - one unit per 100 or part thereof.

4.5 Unless refuse is removed by a competent authority, it shall be disposed of in pits and covered over daily with a layer of earth or ash of sufficient thickness to prevent depredations by rodents and the breeding of flies.

4.6 Adequate measures shall be taken against all vermin and insects responsible for the spread of disease. Any instructions of a competent health authority shall be carried out promptly and implicitly.

4.7 Buildings and bedboards shall be treated whenever necessary with an approved insecticide.

4.8 The Contractor shall permit and facilitate inspection of the camp and structures on the site by the staff of Transnet or any other competent authority, and shall comply with any reasonable request by such staff or any other competent authority to eliminate any unsanitary condition.

4.9 Any outbreak of infectious disease shall immediately be reported telephonically and confirmed in writing to the Employer's Deputy.

4.10 The keeping of animals of any sort is not permitted.

4.11 The Contractor shall have on hand at the camp the necessary tools, disinfectants and cleaning materials to maintain and clean the sanitary facilities.

5. RATIONS

Rations, where supplied by the Contractor, shall be stored in a suitable and rodent proof building with sufficient shelving.

P02b-06 (JLH)

SPOORNET

A division of Transnet limited

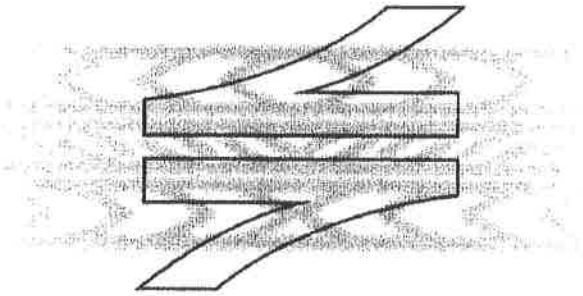
TECHNICAL RAILWAY ENGINEERING SPECIFICATION

PAINTING OF STEEL COMPONENTS OF ELECTRICAL EQUIPMENT

Author:	Senior Technologist Railway Engineering	H.A.Slier	
Approved:	Senior Engineer Railway Engineering	L.O.Borchard	
Authorised:	Principal Engineer Locomotive Environment	W.A.Coetzee	

Date: 27 February 2002

Circulation restricted to:
Technical: Maintenance (Infrastructure)
Technical: Maintenance



SPOORNET

A division of Transnet limited

TECHNICAL RAILWAY ENGINEERING SPECIFICATION

PAINTING OF STEEL COMPONENTS OF ELECTRICAL EQUIPMENT

Circulation restricted to:
Technical: Maintenance (Infrastructure)
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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.

6.1Noxyde 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.....

TRANSNET
freight rail

TECHNOLOGY MANAGEMENT.

SPECIFICATION.

TRANSNET FREIGHT RAIL'S REQUIREMENTS FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT FOR 3kV DC TRACTION SUBSTATIONS

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SECTION 1: SUBSTATION DESIGN INFORMATION

1.0 SCOPE

1.1 This specification covers Transnet Freight Rail's requirements for the installation of electrical equipment in 3kV DC traction substations.

1.2 This specification should be read with the Scope of Work specification for each site/project and the applicable equipment specifications.

1.3 This specification also covers the requirements for the supply of security fencing, preparation of the High Voltage (HV) outdoor yard and the erection of all structural steelwork.

2.0 STANDARDS, PUBLICATIONS AND DRAWINGS

Unless otherwise specified this specification must be read in conjunction with the current edition of the relevant SANS, BS and Transnet Freight Rail's specifications.

2.1 SOUTH AFRICAN NATIONAL STANDARDS (SANS)

SANS 121:	Hot dip galvanized coatings for fabricated iron or steel articles. Specifications and test methods.
SANS 156:	Moulded-case Circuit Breakers.
SANS 780:	Distribution Transformers.
SANS 1019:	Standard voltages, currents and insulation levels for electricity supply.
SANS 1091:	National Colour Standard.
SANS 1222:	Enclosures for Electrical Equipment.
SANS 1339:	Cross-Linked Polyethylene (XLPE) - Insulated Electric cables for rated voltages (3,8/6,6kV to 19/33kV)
SANS 1431:	Weldable structural steels.
SANS 1507:	Electric cables with extruded solid dielectric insulation for fixed installations. (300/500V to 1900/3,300V) Part 1
SANS 10142-1:	The wiring of premises. Part 1
SANS 60044-1:	Instrument Transformers Part 1. Current Transformers.

2.2 TRANSNET FREIGHT RAIL SPECIFICATIONS/ ENGINEERING INSTRUCTIONS

CEE.0023:	Laying of cables.
CEE.0045:	Painting of steel components of electrical equipment.
CEE.0099:	Specification for 3kV DC high speed circuit breakers for traction substations.
CEE.0224:	Drawings, catalogues, instruction manuals and spares lists for electrical equipment supplied under contract.
CEE.0227:	The manufacture of 3kV DC breaker cells and trucks.
BBB 0496:	3kV rectifier for traction substations.
BBB 0845:	Requirements for metal oxide surge arresters in accordance with SANS 60099-4.
BBB 1267:	Specification for Outdoor High Voltage Alternating Current Circuit Breaker in Accordance with SANS 62271-100.
BBB 1616:	450 Volt gas arrester spark gap for traction power supplies.

BBB 2502:	Requirements for battery charger for 3kV DC traction substations.
BBB 2721:	AC primary circuit breaker control panel and AC/DC distribution panel for 3kV traction substation.
BBB 3005:	3kV DC under voltage relay manufacturing specification.
BBB 3139:	Wave filter capacitors for 3kV DC traction substations.
BBB 3162:	Wave filter inductors for 3 kV DC traction substations.
BBB 3890:	Requirements for 1.8 milli Henry DC reactor for 3kV DC traction substations.
BBB 5019:	Requirements for traction transformers for 3kV DC traction substations in accordance with BS 171 and IEC 60076-1.
BBB 7842	Outdoor, High Voltage, Alternating Current Disconnectors combined with earthing switch.
BBC 0198:	Requirements for the supply of cables.
BBC 0330:	Isolation transformer.

2.3 STATUTORY REQUIREMENTS

Occupational Health and Safety Act and Regulations, Act 85,1993

3.0 TENDERING PROCEDURE

3.1 Tenderers shall indicate clause-by-clause compliance with the specification as well as the relevant equipment specifications. This shall take the form of a separate document listing all the specifications clause numbers indicating the individual statement of compliance or non-compliance.

3.2 The tenderer shall motivate a statement of non-compliance.

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

3.4 Failure to comply with clauses 3.1, 3.2, and 3.3 could preclude a tender from consideration.

4.0 SERVICE CONDITIONS

The equipment shall be designed and rated for installation and continuous operation under the following conditions:

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.

5.0 ELECTRICAL SERVICE CONDITIONS

5.1 The incoming AC voltage can vary ±5% of the nominal system r.m.s voltage. Under crippled conditions the supply voltage can drop to as low as minus 15% of the nominal r.m.s voltage.

5.2 Frequency of the supply voltage is 50 ± 2.5 Hz.

5.3 The AC high voltage system shall be treated as effectively earthed unless otherwise specified.

5.4 The traction DC supply voltage is 3,15 kV DC nominal but can vary between 2,4kV and 3,9kV for sustained periods.

5.5 The 3kV DC equipment may be subjected to fault currents up to 30kA for 200 milli seconds.

6. 0 GENERAL REQUIREMENTS

6.1 Equipment/Installations supplied shall be in terms of this specification. Deviations from the specification will not be allowed without the written consent of the Project Manager/Engineer.

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

6.3 The tenderer shall submit the layout drawings of equipment, electrical wiring schematics, and constructional designs to Transnet Freight Rail for design review.

6.4 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 not to comply.

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

6.6 The general design and layout of all equipment shall provide for easy access to all parts.

6.7 The equipment shall be installed in such a manner so as to limit fire damage, which may be caused by equipment failure, overheating or flashovers.

6.8 The substation control and protection circuits shall be designed and wired according to the fail-safe principle. Control equipment, contactors and relays shall de-energise under fault, power failure or alarm (flag) conditions.

6.9 No high voltage cables shall be laid in the same trench or duct as low voltage cables.

7.0 GENERAL DESIGN OF EQUIPMENT

7.1 This section covers substation equipment with electrical capacities between 3,0 MW and 6,0 MW.

7.2 The overload ratings of the rectifier units shall be:

2 times full load for thirty minutes.

3 times full load for one minute.

3 ½ times full load for ten seconds.

7.3 The substation can either be a single unit or double unit substation. Each unit comprises of one set of high voltage AC switchgear, one rectifier transformer, and one rectifier assembly, connected for 6 or 12 pulse operation and protected by a AC primary circuit breaker.

7.4 For a double unit substation each unit shall have the overload rating as specified in clause 7.2.

7.5 Each substation unit shall be capable of operating independently to allow for maintenance, fault finding and servicing of the equipment.

8.0 INSULATION AND CLEARANCES FOR 3kV DC EQUIPMENT

8.1 All indoor equipment, which may be energised at a potential of more than 1,0kV shall be protected by, metal barriers, mesh type screens or panels.

8.2 The minimum clearance in air between the rectifier unit and any metal barriers, mesh type screens or panels shall not be less than 450mm.

8.3 All exposed electrical equipment and busbars connected between the rectifier transformer secondary and the rectifier cubicle(s), or between the rectifier cubicle(s), positive isolators, DC smoothing equipment or track breakers, which is at a potential above 1,0kV, shall be arranged so that there is a minimum clearance of 2,7 m from the lowest "live" high voltage connections and ground or the floor of the access way, unless suitably screened, or otherwise protected.

8.4 All nominal 1,5kV and 3kV insulation to earth shall be designed such that the complete rectifier assembly, when installed on site ready for commissioning, will successfully withstand a test voltage of 10,5kV, 50 Hz AC for one minute.

8.5 Where the equipment or subassemblies of the rectifier assembly is enclosed and insulated from the outer framework, the insulation between the equipment and outer framework shall withstand the test voltage of 10,5kV 50 Hz for one minute.

8.6 The clearance between the reactor and any metal frame shall not be less 100mm. The reactor must successfully withstand a test voltage of 10,5kV AC 50 Hz for one minute

8.7 The successful tenderer shall advise what precautions must be taken before undertaking the withstand insulation level voltage tests to avoid damage to the equipment.

8.8 Creepage distance of insulation and the required air clearances shall be as large as possible. The latter shall not be less than:

- Outdoors: 150mm between the transformer secondary busbars and any steelwork such as wall plates, screening etc.
- Indoors: 100mm between the equipment at nominal 1,5kV or 3kV DC and negative busbars and panel steelwork, between the high voltage AC supply to the rectifier cubicles and panel steelwork, the equipment at nominal 3kV DC and negative busbars.

9.0 OUTDOOR CLEARANCES AND INSULATION LEVELS

9.1 The minimum safety outdoor earth clearances which shall be maintained between any live conductor or metal and earthed metal and the minimum clearances of power lines above ground are in accordance with the statutory requirements of clause 15.1 of the "Electrical Machinery Regulations" of the "Occupational Health and Safety Act and Regulations, Act 85,1993", and are tabled below: -

TABLE 1:

Highest phase-to-phase r.m.s voltage for equipment. (U_m)	24kV	36kV	48kV	72kV	100kV	145kV
Nominal system r.m.s. voltage. (U_n)	22kV	33kV	44kV	66kV	88kV	132kV
Minimum safety outdoor clearance	320mm	430mm	540mm	770mm	1000mm	1450mm
Minimum clearance of power lines above ground						
Outside security fence but within Transnet Freight Rail's reserve	5200mm	5300mm	5400mm	5700mm	5900mm	6300mm
Outside Transnet Freight Rail's reserve	5500mm	5500mm	5500mm	5700mm	5900mm	6300mm

9.2 In terms of Transnet Freight Rail's Electrical Safety Instructions the clearances between the nearest exposed electrical equipment and a restricted access way are tabled below: -

TABLE 2:

Highest phase-to-phase r.m.s voltage for equipment. (U_m)	24kV	36kV	48kV	72.5kV	100kV	145kV
Nominal system r.m.s. voltage. (U_n)	22kV	33kV	44kV	66kV	88kV	132kV
Restricted access way (Vertical height) *	2820mm	2930mm	3040mm	3270mm	3500mm	3950mm

*See clause 903.1.3 of "Transnet Freight Rail's Electrical Safety Instructions"
(The vertical heights in restricted access ways for the various system voltages are calculated by adding 2,5metres to the normal outdoor earth clearance for the different system voltages. Refer to Annexure 9.4 of Transnet Freight Rail's Electrical safety Instructions).

INSULATION LEVELS

9.2 For the medium and high voltage nominal r.m.s voltage systems on Transnet Freight Rail the recommended Insulation levels in accordance with SANS 1019 is tabled in table 3.

TABLE 3

Highest phase-to-phase r.m.s voltage for equipment. (Um)	Nominal system r.m.s. voltage. (U_n)	Rated lightning impulse withstand voltage peak.	Rated short duration power- frequency withstand r.m.s voltage.
7,2 kV	6,6 kV	75 kV	22 kV
12 kV	11 kV	95 kV	28 kV
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 650 kV	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 3: Standard Voltages and insulation levels in accordance with SANS 1019:2008 [1}

SECTION 2: TRACTION SUBSTATION EQUIPMENT

OUTDOOR YARD EQUIPMENT

10.0 METAL OXIDE SURGE ARRESTERS

10.1 The contractor shall supply and install metal oxide gapless surge arresters in accordance with Transnet Freight Rail's specification BBB 0845.

10.2 The surge arresters shall be connected between each phase of the high voltage supply and substation main earth electrode/earth mat

10.3 The maximum protected distance from the main transformer bushing terminal to the surge arrester terminal shall be as indicated in table 4.

TABLE 4:

NOMINAL SYSTEM R.M.S VOLTAGE (kV)	MAXIMUM DISTANCE (Metres)
44kV	5
66kV	6
88kV	6
132kV	7

10.4 The neutrals of high voltage supplies are to be treated as effectively earthed unless otherwise specified.

10.5 For the installation of high voltage surge arresters on the main transformer, refer to Transnet Freight Rail' s drawing BBB 0938

11.0 HIGH VOLTAGE AC DISCONNECTOR

The contractor shall supply and install the high voltage AC disconnecting switch in accordance with Transnet Freight Rail's specification BBB 7842.

12.0 HIGH VOLTAGE PRIMARY CIRCUIT BREAKER

The contractor shall supply and install the high voltage AC primary circuit breaker in accordance with Transnet Freight Rail's specification BBB 1287.

13.0 MAIN CURRENT TRANSFORMERS

13.1 The main current transformers shall comply with the requirements of Transnet Freight Rail specification BBB 0937.

13.2 The main current transformers shall either be fitted in the high voltage bushings of the main traction transformer or shall be free-standing post type current transformers install on the line side of the main traction transformer.

13.3 In the event of Eskom or Local Utility requiring three current transformers for metering purposes the successful contractor shall supply and install the additional current transformer.

13.4 The ratios, accuracy and burdens of the current transformers shall be in accordance with Transnet Freight Rail's Specification BBB 0937.as specified:

14.0 MAIN TRACTION TRANSFORMER

14.1 The contractor shall be responsible for the delivery, assembling, filling of transformer oil and installation on site of the main traction transformer in accordance with Transnet Freight Rail's Specification BBB 5019.

15.0 AUXILIARY TRANSFORMER

15.1 The contractor shall make provision for the supply of an auxiliary transformer which shall comply with the requirements of SANS.780

15.1.1 The auxiliary transformer shall be three phase with a minimum rating of 50kVA or higher depending on the substation requirements.

15.1.2 The 3 phase auxiliary transformer shall be supplied from the tertiary winding of the main traction transformer

15.1.3 The auxiliary transformer shall be the sealed unit type suitable for outdoor installation. Full details of the transformer shall be submitted.

15.2 In the case of a double unit substation one auxiliary transformer may be provided unless otherwise specified.

15.3 The secondary winding of the auxiliary transformer shall be star-connected.

15.4 The auxiliary transformer shall supply the required kVA rating without exceeding the permissible temperature rise laid down in SANS 780.

15.5 The nominal no-load secondary voltage of the auxiliary transformer shall be 400V three phase.

15.6 Off-load, externally operated tap changing gear shall be provided on the transformer, with tappings to compensate for any change in the main transformer tapping.

15.7 All primary and secondary terminals, including the secondary neutral, shall be brought out through the transformer tank by means of bushing type terminals and shall be arranged for busbar/cable connections.

16.0 AUXILIARY TRANSFORMER PROTECTION

PRIMARY WINDING

16.1 The contractor shall make provision for overload protection of the primary winding. Refer to clause 8.8 of specification No BBB 2721.

16.2 The protection system shall consist of an approved type of overload relay with its associated current transformers.

16.3 SECONDARY WINDING

16.4 The contractor shall supply and install a three phase isolating and earthing switch for the secondary supply of the auxiliary transformer to the substation.

16.5 The isolating and earthing switch shall be fitted with mechanical interlocking of the key exchange type, which shall form part of the interlocking procedure for the substation. Refer to clauses 31.0 and 32.0 of this specification.

17.0 AC EARTH LEAKAGE CURRENT TRANSFORMER.

17.1 The contractor shall supply and install a bar primary current transformer for the AC earth leakage protection. The current transformer shall be installed on the support steel structure of the primary circuit breaker.

17.2 One terminal of the primary winding shall be connected to the primary circuit breaker frame and the other terminal shall be connected to the substation main earth electrode/mat. (Refer to drawing CEE-TBD-7 and BBB 3620).

17.3 The current transformer shall be class 10P10, ratio 50/5 or 100/5.

17.4 The current transformer shall be designed to withstand a test voltage of 2kV for 1 minute.

INDOOR EQUIPMENT

18.0 3kV DC RECTIFIER

18.1 The contractor shall supply and install 3kV DC rectifiers in accordance with Transnet Freight Rail's Specification BBB 0496.

18.2 Each rectifier unit and its associated control equipment shall be designed to form an independent unit.

18.3 The rectifier equipment shall be installed in screened bays fitted with gates.

18.4 The gates shall be fitted with mechanical interlocks of the key exchange type in accordance with clauses 31 and 32 of the specification.

18.5 The bay screens shall be constructed of approximately 25mm woven wire mesh or expanded metal fixed to tubular or angle iron frames complete with doors, pillars, gates etc.

18.6 The height of the screens and gates shall be similar to the height of the control panels but shall be not be less than 1,8 m.

18.7 In a double unit substation the rectifier units are referred to as the "A" and "B" units and shall be labelled as such.

18.8 It is required that each rectifier unit in a double unit substation can be isolated independently and earthed without shutting down the whole substation.

18.9 Individual rectifier units shall be screened from each other and from any other live common equipment. A mechanical key exchange interlocking system type in accordance with clauses 31 and 32 shall be fitted to ensure the safety of personnel working on the isolated rectifier equipment.

18.10 The rectifier units and bay screens shall be insulated from the floor.

19.0 3kV DC REACTOR

19.1 The contractor shall supply and install a 1.8 milli Henry 3kV DC air core reactor for each rectifier unit. The installation shall include the supply of all the required insulators, foundations, foundation bolts and fasteners.

19.2 The 3kV DC reactor shall be in accordance with Transnet Freight Rail's Specification BBB 3890.

19.3 The reactor shall be insulated from the substation floor by means of insulators.

19.4 Sufficient space shall be allowed for access to the reactor for maintenance and inspection purposes.

20.0 WAVE FILTER

20.1 The contractor shall supply and install the wave filter equipment in accordance with Transnet Freight Rail's specification BBB 3139 for wave filter capacitors and BBB 3162 for inductor coils.

20.2 A wave filter is connected in parallel with the rectifier output. The filter unit is a capacitive inductive circuit, which is tuned to resonate at specific harmonic frequencies.

20.3 The filter equipment shall be so designed that no individual harmonic voltage is greater than 2% of the output voltage.

20.4 The inductor coils shall have sufficient adjustment to compensate for change in the capacitance values due to ageing. Refer to Transnet Freight Rail's drawing BBB 3483 for assembly.

20.5 A 100 Ampere High Rupturing Capacity (H.R.C) fuse shall be fitted to protect the wave filter equipment.

20.6 The fuse holder shall be mounted on insulators.

20.7 The insulators shall be so designed that the flashover path is not less than 100mm and shall support the fuse at a distance of not less than 100mm from the bolts securing the base plate. The insulators shall have a minimum dry flashover value of 20kV.

20.8 Access to the wave filter equipment shall only be possible once the wave filter capacitors have been connected to rail, discharged and the primary circuit breaker tripped.
A 75 kilo Ohm resistor consisting of two 150 Kilo Ohm, 150 watt vitreous enamel resistors connected in parallel shall be provided for the discharging of the wave filter capacitors when the equipment is isolated and earthed.

20.9 The discharge resistors shall be mounted on a suitable insulation panel or bar, which shall be insulated for 3kV DC. A minimum clearance of 75mm must be provided between the terminals, and 100mm between any 3kV live portion of the equipment and earth.

20.10 The wave filter capacitors shall be earthed with 95mm² PVC insulated copper cables to the DC earth leakage system.

20.11 The wave filter equipment shall be housed in a separate explosion proof room or cubicle.

21.0 3kV DC POSITIVE ISOLATOR

21.1 The contractor shall supply and install the 3kV DC positive isolator in accordance with Transnet Freight Rail's specification BBB 4724.

21.2 The DC positive isolator metal cubicle/housing shall be insulated from the substation floor.

22.0 CONTROL PANELS

22.1 The contractor shall supply and install the AC primary circuit breaker control panel and the AC/DC distribution panel in accordance with Transnet Freight Rail's specification BBB 2721.

22.2 The control panels shall be insulated from the substation floor.

ELECTRONIC EQUIPMENT

22.3 The tenderer must be aware that high voltage surges and transient voltages can be induced in low voltage and control wiring due to switching and lightning. Special care shall be taken in the design and layout of the equipment to limit these voltages.

22.4 Electronic equipment shall suitably be protected against over voltages, surges and transients. Dehn type surge protection units or equivalent shall be used. Liberal use of metal oxide varistors is also encouraged.

23.0 BATTERIES

23.1 The contractor shall supply, install and commission a 53 cell 110 Volt Planté lead acid battery bank. The capacity of the battery can either be 100 Ampere hour rating, 200 Ampere hour rating or capacity dependant on the substation requirements.
The standard for the batteries shall be the 10-hour rate at 20°C. The battery shall be capable of delivering a minimum of 10 Amperes for 10 hours.

23.2 Batteries are installed in traction substations for control and protection purposes. The battery is used for the following functions:

- Tripping and closing of primary circuit breakers.
- Supply to protection relays.
- Closing and holding coil supply to DC high speed circuit breakers.
- 110 Volt supply to control panel.

24.0 BATTERY CHARGER.

24.1 The contractor shall supply and install the battery charger in accordance with Transnet Freight Rail's specification BBB 2502.

24.2 The battery charger shall be insulated from the substation floor by means of "Marley" or "Lino" floor covering not less than 2mm thickness.

25.0 TRACK FEEDER HIGH SPEED CIRCUIT BREAKERS

25.1 The successful tenderer shall supply and install the required 3kV DC high speed circuit breakers in accordance with Transnet Freight Rail's specification CEE.0099 as well as with the following additional requirements:

25.2 The high-speed circuit breakers shall be of the conventional truck mounted type as commonly used by Transnet Freight Rail in the 3kV DC traction substations.

25.3 High-speed circuit breakers shall be fitted with an automatic reclosing feature, which provides for 1 (one) reclosure at 20 to 35 seconds interval. Refer to drawings CEE-TBP-35. "Connection diagram for the high speed circuit breaker and electronic control relay".
CEE-TBP-39."Circuit diagram for auto reclosure for the high speed circuit breaker.

25.4 Transnet Freight Rail shall provide the auto reclosure relays. The relays shall be wired by the contractor in accordance with the requirements of clause 25.3.

25.5 The high speed circuit breakers shall be complete in all respects. This shall include housings, rack out trucks, base rails, main and auxiliary contacts and flapper gear and any other fittings or equipment required for the correct operation of the high-speed circuit breakers.

25.6 The high-speed circuit breakers shall be racked into breaker cells, each having two fixed contacts mounted at the rear of the breaker cell. One contact is connected to the substation positive busbar and the other to a wall bushing mounted in the building outer wall.

25.7 All other items of material such as cell slabs, main busbars, earthing connections, wall bushing plates or blanking-off plates, control cables etc, shall be included in the tenderer's offer.

25.8 Transnet Freight Rail shall provide details of the wall plate frame and standard cell slabs where applicable.

25.9 Where access is possible to the rear of the high-speed circuit breakers (busbar chamber) access barriers shall be installed.

25.9.1 The barriers shall be fixed to angle iron frames with fasteners which only be removed with tools. Warning signs shall be fitted to the barriers.

26.0 MODULAR TYPE STEEL HOUSED HIGH SPEED CIRCUIT BREAKERS

26.1 Where tenderers offer modular type high-speed circuit breakers they shall submit full information, construction and dimensional drawings with their offer.

26.2 Transnet Freight Rail specification CEE.0227 shall be used as a guideline.

26.3 The tenderers must be fully aware that the requirements of Transnet Freight Rail's specification CEE.0099 are relevant.

26.4 Transnet Freight Rail reserves the right to accept or reject offers for equipment after consultation with tenderers. Transnet Freight Rail's Senior Engineer, Technology Management, shall approve all designs.

26.5 The modular type steel housings shall be insulated from the substation floor.

27.0 REGENERATIVE HIGH SPEED CIRCUIT BREAKER

27.1 At certain substations Transnet Freight Rail will require 3kV DC regenerative braking energy absorption equipment. If required the successful contractor shall supply the high speed circuit breaker for the protection of the regenerative breaking equipment in accordance with Transnet Freight Rail's specification CEE.0099.

28.0 3kV DC UNDERVOLTAGE RELAY

28.1 The contractor shall supply and install a 3kV DC undervoltage relay with a high voltage potential divider in accordance with Transnet Freight Rail Specification BBB 3005 and shall provide the following:

28.2 Fibre optic technology must be used to provide galvanic isolation between the potential divider and the undervoltage relay.

28.3 The potential divider shall be mounted in the 3kV busbar chamber or in the high voltage compartment of the positive isolator cubicle in accordance with Transnet Freight Rail's Specification BBB 4724.

28.4 The potential divider shall be protected by an H.R.C fuse connected between the positive side of the 3kV DC supply and the input of the potential divider.

28.5 Insulation clearance shall be not less than 100mm. All normally live equipment on the potential divider shall withstand a test voltage of 10,5kV AC RMS 50 Hz for one minute to earth without breakdown.

28.6 If the undervoltage relay is wall mounted, an engraved warning label shall be fixed to the front of the undervoltage relay panel with the following warning:

WARNING

THE POSITIVE BUSBAR MUST BE ISOLATED AND EARTHED BEFORE WORK IS UNDERTAKEN ON THE UNDERVOLTAGE RELAY

28.7 The following connections shall consist of 95mm² cross-sectional area copper or copper equivalent conductors.

- Potential divider to negative busbar.
- Resistor base plate to DC earth leakage busbar.
- Relay metal case to DC earth leakage busbar.

SECTION 3: INSTALLATION

SUBSTATION EARTHING

29.0 INDOOR EARTHING (REFER TO DRAWING CEE-TBD-0007)

The successful contractor shall supply, install and comply with the following:

29.1. The supply and installation in the substation building of all earthing conductors for the earthing of all metal work which includes supporting frames, control panels, battery charger, positive isolator panel, track breaker cells, rectifier bay screens, chequer plates and metal bases of insulators mounted directly on the walls or floor etc.

29.2. The frames and bases of all items associated with the 3kV DC including the track feeder wall plates, shall be connected through the DC earth leakage relay to the negative busbar in accordance with Transnet Freight Rail' s drawing CEE-TBD-0007.

29.3. The DC earth leakage relay and the installation thereof shall comply with the requirements specified in clause 8.6 of Transnet Freight Rail' s specification BBB2721.

29.4. Earthing conductors which could be subjected to 3 kV DC faults caused by insulation breakdown, etc., shall be not less than 70mm² copper strap cross-sectional area or 95mm cross-sectional area PVC insulated stranded copper cable. Other earth conductors must have a minimum of 16mm² copper cross-sectional area.

29.5. The earthing system for the 3kV DC positive busbar chamber shall be supplied by the successful tenderer. The design of the system shall be in conjunction with Transnet Freight Rail staff.

29.6. The successful tenderer shall supply the portable earthing device and cables according to Transnet Freight Rail's requirements.

29.7. All connections to the DC earth leakage relay shall form part of a ring circuit for safety when part of the circuit is disconnected. Refer to drawing CEE-TBD-0007.

29.8. The earth conductors shall not be installed in such a manner as to bridge out the earth leakage relay.

29.9. The resistance between the DC earth leakage busbar and the substation main earth electrode/mat shall be not less than 25 ohms.

29.10. Holding-down bolts grouted in the floor shall not be in direct contact with reinforcing or in with the earth under the concrete floor in the substation.

29.11. Where mounting bolts are used for securing electrical equipment to the floor, these bolts must be insulated to prevent electrical contact with any reinforcing or floor.

29.11.1 The indoor substation equipment shall be earthed in groups as shown in Transnet Freight Rail's drawing CEE-TBD-0007.

30.0 OUTDOOR EARTHING (DRAWING NO CEE-TBD-7 AND BBB 3620)

The successful tenderer shall supply, install and comply with the following:

30.1 Outdoor yard earthing which includes earth spikes, trench earths, earth connections to the support steel structures and fence posts. The material used shall comply with Transnet Freight Rail's specification BBB 3059 and drawing BBB3620.

30.2 A rail-earth switch mounted on the gate that provides access to the outdoor yard and where applicable to the 3kV DC overhead feeder security area and provide all connections thereto.

30.3 In Transnet Freight Rail switchyards where the supply from the Electrical Utility is terminated on portal structures or where a flying busbar is provided the contractor shall earth these structures.

30.3.1 Install two 50mm² galvanised steel earth conductors, one each between the outside portal structure or flying busbar support and the gable of the substation building.

30.3.2 The earth conductor shall be suitably terminated and connected to the portal or flying busbar structures. A suitable bracket shall be supplied and mounted on the gable of the substation building. The earth conductors shall directly be terminated on the bracket and connected to the main earth electrode/mat.

Insulating of structures and electrical equipment.

30.3.3 The tenderer shall make provision for the insulating of the support steel structures for i.e. the primary circuit breaker, main current transformers and any other structure that is connected to the AC earth leakage system from the concrete foundation.

30.3.3.1 The insulating material shall be either the same material used for the insulating of the mast bases for the overhead track equipment or other insulating material that has been approved by Technology Management.

30.4. The tenderer shall make provision for the insulating of the base of the main traction transformer from the concrete plinth. Malthoid or any other approved insulation shall be used.

31.0 INTERLOCKING (mechanical)

GENERAL

31.1 The equipment for each substation shall include a mechanical interlocking system; preferably the "Castell" or other approved key type. Full details of the type offered instead of the "Castell type shall be submitted with the tender.

31.2 The mechanical interlocking system must be designed to prevent access to the high voltage equipment whilst "live" and ensure that switching and isolating operations are carried out in the correct sequence.

31.3 All equipment shall be delivered with the necessary interlocks fitted.

31.4 It shall not be possible to operate the locks and release the keys in any but the correct sequence or in any position of the switches or gates, other than the fully "closed" or fully "open" position, as the case may be.

31.5 When a unit is switched to local condition and isolated, no remote switching from the control office shall be possible. Tenderers shall furnish full explanatory details of the arrangement whereby the foregoing provisions are met.

31.6 The track feeder breakers shall remain closed throughout the isolation procedure.

32.0 ISOLATING PROCEDURE

Sequence to isolate a single unit substation rectifier unit.

32.1 Trip high voltage AC circuit breaker.

32.2 Open high voltage AC disconnecting switch-key "1" released.

32.3 Remove key "1"- AC disconnecting switch locked in open and earthed position.

32.4 Use key "1" to operate auxiliary supply's three phase isolating and earthing switch - key "1" trapped - key "2" released.

32.5 Use key "2" to unlock DC positive isolating and earthing switch.

32.6 Open DC positive isolating and earthing - key "2" trapped - key "3" released. Remove key "3". DC positive isolating and earthing switch locked in open position.

32.7 Use key "3" to open rectifier unit bay gate (and DC smoothing reactor screen if required).

32.8 If a number of keys are required to open the rectifier cubicles, a key exchange system may be used.

32.9 Procedure is reversed to switch the rectifier unit back on load.

32.10 The number indicated for the keys are for single unit substations only. Where there are two units in one substation the numbers of keys for the two units shall be A1 and B1, A2, and B2, etc. It shall not be possible to exchange keys between any equipment on different units.

32.11 The foregoing sequence is given as a guide and may be altered to suit tenderer's equipment. The design shall be approved by Transnet Freight Rail.

32.12 Where the wave filter equipment is not located in the rectifier bay, the access to the equipment shall be mechanically interlocked and form part of the interlocking procedure.

32.13 Access to the wave filter shall only be possible once the positive isolator is earthed and the primary circuit breaker is tripped. Refer to clause 20.8

32.14 Any deviation from the above guideline must be approved by Transnet Freight Rail.

33.0 INDOOR CABLING, BUSBARS AND ASSOCIATED EQUIPMENT

The contractor shall supply and install the following:

33.1 All low voltage PVC insulated supply and control cables.

33.2 3kV DC copper cables and copper busbars from the Anode wall plate to the rectifier and from the rectifier equipment to the DC positive isolating switches, DC smoothing reactors, and main DC negative busbar. In the event of aluminium (grade 6063) being used the minimum size shall by 50mm X 25mm busbar.

33.3 Where required, the supply and fitting of hot dip galvanised anode wall plates in the wall of the substation building, at the rectifier bays. The wall plate galvanising shall comply with SANS 121.

33.3.1 Wall plates shall be fitted with wall bushings, one for each phase and the neutral.

33.3.2 Designs and drawings of the wall plate arrangement must be submitted for approval after adjudication of the tender.

33.4 The interconnecting busbars from the anode wall plate to the rectifier.

33.5 The main 3kV DC positive and negative copper busbars. Minimum dimension of busbars shall be 100mm X 10mm copper or 127mm X 12,5mm aluminium (grade 6063) busbar.

33.6 The 3kV DC output positive busbar system, which includes high-speed circuit breaker busbars, and where required the outgoing feeder cables between the high speed circuit breaker busbars and wall bushings.

33.7 Barriers in accordance with clause 8.0 where exposed busbars exist between the positive isolator and the DC track breaker positive, busbar.

33.8 Cables from the DC smoothing reactor or main positive busbar to the wave-filter equipment.

33.9 Control cables from the rectifier cubicles to their respective control panels.

33.10 Cables from the auxiliary equipment to the substation control panels.

33.11 Connections and cabling between control panels.

33.12 Cables between the 110V substation battery and the auxiliary DC panel (2 core, minimum 16mm²).

33.13 Cables (95mm² stranded copper) to the wave-filter room(s) for rail (negative) and DC earth leakage connections to wave-filter equipment.

33.14 Earthing cables (95mm² stranded copper) between the DC earth leakage busbar and substation negative busbar.

33.15 Two core 16mm² and multicore 2,5mm² cables between panel and high-speed 3kV DC circuit breakers.

33.16 Two core 6mm² cables between the 25A circuit breakers on the DC panel and the Electrical Supply Utility meter room. Make-off and connect at the DC panel only.

33.17 All other busbars and cables required for the interconnection of the substation indoor equipment.

33.18 Cable glands for the termination of the cables at the control panels and other equipment. Neoprene shrouds shall be fitted over the cable glands.

33.19 The maximum current density per square mm for open conductors shall not exceed 1.55 Ampere for copper and 1.0 Ampere for aluminium.

33.20 Low voltage cables for indoor use may be unarmoured.

33.21 All high voltage cables shall be armoured XLPE insulated and shall comply with SANS 1339 and Transnet Freight Rail specification BBC 0198. All wiring used on the 3kV DC equipment shall have nominal 3kV insulation unless the clearances comply with those laid down in clause 8.9.

33.22 All negative connections and terminals associated with high voltage circuits and which are accessible without first having to isolate and earth such high voltage circuits e.g. the main negative busbar, DC earth leakage relay, etc., shall be of 95mm², copper or copper equivalent cross-section. The terminals shall be painted red.

33.23 Not withstanding the above clauses the contractor shall supply and install any other cables, conductors or busbars required for the successful operation of the substation.

33.24.0 BLOCK JOINTS

33.24.1 The contractor shall make block joints in the armouring of all the low voltage supply and control cables, which are connected between the indoor control equipment and the outdoor yard equipment.

33.24.2 The block joints shall be clearly visible and shall be not less than 200mm from the cable glands terminating at the outdoor equipment.

33.24.3 The block joints shall be sealed with a heat shrink covering to prevent the ingress of moisture.

33.25.0 CHEQUER PLATES

33.25.1 The contractor shall be responsible for the supply of all metal chequer plates required for covering of cable trenches inside the substation.

33.25.2 Earthing studs suitable for the fitting of 95mm² copper cable shall be welded to each chequer plate.

34.0 CABLES, BUSBARS AND CONNECTIONS. (OUTDOOR)

The Contractor shall supply and install the following:

34.1 The Inter-connections cables or conductors in the High Voltage yard.

34.2 The high voltage AC connections which shall be solderless, concentric grip, or other approved solderless type. The connections must have adequate cross-sectional area to suit both electrical and mechanical requirements.

34.3 Copper busbars between separately mounted outdoor equipment. The busbars shall incorporate a degree of flexibility to avoid any overstressing of connections due to foundation movement and expansion or contraction.

34.4 All negative connections and terminals associated with high voltage circuits and which are accessible without first having to isolate and earth such high voltage circuits e.g. the main negative busbar shall be of 95mm², copper or copper equivalent cross-section. The terminals shall be painted red.

34.5 Copper busbars with removable flexible connections or "all aluminium" stranded conductor may be used interconnection conductors between the main traction transformer secondary bushings and the anode wall bushings which are fixed to the anode wall plate of the substation building.

34.5.1 Where "all aluminium conductors are to be installed the following sizes and number of conductors shall be installed:

- 2 X 800 mm² "all aluminium" stranded conductor per each phase for 4,5 MW substations, or 50mm X 25mm aluminium (grade 6063) busbar in accordance to Transnet freight rail drawing BBF1615.
- 2 X 500 mm² "all aluminium" stranded conductor per each phase for 3 MW substations, or 50mm X 25mm aluminium (grade 6063) busbar in accordance to Transnet freight rail drawing BBF1615.

34.5.2 Where two different conductor material joints are used, the Bi-Metallic plates shall be applied.

34.6 Conductors from the high voltage AC line aerial conductors and between the surge arresters, AC disconnecting switch, high voltage AC circuit breaker, current transformers, rectifier transformer and rectifier.

34.7 Cables or busbars from the rectifier transformer to the auxiliary transformer.

34.7.1 The auxiliary transformer shall be connected directly to the tertiary winding of the traction transformer for new installations or existing installations where tertiary windings are employed on the main traction transformer.

34.8 Cable from the auxiliary transformer secondary to the short-circuiting switch.

34.9 Control cables from the high voltage AC disconnector, AC circuit breaker and main and auxiliary transformers to the substation control panels.

34.10 A multi-core 4mm² cable between the current transformers and the Electrical Supply Utility meter room. Make-off and connect at the current transformer only.

34.11 In the case of the Electrical Supply Utility Tee-supplies a multi-core 4mm² cable between the voltage transformers and the Electrical Supply Utility. The Electrical Supply Utility will do the cable connection.

34.12 In the case of the Electrical Supply Utility Duplicate Supplies one multi-core 4mm² cable between Transnet Freight Rail's high voltage AC circuit breaker and the Electrical Supply Utility meter room. (For interlocking Electrical Supply Utility M.O.D's). The cable shall have 10% spare cores.

34.13 A multi-core 2,5mm² cable between the tele-control remote terminals on the control panel and the electrical supply utility meter room. (For tele-control of the Electrical Supply Utility equipment). The cable shall have 10% spare cores.

34.14 All other cables as specified. e.g. security lighting and alarms.

34.15 All control cables, security and alarm cables shall be armoured cables.

34.16 Not withstanding the clauses above the contractor shall be responsible for all cables, busbars and connections required for the successful operation of the 3kV DC traction substation.

35.0 LABELS AND TERMINALS

35.1 All labels shall be in English. All lettering shall be white on a black background. Lettering shall be a minimum of 6mm in height.

35.2 All labels shall be neatly secured by rivets or screws.

35.3 All conductors and cables shall be provided with identification tags at terminals.

35.4 All terminals and equipment such as switches and relays shall be suitably numbered according to the substation schematic and wiring diagrams. All terminal blocks and groups of terminal blocks shall be suitably numbered.

36.0 SUBSTATION NEGATIVE RETURN

The substation negative return system which can be in the form of the following:

- Buried XLPE insulated copper cable.
- Rail on sleepers.
- Aerial conductors.

36.1 BURIED XLPE INSULATED COPPER CABLE

36.1.1 The contractor shall install 2 x 500mm² single core XLPE copper cables from the substation negative busbar to the negative manhole situated near the railway line.

36.1.2 Transnet Freight Rail's staff will undertake the provision of the bare conductors from the negative manhole to track, as well as the rail connections.

36.1.3 The negative manhole to drawing CEE-TU-41 is to be supplied and installed by the contractor.

36.1.4 The negative return cables shall be laid, in 150mm of soft soil in a trench, at a depth of not less than 1000mm below ground level and spaced not less than 300mm between centres.

36.1.5 Where cables are likely to be damaged they shall be protected by concrete slabs. Refer to Transnet Freight Rail specification CEE.0023.

36.1.6 The cable route shall be provided with cable warning tape. Refer to Transnet Freight Rail specification CEE.0023.

36.1.7 The cable runs shall be marked by cable markers painted signal red. (Stores Item No 9/1503)

36.2 RAIL NEGATIVE RETURN.

36.2.1 Where rail is used for the negative return system Transnet Freight Rail shall supply and install the rail from the inside of the substation building to the railway track.

36.2.2 The rail shall be insulated from ground by means of concrete sleepers supplied by Transnet Freight Rail.

36.2.3 Where the rail enters the substation building it must be insulated from all concrete and brickwork to prevent stray current damage to building reinforcing or other metal. After installation the hole in the wall shall be sealed and made good by Transnet Freight Rail.

36.2.4 The rail shall be connected to negative output of the rectifier by means of a suitably rated busbar/cable supplied by the contractor. Transnet Freight Rail will make provision for terminations on the rail.

36.2.5 Transnet Freight Rail shall connect the negative return rail to the track by means of PVC insulated steel conductors.

36.3 NEGATIVE FEEDER MONITORING SYSTEM.

36.3.1 The contractor shall design supply and install a negative feeder monitoring system in accordance with Transnet Freight Rail specification BBB1843.

36.3.2 The negative feeder monitoring system shall be designed to trip the 3 kV DC track breakers in the event of the traction substation negative return circuit becoming open circuited due to cable theft of the negative return cables or other cause of failure of the negative return circuit.

36.4 AERIAL CONDUCTORS

36.3.1 Where aerial conductors are used for the negative return, the contractor shall provide the wall plates and wall bushings where required.

36.3.2 In the case of aerial conductors used for the negative return, Transnet Freight Rail shall provide the conductors and the installation.

37.0 3kV DC POSITIVE FEEDER CABLES

The positive feeder cables shall be either:

- Buried armoured medium voltage XLPE insulated cable.
- Aerial aluminium conductor

37.1 BURIED XLPE INSULATED CABLE

37.1.1 The contractor shall install two single core 6,6kV, 500mm² armoured medium voltage XLPE insulated cables with stranded copper conductors. The cables shall be manufactured with copper tape screen, armour and sheath in accordance with SANS 1339 and Transnet Freight Rail specification BBC 0198. The cables shall run from the high-speed circuit breaker busbar chamber to the associated track switch structure.

37.1.2 Tenderers are to allow for making off the cables with suitable terminations. Sufficient length of cable must be left buried at the base of the track switch structure for erection and connection to the track switch. Transnet Freight Rail will do connection to the track switch.

37.1.3 The medium voltage cables shall be laid in 150mm of soft soil, in a trench at a depth of not less than 1000mm below ground level and spaced not less than 300mm between centres.

37.1.4 Where cables are likely to be damaged they shall be protected by concrete slabs. Refer to Transnet Freight Rail specification CEE.0023.

37.1.5 The cable route shall be provided with cable warning tape. Refer to Transnet Freight Rail specification CEE.0023.

37.1.6 The cable runs shall be marked by cable markers painted white (Stores Item No 9/1539).

37.1.7 Should it be necessary for the cables to pass under the tracks suitable pipes will be installed by Transnet Freight Rail.

37.1.8 Where required, the contractor shall supply the necessary wall bushings for positive feeder cables.

37.2 AERIAL CONDUCTOR

37.2.1 In the case of aerial conductors used for the positive feeders, Transnet Freight Rail shall make provision for conductors and installation.

37.2.2 Where aerial conductors are used for the 3kV DC positive, the contractor shall provide the wall plates and wall bushings.

38.0 TRENCHING FOR OUTDOOR YARD EARTHING CONDUCTORS AND CONTROL CABLES.

38.1 Before any trenching commences the contractor shall consult with Transnet Freight Rail staff for approval of the routing of the trenches in the outdoor yard.

38.2 In existing substation outdoor yards the contractor shall remove the necessary crusher stone in the outdoor yard before any excavation commences. The contractor shall restore the crusher stone after the completion of the work.

38.3 Trenching includes all trenches required for the installation of the earthing system and control cables.

38.4 The depth of trenches shall not be less than 700 millimetres.

38.5 With the installation of new earthing conductors and control cables at existing substations, care must be taken not to damage existing cables in the high voltage outdoor yard during trenching operations.

38.6 The Contractor and Transnet Freight Rail staff shall inspect the trenches before and during the installation of the earthing system and control cables.

38.7 Before the trenches are closed a representative from Transnet Freight Rail shall inspect the earthing system and other cabling for damage.

39.0 FOUNDATIONS.

39.1 The successful tenderer shall be responsible for the design and casting of foundations for the portal and support structures in the traction substation high voltage outdoor yard.

39.2 Notwithstanding the supply arrangements (single or double) at any particular substation, tenderers shall clearly understand that all foundations and steelwork to accommodate the supply and to cater for the traction yard are to be provided and erected by the successful tenderer.

39.3 Wherever there is a combined traction and 11kV/6,6kV distribution yard, a flying busbar is to be provided in Transnet Freight Rail's yard. All foundations and steelworks required to suit this arrangement, including the erection and earthing thereof shall be included in tenderer's offers.

39.4 The foundations in the high voltage outdoor yard shall include the following:

- Voltage Transformers if applicable.
- Surge arresters.
- AC disconnectors.
- Current transformers. (If applicable)
- Primary circuit breakers.
- Main traction transformer.
- Auxiliary transformers.
- Portal lattice structures as required.
- Any other foundations as specified.

39.5 The successful tenderer shall carry out his own survey in regard to soil types and their load bearing capabilities.

39.6 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.

39.7 All foundation edges shall be bevelled, and the surfaces must be float finished.

39.8 All support foundations shall be at the same level.

39.9 The design of the concrete plinth for the main traction transformer shall include a concrete gutter around the perimeter of the plinth to contain any spillage of transformer oil.

39.10 Provision shall be made on the plinth for skid rails. The spacing of the rails between centres shall be a minimum of 1meter. Details of the design and load bearing parameters of the skid rail system, plinth and rail shall be submitted to Transnet Freight Rail for approval.

39.11 The auxiliary transformer if separate shall be provided with its own concrete plinth with a concrete gutter, or may be installed on the same plinth as the main traction transformer.

39.12 The 28-day strength of all concrete used shall be a minimum of 20Mpa.

39.13 Hand mixed concrete is not acceptable, it must be mechanically mixed.

40.0 SUPPORT STRUCTURES

40.1 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.

40.2 Special attention shall be taken for the prevention of corrosion of all metallic parts.

40.3 The bases of insulators, studs, bolts, support structures and other parts made of ferrous material associated with the electrical connections outdoors, shall be hot-dip galvanised, in accordance with SANS 121.

40.4 Steelwork for outdoor installation in coastal areas, i.e., within 50km of the coast, shall first be hot-dip galvanised in accordance with SANS 121, followed immediately at the galvanising plant by the application of the Sterling paint system in accordance with specification CEE.0045.

40.5 Steelwork for outdoor installation in inland areas, i.e., at a distance greater than 50km from the coast, shall be hot-dip galvanised to SANS 121.

40.6 All high voltage equipment shall be provided with hot-dipped galvanised support structures or pedestals to provide a minimum clearance of 3,6 m (up to 88kV) or 4,1 m (above 88kV) from the lowest "live" high voltage connection to finished ground level.

40.7 Structural steel shall comply with SANS 1431.

40.8 All welded joints shall be seal welded with no gaps or blowholes.

40.9 All fasteners, nuts and bolts used for the installation of substation steelwork and equipment shall be hot dipped galvanized to prevent corrosion.

41.0 FENCING

41.1 The successful tenderer shall supply and install new perimeter fencing as specified.

41.2 The successful tenderer shall make provision for the levelling of outdoor yard if required.

41.3 The fencing shall be either of the following:

- Concrete palisade fencing in accordance to drawing CEE-TDF- 0016.
- Hot dipped galvanised steel palisade fencing with the minimum requirements of:
  Height 2,4 metres
  Size and thickness of pales 40mm x 40mm x 3mm thick.
  Corner and intermediate posts 100mm x100mm x 3mm.
  Horizontal cross bars 40mmx5mm.

41.3.1 The successful tenderer shall make provision for the installation of safety barriers in the high voltage yard in accordance with Transnet Freight Rail's requirements. (Refer to Transnet Freight Rail's Engineering instruction S.016)

41.3.2 The successful tenderer shall make provision for a metal barrier screen of 25mm-wire mesh or expanded metal to be constructed around the auxiliary transformer to prevent accidental contact.

41.3.3 The successful tenderer shall cast a concrete apron of 150mm wide x 300mm under the perimeter fences of the substation. The top of the apron shall be a minimum of 100 mm above the ground level.

42.0 GATES

42.1 The contractor shall supply and install two 4.6 metre wide X 2,4 metres minimum height lockable gates in the perimeter fence to allow for:

- Entrance to substation building and yard.
- Entrance to the high voltage outdoor yard adjacent to the main transformer (s).

42.2 Where access to the HV outdoor yard is gained between the substation building and perimeter fence, a fence the same height as the perimeter fence shall be installed. A 1000mm wide lockable gate shall form part of the fence.

42.3 Provision must be made for the fitting of a spark gaps and rail earth switch on the HV yard small gate. Refer to drawings CEE-TBD-7 and BBB3620. The spark gaps shall be provided by Transnet Freight Rail on request.

42.4 Where steel palisade fencing is used the gates shall be connected to the fence support post by means of a flexible connection to prevent electrolytic corrosion of gate hinges.

42.5 Warning notices and danger signs in accordance with Transnet Freight Rail's Electrical Safety Instructions shall be fitted to the perimeter fencing and gates. This shall be provided by Transnet Freight Rail.

43.0 CRUSHER STONE AND WEED KILLER

43.1 After completion of construction, installation of equipment, the laying of all cables and earthing conductors, a suitable weed killer approved by the Technical Officer shall be applied in HV outdoor yard.

43.2 Great care shall be exercised to avoid contaminating private property and water supplies.

43.3 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 high voltage outdoor yard (within the apron).

44.0 PAINTING

44.1 All indoor and outdoor steelwork, metal screens and barriers shall be painted in accordance with Transnet Freight Rail's Specification CEE.0045.

44.2 The finishing coats for indoor equipment shall be in accordance with SANS 1091.

Metal Bay Screens - Eau-de-Nil (H43).
Support frameworks (indoor) - Eau-de-Nil (H43).

45.0 DISTRIBUTION, LIGHTING OF SUBSTATION BUILDING AND STANDBY 400V AUXILIARY SUPPLIES

45.1 The successful tenderer shall supply and install all light fittings, plugs, conduits, distribution boards, switches, cables and other material in accordance with SANS 10142-1. Galvanised, alternatively PVC conduit and galvanised fittings shall be provided at all substations within 50km of the coast.

45.2 The contractor shall furnish a certificate of compliance for the 400V/220V AC distribution and lighting of the traction substation signed by the accredited person in terms of SANS 10142-1 and who is registered with "Electrical Contracting Board".

45.3 Complete Layout drawing showing the position/type of light fittings, position of plugs, distribution board and switches to be submitted to Transnet Freight Rail for approval.

45.4 220V AC fluorescent light fittings shall provided. The minimum lighting requirement shall be 100 lux in terms of the "Occupational Health and Safety Act".

11KV/6,6KV TO 400V AUXILIARY SUPPLY AND CHANGE OVER SYSTEM.

45.5 Where specified a 11kV/6,6kV to 400V distribution transformer will be installed to supply the traction substation in the event of substation failure or when the substation is taken off load.

45.5.1 The 3 phase 400V supply from the above transformer shall be connected to the control circuitry via a automatic change over switching system.

45.5.2 The change over switching system shall be mechanically and electrically interlocked.

45.5.3 Transnet Freight Rail shall supply and install a suitably rated 4core armoured cable from the 11kV/6,6kV to 400V distribution transformer to the change over switching unit.

45.5.4 A 1:1 ratio isolation transformer shall be installed between the 11kV/6.6kV to 400V distribution transformer and change over switching system.

45.5.5 The isolation transformer shall comply with specification BBC 0330.

45.5.6 The successful tenderer shall supply the isolation transformer unless otherwise specified.

EMERGENCY LIGHTING.

45.6 Fluorescent light fittings with its own battery back up supply shall be supplied for emergency lighting.

45.6.1 A minimum of three fittings shall be installed in a single unit substation and four in a double unit substation.

45.6.2 The light fittings shall be installed at the following locations:

- In single unit substations two in the main walkway between the control panels and rectifier unit. One flameproof fitting in the battery room
- In a double unit substation three in the main walkway and one flameproof fitting in the battery room.
- In additional locations where requested by the Project Manager/Engineer.

45.6.3 The light switch shall be clearly labelled " EMERGENCY LIGHTNING".

MOULDED CASE CIRCUIT BREAKERS

45.7 All low voltage circuits and equipment shall be protected by moulded case circuit breakers, which comply with specification SANS 156.

SECURITY LIGHTS

45.8 Where outdoor security lights are specified 400W high-pressure sodium fittings shall be installed at locations specified by the "Scope of Work".

46.0 COOLING AND VENTILATION

46.1 Where specified, 3 phase cooling fans shall be supplied and installed in the substation building.

46.2 The required filters, louvres and guards shall be provided and installed.

47.0 BATTERY ROOM

47.1 A three/single phase non-sparking extraction fan shall be installed for the battery room.

47.2 Only Ex non-sparking light fittings shall be installed in the battery room.

47.3 Light switches and plug sockets shall not be installed in the battery room.

47.4 No-smoking, naked flames and hand protection warning signs shall be fitted to the battery room doors.

47.5 A wooden stand treated with acid proof paint shall be provided for the batteries.

47.6 A hydrometer and logbook shall be supplied by the contractor for each installation.

47.7 The floor of the battery room shall be painted with acid proof paint.

48.0 CLEARING OF SITE

48.1 All rubble which is left over as a direct result of work performed by the Contractor shall be removed from the substation building and yard and disposed of by the Contractor. The substation floors and walls shall be left in a clean condition. All cable, wire and conductor cut-offs and surplus material shall be removed from site.

SECTION 4: SITE TESTING AND COMMISSIONING

49.0 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.

49.1 ON-SITE TESTS

49.1.1 Functional on-site tests shall be conducted on all items of equipment, circuitry and interlocking to prove the proper functioning and installation thereof.

49.1.2 The successful tenderer shall submit a detailed list of on-site tests for the approval of the Project Manager/Engineer at least six weeks before tests are due to commence at the first substation.

49.1.3 The successful tenderer shall arrange for the Project Manager/Engineer or his representative to be present to witness the on-site tests at each substation.

49.1.4 On-site tests and subsequent commissioning shall 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.

49.1.5 On-site tests shall include the following;

- Polarity tests on all CT's.
- Ratio tests on all 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.
- The operation of both mechanical and electrical interlocking.
- Tests on primary circuit breakers and other primary equipment in accordance with manufacturer's instructions.

49.1.6 At the completion of the on-site tests the Project Manager/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.

49.1.7 Upon rectification of defects the successful tenderer shall arrange for the Project manager/Engineer or his representative to certify satisfactory completion of on-site tests for that particular substation.

49.1.8 Acceptance by the Project Manager/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.

49.2 COMMISSIONING OF EQUIPMENT

49.2.1 Commissioning will include the energising of equipment from the AC disconnects to the OHTE track feeder switches. The successful tenderer must prove the satisfactory operation of all equipment under live conditions.

49.2.2 On completion of commissioning the successful tenderer will hand the substation over to the Project Manager/Engineer in terms of the relevant instructions.

49.2.3 Tenderers shall allow a period of at least three days per substation between satisfactory completion of on-site tests and commissioning of equipment.

49.2.4 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.

49.2.5 The contractor shall rectify any faults found during the testing and setting of the protection relays.

49.2.6 The final testing of the substation must commence at least three days ahead of the contract completion date.

49.2.7 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 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.

49.2.8 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 Project Manager/Engineer.

SECTION 5: GENERAL

50.0 QUALITY ASSURANCE

50.1 Transnet Freight Rail reserves the right to carry out inspection and tests on the equipment at the works of the supplier/manufacturer.

50.2 Arrangements must be made timeously for such inspections and type/routine tests in accordance with the equipment specifications are carried out before delivery of the equipment to the site.

50.3 Type/routine test sheets of the equipment shall be forwarded to the Project Manager.

51.0 GUARANTEE AND DEFECTS

51.1 The contractor shall guarantee the satisfactory operation of the complete electrical installation supplied and installed by him and accept liability for maker's defects, which may appear in design, materials and workmanship.

51.2 The guarantee period shall commence from the date of successful commissioning of the substation.

51.3 The guarantee period for all substations shall expire after a period of 12 months commencing from the date of successful completion of the contract or the date the equipment is handed over to Transnet Freight Rail whichever is the later.

51.4 If urgent repairs have to be carried out by Transnet Freight Rail staff to maintain supply during the guarantee period the contractor 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.

51.5 The cost of training shall be included in the tenderers quotation.

52.0 DRAWINGS, INSTRUCTION MANUALS AND SPARES LISTS

52.1 Drawings, instruction manuals and catalogues shall be supplied in accordance with Transnet Freight Rail specification CEE.0224.

52.2 The tenderer shall supply three copies of an instruction/maintenance manuals, schematic and wiring diagrams.

52.3 The contractor shall submit details of spares required in accordance with Transnet Freight Rail's specification no. CEE.0224.

52.4 All spares recommended for normal maintenance purposes that are not available locally (requires importation) must be highlighted.

53.0 SPECIAL TOOLS AND/OR SERVICING AIDS

Special tools or servicing aids necessary for the efficient maintenance, repair or calibration of the equipment shall be quoted for separately.

54.0 TRAINING

54.1 The contractor shall submit details with the tender of the training courses which will be conducted by the contractor for the training of Transnet Freight Rail maintenance staff in the operation and maintenance of the equipment supplied. 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.

55.0 PACKAGING AND TRANSPORT.

55.1 The contractor shall ensure that the equipment be packed in such a manner that it will be protected during handling and transport.

55.2 The contractor shall provide transport for the delivery of the equipment to the site where required.

56.0 BIBLIOGRAPHY

[1] SANS 1019: 2008 Edition 2.5 Standard voltages, currents and insulation levels for electricity supply

APPENDIX 1

DRAWINGS ISSUED WITH THIS SPECIFICATION

DRAWING NUMBER	AMENDMENT	DESCRIPTION.
CEE-TDF-0016		Concrete fencing
CEE-TBD-7		Earthing Arrangements Traction Substations.
CEE-TU-41		Negative Return Cable Terminating Box.
CEE-TCK-1		Reactor 1,84mH, 1 500 A. (For reference purposes only)
CEE-TBP-1		Wiring diagram for auto reclosure for HSCB.
CEE-TBP-39		Circuit diagram for auto reclosure for HSCB
CEE-TBP-35		Connection diagram for HSCB and electronic control relay
CEE-TBP-38		Schematic Diagram of 3kV HV Protection.
CEE-TCL-63		3kV Busbar Chamber Arrangement: Cable Feeders.
CEE-TCQ-208		DC High Speed Circuit Breaker Cell Panel (Cell slabs) (sheets 1 to 10)
CEE-TBP-33		DC Track Breaker and Truck Wiring Diagram.
BBB 0938		Surge arresters mounted on traction transformer.
BBB 3620		3kV Earthing arrangement for traction substation
BBF 1615		Busbar connection assembly