Contract Data

The Employer is

Name	**Transnet Limited Trading as Transnet Freight Rail**
Address	**3rd Floor, Inyanda House 2, 15 Girton Road, PARK TOWN**
Telephone	**(011) 584 0580**
Fax No.	
E-mail	**anneline.scholtz@transnet.net**

The works is:	**DESIGN, SUPPLY, INSTALL, TEST AND COMMISSION OF AC/DC DISTRUBUTION PANEL, PRIMARY CIRCUIT BREAKER CONTROL PANEL AND SF6 PRIMARY CIRCUIT BREAKER AT VAN DER MERWE 3Kv DC TRACTION SUBSTATION AND AT BURGERREG 25 KV AC TRACTION SUBSTATION UNDER THE CONTROL OF THE DEPOT ENGINEER, KOEDOESPOORT.**
The site is	**VAN DER MERWE AND BURGERREG 25 KV AC TRACTION SUBSTATION**
The starting date is	The date of the contract
The completion date is	……
The reply period is	two weeks
The defects date is	three weeks after completion
The defect correction period is	**2(two)** weeks
The delay damages are	R4,000.00 per day
The assessment day is the	Thirteenth (13) of each month
The retention is	**10 %(ten)**%
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 **2 % above the prime rate per annum** of delay.

The *Contractor* is not liable to the *Employer* for loss of or damage to the *Employer*'s property in excess of 20% of the total contract value 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 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 on site at all times.

1.3 The Contractor shall comply with all applicable legislation and Transnet safety requirements adopted from time to time and instructed by the Project Manager / Supervisor. Such compliance shall be entirely at his own cost, and shall be deemed to have been allowed for in the rates and prices in the contract.

1.4 The Contractor shall, in particular, comply with the following Acts and Transnet Specifications:-

1.4.1 The Compensation for Occupational Injuries and Diseases Act, No. 130 of 1993. The Contractor shall produce proof of his registration and good standing with the Compensation Commissioner in terms of the Act.

1.4.2 The Occupational Health and Safety Act (Act 85 of 1993).

1.4.3 The explosive Act No. 26 of 1956 (as amended). The Contractor shall, when applicable, furnish the Project Manager / Supervisor with copies of the permits authorising him or his employees, to establish an explosives magazine on or near the site and to undertake blasting operations in compliance with the Act.

1.4.4 The Contractor shall comply with the current Transnet Specification E.4E, Safety Arrangements and Procedural Compliance with the Occupational Health and Safety Act, Act 85 of 1993 and Regulations and shall before commencement with the execution of the contract, which shall include site establishment and delivery of plant, equipment or materials, submit to the Project Manager / Supervisor.

1.4.5 The Contractor shall comply with the current Specifiaction for Works On, Over, Under or Adjacent to Railway Lines and near High Voltage Equipment – E7/1, if applicable, and shall take particular care of the safety of his employees on or in close proximity to a railway line during track occupations as well as under normal operational conditions.

1.5 The Contractor's Health and Safety Programme shall be subject to agreement by the Project Manager / Supervisor, who may, in consultation with the Contractor, order supplementary and/or additional safety arrangements and/or different safe working methods to ensure full compliance by the Contractor with his obligations as an employer in terms of the Act.

1.6 In addition to compliance with clause 1.4 hereof, the Contractor shall report all incidents in writing to the Project Manager / Supervisor. Any incident resulting in the death of or injury to any person on the works shall be reported within 24 hours of its occurrence and any other incident shall be reported within 48 hours of its occurrence.

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

1.8 10% of the total contract value in respect retention money will be retained and will be released 12 months after the completion date of the contract.

1.9 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 Supervisor must countersign such delays. Other delays such as non-availability of equipment from 3rd party suppliers must be communicated to the Project Manager or Supervisor in writing.

1.10 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 Supervisor and must be countersigned by the Contractor.

1.11 Both books mentioned in 1.10 and 1.11 shall be the property of Transnet Freight Rail and shall be handed over to the Project Manager or Supervisor on the day of energising or handing over.

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

1.13 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/Manufacturers.

1.14 The Contractor shall prove to Transnet Freight Rail that his equipment or those supplied from 3rd party suppliers/manufacturers confirms to Transnet freight rail specifications.

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

Contract Data

The *Contractor*'s Offer

The Contractor is

Name ……..

Adress ……..

……..

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 ……

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 ……

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.

Contract Data
Price List

Item	Description	Unit	Qty	Rate	Price
A	**Burgerreg 25 kV AC Substation**				
1	Supply double pole SF6 Primary Circuit Breaker	ea	1		
2	Modify the steel structure for Primary Circuit Breaker including channel to support the steel structure	ea	1		
3	Supply flying busbars c/w clamps from AC disconnects to PCB to Current Transformers to main Transformer	sum	1		
4	Supply low SF6 gas indication in control circuitry	ea	1		
5	Supply AC Primary Circuit Breaker control panel. This panel should cater for battery under-voltage relay	ea	1		
6	Supply all Control and Protection Cables from the Primary Circuit Breaker to the Panel and AC disconnects	sum	1		
7	Dismantle and Transport old equipment including breaker oil to Koedoespoort depot	sum	1		
8	Reconnect the SF6 Breaker to the earth mat	sum	1		
9	Rewire the protection interlock in panel for phase failure and low SF6 gas with distribution switchgear	sum	1		
10	Installation, Testing and Pre-commissioning	sum	1		
11	Catalogues, Manuals and Drawings	sum	1		
12	P's and G's (Labour, Site establishment, transport, civil works, soil testing and preparations, etc)	sum	1		
13	Cable laying	sum	1		
14					
15					
A	**Total Price for Burgerreg =**		**R**		
B	**VAT (14 % of A) =**		**R**		
C	**Gross Total (A + B) =**		**R**		

Contract Data
Price List

Item	Description	Unit	Qty	Rate	Price
B	**Van der Merwe 3 kV Traction Substation**				
1	Dismantle, remove and transport old equipment from site to Koedoespoort Depot.	sum	1		
2	Supply joint kits and all required terminations	sum	1		
3	Supply DC earth leakage relay outside the panel and its polycarbonate box	sum	1		
4	Supply cables for the new DC earth leakage system (Indoor earthing), all control and power cables	sum	1		
5	Supply AC primary circuit breaker control panel	ea	1		
6	Supply AC/DC distribution panel	ea	1		
7	Supply FP-2004 relays	ea	2		
8	Supply mechanical interlocking keys	sum	1		
9	Redo outdoor earthing complete	sum	1		
10	Supply paint and paint substation floor red oxide	sum	1		
11	Supply 88 kV SF6 Primary Circuit Breaker	ea	1		
12	Supply low SF6 gas indication in control circuitry.	ea	1		
13	Modify existing support steel structure	sum	1		
14	Supply flying busbars from AC Disconnects to Primary circuit breaker	sum	1		
15	Supply clamps for primary circuit breaker	sum	1		
16	Drawings and catalogues	sum	1		
17	P's & G's	sum	1		
18	Installation, Testing and Pre-commissioning	sum	1		
19					
20					
21					
A	**Total Price for Van Der Merwe =**		**R**		
B	**VAT (14 % of A) =**		**R**		
C	**Gross Total (A + B) =**		**R**		

2.0 Description of work (Burgerreg Substation)

3.1 The Contractor shall supply all the new equipment in accordance with paragraph 12.0 of this project specification.

3.2 Disconnect, dismantle and remove the existing oil filled primary circuit breaker, which include the mechanisms and the poles.

3.3 The Contractor shall transport the breaker oil and the old oil circuit breaker to Koedoespoort depot.

3.4 The Contractor shall provide drums for oil to be drained from the OCB's.

3.5 The Contractor shall take special precautions not to pollute the site with oil. If any oil were to spill at any stage of the work then it will be the responsibility of the Contractor to clean the oil and to restore the soil.

3.6 The Contractor shall supply, deliver, install and connect the new high voltage double pole 88kV SF_6 alternating current primary circuit breaker complete with its associated operating mechanism box and support steel structure as per Price list.

3.7 The front door position of the circuit breaker operating mechanism box shall be determined on site between the Employer and the Contractor.

3.8 The Contractor shall electrically connect the newly installed equipment to the existing earthing system.

3.9 The Contractor shall test, commission and hand over the equipment.

3.10 The Contractor shall re-use the existing foundations.

3.11 The Contractor shall design, supply and install all steel structures for the support of equipment.

3.12 The manufacture of any steelwork shall not take place prior to the approval of the design drawings. Transnet freight rail shall inspect the steelwork at the manufacturer's works prior to dispatch.

3.13 All fasteners (nuts & bolts) shall be secured using flat or bevelled washers, as necessary, as well as lock washers.

3.14 All steelwork shall be galvanised in accordance with SANS 121, CEE 0183 issue 2002 and, and where required painted in accordance with specification CEE 045 of 2002/1.

3.15 All cables shall terminate in compression type glands. These glands shall be fitted with neoprene shrouds.

3.16 The Contractor shall supply and install new aluminium flying busbars between the primary circuit breaker and the AC disconnects and between the current transformer and the primary circuit breaker. The busbars shall be of the same conductor size.

3.17 The Contractor shall fill each flying busbar clamp on connection with anticorrosive grease type SANCHEM - NO- OX – ID "A ". Each clamp shall be torqued on flying busbar connection in accordance with manufacturer's specification.

3.18 The Contractor shall remove all the existing PCB control cables between the primary circuit breaker mechanism box and the 88kV switch room.

3.19 The Contractor shall supply and install new control cables between the new SF_6 primary circuit breaker and the control panel in the 88kV switch room. The Contractor shall be responsible to connect and interconnect all new and existing functions in the control panel.

3.20 A new control cable shall be installed between the control panel and the AC disconnects and the fleeting contact be connected to it.

3.21 The Contractor shall connect the fleeting contact to the control of the primary circuit breaker to trip the PCB before the contacts of the 88kV AC disconnects are fully open.

3.22 The following types of cables shall be used: -

- Control cable for the PCB N03.
- Cable for the heater supply – 2 core 6m².
- Cable between the PCB and the AC disconnects 4mm² 4 core.
- Control cable for PCB N04 – 4mm².
- Cable for the spring wind motor supply – 2 core 10mm².
- Cable for the heater supply – 2 core 6mm².
- Cable between the PCB and the AC disconnects - 4mm² 4 core.

3.23 Cables and earthing conductors connected to the equipment installed on steel support structures shall be supported on the steel structure vertically and horizontally by means of a cable tray. This cable tray shall be of the O-Line GS50 Grid span Wire Mesh type or similar with the wire mesh having a diameter of 4mm and a hot dip galvanised finish.

3.24 The cables shall be fixed to the cable trays using UV stabilised cable ties. Cabling and wiring shall be in accordance with CEE.0023.90 and SANS 10142-1.

3.25 When doing any cabling, the ballast stone shall be removed, trenching and laying of cables done, the soil compacted back and the ballast washed and placed back neatly.

3.26 No joining of cables or busbars will be accepted. The Contractor shall provide cables or busbars that are long enough for the application (earthing, control etc.). No junction boxes, underground, shall be used.

3.27 All the control cables shall be housed in a 110mm diameter PVC pipe between the PCB and the cement cable ducting.

3.28 The Contractor shall make use of the concrete cable trench to route the cables to the 88kv switch room. And these cables must be installed in this order: they shall follow the existing cable duct, a bed of **river sand** should be laid, followed by the cables, ontop of the cables put another **river sand**, and finally put the re-enforcement concrete.

3.29 Only hexagon type crimps shall be allowed on any crimping lug. All wires terminate in a connection strip shall be fitted with a wire number and a terminal lug.

3.30 The support steelwork for the circuit breaker shall be re-connected to the existing substation AC earth system.

3.31 The Contractor shall take precautions not to pollute the existing outdoor yard stone with soil. Should this happen, it shall be the responsibility of the Contractor to clean the stone before leaving the site.

3.32 Contractor shall use plastic covers to separate the soil from the stone when digging the trenches.

3.33 On backfilling of the soil after trenching has been done the Contractor shall compact the soil to the same pressure as the surrounding soil before it is covered with stone.

3.34 The Contractor's team/s could be requested to attend the Transnet freight rail's electrical safety training course and be authorised to supervise the Contractor's staff whilst working in the substations on this contract. Transnet freight rail will organise the course and further details will be communicated to the successful Contractor.

3.35 The Contractor shall provide training for the operation and maintenance of the circuit breaker to Transnet freight rail maintenance staff and as per specification BBB1267 clause 8.0.

3.36 The Contractor shall provide his own electrical power whilst working in the substation outdoor yard, since availability of power from Eskom or auxiliary supplies cannot be guaranteed.

3.37 Schematic wiring diagrams of the PCB control shall be forwarded to the Employer before the installation of the primary circuit breaker for approval.

3.38 On completion of the installation, it will be required from the Contractor to submit as built drawings and schematic diagrams of all newly installed equipment as well as showing interface to the existing equipment.

3.39 The contractor shall perform on site, trip, close and speed tests of the PCB after the installation.

3.0 STEELWORK

3.1 The design, supply and installation of all steel structures for the support of equipment shall be the responsibility of the Contractor. This shall be in accordance with Transnet Freight Rail specification CEE.0183.2002

3.2 The manufacture of any steelwork shall not take place prior to the approval of the design drawings by the / Electrical Officer.

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

3.4 All fasteners (nuts & bolts) shall be secured using flat and spring washers where necessary.

3.5 All steelwork shall be galvanized in accordance with SANS 121 and, where required painted in accordance with specification CEE 045 of 2002/1.

4.0 INSTALLATION

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

4.2 All fasteners on steelwork, components and electrical connections (nuts and bolts) shall be secured using flat as well as lock washers.

4.3 Contractor shall supply multi core cable and connect the tele-control. The substation shall not be switched on unless the tele-control is fully operational.

5.0 INTERCONNECTION OF EQUIPMENT

5.1 High conductive silicon grease shall be liberally applied to all the connections.

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

6.0 DRAWINGS, INSTRUCTION MANUALS AND SPARE PART CATALOGUES

6.1 All as built drawings shall be supplied in electronic format (Microstation/Acad).

6.2 The successful Contractor shall be required to submit all drawings (paper prints), within four weeks of award of tender, to the Employer for approval. No construction or manufacturing activity will be allowed prior to the associated drawings having been approved.

6.3 During the duration of the contract period, the successful Contractor will be required to inform the Employer of any changes to these drawings and will have to resubmit the affected drawings for approval prior to it being used on this contract.

6.4 All drawings, catalogues, instruction book and spares lists shall be in accordance with Transnet Freight Rail's specification CEE.0224.2002.

6.5 All final as built drawings shall be provided to Transnet Freight Rail within four weeks after commissioning.

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

7.0 SITE TESTS

7.1 The equipment shall be inspected/tested and approved by Transnet Freight Rail Quality Assurance at the Contractor's workshop prior to it being taken to site. Only once the approval has been granted can the equipment be taken to site for installation.

7.2 The Contractor shall be responsible for carrying out of on-site tests and commissioning of all equipment supplied and installed in terms of this specification and the contractual agreement.

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

7.4 The Contractor shall submit a detailed list of on-site tests for the approval of the Employer.

7.5 The Contractor shall arrange for the Employer or his representative to be present to witness the on-site tests.

7.6 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 power plants equipment will not be allowed to take place in a construction site environment.

7.7 The on-site tests shall include the following:

7.7.1 Test for the functionality of all electrical circuitry.
7.7.2 Trip tests on relays.
7.7.3 Test on equipment as per manufacturer's instructions.
7.7.4 Insulation tests.

7.8 At the completion of the on-site tests, the Employer 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.

7.9 Upon rectification of defects, the Contractor shall arrange for the Employer or his representative to certify satisfactory completion of on-site tests.

7.10 Acceptance by the Employer 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.

8.0 COMMISSIONING OF EQUIPMENT

8.1 Commissioning will only take place after all defects have been rectified to the satisfaction of the Employer.

8.2 On completion of commissioning, the Contractor will hand the equipment over to the Employer in terms of the relevant instruction.

8.3 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.

8.4 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.

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

9.0 GUARANTEE AND DEFECTS

9.1 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.

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

9.3 The guarantee period for these standby plants shall expire after: A period of 12 months commencing on the date of completion of the contract or the date the standby plant was handed over to Transnet Freight Rail.

9.4 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.

9.5 The Contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7-days of him being notified by Transnet Freight Rail of such defects.

9.6 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.

9.7 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 Employer and at the cost of the Contractor.

9.8 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.

10.0 QUALITY AND INSPECTION

10.1 Transnet Freight Rail shall inspect the equipment under contract on the premises of the Manufacturer or successful Contractor.

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

10.3 The Contractor shall apply 14 days in advance for the date of energizing and ensure that all work is completed before any commissioning can take place.

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

11.0 Description of work (Van Der Merwe Substation)

11.1 The Contractor shall dismantle, remove and transport all old equipment from site to Koedoespoort Depot.

11.2 SUPPLY AND INSTALLATION OF CABLES

11.2.1 Contractor shall supply and install all the control and power cables in accordance with the specifications BBC 0198 version 1 and CEE 0023 of 1990.

11.2.2 The Contractor shall supply all the control cables, from the AC disconnects to the indoor substation building.

11.2.3 The Contractor shall make provision for terminating the armoured cables both in the substation indoor building and outdoor yard.

11.2.4 The Contractor shall supply joint kits and all necessary terminations.

11.2.5 The Contractor shall supply and connect the 95 mm^2 PVC insulated welding cable to interconnect all new and existing equipment to the DC earth leakage relay system.

11.3 DIRECT CURRENT EARTH RELAY CIRCUIT

3.7.1 Supply and install the DC earth leakage relay. The DC earth leakage relay shall be mounted outside the control panel at a position pointed out by Transnet Freight Rail. The relay shall be enclosed in a polycarbonate box.

11.3.1 The Contractor shall connect all existing checker plates as well as existing equipment (all indoor steelwork) to the DC earth leakage system. The Contractor shall also supply any missing checker plate.

11.3.2 The Contractor shall replace the DC earth leakage arrangement (system) as per drawing CEE TBD 0007 and enclosed in 25 mm^2 PVC conduits against the walls. The crimping lugs of the interconnection cables shall be correspondingly marked with the busbar as shown on drawing CEE TBD 0007.

11.3.3 Only hexagon crimps will be accepted on all crimping lugs.

11.3.4 Resistance between the DC earth leakage busbar and the substation earthmat shall not be less than 25 Ohm.

11.4 AC PCB CONTROL PANEL AND AC/DC DISTRIBUTION PANEL

11.4.1 Remove the existing AC primary circuit breaker (PCB) and AC/DC distribution panels from site and transport them to Koedoespoort depot.

11.4.2 Supply and install AC PCB control panel and AC/DC distribution panels in accordance with the specification BBB 2721 version 9.

11.4.3 Supply and install AC earth leakage protection.

11.4.4 The Contractor shall wire the tripping and lock out circuits in accordance with the drawings CEE TBK 0027 and CEE TBK 0028. The circuits shall be incorporated into the AC PCB control panel.

11.4.5 The Contractor shall wire all the track breaker cells inside the panel.

11.4.6 The Contractor shall rewire controls for the extractor fan and incorporate into the distribution panel.

11.4.7 Ensure room fan circuit is still working.

11.4.8 Transnet Freight Rail representative shall inspect all the panels on the Contractor's premises prior to delivery to site.

11.4.9 All direct current wiring shall be done in grey coloured wire.

11.4.10 Colour Red, White and Blue shall be used for AC circuits only. All alternating current wiring shall be colour coded using the standard colours red, white, blue and black for neutral.

11.4.11 Interior shall be done in gloss white and exterior shall be done in Eau- de- nil high gloss to SANS 1091 colour code no G22.

11.4.12 Panels shall be colour coated in accordance with SANS 1274.

11.4.13 Insulated lugs, of the crimp on type, shall be used to terminate wiring onto equipment, strip connectors and protection relays.

11.4.14 Screw on terminal lugs shall be used on all the protection relays.

11.4.15 All new and existing cables and wiring shall be clearly labelled by using an approved slide on wiring label system as described.

11.4.16 Where applicable, the Contractor will be responsible to connect and interconnect the control wiring and cabling of existing equipment to the new and old equipment.

11.4.17 The Contractor shall make provision for a connection strip in the AC/DC distribution panel and the primary circuit breaker control panel for remote tele-control operations.

11.4.18 The Contractor shall notify Transnet Freight Rail on completion of the panels in order to witness functional tests on the premises of the Contractor before delivery.

11.4.19 The Contractor shall incorporate all existing equipment functions into the schematic drawings as per specification CEE 0224 0f 2002.

11.4.20 A copper busbar system consisting of a busbar for each phase red, white and blue shall be used, in the AC/DC panel and concealed behind perspex with warning sign and voltage identification label.

11.4.21 A copper busbar system consisting of battery supply, holding coil volts and negative shall be used and covered with perspex with a warning sign and voltage labels.

11.4.22 The Contractor shall supply and install the auxiliary supply switch inside the AC/DC control panel.

11.4.23 Provision will be made in the primary circuit breaker control panel to install primary overload protection for the auxiliary supply.

11.4.24 All control panels shall be insulated from the substation floor.

11.4.25 The layout of the AC and DC equipment inside the control panels shall be done in such a way that the equipment is separated from each other.

11.4.26 Transnet Freight Rail shall inspect the layout of the equipment before wiring commences of the panels.

11.4.27 All equipment used in the primary circuit breaker control panel and the AC/DC distribution panel shall comply with the SANS 0142.

11.5 Contractor shall supply his/her own security for the duration of the contract.

11.6 Supply cables and redo a complete outdoor yard and indoor substation earthing.

11.7 Supply paint, clean substation inside floor and paint red oxide.

11.8 SF_6 PRIMARY CIRCUIT BREAKER

11.8.1 The Contractor shall supply and install 88 kV SF_6 primary circuit breaker in accordance with Transnet Freight Rail specification BBB 1267 version 9.

11.8.2 Modify existing primary circuit breaker structure (steel work) and mount the new SF6 primary circuit breaker.

11.8.3 The Contractor shall dismantle, remove and transport all old equipment from site to Koedoespoort Depot.

11.8.4 Supply polycarbonate box and mount existing AC earth leakage CT and DC earth leakage relay.

12.0 STEELWORK

12.1 The design, supply and installation of all steel structures for the support of equipment shall be the responsibility of the Contractor. This shall be in accordance with Transnet freight rail specification CEE.0183.2002.

12.2 The manufacture of any steelwork shall not take place prior to the approval of the design drawings by the Supervisor/ Electrical Officer.

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

12.4 All fasteners (nuts & bolts) shall be secured using flat and spring washers where necessary.

12.5 All steelwork shall be galvanized in accordance with SANS 121 and, where required painted in accordance with specification CEE 045 of 2002/1.

13.0 INSTALLATION

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

13.2 All fasteners on steelwork, components and electrical connections (nuts and bolts) shall be secured using flat as well as lock washers.

13.3 Contractor shall supply multi core cable and connect the tele-control. The substation shall not be switched on unless the tele-control is fully operational.

14.0 INTERCONNECTION OF EQUIPMENT

14.1 High conductive silicon grease shall be liberally applied to all the connections.

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

15.0 DRAWINGS, INSTRUCTION MANUALS AND SPARE PART CATALOGUES

15.1 All as built drawings shall be supplied in electronic format (Microstation/Acad).

15.2 The successful Contractor shall be required to submit all drawings (paper prints), within four weeks of award of tender, to the Project Manager or Supervisor for approval. No construction or manufacturing activity will be allowed prior to the associated drawings having been approved.

15.3 During the duration of the contract period, the successful Contractor will be required to inform the Project Manager or Supervisor of any changes to these drawings and will have to resubmit the affected drawings for approval prior to it being used on this contract.

15.4 All drawings, catalogues, instruction book and spares lists shall be in accordance with Transnet Freight Rail's specification CEE.0224.2002.

15.5 All final as built drawings shall be provided to Transnet Freight Rail within four weeks after commissioning.

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

16.0 SITE TESTS

16.1 The equipment shall be inspected/tested and approved by Transnet Freight Rail Quality Assurance at the Contractor's workshop prior to it being taken to site. Only once the approval has been granted can the equipment be taken to site for installation.

16.2 The Contractor shall be responsible for carrying out of on-site tests and commissioning of all equipment supplied and installed in terms of this specification and the contractual agreement.

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

16.4 The Contractor shall submit a detailed list of on-site tests for the approval of the Project Manager or Supervisor.

16.5 The Contractor shall arrange for the Supervisor or his representative to be present to witness the on-site tests.

16.6 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 power plants equipment will not be allowed to take place in a construction site environment.

16.7 The on-site tests shall include the following:

16.7.1 Test for the functionality of all electrical circuitry.
16.7.2 Trip tests on relays.
16.7.3 Test on equipment as per manufacturer's instructions.
16.7.4 Insulation tests.

16.8 At the completion of the on-site tests, the Project Manager or Supervisor 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.

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

16.10 Acceptance by the Project Manager or Supervisor 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.

17.0 COMMISSIONING OF EQUIPMENT

17.1 Commissioning will only take place after all defects have been rectified to the satisfaction of the Project Manager or Supervisor.

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

17.3 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.

17.4 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.

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

18.0 GUARANTEE AND DEFECTS

18.1 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.

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

18.3 The guarantee period for these standby plants shall expire after: A period of 12 months commencing on the date of completion of the contract or the date the standby plant was handed over to Transnet Freight Rail.

18.4 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.

18.5 The Contractor shall undertake work on the rectification of any defects that may arise during the guarantee period within 7-days of him being notified by Transnet Freight Rail of such defects.

18.6 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.

18.7 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 Supervisor and at the cost of the Contractor.

18.8 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.

19.0 QUALITY AND INSPECTION

19.1 Transnet Freight Rail shall inspect the equipment under contract on the premises of the Manufacturer or successful Contractor.

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

19.3 The Contractor shall apply 14 days in advance for the date of energizing and ensure that all work is completed before any commissioning can take place.

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

Scope of Works
Works Information

11.0 Specifications

11.1 South African National Standards**:**

11.1.1 SANS 1091	National colour standard
11.1.2 SANS 763	Hot dip galvanised zinc coating
11.1.3 SANS 121	Hot Dip Galvanised Coating for Fabricated Iron or Steel Article
11.1.4 SANS 8528	Reciprocating internal combustion engine driven alternating current generating set
11.1.5 SANS 10142	Wiring Code

11.2 Transnet Freight Rail Specifications:

11.2.1 BBB 1267 version 9	Specification for outdoor high voltage alternating-current circuit breakers for traction and distribution substations.
11.2.2 BBB 7842 version1	Outdoor, high voltage, alternating current disconnectors combined with earthing switches.
11.2.3 S420 (1999)	Specification for concrete work.
11.2.4 BBC 0198 version 1	Specifications for the supply of cables.
11.2.5 CEE.0023.90	Specifications for installation of cables.
11.2.6 CEE.0045.2002/1	Painting of steel Components of Electrical Equipment.
11.2.7 CEE.0111.99	Specification for 25kv traction substation.
11.2.8 CEE.0183.2002	Hot dip galvanising and painting of electrical equipment.
11.2.9 CEE.0224.2002	Drawings, catalogues, instruction manuals and spares list for electrical equipment supplied under contract.
11.2.10 CEE-TBD-8	Earthing arrangement 25kV AC Traction Substation.
11.2.11 CEE-TBK-0027	Control circuit diagrams – NO volt operation
11.2.12 CEE TBK 0028	Trip, lockout and indication circuit diagram.
11.2.13 BBB 2721 version 9	AC Primary Circuit Breaker Control Panel and AC/DC

Distribution Panel for 3kV DC Traction substation.

11.2.14 CEE-TBD-0007 Earthing arrangement for traction substations.

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

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

12.0 Constraints on how the *Contractor* Provides the Works

12.1 The constraints shall be as specified in the specifications of the particular equipment.

13.0 Requirements for the programme

13.1	Programme of work	: To be submitted by successful Contractor
13.2	CIDB rating	: 3EE or above
13.3	Format	: Gantt chart
13.4	Information	: How work is going to be executed and commissioned
13.5	Submission	: 3 weeks after the award of contract
13.6	Site diary	: Successful Contractor to supply in triplicates carbon copies
13.7	Site instruction book	: Successful Contractor to supply in triplicates carbon copies

14.0 Services and other things provided by the *Employer*

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

14.2 Transnet Freight Rail shall inspect all equipment before the equipment can be dispatched to site.

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

14.4 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.

20.0 Specifications

20.1 South African National Standards:

20.1.1	SANS 1091	National colour standard.
20.1.2	SANS 763	Hot dip galvanised zinc coating.
20.1.3	SANS 121	Hot Dip Galvanised Coating for Fabricated Iron or Steel Article.
20.1.4	SANS 8528	Reciprocating internal combustion engine driven alternating current generating set.
20.1.5	SANS 10142	Wiring Code.

12.2 Transnet Freight Rail:

12.2.1	BBB 0496 version 10	3 kV rectifier for traction substations.
12.2.2	BBB 1267 version 9	Specification for outdoor high voltage alternating current circuit breaker in accordance with SANS 62271
12.2.3	BBB 3620 version 4	3kV DC earthing arrangement – Traction Substation.
12.2.4	BBB 5452 version 2	Transnet freight rail requirements for installation of electrical equipment for 3 kV DC substations.
12.2.5	BBB 2721 version 9	AC Primary Circuit Breaker Control Panel and AC/DC Distribution Panel for 3kV DC Traction substation.
12.2.6	CEE-TBD-0007	Earthing arrangement for traction substations.
12.2.7	CEE TBK 0027	Control circuit diagrams – NO volt operation.
12.2.8	CEE TBK 0028	Trip, lockout and indication circuit diagram.
12.2.9	BBB 4724 version 3	Positive Isolator switch for 3 kV DC Traction substations.
12.2.10	BBB 2502 version 5	Requirements for battery chargers for 3 kV DC traction substations.
12.2.11	BBB 3005 version 1	3 kV DC under voltage relay manufacturing specification.
12.2.12	BBC 0198 version 1	Specifications for the supply of cables.
12.2.13	CEE.0023.90	Specifications for installation of cables.
12.2.14	CEE.0045.2002/1	Painting of steel Components of Electrical Equipment.
12.2.15	CEE.0183.2002	Hot dip galvanising and painting of electrical

equipment.

12.2.16 CEE.0224.2002 Drawings, catalogues, instruction manuals and spares list for electrical equipment supplied under contract.

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

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

21.0 Constraints on how the *Contractor* Provides the Works

21.1 The constraints shall be as specified in the specifications of the particular equipment.

22.0 Requirements for the programme

22.1	Programme of work	: To be submitted by successful Contractor
22.2	CIDB rating	: 3 EE or 2EEPE and above
22.3	Format	: Any
22.4	Information	: How work is going to be executed and commissioned
22.5	Submission	: 1 weeks after the award of contract
22.6	Site diary	: Successful Contractor to supply in triplicates carbon copies
22.7	Site instruction book	: Successful Contractor to supply in triplicates carbon copies

23.0 Services and other things provided by the *Employer*

23.1 Transnet Freight Rail Nelspruit depot shall take full responsibility for any damage to the existing cables between positive isolator and the busbar chamber.

23.2 Transnet Freight Rail Nelspruit depot shall provide Security for the duration of the contract.

23.3 Transnet Freight Rail shall inspect all equipment before the equipment can be dispatched to site.

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

23.5 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.

Contract Data

Site Information

The works shall be performed at the **BURGERREG 25 KV AC TRACTION SUBSTATION AND VAN DER MERWE SUBSTATION.**