

ANNEXURE A

BLE52166 : DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SURGE ARRESTERS, COPPER BUSBARS, TRANSFORMER BUSHINGS AND OIL FILTERING AT KOUP AND BAVIAAN 3KV DC TRACTION SUBSTATIONS

1. SPECIAL CONDITIONS OF CONTRACT

1.1 Sufficiency of Tender

- 1.1.1 Tender shall indicate clause-by-clause compliance with the 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. This document shall be used by Tenderers to elaborate on their response to a clause.
- 1.1.2 Where equipment offered does not comply with standards or publications referred to in any of the specifications, Tenderers shall state which standards of specifications apply and submit a copy of the applicable specification and or standard in English.
- 1.1.3 Any drawings and information required by Transnet but not included in the specification shall be furnished on request.
- 1.1.4 All relevant information of the material used for the installation shall be submitted with the tender document including the technical specification.
- 1.1.5 Transnet reserves the right to inspect the tenderer's facilities prior to awarding the contract in order to ensure that it is suitable for the type of repair required.
- 1.1.6 The Contractor shall indicate at the tendering stage what steps have been taken to implement a Quality System in terms of ISO 9002 and shall submit such a Quality Plan.
- 1.1.7 Incomplete tenders will be automatically disqualified.

1.2 Duration of contract

- 1.2.1 The contract will commence immediately after the acknowledgement of receipt of the notification of acceptance of tender with Transnet Freight Rail.
- 1.2.2 The contract will be completed within 3 weeks of acknowledgement of receipt of the notification of acceptance of tender with Transnet Freight Rail.

1.3 Compliance with statutes

- 1.3.1. The Contractor shall comply with all applicable legislation, Codes of Practice and Local, Regional or Provincial Authority regulations. The Contractor shall in particular, comply with the following Instructions, Acts etc;
- SANS 1019 Standard voltage, current and insulating level for electrical supply
 - The compensation for Occupational Injuries and Diseases Act (Act 130 of 1993).
 - The Occupational Health and Safety Act (Act 85 of 1993)

- Common law of nuisance

1.4 Maintenance period

A maintenance period of 6 months after the date of completion of the works will be instituted to ensure that installation works has been properly done. Contractor shall repair any defects within two weeks from the date of such notification of the defect(s).

1.5 Retention money

10% of the total value of the contract will be retained for the maintenance period, until work has been satisfactory completed.

1.6 Penalties for late completion

A penalty fee for late completion of R1500 per calendar day shall be levied.

1.7 To be provided by the contractor

- 1.7.1 In addition to all labour, water, materials, plant, equipment and incidentals needed to complete the work, the Contractor shall provide all accommodation and toilet facilities for his/her employees. No accommodation shall be erected or utilised on Transnet Freight Rail property.
- 1.7.2 The Contractor shall provide safe and secure storage facilities for all tools, machineries plant equipment brought onto and in use on the site. Such facilities shall be capable of ensuring that unauthorised persons or animals cannot gain access to such chemicals and equipment. Such storage facilities shall not be on Transnet Freight Rail property.
- 1.7.3 The Contractor shall provide at his/her own cost any security measures he/she may deem necessary for safe and effective execution of the work within the contract area.
- 1.7.4 An effective safety procedure to be followed by all personnel on any work site shall be compiled by the Contractor and implemented before any work commences. The procedure shall be updated whenever the need arises and any changes shall be communicated to all employees on a work site before work proceeds.

1.8 Schedule of quantities and prices

- 1.8.1 The quantities in the Service and Cost are estimated and may be more or less than stated.
- 1.8.2 The tenderer shall price each item. If the Contractor has omitted to price any items in the Schedule, the cost of the work included in such items will be held to be included in the price given for preliminary and general.
- 1.8.3 The absence of stated quantities in the Schedule is no guarantee that none will be required. Reasonable prices should therefore be inserted for every item as these prices may be considered in adjudication of tenders.
- 1.8.4 The short descriptions of the items in the Schedule are for identification purposes only. In so far as these documents have any bearing, they shall be referred to for details of the description, quality, and test of plant and material used, and the workmanship, conditions, obligations, liabilities and instructions generally which shall be complied with in carrying out the Contract. The cost of complying with all conditions, obligations and liabilities described in the contract documents including profit, shall be deemed to be included in the rates quoted by the Contractor in the Schedule of Prices.

1.9 Site meetings

The Contractor shall attend site meetings when required. These meetings will be held under the chairmanship of the Supervisor or his/her deputy. When sub-contractors are required to attend, the Contractor shall ensure their attendance.

1.10 Site books

- 1.10.1 The Contractor shall provide a site instruction book and a daily diary (both in triplicate) at the site as directed by the Supervisor for the duration of the contract.
- 1.10.2 The site instruction book shall only be used by the Supervisor or his/her deputy and will be used for the issuing of instructions to the Contractor.
- 1.10.3 The site diary book shall be used to record any unusual events during the period of the contract. All delays caused by the Contractor, Transnet Freight Rail employees and due to natural causes shall be recorded. Such delays must be counter-signed by the appointed Supervisor. Other delays caused by the 3rd party shall be reported to the Project Manager immediately in writing.
- 1.10.4 The Contractor shall complete the daily diary and a detailed description of the work done shall be recorded on a daily basis. Neither of the books shall be removed from the site without the permission of the Supervisor or his/her deputy.

1.11 Information to be provided with tender

- 1.11.1. The Contractor shall undertake the planning and programming of the entire installation works and shall submit to the Supervisor for approval full particulars thereof with his/her tender.
- 1.11.2. An undertaking that all equipment will be ready for operation and that the work can commence timeously, to comply with requirements of the contract.
- 1.11.3. The contractor must indicate whether he/she intends using sub-contractors.

1.12 Damage to fauna and flora

- 1.12.1 The Contractor shall ensure that his/her employees at all times exercise care and consideration for the fauna and flora within and adjacent to the area to be treated for oil contamination.
- 1.12.2 The Contractor shall not apply any chemicals of an explosive, inflammable, highly volatile or corrosive nature, which may damage painting and steel components of Electrical Equipment or property, or be hazardous to humans or animals. The Contractor shall assume full responsibility for the efficiency and safety of whatever chemicals used to treat the oil contaminated yard stones and plinths.
- 1.12.3 Dumping or polluting of any kind will not be permitted. This stipulation is also applicable to the washing out of tanks and equipment containing harmful chemicals and pollutants.
- 1.12.4 The Contractor shall institute and maintain procedures for the safe disposal of all chemicals and residual materials originating from the execution of the works.
- 1.12.5 Containers and residual material shall not be disposed of on Transnet Freight Rail property or as part of Transnet Freight Rail refuse.
- 1.12.6 The Contractor shall take particular note of environmentally sensitive areas and shall plan and execute his/her work with the utmost care and responsibility.

- 1.12.7 Burning will not be allowed under any circumstances as a means of control. The making of fires, for whatever purpose, on Transnet Freight Rail property is also strictly prohibited.

1.13 Damage to adjoining property

The Contractor shall ensure that no damage occurs to adjoining property. He shall take all necessary precautions as the work progresses not to damage any structure, equipment, persons or other items on any adjoining property.

1.14 Hours of work

Hours of work will be limited from Monday to Friday, 07:30 – 16:30. No work shall be performed outside these hours unless prior approval is granted by Transnet Freight Rail.

1.15 Contractual obligation

- 1.15.1 The Contractor shall provide a provisional Gantt or a similar chart showing proposed work program. The final chart shall be submitted within seven working days of awarding the tender.
- 1.15.2 This Instruction book shall be used to record any instructions to the Contractor and disputes regarding the quality of work on site. This book will be filled in by the Supervisor or Manager and must be countersigned by the Contractor.
- 1.15.3 The site diary and the site instruction book shall be the property of Transnet and shall be handed over to the Supervisor or Manager on the day of energizing or handing over.
- 1.15.4 Transnet reserves the right to be present during installation and testing and must be timeously advised of the dates of commencement of the installation and testing. Arrangements must be made with the Manager or his designated personnel to perform witness and authorize the tests.
- 1.15.5 Calibration certificates less than 12 months old issued by a recognized authority for all the instruments to conduct tests on lightning arresters shall be made available for inspection, if requested by Transnet.
- 1.15.6 The Contractor shall repair any damage resulting from negligence of his or her staff to the substation equipment.
- 1.15.7 No sub-contractor shall be appointed without obtaining prior authority from the Project Manager.

1.16 Safety requirements

- 1.16.1 The Contractor or his/her Sub-Contractor shall be required to work on site in accordance with Transnet Freight Rail's safety specification E4E of April 1997 and the occupation Health and safety act 85 of 1993.
- 1.16.2 The Contractor shall be required to work under direct supervision of Transnet's appointed Supervisor on site and shall work only in the area, which shall be demarcated by suitable barriers.
- 1.16.3 Transnet shall during the contract have a Supervisor available on site for the necessary isolation of electrical equipment and issuing of work permits.
- 1.16.4 Substation permit condition shall be determined during site meeting and should be approximately 1-4 weeks.
- 1.16.5 All team members, visitors or casual workers are to be inducted if they do not have a current induction certificate valid for the site.
- 1.16.6 Ensure that safety performance expectations are clearly communicated regularly to the project team.

- 1.16.7 Lengthy discussion of safety performance expectations preferably face-to-face (where possible) shall be held by the Contractor of which Contractor, Project Manager, Technical Officer, Safety Rep or Supervisor has the right to be a witness.
- 1.16.8 The Contractor shall produce Health & Safety Plan for the team including all sub-contractors.
- 1.16.9 The Contractor shall list all training requirements for the team for any specific competency and/or awareness training according to various Transnet Freight Rail policies
- 1.16.10 Workers must carry proof of training attended for execution of the works
- 1.16.11 The contractor shall carry out the risk assessment of the work site to identify hazards before work commences
- 1.16.12 Records to be kept in Health and Safety file including sub-contractors:
- i. All safety audits will be discussed and corrective actions monitored
 - ii. All audit results are to be recorded in the site diary
 - iii. Unscheduled visits and “STOP” Visits using stop cards shall be conducted by Transnet Freight Rail
 - iv. The Contractor must communicate Safety Critical incidents via Green Areas to the rest of TFR
 - v. The Contractor shall check if assets are safe for operations e.g. Train ops, safe access and exit of buildings etc
 - vi. Review safety performance stats: Incidents, Corrective Action matrix, audits etc.
 - vii. The contractor must supply his own PPE
 - viii. Employees that do not wear the necessary PPE will not be allowed on site.
 - ix. Defective PPE must be reported immediately to their Supervisor.

Annexure B

1. PROJECT SPECIFICATION

BLE52166 : DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SURGE ARRESTERS, COPPER BUSBARS, TRANSFORMER BUSHINGS AND OIL FILTERING AT KOUP AND BAVIAAN 3KV DC TRACTION SUBSTATIONS

2.1 Scope of work

This contract covers the design, supply, installation, testing and commissioning of surge arresters, copper busbars, transformer bushings and oil filtering at Koup and Baviaan 3kV DC Traction substations.

2.2 Description of work

The Contractor shall perform the following at Koup and Baviaan 3kV Traction Substations.

2.3 Testing and analysis of transformer oil

The contractor shall test and sample the oil before and after the refurbishment in accordance with the specification SANS 555.

The tenderer shall provide the following tests:

- Moisture Content
- Acid Content
- Dielectric Strength Test
- Dissolved Gas Analysis

The contractor shall provide containers for sampling and labels for the information to be supplied with the sample. The labels must make provision for the following information: -

- District / Depot
- Location (of substation)
- Date of sample
- Sampled by: (name)
- Unit Duty (Traction/ Auxilliary Transformers)
- Unit Make
- Unit Serial Number
- Unit Voltage (kV)
- Unit Capacity (MVA)
- Sampling Point
- Gauge Temperature
- Contract Number

Transnet shall not accept samples unless all the information has been provided. Of special importance is the serial number and Temperature.

The contractor shall provide a hard copy of the results to the Manager and Supervisor.

The test shall be performed by fully accredited oil test laboratory of which proof of accreditation must be supplied to Supervisor

For each parameter tested, the contractor shall show proof that oil conforms to this specification as follows after refurbishment.

PARAMETER	ACCEPTABLE
Electric Strength	> 30kV
Acid	< 0.50 mg KOH/g
Hydrogen	< 150 ppm
Methane	< 25 ppm
Carbon Monoxide	< 500 ppm
Carbon Dioxide	< 10000 ppm
Ethylene	< 20 ppm
Ethane	< 10 ppm
Acetylene	< 15 ppm
Moisture	

Terminals and Bushings

All terminals shall be extended to the top of the transformer tank through suitable outdoor type bushings.

The bushings shall conform to the insulation levels as specified in IEC 60137 for the system nominal supply voltage at which the equipment must operate.

All bushings, stems and terminals shall be of sufficient size to ensure sufficient mechanical strength of attaching and supporting external connections and shall not be smaller than

- a) 19 mm diameter for primary and secondary connections.
- b) 12 mm diameter for auxiliary supply connections.

Provision shall be made for an earthing terminals fitted on the outside of the transformer tank for the connection of a 95 mm² cable.

The height of the wall bushing of the substation is 2.8 meters above ground level. Should the design of the transformer offered be such that the total height of the transformer and secondary bushing is less than 2.7 meters, screens must be provided. Tenderers must include the provision of screens in their offer. Details of screens shall be submitted to Transnet freight rail for approval.

The clearance from the lowest, high voltage connection of the transformer to the finished ground level shall not be less than 3.6m for supply voltages up to 88kV, and not less than 4.1m for supply voltages exceeding 88kV.

Cables, Busbars and Connections

The Contractor shall supply and install the following:

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

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.

Copper busbars between separately mounted outdoor equipment. The busbars shall incorporate a degree of flexibility to avoid any overstraining of connections due to foundation movement and expansion or contraction.

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.

Copper busbars with removable flexible connections 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.

Where two different conductor material joints are used, the Bi-Metallic plates shall be applied.

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.

Notwithstanding 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.

2.2.1 Busbars

- 2.2.1.1 Supply and install all copper bus-bars 50mm x10mm busbars to and from the rectifier, reactor coil, positive isolator and the negative bar.
- 2.2.1.2 The Contractor shall dismantle, remove and transport all old equipment from site to Salt River Scrap Bank for both substations.
- 2.2.1.3 All busbars connections shall be greased by means of silicon substance
- 2.2.1.4 Nuts and bolts on busbars connections shall be stainless steel.

2.2.2 Supply and installation of cables

- 2.2.2.1 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.
- 2.2.2.2 The Contractor shall supply all the control cable from the AC disconnects to the indoor substation building.
- 2.2.2.3 The Contractor shall make provision for terminating the armoured cables both in the substation indoor building and outdoor yard.
- 2.2.2.4 The Contractor shall supply joint kits and all necessary terminations.
- 2.2.2.5 Supply and install the auxiliary isolating switch control cable (50mm² x 4 core). The Contractor shall terminate and connect on the auxiliary transformer and inside the control panel.
- 2.2.2.6 The Contractor shall supply and connect the 95 mm² PVC insulated welding cable to interconnect all new and existing equipment to the DC earth leakage relay system.
- 2.2.4.1 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.
- 2.2.4.2 The Contractor shall replace the DC earth leakage arrangement (system) as per drawing CEE TBD 0007 and enclosed in 25mm² 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.
- 2.2.4.3 Only hexagon crimps will be accepted on all crimping lugs.
- 2.2.4.4 Resistance between the DC earth leakage busbar and the substation earth mat shall not be less than 25 Ohm.

2.2.3 Installation

- 2.2.8.1 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.
- 2.2.8.2 All fasteners on steelwork, components and electrical connections (nuts and bolts) shall be secured using flat as well as lock washers.
- 2.2.8.3 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.

2.2.4 Site Tests

- 2.2.11.1 The equipment shall be inspected or 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.
- 2.2.11.2 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.
- 2.2.11.3 Functional on-site tests shall be conducted on all items of equipment and circuitry to prove the proper functioning and installation thereof.
- 2.2.11.4 The Contractor shall submit a detailed list of on-site tests for the approval of the Project Manager or Supervisor.
- 2.2.11.5 The Contractor shall arrange for the Supervisor or his representative to be present to witness the on-site tests.
- 2.2.11.6 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.
- 2.2.11.7 The on-site tests shall include the following:
 - i) Test for the functionality of all electrical circuitry
 - ii) Trip test on relays
 - iii) Test on equipment as per manufacturer's instructions
 - iv) Insulation tests
- 2.2.11.8 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.
- 2.2.11.9 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.
- 2.2.11.10 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.

2.2.5 Drawings, Instruction Manuals and Spare Part Catalogues

- 2.2.12.1 All as built drawings shall be supplied in electronic format (Microstation/Acad).
- 2.2.12.2 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.
- 2.2.12.3 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.

- 2.2.12.4 All drawings, catalogues, instruction book and spares lists shall be in accordance with Transnet Freight Rail's specification CEE.0224.2002.
- 2.2.12.5 All final as built drawings shall be provided to Transnet Freight Rail within four weeks after commissioning.
- 2.2.12.6 Supply three sets of A3 schematic wiring diagrams in hard copy format and electronic format for approval.

2.2.6 Commissioning of equipment

- 2.2.13.1 Commissioning will only take place after all defects have been rectified to the satisfaction of the Project Manager or Supervisor.
- 2.2.13.2 On completion of commissioning, the Contractor will hand the equipment over to the Project Manager or Supervisor in terms of the relevant instruction.
- 2.2.13.3 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.
- 2.2.13.4 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.
- 2.2.13.5 The Contractor shall be present during the testing and setting of the protection to rectify any faults found.

2.2.7 Guarantee and defects

- 2.2.14.1 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.
- 2.2.14.2 The Contractor shall be issued with a completion certificate with the list of all defects to be repaired within 14 working days after commissioning.
- 2.2.14.3 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.
- 2.2.14.4 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.
- 2.2.14.5 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.
- 2.2.14.6 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.
- 2.2.14.7 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.
- 2.2.14.8 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.

2.2.15 Quality and inspection

- 2.2.15.1 Transnet Freight Rail shall inspect the equipment under contract on the premises of the Manufacturer or successful Contractor.
- 2.2.15.2 The Contractor shall notify Transnet Freight Rail 14 days in advance of such an inspection date.

2.2.15.3 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.

2.2.15.4 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.

2.2.16 Scrap materials

2.2.16.1 All redundant/old materials/equipment to be removed from site and transported to TFR Scrap Bank in Salt River.

AnnexureB.ProjectSpecifications52166

"PREVIEW COPY ONLY"

Annexure C

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1. MEASUREMENTS AND PAYMENT

- 3.1 Preliminary and general shall be measured and paid for as lump sum. Tendered rates must therefore include labour, site establishment, transport, civil works, soil testing, preparations and all necessary resources required to complete the works.
- 3.2 Dismantling, removal and transportation of old equipment from site to Salt River Scrap Bank shall be measured and paid for as lump sum. Tendered rates must therefore include delivery of equipment and all necessary resources to complete this item.
- 3.3 Supply and installation of copper busbars from the transformer to the Rectifiers, to Reactor coils, and to the positive isolators including negative busbar shall be measured and paid for as lump sum. Tendered rates must therefore include supply, delivery of materials and installation of all busbars including brackets, clamps, bolts, nuts etc and all necessary resources and works to complete this item.
- 3.4 Supply and installation of surge arresters shall be measured and paid for per surge arrester installed. Tendered rates must therefore include supply, installation, delivery of materials, cabling and all necessary resources and works to complete this item.
- 3.5 Refurbish the main/auxiliary transformer complete transformer complete. Tendered rates must therefore include supply, delivery of materials, and all necessary resources needed to complete this item.
- 3.6 Filtering and purifying of the transformer oil shall be measured and paid for filtering. Tender rates must therefore include filtering, purifying, oil test before and after, and all necessary resources to complete this item
- 3.7 Drawings and catalogues shall be measured and paid for as lump sum. Tendered rates must therefore include supply, delivery of all drawings and catalogues.

Annexure D

BLE52166 : DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF SURGE ARRESTERS, COPPER BUSBARS, TRANSFORMER BUSHINGS AND OIL FILTERING AT KOUP AND BAVIAAN 3KV DC TRACTION SUBSTATIONS

1. SCHEDULE OF APPLICABLE SPECIFICATIONS, INSTRUCTIONS & DRAWINGS

6.1 South African National Standards:

- 6.1.1 SANS 1091 National Colour Standard
- 6.1.2 SANS 8528 Reciprocating internal combustion engine driven alternating current generating set.
- 6.1.3 SANS 10142 Wiring Code

6.2 Transnet Freight Rail:

- 6.2.1 BBB 3620 version 5: 3kV DC earthing arrangement – Traction Substation
- 6.2.2 BBB 0845 version 4 Requirements for metal oxide surge arresters
- 6.2.3
- 6.2.4 BBB 3059 version 2: 3kV DC Traction Substation Earthing System For High Voltage Outdoor Yard
- 6.2.5 BBB 5452 version 6: Transnet Freight Rail requirements for installation of electrical equipment for 3kV DC substations
- 6.2.6 CEE-TBD-0007: Earthing arrangement for traction substations
- 6.2.7 BBB 0198 version 1: Specifications for the supply of cables
- 6.2.8 CEE. 0023.90: Specifications for installation of cables
- 6.2.9 CEE. 0045.2002/1: Painting of steel components of electrical equipment
- 6.2.10 CEE. 0183.2002: Hot dip galvanizing and painting of electrical equipment
- 6.2.11 CEE 0224.2002: Drawings, catalogues, instruction manuals and spares list for electrical equipment supplied under contract