
Part C2: Pricing Data

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PART C2 Pricing Data

C2. PRICING INSTRUCTIONS

C2.1 GENERAL

- a). Tenderers must submit prices for all items as a pre-requirement.
- b). Employer does not/ and will not guarantee any quantities associated with the pricing of this tender or throughout execution of the works.
- c). Employer reserves the right to split or award this tender in terms of its respective requirements.
- d). All rates specified in the Activity Schedule must be fixed for 12-months.
- e). Installation cost(s) must include:-
 - i. Remuneration, 3-rd party engineering cost for boom design, 3-rd party sign-off mast concrete base(s), training, certification, leave, protective clothing (PPE), accommodation, vehicles, equipment and tools required to perform the Works safely and effectively.
 - f). The Contractor is also permitted to include items into the activity schedule for additional items not included or omitted that may be required to provide the works.

C2.1.1 CONTRACT SUM INCLUSIONS

The contract sum includes all *Contractor's* supply, installation, administration, supervision, materials, plant, equipment, auxiliary costs, duties, taxes and profit. Similarly the unit rates for extra work shall also include all the above costs. This includes, but is not limited to, any error or omission by *Contractor* in estimating the cost of Works; any additional compensation for overtime, even when such overtime is required to maintain or recover progress on instruction of the *Employer's* Representative; and any premium or bonus paid to secure deliveries of construction tools, equipment and materials.

C2.1.2 PRELIMINARY AND GENERAL

The Preliminary and General costs shall be fully inclusive of all fees, costs, charges, expenses and all other costs incurred to administer the Contract including costs for the administration of sub-contractors (if any) and these costs shall include, but not be limited to the following items: Supervisory and planning staff, satisfactory to the *Employer's* Representative as to numbers, qualifications, experience and duration of assignment, as are required to ensure the efficient execution of the Contract in accordance with the agreed programme; and all salaries, burden, transfer costs, housing, travel and living expenses, personnel transport and all other allowances, costs and other charges incurred by or as a result of providing such supervisory personnel,

- Administration and clerical personnel as are required to ensure the efficient execution of the Contract; all necessary security services; warehouse staff for the safekeeping and administration of material intended for permanent incorporation in the Works; as well as all salaries, burden, transfer costs, housing, travel and living expenses, personnel transport and all other allowances, costs and other charges incurred by or as a result of providing such personnel.
- Buildings for the use of *Contractor's* construction, supervisory and administrative personnel and clerical staff; all mess rooms, washrooms, toilets, workshops, warehousing, stores, and like buildings required by the *Contractor*; all necessary office furniture and equipment;

telephone systems as may be required for the proper administration of the Contract; including delivery, erection and subsequent dismantling.

- The provision of, installation, maintenance and dismantling of all temporary facilities, which may be required for the efficient execution of the Contract, including materials, equipment and labour for electrical power supplies, water supply (including drinking water), air supplies, weather protection, foundations, sanitary facilities, sewage system, security fencing.
- Field general expenses such as office cleaning and running expenses, sanitary costs, telephone and fax costs, postal costs, stationery, office equipment hire, labour recruiting and advertising costs, expenses arising from visits to Site by *Contractor's* home office staff and all costs associated with their visits, staff welfare costs, entertainment expenses, personnel transport costs, permit and licence costs, and like costs.
- Insurance and legal fees including payments to statutory authorities or government bodies, local taxes whether public or private, and other similar disbursements or payments necessary for the execution of the Contract as well as all insurance fees in accordance with the Contract.
- All costs incurred in furnishing the Guarantees which are required by the Contract.
- Costs involved in implementing the requirements of the OSH Act; No.85 of 1993, as amended, and specifically the Construction Regulations.

C2.2 MEASUREMENT AND PAYMENT

C2.2.1 ACTIVITY SCHEDULES

The Schedules of Activities, if supplied with this enquiry, are made up of Scopes of Supply and / or Lists of Activities and Sub Activities which the Tenderer shall price.

The Schedules are Discipline specific and contain the full Scope of Supply and Installation as described in **PART C3.1**. Where activities cannot be defined to complete pricing detail, eg inspect/check etc. the subsequent activity, replace/service, etc. may be provided for from the Provisional Sum for that Discipline, at the *Project Manager's* discretion.

The Tenderer is at liberty to add additional activities and sub activities. Some items in the Schedules may be required to be priced on a rates basis. An item against which no price is entered will be considered to be covered by the other prices or rates in the Schedules.

The General Conditions, the Particular Conditions, the Specification and the drawings are to be read in conjunction with the Schedules. Rates are inclusive of waste. The *Employer* shall not be held liable for any costs incurred due to over or under ordering.

The contract price shall be fixed and firm. The prices and rates inserted in the Schedules are fully inclusive prices to the *Employer* for the work described under the several items. Such prices shall cover all costs and expenses that may be required in and for the construction of the work described and shall cover the cost of all general risks, liabilities and obligations set forth or implied in the Contract. Free issue equipment shall include for costs of storage, safe keeping and installation only.

C2.2 ACTIVITY SCHEDULES

PROJECT: SUPPLY AND INSTALLATION OF 8.8KV EQUIPMENT FOR HEIDELBERG DEPOT ENGINEER
DESCRIPTION: Option A - Activity Schedules

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	ACTIVITY TOTAL AMOUNT
	SECTION 1					
	Preliminary and General					
	General					
	The Tenderer shall, prior to submitting their tender assess and investigate all requirements to provide the works					
1a.	Fixed charge and Value related items					
1a.1	Contractual requirements	Sum	1			
1a.2	Establishment of facilities on the site as required to provide the works:					
	Offices and workshop	Sum	1			
	Ablution	Sum	1			
	Tools and Equipment	Sum	1			
	Water and Power Supply	Sum	1			
1b.	Time related items					
1b.1	Contractual requirements	Sum	1			
1b.2	Operations and Maintenance of the site to provide for the works	Sum	1			
1b.3	General responsibilities and other Time related obligations: (Tenderer to specify)	Sum	1			
	a).	Sum	1			
	b).	Sum	1			
	c).	Sum	1			
	d).	Sum	1			

1c.	Safety and Environmental Compliance				
1c.1	Compliance with Department of labour and IFR safety requirements and OHS regulations, inclusive of inductions and all safety staff and equipment	Sum	1		
1c.2	Compliance with environmental regulations for durations of project, inclusive of environmental requirements, prevention of run-off hazardous materials, and the like.	Sum	1		
1e.	Ancillary Items				
1e.1	Supply and complete as-built information and drawings to be submitted to Project Manager	Sum	1		

P&G Total and Carried Forward

ITEM	DESCRIPTION	UNIT	QTY	RATE SUPPLY & INSTALL	AMOUNT	ACTIVITY TOTAL AMOUNT
	SECTION 2					
	THE SUPPLY AND INSTALLATION OF OHTE, PIN INSULATORS, SURGE ARRESTORS, PHASE WIRE, AERIAL FEEDERS, EARTH WIRE, ARMOUR RODS AND EARTH CLAMPS					
2a.	Supply and install 6.6 kv Phase wire	m	30000			
2b.	Supply and install vandal proof insulators	ea	20150			
2c.	Supply and install surge diverters	ea	1260			
2d.	Supply and install earth spikes	ea	420			
2e.	Supply and install water meter box	ea	420			
2f.	Supply and install cabling from the LA to earth spike	m	7000			
2g.	Supply and install spark gaps	ea	420			
2h.	Supply and install bonding at make-off and H-frame mats	sum	420			
2i.	Other (specify)					
	a). Supply back-up generator	sum	1			
	b). Transport stripped and old equipment to Heidelberg Depot when clearing site	sum	1			
	c).					

Section 2 Total and Carried Forward

ITEM	DESCRIPTION	UNIT	QTY	RATE SUPPLY & INSTALL	AMOUNT	ACTIVITY TOTAL AMOUNT
3a.	Supply and install boom structures	ea	59			
3b.	Supply and install boom with switch structures	ea	29			
3c.	Supply and install single switch structures	ea	0			
3d.	Supply and install earth wire	m	8800			
3e.	Supply and install suspension Insulators	ea	360			
3f.	Supply and install spark gaps	ea	88			
3g.	Repositioning of track switches, section Insulators, etc	Sum	16			
3h.	Erect Mast foundations	ea	176			
3i.	Supply and install 800mm Feeder wire	m	8800			
3j.	Supply and install wall bushings	ea	360			
3k.	Other (specify)					
	a).					
	b).					
	c).					

Section 3 Total and Carried Forward

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT	ACTIVITY TOTAL AMOUNT
4b.		Sum				
4c.		Sum				
4d.		Sum				
4e.	Other (specify)	Sum				
	a).	Sum				
	b).	Sum				

Section 4 Total and Carried Forward

	SECTION 5		
	Summary		
Section 1	P&G Total Carried Forward	Sum	
Section 2	The Supply and Installation of OHTE, Pin Insulators, Surge Arrestors, Phase Wire, Aerial feeders, Earth Wire, Armour rods and Earth clamps Total Carried Forward	Sum	
Section 3	The Supply and Installation Feeder Wires as well as the erection of Mast poles at various substations	Sum	
Section 4		Sum	

Sub-total 1

10% Contingencies at Employer's discretion

TOTAL

VAT

CONTRACT VALUE

PART C3: SCOPE OF WORKS

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PART C3
SCOPE OF WORKS
INDEX

Section No.	Description
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GENERAL

- | | |
|--------------|--|
| 3.1. | DESCRIPTION OF THE WORKS |
| 3.2. | ENGINEERING STANDARDS |
| 3.3. | DETAILED DESCRIPTION OF WORK |
| 3.4. | CONTRACTUAL OBLIGATIONS |
| 3.5. | EMPLOYER OBLIGATIONS |
| 3.6. | TECHNICAL COMPLIANCE REQUIREMENTS |
| 3.7. | DRAWINGS, INSTRUCTION MANUALS AND SPARE PART CATALOGUES |
| 3.8. | SITE TESTING |
| 3.9. | COMMISSIONING OF EQUIPMENT |
| 3.10. | GUARANTEE AND DEFECTS |

3.1 DESCRIPTION OF THE WORKS

The Scope of Work covers Employer's requirements: -

- i). The Supply and Installation of OHTE, Pin Insulators, Surge Arrestors, Phase Wire, R-switches (with digi-tone), Aerial feeders, Earth Wire, Armour rods and Earth clamps; and
- ii). The Supply and Installation Feeder wires as well as the erection of Mast poles at various substations.

3.2 ENGINEERING STANDARDS

- a. Unless otherwise specified all material and equipment supplied shall comply with the current edition of the relevant SANS, BS, IEC or Transnet publication where applicable.
- b. The following publications are referred to in this specification: -
 - i. South African National Standards
 1. SANS 121: Hot dip galvanised coatings for fabricated iron or steel articles – Specifications and test methods
 2. SANS 182-2 Stranded aluminium conductors
 3. SANS 182-3 Aluminium Conductors, steel reinforced
 4. SANS 1019: Standard voltages, currents and insulating levels for electrical supply
 5. SANS 1091: National colour standard
 6. SANS 1339: Cross linked polyethylene (XLPE) – Insulated electric cables for rated voltages (3.8/6,6KV to 19/33KV)
 7. SANS 10142-1: The wiring of premises. Part 1
 - ii. Transnet
 1. BBB 1616: 450 Volt gas arrester Spark-gap for traction power supplies
 2. BBC 0198 Ver-1: Specifications for requirements for the supply of electrical cables
 3. CEE.0017.83: Provision of foundations for electrification masts
 4. CEE.0023.90: Specifications for the installation of cables
 5. CEE.0166.96: Insulating pads, washers and bushes for traction mast base
 6. CEE.0177.86: Code of Practice: Earth Systems for Electric Light and Power and Traction Installation
 7. CEE.0224.2002: Drawings, catalogues, instruction manuals and spares lists for electrical equipment supplied under contract
 8. CEE.045: Painting of steel Components of Electrical Equipment

9. CEE P003_iss 2: Step-down points from transmission lines for signal Relay rooms where Tele-control is provided
 10. CEE-T-T6E-0004: 3kV DC electrification overhead equipment
 11. S420 (1999): Specification for concrete work
 12. Maintenance of 3KV DC electrification hand book
 13. High Voltage Electrical Safety standards
 14. Occupational Health and Safety Act No. 85 of 1993 (Available at depot for referral)
 15. E7/1 Specification for works on , over, under or adjacent to railway lines and near high voltage equipment.
- iii. Transnet Freight Rail drawings
1. CEE-TU-0143 sh1 to 4: Mast base Anti-electrolysis Arrangement
 2. CEE-TU-0035: Drawing for bonding Mast to Rail
 3. CEE-TQ-0028: Drawing for Foundation Bolt Group – Rail Mast
 4. CEE-TQ-0027 Foundation: Rail Mast
- iv. Engineering Instructions
1. Engineering instructions No: T.024. "Testing of mast base insulation after erection of electrification mast
 2. Occupational Health and Safety Act No. 85 of 1993 (Available at depot for referral)
- v. Any items offered in accordance with other standards will be considered at the sole discretion of Employer. The Contractor shall supply the details stating where the item differs from these specifications as well as supply a copy (in English) of the recognised standard specification(s) with which it complies.

3.3 DETAILED DESCRIPTION OF WORK

- c. The Supply and Installation of OHTE, Pin Insulators, Surge Arrestors, Phase Wire, R-switches (with digi-tone), Aerial feeders, Earth Wire, Armour rods and Earth clamps: -
- i. Supply and Install 6.6 KV phase and earth wires:
 1. The phase and earth wires shall be bare hard-drawn aluminium conductors, steel, reinforced in accordance to specification SANS 182 Part 2 and Part 3.
 2. The application of a High conductive silicon grease must be made to the centre steel wire evenly throughout the length of the conductor.
 3. The phase wires shall have a cross sectional area capable of carrying continuously a load of 800amps without exceeding the recommended current carrying capacity of the conductors.
 4. The earth wire shall have a reference area (al/st) 50/9,0 mm squared, and stranding 6/1/3,34mm.

5. The phase wires shall be tensioned in accordance with the requirements of the Code of practice for overhead power lines. The minimum height above ground of any conductor shall not be less than 6m under condition of maximum sag, and all other clearances and crossings shall be in accordance with the Code of Practice for Overhead Power lines.
 6. Conductors shall preferably be run out from drum, conveyed on vehicle. Where it is necessary to draw wire off a stationary drum, this shall be done in such a manner that the wire is not cut or abraded when pulled over the ground for any undue length of time, nor shall it be temporarily suspended over support insulators for any undue length of time.
 7. At strain points sufficient length of wire shall protrude through the strain clamp for use as a jumper connection.
 8. Joints in the conductors shall be made with "preformed" or approved tubular aluminium wire splicers of the appropriate material and size of the wire to which it is to be used.
 9. All joints to be made as per SANS 182 part 3. No joints to be done 15m apart and a maximum of 4 joints per unit length of 1000m are not exceeded.
- ii. Earth the 6.6KV make-off and the H-Frame as per drawing CEE PFB 20, CEE PFD 10, CEF-PA-41 and specification CEE 0177.86:
1. The earth connection from structures and surge diverters to the earth electrode shall not pass inside any closed steel loop, such as is formed by a U-bolt and back strap.
 2. The earth connection shall be made of 2 x 95mm sq composite cable, and shall be as straight as possible, avoiding sharp bends and kinks etc.
 3. The surge diverters shall conform to Specification BBB0845 version 4.
 4. Whatever form of earth connection is used, the resistance to earth, at any structure, measured by an earth resistance tester, shall not be greater than 5 ohms. Salt or other corrosive substances shall not be used to reduce earth resistance.
- iii. Supply and Install post type insulators in accordance with specification BBC8439 version 1.
1. The tying of phase wire to the insulator shall be carried out in accordance with fig 6.12 of maintenance of 3KV electrification hand book.
 2. In order to prevent electrolytic corrosion of the phase wire, it will be necessary that the binding wire be of the same material as the phase wire. Strands of phase wire off-cuts may be used for this purpose.
- iv. Supply and install Gas filled spark gap in accordance with specification BBB1616.
- v. Supply and install termination and splicing kits:

1. Contractor's shall satisfy the administrator/ project manager that they are competent to joint the cables specified. This shall be indicated in the "Statement of Works successfully carried out by Contractors E4C"
- vi. All steelwork shall be galvanised in accordance with SANS 121 and where required, painted in accordance with specification CEE 0045. The manufacture of any steelwork shall not take place prior to the approval of the design drawings. Employer shall inspect the steelwork at the manufacturer's works prior to dispatch. All fasteners (nuts & bolts) shall be secured using flat or bevelled washers, where necessary, as well as lock washers.
- d. The Supply and Installation Feeder wires as well as the erection of Mast poles at various substations
 - i. Excavate and build Mast foundations where new booms and switch structures are to be erected:
 1. The booms must be designed, fabricated, supplied and installed.
 2. The mast foundations must be as per section 6.1 of Maintenance of 3KV DC electrification hand book.
 3. The insulation at the base of all mast erected shall be as per specification CEE.0166.96, CEE-TQ-0027 and drawing CEE-TU-0143.
 4. The erected must shall be tested to comply with engineering instruction T 024.
 5. Anti-electrolytic mast base insulation in compliance with the requirements of Specification No. CEE.0166.96 incorporating drawing CEE-TU-0143 Sh1 to 4 shall be installed.
 6. The procedures for the installation of the mast base insulation shall be in accordance with Specification No. CEE.0242.98.
 7. The anti-corrosive materials that will be used during the installation procedures shall comply with Specification No. CEE.0119.85.
 8. After installing the mast structure the insulation between the mast and the foundation bolt group shall be tested with a multi-meter similar to an AVO meter. If a resistance greater than 25-Ohm is not achieved, the mast shall be removed and insulation improved. Before any arrangement for rewiring is made, the Technical Officer shall verify the measurements in the presence of the Contractor.
 9. No overhead track equipment may be energised unless each mast has passed the test.
 10. After re-suspension of wires and making "live", a further test shall be carried out by measuring the voltage between mast base and bolt group. A voltage fluctuating between zero and 50 volts should be observed, failing which, the mast base insulation shall be considered defective. The contractor shall then affect the required repairs at his own cost.
 11. The concrete work shall comply with specification S420.

12. Foundations shall be cast as a whole. (When different batches of concrete are used, the first batch shall not be allowed to set before the next batch is cast.)
13. The top of the foundation block shall be completely level and of a good finish so that the top of the erected mast does not deviate from true vertical by more than 12mm.
14. Anchor foundations shall be built to drawing CEE-TQ-43 but the top of the foundation above ground level shall be 200 mm and not 100 mm as drawing shows.
15. All foundations must be allowed 7 days to cure.

ii. Supply and Erect booms for aerial feeder wire and Switch structures

Contractor to provide proposed design as part of his/her offer.

1. The Booms should erect as per section 6.4 of the Maintenance of 3KV DC Electrification hand book.
2. The position and direction of where the booms are to be erected will be indicated at site briefing. The number of Booms will differ per site/substation.
3. The switch structure and its bonding or connection to track must be as per section 1.9 of the Maintenance of 3KV DC electrification hand book.
4. The boom supplied must be made of rail masts.
5. All booms erected must be earthed. The contractor is required to supply and install earth wire to the newly erected boom/masts. The earth wire must be as per specification SANS 83 part 2.

iii. Reposition Track switches, surge arrestors, spark gaps and section insulators.

1. The reposition of various equipment will differ per site/substation.

iv. Supply and install wall bushings

1. The wall bushings supplied must be as per specification **(to be supplied at the site meeting)**.

v. Supply and install 800mm ACSR feeder wire.

1. The feeder wire supplied must comply with specification SANS 83 part 2.
2. The feeder wire must be erected as per section 6.5 of the Maintenance of 3KV DC Electrification hand book.
3. The length of feeder wire to be installed will be measured during the site briefing per site.
4. The Tensioning and sagging of the installed feeder wire must be as per annexure 6 of Maintenance of 3KV DC electrification hand book.
5. The clearance between the installed feeder wires must comply with the High Voltage electrical safety instruction.

6. The anchoring of feeder wire shall be as per section 6.6 of Maintenance of 3KV DC electrification hand book.
 7. Wires shall be thoroughly cleaned at all places where current carrying clamps are to be installed. Electric jointing compound NO-OX-ID "A" shall be used on aluminium wires and Copper Slip on copper wires.
 8. All joints to be made as per SANS 182 part 3. No joints to be done 15m apart and a maximum of 4 joints per unit length of 1000m are not exceeded.
- vi. Supply and install negative return wire.
 - vii. Supply and install Gas filled spark gap in accordance with specification BBB1616.
 - viii. Supply and install termination and splicing kits
 1. Contractor's shall satisfy the administrator/ project manager that they are competent to joint the cables specified. This shall be indicated in the "Statement of Works successfully carried out by Contractors E4C"
 - ix. All steelwork shall be galvanised in accordance with SANS 121 and where required, painted in accordance with specification CEE 0045. The manufacture of any steelwork shall not take place prior to the approval of the design drawings. Employer shall inspect the steelwork at the manufacturer's works prior to dispatch. All fasteners (nuts & bolts) shall be secured using flat or bevelled washers, where necessary, as well as lock washers.
- e. Installation Requirements
- i. 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.
 - ii. The Contractor shall be responsible for all necessary (as decided by the Project Manager) connections between the equipment supplied and other components in the section including connections to the earth.
 - iii. All fasteners on steelwork, components and electrical connections (nuts and bolts) shall be secured using flat as well as lock washers.
 - iv. No two adjacent subs will be switched off at the same time when erecting the feeder wires and masts.
 - v. There will be substations that will only be done on an allotted double line occupation day.
 - vi. The work must be done in such a way that three adjacent relay rooms are isolated; the contractor must have a standby plant to supply the middle Relay room.
 - vii. The standby plant must be minimum 25KVA 3 phase supply with 2 x 220 sockets.
- f. Inter-connection of Equipment
- i. High conductive silicon grease shall be liberally applied to all the connections.

- ii. 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).
- g. Resources, vehicles, equipment and tools will be required to undertake the works: -
 - i. Ladder Team(s) will be required with the following resources: -
 - 1. Foreman(s) (The team or individuals within the team will be expected to perform independently (without the assistance of Transnet Freight Rail Infrastructure staff). This effectively means that the contractor will be authorized to work to clearance according to the Electrical Safety Instruction (Category A Brown) able to do switching)
 - 2. Assistant Foreman(s)
 - 3. Flagmen
 - 4. Erector(s)
 - 5. Labourer(s)
 - 6. Vehicle driver(s)
 - ii. Only qualified technical personnel may undertake the works on the OHTE(s). The Contractor is required to inform the Project Manager or any person lawfully delegated in that capacity to manage the contract of any personnel changes and provide the qualifications of the replacement incumbent for approval. Employer may insist that the successful Contractor transfers knowledge and skills to appointed Employer's maintenance staff who will shadow the nominated Contractor.
 - iii. Vehicles (Required and not limited-to): -
 - 1. 8-ton truck(s) with high-up
 - 2. 18-Seater personnel carrier(s)
 - 3. 4x4 LDV(s)
 - ii. Equipment/ Tools (Required and not limited-to): -
 - 1. 10kva Emergency lighting plant with lights
 - 2. Hand tools for each erector similar to tools required by the traction linesman
 - 3. 50 ton feeder press
 - 4. 20 ton hand crimping tool(s)
 - 5. Section insulator alignment tool(s)
 - 6. Height and stagger gauge(s)

3.4 CONTRACTUAL OBLIGATIONS

- h. All other equipment appearing on various drawings attached to this specification.
- i. Over and above the conditions mentioned in the Conditions of Contract, the Contractor shall also be responsible for the conditions mentioned hereunder.
- j. The Contractor shall not make use of any subcontractor to perform the works or parts thereof without prior permission from the Project Manager.
- k. The Contractor shall ensure that a safety representative is at site at all times. All safety measures prescribed by Transnet – 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.

- l. The Contactor must comply to and also use section 4.1 of Maintenance of 3KV DC electrification hand book and specification E7/1 as a guideline for safety measures during execution of the work.
- m. 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 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 Manager or Technical Officer in writing.
- n. 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 Manager or Technical Officer and must be countersigned by the Contractor.
- o. Both books mentioned in D and E shall be the property of Employer and shall be handed over to the Manager or Technical Officer on the day of energising or handing over.
- p. The penalty charge will be R10,000.00 per day.

3.5 EMPLOYER'S OBLIGATIONS

- q. Project Manager will have a Site Supervisor available for issuing of work permits.
- r. Project Manager on completion of the works will perform necessary tests and commissioning.
- s. Project Manager will issue and endorse C-green certificates.

3.6 TECHNICAL COMPLIANCE REQUIREMENTS

- t. Contractors shall duly fill in the 'Schedule of Activities'. Items not reflected in this Schedule, but covered in the project specification or agreed at site meetings, shall be added to the 'Schedule of Activities' by the Contractor and priced for accordingly.
- u. Contractors shall provide a provisional Gantt or a similar chart showing when the section will be done and energised, when submitting the tender.
- v. Contractors shall submit qualifications of the staff that will be performing the works. 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 Project Manager of any staff changes and provide the qualifications of the replacement staff for approval.
- w. 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.
- x. Contractors shall motivate a statement of non-compliance.

- y. 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.
- z. 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 Technical Officer of changes to equipment offered and submit detailed information on replacement equipment for approval prior to it being used on this contract.
- aa. Contractors shall submit equipment type test certificates as specified with the Tender. These shall be in English or certified translation.

3.7 DRAWINGS, INSTRUCTION MANUALS AND SPARE PART CATALOGUES

- bb. All as built drawings shall be supplied in electronic format (Microstation/ Acad).
- cc. All drawings (paper prints) shall be submitted to the Project Manager for approval. No construction or manufacturing activity will be allowed prior to the associated drawings having been approved by the Manager or Technical Officer.
- dd. All drawings, catalogues, instruction book and spares lists shall be in accordance with Transnet's specification CEE.0224.2002.
- ee. All final as built drawings shall be provided to Employer within four weeks after commissioning.

3.8 SITE TESTING

- ff. The equipment shall be inspected/ tested and approved by Employer's Quality Assurance at the Contractor's workshop prior to it being taken to site. Only once the approval has been granted in writing can the equipment be taken to site for installation. The approval should also be recorded on the site instruction book and countersigned by both parties.
- gg. 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.
- hh. Functional on-site tests shall be conducted on all items of equipment and circuitry to prove the proper functioning and installation thereof.
- ii. The Contractor shall submit a detailed list of on-site tests for the approval of the Project Manager.
- jj. The Contractor shall arrange for the Project Manager or his representative to be present to witness the on-site tests.
- kk. 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.

- ll. Testing of the installation shall be carried out by the contractor in the presence of the Project Manager or his representative and all results shall be in writing to the project manager for approval.
- mm. The mechanical operation of all line Track switches shall be tested and the correct opening and closing thereof checked.
- nn. The resistance of all earthing points shall be measured by means of an earth resistance test set. The ground around the earth spike shall not be watered before testing. The minimum earth resistance obtained shall not be less than 5 ohms.
- oo. All the above test shall be carried out in the presence of a representation of the project manager. Adequate notice of such test shall be given to ensure that there are no other personnel working on the line.
- pp. At the completion of the on-site tests, the Project Manager 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.
- qq. Upon rectification of defects, the Contractor shall arrange for the Project Manager or his representative to certify satisfactory completion of on-site tests.
- rr. Acceptance by the Project Manager 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.

3.9 COMMISSIONING OF EQUIPMENT

- ss. Commissioning will be done by identified section(s) as agreed with the Project Manager prior to execution of works.
- tt. Commissioning will only take place after all defects have been rectified to the satisfaction of the Project Manager.
- uu. Commissioning will include energising of equipment from the track breakers to the track switches. The Contractor must prove the satisfactory operation of all equipment under live conditions.
- vv. On completion of commissioning, the Contractor will hand the equipment over to the Project Manager in terms of the relevant instruction.
- ww. The commissioning of protection equipment by Employer 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/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.

3.10 GUARANTEE AND DEFECTS

- xx. - 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.

- yy.** The Contractor shall be issued with a completion certificate with the list of all defects to be repaired within 14 working days after commissioning.
- zz.** The guarantee period for these substations shall expire after a period of 12 months commencing on the date of completion of the contract.
- aaa.** Act or the date the section is handed over to Employer whichever is the earliest.
- bbb.** The specified guarantee period shall only apply to the new equipment installed and from the time of energising the equipment and the acceptance thereof.
- ccc.** Any defective part or component supplied and installed must be replaced by the Contractor within the correction period i.e. 3-days. Subsequently, the defective part or component supplied and installed will be jointly tested to indentify the route-cause-of-failure, if the route-cause-of-failure is caused by the Employer it will be treated as an compensation event.
- ddd.** If urgent repairs have to be carried out by Employer's 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 Employer's the cost of material and labour.

PART C3

Section 3.1

DESCRIPTION OF THE WORK

		INDEX	
Item	Description		Page
3.1.1	Employer's Objective.....		2
3.1.2	Overview of the Works.....		2
3.1.3	Extent of the Works.....		2
3.1.4	Location of the Works.....		2
3.1.5	Temporary Works.....		2

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PART C3

Section 3.1

DESCRIPTION OF THE WORKS

3.1.1 Employer's Objective

3.1.1.1 Transnet Freight Rail, the *Employer*, wishes to undertake the upgrade and modernisation of its associated Overhead Traction Infrastructure so as to increase their operational reliability and increase their working life. The purpose of the works is to ensure a minimum of 15 years safe and reliable operation in accordance with the *Employer's* programme for Central Region.

3.1.2 Overview of the Works

The scope of this tender includes: -

- i). The Supply and Installation of OHTE, Pin Insulators, Surge Arrestors, Phase Wire, R-switches (with digi-tone), Aerial feeders, Earth Wire, Armour rods and Earth clamps; and
- ii). The Supply and Installation Feeder wires as well as the erection of Mast poles at various substations.

All as itemised below and detailed in **PART C3.2**

3.1.3 Extent of the Works

3.1.3.1 The works includes the supply, installation and commissioning of all Pin Insulators, Surge Arrestors, Phase Wire, R-switches (with digi-tone), Aerial feeders, Earth Wire, Armour rods and Earth clamps for Heidelberg Depart Engineer under the control of the Chief Engineer Central Region (NATCOR).

3.1.4 Location of the Works

3.1.4.1 The location of the works is within the confines of the Heidelberg Section, Rooikop to Glencoe, South Africa.

Specific Site information is provided in **PART C4.**

3.1.5 Temporary Work

Not Applicable



SECTION 3.2

DETAILED SCOPE OF WORK AND SPECIFICATIONS

INDEX

3.2.1	Scope of Work
3.2.2	Contract Document
3.2.3	Definition
3.2.4	Tariff/ Rates
3.2.5	Value Added Tax
3.2.6	Duration of Contract
3.2.7	Specification
3.2.8	Detailed Description of Works
3.2.9	Contract Obligation
3.2.10	Transnet Freight Rail (undertakings)
3.2.11	Warranty
3.2.12	Payment Terms
3.2.13	Additional Requirements

3.2.1 Scope of Work

- a. The Scope of Work covers Transnet Freight Rail's requirements for the Supply and Installation of OHTE, Pin Insulators, Surge Arrestors, Phase Wire, R-switches (with digi-tone), Aerial feeders, Earth Wire, Armour rods and Earth clamps for Heidelberg Depot Engineer under the control of the Chief Engineer Central Region (NATCOR).
- b. This specification is applicable to the following footprint areas within the Central Region (NATCOR)
 1. Heidelberg
 - a. Rooikop to Glencoe (\pm 350km)
- c. The following resources, vehicles, equipment and tools will be required to undertake the works: -
 - i. Ladder Team(s) will be required with the following resources: -
 1. Foreman(s) (The team or individuals within the team will be expected to perform independently (without the assistance of Transnet Freight Rail Infrastructure staff). This effectively means that the contractor will be authorized to work to clearance according to the Electrical Safety Instruction (Category A Brown) able to do switching)
 2. Assistant Foreman(s)
 3. Flagmen
 4. Erector(s)
 5. Labourer(s)
 6. Vehicle driver(s)

Only qualified technical personnel may undertake the works on the OHTE(s). The Contractor is required to inform the Project Manager or any person lawfully delegated in that capacity to manage the contract of any personnel changes and provide the qualifications of the replacement incumbent for approval.

The Transnet Freight Rail's philosophy is that the depots/ terminals must maintain their own assets. Transnet Freight Rail's may insist that the successful tenderer transfer knowledge and skills to appointed TFR maintenance staff who will shadow the nominated contractor.

- ii. Vehicles (Required): -
 1. 8-ton truck(s) with high-up
 2. 18-Seater personnel carrier(s)
 3. 4x4 LDV(s)
- iii. Equipment/ Tools (Required): -
 1. 10kva Emergency lighting plant with lights
 2. Hand tools for each erector similar to tools required by the traction linesman
 3. 50 ton feeder press
 4. 20 ton hand crimping tool(s)
 5. Section insulator alignment tool(s)
 6. Height and stagger gauge(s)
 7. Tressle(s)
 8. Tackles and handlines
 9. Torque wrenches
 10. Lifting slings

iv. Materials (Required): -

1. All material will be supplied by the Contractor. Planning meeting(s) will be held in-advance to plan material and occupation requirements.

v. The Contractor will be responsible for the following Works: -

1. Supplying the following Material: -

- a. Pin Insulator(s)
 - b. Design Mast (Booms)
 - c. Surge Arrestor(s)
 - d. Phase Wire
 - e. R-switches (with digi-tone)
 - f. Aerial Feeder(s)
 - g. Earth Wire
 - h. Earth Clamps
 - i. Composite Wire
2. Supply competent and experienced labour for the installation of the Pin Insulators, Surge Arrestors, Phase Wire, R-switches (with digi-tone), Composite Wire, Aerial feeders, Earth Wire, Armour rods, Earth clamps and Design Mast (Boom).

3.2.2. Contract Document

The contract document will comprise the items listed on the table of contents, which must be duly signed and completed where relevant.

3.2.3. Definition

Project Manager means the Depot Engineer or any person lawfully delegated in that capacity to manage the contract.

3.2.4. Tariff or Rate

Tariff(s) or Rate(s) will be as per the Schedule of Activities. The installation cost(s) must include labour, accommodation, transport and all tools/ equipment required to execute the installation of the material.

3.2.5. Value Added Tax

All tariffs or rates to be exclusive of VAT. VAT at the ruling percentage shall be paid separately on-an-add-on basis on the value of the work done. Tenderers are required to submit a valid Tax Clearance Certificate.

3.2.6. Duration of Contract

The contract period will be \pm 12-months from the date of official commencement.

3.2.7. Specification

- a. Unless otherwise specified all material and equipment supplied shall comply with the current edition of the relevant SANS, BS, IEC or Freight Rail publication where applicable.
- b. This Scope of Work must be read with the following publications (Instructions, Specifications and Principles). (All references to Spoornet must be ignored and substituted with Transnet Freight Rail: -
 - i. All relevant and latest versions of Spoornet Electrical Engineering Instructions
 - ii. All relevant and latest versions of Spoornet Engineering Specifications
 - iii. All Spoornet Electrical Safety Instructions of 1999
 - iv. Maintenance Manual of 25/50kv AC Electrification (January 1987)
 - v. Maintenance Manual of 3kv DC Electrification (January 1986)

- vi. Earthing and Bonding Manual of 25/50kv AC Electrification (April 1984)
 - vii. Earthing and Bonding Manual of 3kv DC Electrification (April 1984)
 - viii. RCM Infrastructure Maintenance schedules for OHTE
 - ix. SAP R3 PM Order principles
 - x. Spoornet Infrastructure and SCS Material Control Principles
 - xi. NOC permit & occupation principles
 - xii. Spoornet Infrastructure staff structure for OHTE Ladder team
 - xiii. E4E – Safety arrangements and procedural compliance with the occupational health and safety act (act 85 of 1993) and applicable regulations
 - xiv. E7/1 and the E/7/2- Specifications for works on, over, under or adjacent to Railway lines and near High voltage Equipment
 - xv. Occupational Health and Safety Act No. 85 of 1993
- c. Any items offered in accordance with other standards will be considered at the sole discretion of Transnet Freight Rail. The Contractor shall supply the details stating where the item differs from these specifications as well as supply a copy (in English) of the recognized standard specification(s) with which it complies.

3.2.8. Detailed Description of Works

- a. The Contractor will be responsible for the following, which is regarded as the Works: -
- i. Supplying of Material: -
 - 1. Pin Insulator(s)
 - 2. Design Mast (Booms)
 - 3. Surge Arrestor(s)
 - 4. Phase Wire
 - 5. R-switches (with digi-tone)
 - 6. Aerial Feeder(s)
 - 7. Earth Wire
 - 8. Earth Clamps
 - 9. Composite Wire
 - ii. Installation of Material
 - 1. All material must be installed by competent and experienced labour to prevent deterioration of asset condition and potential failure.

The Contractor will be expected to perform independently (without the assistance of Transnet Freight Rail Infrastructure staff), which effectively means that the contractor will be authorized to work to clearance according to the Electrical Safety Instruction (Category A Brown) and in accordance to the specifications mentioned Clause 7.
 - iii. Contractor(s) resources
 - 1. The Contractor will be responsible for his own staff in respect of remuneration, training, certification, leave, protective clothing (PPE), accommodation, transport etc.
 - iv. Supply of Vehicles, Equipment and Tools
 - 1. The Contractor is responsible to supply and maintain all vehicles, equipment and tools required to perform the Works safely and effectively. All vehicles, equipment and tools will be kept in a good condition and will be inspected on an ad-hoc basis.

v. Statutory Meetings

1. The Contractor's Assistant Foreman must attend all monthly Maintenance Planning meetings to schedule and agree required work, plan future work and integrate into the complete network of activities.
2. The Contractor's Assistant Foreman and Safety Representative shall attend all Monthly and Tri-Monthly Depot(s) Act 85 Safety meetings, in order to be integrated into the Safety program of Transnet Freight Rail Infrastructure Maintenance, Central Region (NATCOR).

3.2.9 Contractual Obligation associated with the Works

- d. The Contractor shall not make use of any subcontractor to perform the works or any parts thereof without prior permission from the Project Manager or any person lawfully delegated in that capacity to manage the contract.
- e. 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 similar Works.
- f. The Contractor shall supply site diaries (with triplicate pages): -
 - i. Site diary shall be used to record any unusual events during the period of Works. Any delays to the Works shall also be recorded such as delays caused by poor weather conditions, delays caused by permits been cancelled etc. The appointed Project Manager or any person lawfully delegated in that capacity to manage the contract must concur and sign for such delays. Other delays such as non-availability of equipment from 3rd party suppliers must be communicated to the Project Manager or any person lawfully delegated in that capacity to manage the contract in writing.
 - ii. Site diary shall be used to record any instructions to the Contractor regarding problems encounter on site i.e. for example the quality of work or the placement of equipment. Site diary shall be filled in by the Project Manager or any person lawfully delegated in that capacity to manage the contract and must be countersign by the Contractor.
- g. Site diaries mentioned in Clauses c(i) and (ii) will be regarded as the property of Transnet Freight Rail (handover dates for site diaries will be at the discretion of Project Manager or any person lawfully delegated in that capacity to manage the contract).

3.2.10 Transnet Freight Rail (undertakes to carry-out the following actions)

- h. Arrange for all RPM documents and issue scheduled RPM's at least one month in advance.
- i. Perform scheduled and adhoc inspections on OHTE and related equipment, which the Contractor's Assistant Foreman attend.
- j. Arrange for CPM documents (after Freight Rail inspections) and will issue scheduled CPM's, as soon as possible.
- k. Arrange for all scheduled permits and will issue Permit Notices, before any permit work will commence.

3.2.11 Warranty

- l. The Contractor shall guarantee the satisfactory operation of the complete electrification system, attended to by him, and accept liability for all workmanship.
- m. The Contractor is required to guarantee all material supplied for 12-months.
- n. Any fault (specific type) occurring more than once, after attendance to by the Contractor that cannot be attributed to faulty equipment i.e. faulty locomotive, shall be regarded as a primary defect which must be corrected by the Contractor without cost.

3.2.12 Payment Terms

- o. The Schedule of Activities is not the Works. The Schedule of Activities is the basis of payment.
- p. The Schedule of Activities reflects an estimate of the quantities. The appropriate rate will be selected, applied and certified for payment.
- q. Claim(s) will only be accepted, if all documentation (PM orders, Reports, etc.). All certification and sign-offs must be included as support documentation.

3.2.13 Additional Requirements

- a. The tenderer must possess insurance to cover third party and public liability (proof to be submitted with tender).
- b. The tenderer is required to submit a detailed method statement.
- c. The tenderer is required to submit a proposed maintenance execution team organogram.
- d. The tenderer is required to submit the CV(s) and qualification(s) for the execution team. Only qualified technical personnel may perform the Works on OHTE(s).
- e. The tenderer must indicate a clause-by-clause compliance with the specification. All non-compliances must be qualified.
- f. The tenderer must prepared to do a presentation for TFR in terms of been au fait with TFR's requirements.