

PASSENGER RAIL AGENCY OF SOUTH AFRICA

Supply, Delivery, installation, testing and commissioning of 11 kV equipment Between Pretoria and Saulsville.

SPECIFICATION AND SCOPE OF WORK

CIDB (Construction Industry Development Board = 3 EP)

COMPULSORY REQUIREMENTS:

The following schedules shall be returned with the tender document which shall be evaluated:

- *Programme of execution with clear duration of project execution. The duration of the project is 3 weeks.*

SAFETY REQUIREMENTS:

All work in this contract shall comply with the Occupational Safety Act, 1993 (Act No: 85 of 1993). These items shall all be included in the tendered rates. A copy of the act as well as an approved safety file shall be kept on site for the duration of the project.

1. General

- The contractor shall be responsible for the removal and transportation of any necessary scrap long the corridor to Rebeca stores.
- The Contractor shall be responsible for the installation of new pin type insulators between Pretoria and Saulsville
- The contractor shall be responsible for the supply, delivery and installation of 70mm² ABC bundled conductor across 8 bridges between Pretoria station and Saulsville station, including terminations kits (x 2 per bridge), Supporting brackets.
- The contractor shall be responsible for the Supply deliver and install bonding in all the H-frames along the Pretoria – Saulsville line.
- The Contractor shall be responsible for the Testing and commissioning of the installed equipment on the line.

- The contractor shall
 - Perform the services as outlined by the scope of work below.
 - Be responsible for cleanliness of site after the work is done.
 - Work under Prasa supervision at all times
 - Be responsible for security and safety of their staff and equipment during the duration of the contract.

2. Particulars of scope of work

2.1. Specs of the Aerial Bundled Conductors (ABC)

- Aerial Bundled Conductors (ABC) shall be supplied and installed under bridges. The supplied ABC shall be 12 kV rated to SABS 1339 (adapted) with a minimum cross-sectional area of 70 mm². ABC – 70 mm² 3-core (6.6 /11 kV), ABC cable with PVC served galvanised steel wire catenary.
- Double back guides shall be installed on both sides of the bridges - one to support the ABC and the other to support the phases.

2.2. Earthing, Bonding And Surge Suppression

- Before any welding connection, the surface(s) shall be thoroughly prepared as per detailed instructions to ensure a strong and continuous bond. The galvanizing of the structures shall be removed with a grinder, and the surface where the exothermic weld is to be performed should be thoroughly cleaned.
- The area where the galvanizing was removed shall be treated with zinc spraying, hot – patch soldering, or coated with zinc-rich paint complying with the requirements of SABS 920.
- All welded joints shall be “hammer tested” to ensure that the mechanical strength of the joints is sound. Welded joints shall also be painted.
- PRASA’s Technical Officer shall inspect and approve the work before any Grading Ring is covered by soil.
- Rail continuity Bonds – All joints in the rail shall be bonded with 4 x 96 mm² PVC sheeted steel cables. The continuity bonds shall be bolted to the web of the rail using the Expanding collar system. The ends of the bonds shall have lugs

crimped to it, which shall then be fastened to the rail using the Expanding collar system.

- Cross bonds – are applied between various tracks that share the return current. It consists of a 96 mm² PVC sheeted composite bond that is fastened to the web of the rail using the Expanding collar system. Cross bonds shall be provided at intervals not exceeding 500 m.
- Mast to rail bonds – shall exist in spacing not exceeding 350 m (5 spans). They shall consist of a 2x 96 mm² PVC sheeted bond that is fastened with WAM Stud and Lug to the mast and fastened to the web of the rail using the Expanding collar system. The end bolted to the rail shall have a lug crimped to it, which shall be fastened to the rail with a WAM stud. Where no earth wire is connected to the mast, 4 Mast to rail bonds shall be provided.
- Switch Structure – shall be provided with double mast to rail bonds of 96 mm² PVC sheath steel cable.
- The bridges may not be connected directly to the “traction earth wire” or to “rail” but shall be connected to rail via spark gap at 2 separate positions. Furthermore, the “dead” side of the 3kV DC insulators shall be insulated from the structure either by means of an additional disc insulator or insulating pads, bushes or washers between the insulator support bracket and the fixing bolts, the insulator support brackets then being connected to rail either directly or via a common earth wire, with two earth paths. Where only one earth cross span exists, a second shall be installed. The earth conductor protecting each set of “live” cross-spans shall be so arranged as to provide a ring connection with dual connections for every earth point.
- Spark gaps to be supplied as per specification BBB1616 and installed as indicated on drawing CEE-TU-100.
- A 95mm² composite cable shall be supplied and installed for all mast to rail bonds. Rail bonding fasteners shall comply with BBB6017.
- Lightning arrestors compliant to specification BBB2141 shall be supplied and installed as per specification BBB2144.

2.3. 44kV MOD

- Nominal system voltage: 44kV

- Rated current: 800 A
- Frequency: 50Hz
- The control panel for MOD shall be installed inside the substation.
- The control panel shall have the local remote switch, closing and opening switches.
- The opening and closing switch shall also be on the outside box.
- All cabling for the MOD shall be the responsibility of the contractor e.g., cabling required to connect the MOD to the tele-control, trenching for the cable from the substation to the 44kV tower to carry the MOD etc.
- The contractor shall supply and install jumpers (200mm² aluminium conductors) together with the clamps and all the associated works.
- The MOD shall be provided with a name plate. The name plate shall be weather and rust proof.

3. Subcontracting

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

4. Health and Safety

- 4.1.1. The contractor shall be responsible for the safety of personnel on site; a detailed safety plan shall therefore be submitted by the appointed contractor upon award. The safety file requirements are provided to assist the tenderers to cater for the safety aspects.
- 4.1.2. The site access certificate shall only be issued (to the successful bidder) after the evaluation and approval of the safety file.
- 4.1.3. The Contractor shall comply with all applicable legislation and Metrorail's safety requirements adopted from time to time and instructed by the Project Manager / Technical Officer. 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.
- 4.1.4. The Contractor shall ensure that a safety representative is at site at all times.
- 4.1.5. The Contractor shall report all incidents in writing to the Project Manager / Technical Officer. 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.

5. Financial

- 5.1. Payments shall be made for fully functional equipment only, i.e, all work completed.
- 5.2. All prices quoted shall be fixed and firm for the duration of the contract
- 5.3. Penalties shall be applicable for late completion of work and the rate shall be as stipulated in the contract terms and conditions for each day the completion is delayed. Terms and conditions in this contract are applicable in this regard.
- 5.4. Rates supplied in the BOQ shall be used to calculate the final payment for equipment.

6. ANNEXURE "A": EVALUATION MATRIX

6.1. Overall Staffing and Key Professional staff

6.1.1. The contractor shall provide qualified and experienced professional staff for the following positions.

- a) Electrical Installation Supervisors
- b) Electrician

6.2. Minimum Qualifications of the technical staff listed above are outlined below. All educational qualifications should be SAQA accredited.

1.1 ELECTRICAL INSTALLATION SUPERVISORS

- (a) National Certificate level 3 (N3) in Electrical Engineering (Heavy Current) or previously issued with A-brown certificate for 11KV (a copy of the withdrawn certificate shall be provided).
- (b) Trade test certificate.

1.2 ELECTRICIAN

- (a) National Certificate level 3 (N3) in Electrical Engineering (Heavy Current)
- (b) Trade test certificate.

5. TECHNICAL / FUNCTIONALITY REQUIREMENTS

5.1 Details of the technical/functional requirements are presented below:

ITEM	CRITERIA	WEIGHT / SCORING
1	Organizational Experience	40
2	Qualifications and Experience of key personnel	40
3	Project program (Work plan)	20
	TOTAL	100

5.2 Technical Scoring Methodology

Technical Scoring Methodology CRITERIA	WEI GHT	SCORES
<p>Organizational Experience Provide for each successfully completed project/s in the following sequence: Copy of an appointment letter/s on a company letterhead, description of the project, Client name, Client contact (i.e., email and office number), Project start date, project end date, extension of time where applicable, contract value inclusive of VAT.</p> <p>Furthermore, attach completion certificate signed by client or letter from the client confirming successful completion of the project.</p>	40	<p>Score will be based on successfully executed and completed similar projects in the installation of 11 kV substation and transmission equipment in the rail network in the last fifteen (15) years from the presented details in the tender document.</p> <p>Zero (0) Similar Projects/non-submission/incomplete submission = 0</p> <p>1: 1 Similar project = 8 points</p> <p>2: 2 Similar projects = 16 points</p> <p>3: 3 Similar projects = 24 points</p> <p>4: 4 Similar projects = 32 points</p> <p>5: 5 similar projects = 40 points</p>
<p>Key Personnel Experience (based on Submitted CVs) of Key Staff</p> <p>a) Electrical Installation Supervisor b) Electrician</p> <p>Provide copies of original qualifications and certificates of professional bodies. The copies must be certified by the commissioner of oath. The date on the stamp shall be three months or less old, before the closing date of the tender. If the qualification has been awarded in other language than English, please provide translation in English. Evaluation will be done on all 2 personnel and maximum points shall be obtained on 2 personnel. Each must have a minimum of 5 years. All educational qualifications should be SAQA accredited.</p>	40	<p>Detailed CVs of the team members who will be used in completing the works must be submitted. Scores would be based on the experience in the installation of 11 KV substation and transmission equipment in the rail network of proposed personnel. The points will be based on the two key personnel listed here.</p> <p>No information provided/incomplete submission = 0 points</p> <p>1: Average < 5 years of experience of Key Staff = 8 points</p> <p>2: Average > = 5 up to 8 years of experience of Key Staff = 16 points</p> <p>3: Average > 8 up to 10 years of experience of Key Staff = 24 points</p> <p>4: Average > = 10 up to 15 years of experience of Key Staff = 32 points</p> <p>5: Average > = 15 years of experience of Key Staff = 40 points</p>

<p>Project program (Work plan)</p> <p>Provide project schedule in MS projects or MS excel that meets the client’s timeline requirements and the schedule to cover the following key Milestones:</p> <ul style="list-style-type: none"> • Project duration within the targeted duration of 3 weeks. • Resource allocation • Critical Path clearly highlighted • Activities showing safety measures to be taken activities included. <p>The overall schedule should clearly indicate sequencing of activities with clear understanding of scope.</p>	20	<p>Score will be allocated for MS Project or MS excel Schedule provided.</p> <p>No information provided = 0 points.</p> <p>1: Project schedule provided with relevant activities and 1 of the indicated elements addressed = 5.</p> <p>2: Project schedule provided with relevant activities and 2 of the indicated elements addressed = 5.</p> <p>3. Project schedule provided with relevant activities and 3 of the indicated elements addressed = 15.</p> <p>5. Project schedule provided with relevant activities and all the indicated elements addressed = 20.</p>
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A minimum of 60 points shall be attained for the bidder to be evaluated further.

Bill of Quantity

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Removal of all the decommissioned equipment and transportation to Rebecca stores. Including transportation of the ABC conductor and other associated equipment from Capital park Depot to site.	Sum	1	R.....	R.....
2	Install 70mm ² ABC bundled conductor (will be provided by PRASA) across 5 bridges between Pretoria station and Saulsville station, including terminations kits (x 2 per bridge), and all the associated works	M	500	R.....	R.....
3	Supply deliver and install termination kits	Each	5		

	(x 2 per bridge), supporting brackets and all the associated works, during installation of the ABC conductor			R.....	R.....
4	Supply delivery and install surge arrestors on every H frame and bundled conductor on the bridges along Pretoria-Saulsville line	Each	72	R.....	R.....
5	Install pin type Anti vandal insulators for 11kV transmission line. CEE-TPF-4 (Insulators will be provided by PRASA)	EACH	700	R.....	R.....
6	Install link-switches complete and all the associated works. (Link-switch will be provided by PRASA)	Each	2	R.....	R.....
7	Supply deliver and install bonding in all the H-frames along the Pretoria – Saulsville line. This includes (per H- frame) 2 x spark gaps, 2 x PVC cables, and 2 x earth spikes	Each	7	R.....	R.....
8	Supply deliver and install of 44kV MOD at Koedoespoort Traction substation, with all the associated works	Each	1	R.....	R.....
9	Testing and commissioning	Sum	1	R.....	R.....
TOTAL EXCL. VAT					R.....
VAT @ 15%					R.....
GRAND TOTAL					R.....

NB! For the briefing session, attendees are required to wear PPE, that is, a reflective vest and safety boots. Failure to comply will result in the attendee being removed from the briefing session and the attendance certificate will not be signed.