| APPOINTMENT OF A CONTRACTOR FOR THE SUPPLY, INSTALLATION AND COMMISSIONING OF 3KV DC OVERHEAD TRACK EQUIPMENT IN THE NALEDI - JOHANNESBURG PHASE 2 CORRIDOR FOR THE GAUTENG REGION.<br>**Name of the Bidder: ……**<br><br>**Tender Number: 20/07/2023 GAU-(EL)** | prasa<br>PASSENGER RAIL AGENCY OF SOUTH AFRICA |
|---|---|

**COMPLIANCE SPECIFICATION SHEET**

**1 SPECIFICATIONS OF THE WORK OR PRODUCTS OR SERVICES REQUIRED**

| No. | Specification Description | PRASA'S Evaluation Compliance Response: (Yes/No) |
|---|---|---|
| **1.** | **WIRE WORKS** | |
| 1.1 | Supply and install 161 mm² grooved copper magnesium shall be supplied in continuous lengths of 1830 meter [plus 2m minus 0 (zero)] in accordance with BBD 7267 Version 2 and installed in accordance with CEE 241. | |
| 1.2 | Supply and install catenary wire with 160mm² Aluminium Conductor Steel Reinforced (ACSR). | |
| 1.3 | Supply and install feeder wire with 800mm$^2$ (61/4, 25 stranding) hard drawn Aluminium in accordance with SABS 182. | |
| 1.4 | Supply and install feeder catenary contact jumper with 160mm² aluminium soft stranded jumper in accordance with BBH 2161 Version 1 in line with drawing BBH 2164. | |
| 1.5 | Supply and install earth wire with 61mm$^2$ ACSR Conductor. | |
| 1.6 | Supply and install dropper wire made of stainless-steel type. | |
| 1.7 | Maximum span length in the Gauteng region to be applied is 67m. | |
| 1.8 | All terminations shall comply with Drawing CEE-TPB-3. | |
| 1.9 | Spring terminations devices shall apply across the section and all thimbles and Crosby clamps shall be stainless steel throughout. | |

| | | |
|---|---|---|
| 1.10 | All phase and earth conductors shall be 50 mm2 AAC "ANT" (greased) conductor and suspended onto the structures in a vertical configuration. | |
| 1.11 | 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. | |
| 1.12 | 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.** | **SECTION INSULATORS** | |
| 2.1 | The contractor shall supply and install Section Insulators at identified locations, these shall conform to the specification CEE-0054-83. | |
| 2.2 | Section insulators shall only be cut into the overhead wires where the separation between contact and catenary wires is not less than 750 mm after installation of the section insulator. | |
| 2.3 | The contractor shall supply and install numbering plates for all section insulators supplied under this | |
| 2.4 | It is the contractor's responsibility to smooth out kinks on contact wire as a result of tensioning or other activities. | |
| **3.** | **INSULATORS** | |
| 3.1 | All insulators shall be replaced with the vandal proof type. | |
| 3.2 | All such new Insulators shall be of the silicone composite type, adequately rated for the specific voltage and have an ultimate mechanical strength in tension of not less | |

| | | |
|---|---|---|
| | than 54kN, and to SANS standards. The minimum creepage path shall be 450 mm. | |
| **4.** | **EQUIPMENT AT BRIDGES** | |
| 4.1 | All existing bridge cross spans shall be replaced. This work shall include the following:<br>• Replacement of all insulators (composite)<br>• Replacement of cross span wiring (Live – and Earth cross-spans). All turnbuckles and Crosby's shall be stainless steel. | |
| 4.2 | Replacement of all steel supports (including brackets at steel bridges) | |
| 4.3 | Greasing of equipment | |
| 4.4 | Replacement of bolts and plates. | |
| 4.5 | Re-instating bonds and all OHTE and transmission line components | |
| **5.** | **EARTHING, BONDING AND SURGE SUPPRESSION** | |
| 5.1 | 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. | |
| 5.2 | 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. | |

| | | |
|---|---|---|
| 5.3 | All welded joints shall be “hammer tested” to ensure that the mechanical strength of the joints is sound. Welded joints shall also be painted. | |
| 5.4 | PRASA’s Technical Officer shall inspect and approve the work before any Grading Ring is covered by soil. | |
| 5.5 | 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. | |
| 5.6 | 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. | |
| 5.7 | 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. | |
| 5.8 | Switch Structure – shall be provided with double mast to rail bonds of 96 mm2 PVC sheath steel cable. | |
| 5.9 | 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. | |
| 5.10 | Spark gaps to be supplied as per specification BBB1616 and installed as indicated on drawing CEE-TU-100. | |
| 5.11 | A 95mm2 composite cable shall be supplied and installed for all mast to rail bonds. Rail bonding fasteners shall comply with BBB6017. | |
| 5.12 | Lightning arrestors compliant to specification BBB2141 shall be supplied and installed as per specification BBB2144. | |
| **6.** | **SMALL PART COMPONENTS (SPC)** | |
| 6.1 | The contractor shall supply and install the following small parts in accordance to the specifications as indicated:<br>• Push Pull Offs shall be to Drawing CEE-TMGC-14<br>• Cross Spans to DB's shall be to Drawing CEE-TMGC-13<br>• Vertical members shall be to CEE-TMF-106.<br>• Cross arms: Intermediate transmission line X-arms shall be to Drawing CEE-TPF-4<br>• Suspension arm arrangements for supporting Aerial Bundled Conductors | |

| | | |
|---|---|---|
| | on concrete masts and through bridges shall be to drawing CEE-TMGC-22. | |
| 6.2 | The Contractor shall allow for the clamping brackets (back-straps) to be modified (i.e. extended) to include a 14 mm ø hole for bonding cable. | |
| 6.3 | Shop drawings of all the SPC shall be required for approval prior to manufacture | |
| **7.** | **MAST POLE NUMBERING** | |
| 7.1 | The mast pole numbers shall be stencilled on the existing mast poles in accordance to drawing CEE-TW-646. | |
| **8.** | **SCRAPPING OF MATERIAL** | |
| 8.1 | PRASA staff shall be allowed to scrutinize the scrap material and have first choice to remove re-useable materials to the depot supervised stores. | |
| 8.2 | The contractor shall be responsible for the safe movement of scrap to Rebecca Depot. | |
| 8.3 | Abandoned steel components shall not be left unattended on site. The steel shall be removed from the track side after each occurrence, safely stored temporarily (if required) and transported to the Driehoek depot as soon as practically possible. All care shall be taken to avoid unlawful removal of these components from site. | |
| 8.4 | All occurrences shall be documented in the site diary and signed by both parties. | |
| 8.5 | The cost to be allowed for here is:<br>8.5.1. Administration<br>8.5.2. Transport<br>8.5.3. Loading and off-loading | |
| **9.** | **DEMOLITION** | |

| | | |
|---|---|---|
| 9.1 | The contractor shall be responsible for demolition of existing equipment and transporting released material to the Rebecca depot which shall be indicated to the appointed contractor. | |
| **10.** | **CARE FOR SITE** | |
| 10.1 | From the date on which the Site is handed over to the Contractor to the date of the issue of a Certificate of Completion, the Contractor shall take full responsibility for the care of the Works and the Employer's Assets on the Site and of all Plant intended for incorporation into the Works and materials on the Site intended for incorporation into the Works. | |
| **11.** | **OVERALL STAFFING AND KEY PROFESSIONAL STAFF** | |
| **11.1** | the contractor shall provide qualified and experienced professional staff for the following positions.<br>a. Team Leader/Project Director<br>b. Site Supervisor<br>c. Traction Linesmen<br>d. Erectors<br>e. Flagman<br>f. Construction Health and Safety Officer | |
| **12.** | **CUTTING OF VEGETATION AND TREE FELLING** | |