

## **ANNEXURE 3 SPECIFICATION**

### **1. SCOPE OF WORKS AND AREAS OF FOCUS**

#### **1.1 SCOPE OF WORK FOR AERIAL OPTIC FIBRE NETWORK**

- 1.1.1** Pre-build survey for the entire corridors in line with the existing drawings.
- 1.1.2** Supply, installation, rehabilitation, testing and commissioning of 48 core single mode aerial optic fibre network cable ITU G652.D Dark fibre between Signals Equipment Rooms, Tickets Offices, Depots, PRASA Buildings and Substations in Gauteng South region.
- 1.1.3** Supply and install wooden poles 9m long.
- 1.1.4** Supply and install wooden pole suspension fittings.
- 1.1.5** Supply and install wooden termination fittings.
- 1.1.6** Supply and install wooden pole joint fittings.
- 1.1.7** The Contractor shall Apply wooden pole fire protector coating on wooden poles.
- 1.1.8** Supply and install Eco pole stay wire.
- 1.1.9** The contractor shall excavate and Supply concrete for the wooden poles 500mm (L) x 500mm (W)x 1200mm (Depth).
- 1.1.10** Supply and install wire tangent support.
- 1.1.11** Supply and install dead ends.
- 1.1.12** Supply and install dome joints.
- 1.1.13** Supply and install of the I-beam suspension brackets single and dual.
- 1.1.14** Supply and install suspension hooks.
- 1.1.15** Supply and install brick wall terminations and entry plate.
- 1.1.16** Supply and install 43 U 19-inch cabinets at Signals Equipment Rooms, Tickets Offices, Depots, PRASA Buildings, and Substations.
- 1.1.17** Supply and install 1U 19" rackmount 48 LC Splice tray rodent-free patch panel.
- 1.1.18** Supply and install brush panel 1U short base.
- 1.1.19** Supply and install duplex SM LC-LC mid-couplers.
- 1.1.20** Supply and install simplex SM unjacketed LC pigtail 1M.
- 1.1.21** Supply and Install a 3m steel cable tray with all accessories
- 1.1.22** The Contractor shall perform Fusion splicing including all terminations with a splice loss of less than 0,03 and OTDR test.
- 1.1.23** The Contractor shall update an As-built drawing for the optic fibre network.
- 1.1.24** Rehabilitate, re-label, and cable ties all the existing terminations points in the Gauteng South region.

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## **AERIAL OPTIC FIBRE CORRIDORS TO BE RECOVERED**

**Table 1**

<b>SITES &amp; CORRIDORS (AERIAL FIBER 48 Core)</b>	<b>NO. STATIONS</b>	<b>OVERHEAD OFC</b>	<b>TERMINATION SLAG</b>	<b>TOTAL</b>
<b>New Canada to George Goch</b>	<b>22</b>	<b>24,621 KM</b>	<b>6,600 KM</b>	<b>31,221 KM</b>

**Table 2**

<b>SITES &amp; CORRIDORS (AERIAL FIBER 48 Core)</b>	<b>NO. STATIONS</b>	<b>OVERHEAD OFC</b>	<b>TERMINATION SLAG</b>	<b>TOTAL</b>
<b>Germiston to New Canada</b>	<b>2</b>	<b>28 KM</b>	<b>600 M</b>	<b>28,600 KM</b>

**Table 3**

<b>SITES &amp; CORRIDORS (AERIAL FIBER 48 Core)</b>	<b>NO. STATIONS</b>	<b>OVERHEAD OFC</b>	<b>TERMINATION SLAG</b>	<b>TOTAL</b>
<b>Germiston to Vereeniging (Via Meyeton)</b>	<b>6</b>	<b>66,710 KM</b>	<b>1,800 KM</b>	<b>68,510 KM</b>

## **1.2 REQUIRED PROFESSIONAL SERVICES**

- 1.2.1** The appointed company will be required to supply, install, and rehabilitate of Aerial Optic Fibre Transmission Network on an as-and-when-required basis in the Gauteng South region.

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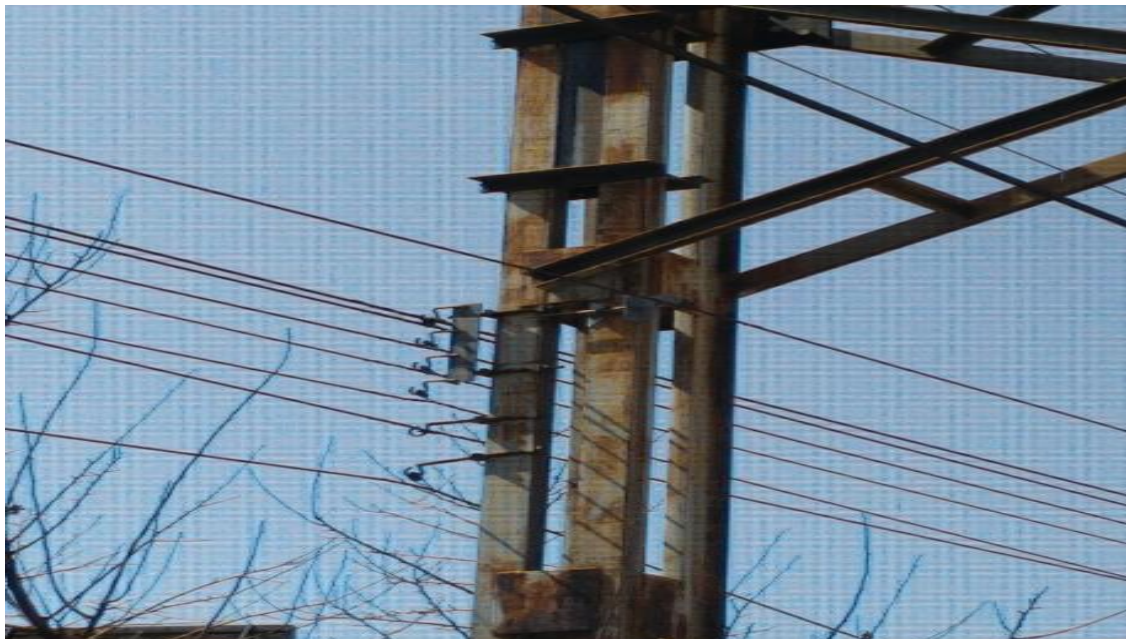


### 1.3 PICTORIALS

#### **SUSPENSION BRACKET**



**Figure 1.3.1 SUSPENSION BRACKETS**



**Figure 1.3.1 OPTIC FIBRE AERIAL WITH SUSPENSION BRACKETS**

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Figure 1.3.2 DOME JOINTS

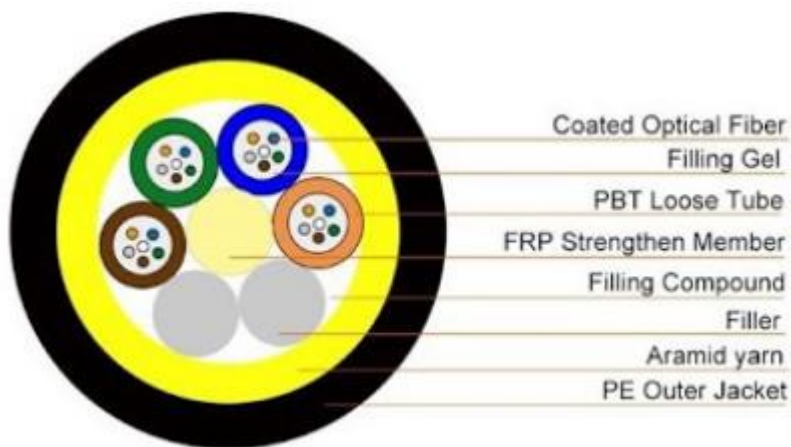
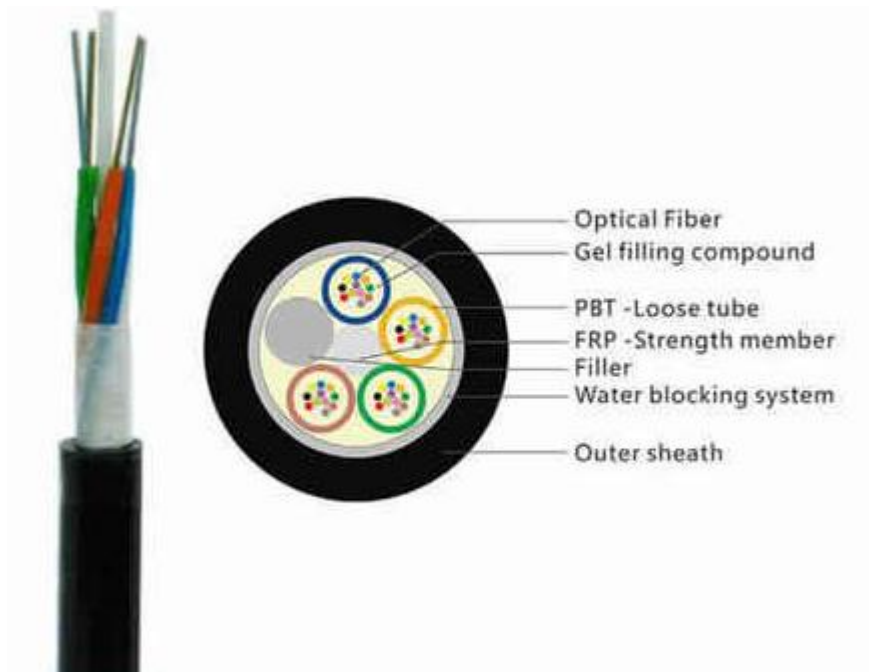


Figure 1.3.3 24 CORE AERIAL FIBRE, 4 TUBES



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**Figure 1.3.4 CORE AERIAL FIBRE, 4 TUBES**



**Figure 1.3.5 AERIAL OPTIC FIBRE DRUM**

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**Figure 1.3.6 RODENT FREE PATCH PANEL**



**Figure 1.3.7 43U 19INCH RACK CABINET**

## **1.4 TARGETED AREA BY THIS PROJECT**

- 1.4.1** New Canada – George Coch line
- 1.4.2** Germiston – New Canada (via India) line
- 1.4.3** Germiston - Vereeniging (via Meyerton) line

## **1.5 EXTENT AND COVERAGE OF THE PROPOSED PROJECT**

The project will cover the following areas: Ticket offices, Electrical Sub-Stations, Signals Equipment Rooms, Depots, and PRASA Buildings.

## **1.6 MEASUREMENTS AND PAYMENT**

- 1.6.1** Claims for payment will be made for completed work only.
- 1.6.2** Any rejected and incomplete work will not be paid for.
- 1.6.3** All rates in the schedule of quantities must be made per unit as requested and should be an all-inclusive rate.
- 1.6.4** The rate quoted by the Contractor (s) and accepted by PRASA must hold well till the completion of the work and shall not be subject to any escalation due to an increase in the local market rates for materials & labor. No claim on this account whatsoever shall be entertained at any stage including the extended period.

## **1.7 OTHER RELATED PROJECTS**

- SAULSVILLE LINE

## **2. SPECIFICATION OF THE WORK OR PRODUCTS OR SERVICES REQUIRED**

### **2.1 PROFESSIONAL TECHNICAL STAFF REQUIREMENTS**

#### **2.1.1 KEY PROFESSIONAL STAFF**

Experience key professional staff in relation to the scope of work – Professionals Services:

##### **2.1.1.1 Team Leader/ Site Supervisor**

The desired minimum qualifications for the Team Leader/ Site supervisor are as follows:

- N6 National Diploma/ National Diploma/ B-Tech Electrical/ Electronic Engineering;
- Minimum of Five (5) years of post-graduation experience in Telecommunication Optic Fibre Networks.

- SAQA Accredited.

#### **2.1.1.2 Optic Fibre Specialist and Technician**

The desired minimum qualifications for optic Fibre Specialist and Technicians are as follows:

- Outside Plant (OSP) Project Specialist certificate, with a Minimum of Three (3) years of experience.
- Certified Fibre Optics Technician, with a Minimum of Three (3) years of experience.
- FOA/ equivalent Certification accredited.
- Working at Heights Certificate.

#### **2.1.1.3 Construction Health and Safety Officer**

- Health, safety, and risk Certified.
- Minimum of 5 years of industry experience as a health and safety officer.

### **2.2 TECHNICAL INFORMATION TO BE PROVIDED WITH TENDER**

The Bidders shall submit Organisational Experience

### **3 TECHNICAL SPECIFICATIONS RELATED TO THIS PROJECT**

The design for this project shall meet the technical capabilities & performance requirements of the Aerial Optic Fibre Network.

#### **3.1 OPTIC FIBRE SPECIFICATIONS**

- 3.1.1** SPC-00033: Optical Fibre Testing Equipment
- 3.1.2** SPC-00575: Planning and Erection of Self-Supporting Optical Fibre Cable on Traction Masts.
- 3.1.3** SPC-00583: Optical Fibre Accessories
- 3.1.4** SPC-01242: Wooden Poles for OFC Installations
- 3.1.5** SPC-01279: Erection of Wooden Pole Routes
- 3.1.6** PRC-00106: Post-installation Test for Optical Fibre Cables
- 3.1.7** PRC-00107: Pre-testing of Optical Fibre Cables on Drums
- 3.1.8** PRC-00112: Written Safe Working Procedures for Erection of ADSS OFC on AC/DC OHTE.
- 3.1.9** SPC-00590: Working to Way leaves, Site Establishment, Safety and Local Authority Requirements



### **3.2 48 CORE SINGLE MODE OPTIC FIBRE CABLE TYPE:**

- 3.2.1** Fibre Count: 48 Fibre Cores.
- 3.2.2** Fibre type: 9/125 um, Single Mode.
- 3.2.3** Number of Elements/ Tubes 4: 12 cores per tube.
- 3.2.4** Temperature performance: - 20 to 70°C.
- 3.2.5** Cable Specification: ITU G.652.D.
- 3.2.6** Cladding diameter: 125 um.
- 3.2.7** Primary coating diameter: 245 um.
- 3.2.8** Operating wavelength: 1310 nm and 1550 nm.
- 3.2.9** The fibre types used must be easily strippable and comply with customer specifications for single-mode optical fibre.

### **3.3 PATCH LEADS REQUIREMENTS PACKAGE:**

- 3.3.1** Insertion loss @ 1310 nm and 1550 nm (Single mode).
- 3.3.2** Return loss @ 1310 nm and 1550 nm (Single mode).
- 3.3.3** Unique serial number
- 3.3.4** Product description.
- 3.3.5** Order number.
- 3.3.6** Date tested.
- 3.3.7** Length of tail or patch-lead.
- 3.3.8** Type of connector.
- 3.3.9** Type of fibre (e.g., 1310nm 1550 nm single modes).
- 3.3.10** The rubber boot of the connector must be green for 8" angle polished connectors. (APC E2000 connectors)
- 3.3.11** A unique identification mark (colour or number) must be applied to either end of Patched-leads to assist with identification of patched-leads in densely populated ODF's or termination cabinet.
- 3.3.12** The A and B leg of Duplex Patch lead must be identified.

**3.3.13** The sheath must be yellow for single mode (SM) and orange for multi-mode (MM).

### **3.4 OTHER OPTICAL FIBRE ACCESSORIES:**

**3.4.1** Pigtails (ruggedized and un-ruggedized).

**3.4.2** Mid-Coupler (Mid alignment sleeves).

**3.4.3** Patch cords with Connectors.

**3.4.4** ODF's (Optical distribution sub racks)

**3.4.5** ODF's (Optical distribution Main Frames)

**3.4.6** Splice protectors

**3.4.7** Joint closures with splice organizers.

**3.4.8** Duplex patch-leads must be offered.

**3.4.9** Cable ties

**3.4.10** Screws

**3.4.11** Heat Shrink

### **3.5 DUST CAPS:**

**3.5.1** Each E-2000 (or otherwise specified) connector or mid-coupler supplied must be fitted with an integrated dust cap to protect the end face from dust and scratches.

**3.5.2** The E-2000 (or otherwise specified) dust cap must be spring-loaded to ensure positive closure when not mated and constructed of a material to protect users from laser radiation.

**3.5.3** Dust caps for other connectors and mid-couplers must comply with the requirements of this specification.

**3.5.4** Dust caps must be color coded to differentiate between single-mode and multi-mode units as well as angle and flush polished.

### **3.6 MID-COUPLER**

**3.6.1** Single-mode mid-couplers must have a ceramic alignment sleeve with a yellow insert for identification purposes.

**3.6.2** Mid-coupler offered must have a self-secured clip that can easily connect to the coupling plate supplied by the optical distribution frame or rack.

**3.6.3** The color coding must be green for 8" angle polished mid-couplers, LC type.

### **3.7 SPLICE PROTECTORS:**

<b>Technical Specifications</b>	
Application Type:	Single Fiber 250µm
Compatibility:	All splice trays, ovens and coated fibers
Colours:	Clear for easy visual inspection
Splice Operating Temperature:	-40°C to +70°C (Heat shrink outer rated at -55°C to +135°C)*
Storage Temperature:	-40°C to +70°C
Length of Splice Protector	60 mm

### **3.8 JOINT CLOSURE WITH SPLICE ORGANIZER:**

- 3.8.1** All closures must be re-enterable and designed to protect splices and bare fiber from environmental and mechanical damage.
- 3.8.2** Closures must be available in various sizes and designed to accommodate splice organizers for a minimum of 48, 96, 144, and 288 splices.
- 3.8.3** All closures must be designed with a minimum of 6 cable entry ports.
- 3.8.4** At ISouth one entry port must be oval or be able to do a "loop through" facility with minimal fiber splices.
- 3.8.5** All cable entry ports must normally be sealed off and will only be opened when required.
- 3.8.6** The closure must be suitable to simultaneously accommodate conventional cables as well as micro-tubes and micro cables.
- 3.8.7** Every component of the closure and organizer must be corrosion-proof.
- 3.8.8** All closures must be UV stabilized for outdoor installation.

### 3.9 INSERTION LOSS:

- 3.9.1** The insertion loss throughout the range of 1260 nm and 1558 nm must not be greater than.

Type connector 1	Specification
Single mode 0° PC	0.3dB
Single mode 8° PC	0.3dB

### 3.10 RETURN LOSS:

- 3.10.1** The return loss throughout the range of 1260 nm and 1580 nm must not be greater than or equal to:

Type connector	Specification
Single mode 0° FC-PC	45dB
Single mode 8° APC	70dB

### 3.11 GENERAL PRECAUTIONS:

- 3.11.1.1** All tests must be conducted between 20 °C and 25 °C.
- 3.11.1.2** For convenience, the optical measurements are performed on cable terminated at both ends.
- 3.11.1.3** On completion of the measurements, the cable may be cut to provide two optical terminations (pigtail).
- 3.11.1.4** If equipment or test methods used are other than those specified below, prior permission must be obtained from PRASA responsible person.
- 3.11.1.5** Test methods and procedures must comply with the following standard: IEC 61300

### 3.12 MEASUREMENT SYSTEM:

- 3.12.1** The source and power meter combination must be stable to within +0, 05 dB over a period sufficiently long to enable a measurement to be completed.
- 3.12.2** The testing source must consist of a 1310 nm and 1550 nm laser (+20 nm) for Single mode and at 850 nm and 1300 nm LED for Multi-mode testing.

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### **3.13 43U 19INCH RACK CABINET**

<b>Rack Height 43U</b>	<b>600 X 600 mm</b>
Maximum Height	2120 mm
Maximum Width	600 mm
Maximum Depth	600 mm
Colour	Black or Gold
Door Type	Glass (steel frame)

### **3.14 TO BE PROVIDED BY THE CONTRACTOR**

- 3.14.1** Site books (each in triplicate) to record All incidents as well as the progress of work during the occupation.
- 3.14.2** All instructions pertaining to the technical details of the work being performed at that time.
- 3.14.3** Upon appointment, the contractor shall supply machinery, equipment, material, labour, consumables, etc. necessary for the undertaking and completion of the works to the satisfaction of the client.
- 3.14.4** The client will require conformance documentation for each item of material procured by the contractor for installation used in this contract prior to the installation.
- 3.14.5** Any damage caused to the property of PRASA will be for the contractor's account.
- 3.14.6** Before commencing construction in any area, the contractor shall verify the positions of services. Where any underground services are shown on the drawings, the contractor shall have the equipment available on-site for as long as is necessary to detect and locate such services and, if so ordered, he or she shall excavate by hand to expose such services in areas and in a manner and at a time agreed upon with the Project manager.
- 3.14.7** Protection of cables- Before any excavations take place near identified service cables, the contractor shall contact the Project manager. The contractor shall advise the Project manager at least 7 days in advance of the actual date on which to excavate near any cable. The contractor shall not use mechanical equipment to excavate within 3m of the estimated position of identified cable and shall, if necessary, expose the cable by means of hand excavation carried out under proper supervision.



### **3.15 QUALITY ASSURANCE**

- 3.15.1** Contractors shall submit descriptive literature consisting of detailed technical specifications, constructional details, and principal dimensions, together with clear illustrations of the material offered.
- 3.15.2** Contractors shall submit material-type test certificates for material to be supplied and used in this contract. These shall be in English.
- 3.15.3** The Project Manager shall be notified timeously for the inspection of material before it is delivered to the site.
- 3.15.4** Testing and commissioning schedules shall be provided for all material provided under this contract.

### **3.16 GUARANTEES AND DEFECTS**

- 3.16.1** The works shall be guaranteed for a period of 12 months commencing from the date of commissioning or hand over to Metrorail whichever comes first.
- 3.16.2** The contractor shall be responsible for guarantees and maintenance-on-guarantees of the equipment, materials, and labour.
- 3.16.3** The contractor shall rectify defects that may arise during the guarantee period within 7 days of being notified by PRASA.
- 3.16.4** Should the Contractor fail to comply with the requirements stipulated above, Metrorail shall be entitled to undertake the necessary repairs of work or effect replacement of defects apparatus or material, and the contractor shall reimburse the client the total cost of such repair or replacement, including labour costs incurred in replacing defective apparatus or materials.
- 3.16.5** PRASA shall issue a completion certificate indicating the completion date.

### **3.17 GENERAL**

- 3.17.1** Should any claim arise due to damage caused by any action of work by the Contractor to the property of PRASA and his employees or any other person/s, the Contractor shall be held liable to settle such claims at his own cost.
- 3.17.2** The contractor shall provide transport, equipment, tools, consumables, supervision, protection, and labour necessary to successfully complete the contract.

**3.17.3** The contractor is to provide a minimum of two technicians for the aerial optic fibre project.

### **3.18 SAFETY: HEALTH, SAFETY, AND ENVIRONMENT**

**3.18.1** All work in this contract shall comply with the Occupational Safety Act No 85 of 1993, National Environmental Management Act 107 of 1997 Act and construction regulation 2014. These items shall all be included in the tendered rates.

**3.18.2** A copy of the act as well as an approved safety file shall be kept on-site for the duration of the project.

**3.18.3** The Contractor shall comply with all applicable legislation and PRASA's safety requirements adopted from time to time and instructed by the Project Manager. Such compliance shall be entirely at the contractor's cost and shall be deemed to have been allowed for in the rates or total prices in the contract.

**3.18.4** The Contractor shall report all incidents in writing to the Project Manager. Any incident resulting in the death of or injury to any person on the works shall be reported within 1 hour of its occurrence and any other incident shall be reported within 24 hours of its occurrence.

**3.18.5** All personnel employed by the Contractor shall have undergone a Health and Safety Induction.

**3.18.6** Permits to work (in line with Covid-19 regulations) shall be issued at the cost of the contractor to all personnel on that shall be signed and stamped by the authorized PRASA Official responsible for Risk Management.

**3.18.7** The contractor shall ensure that all Covid 19 protocols are adhered to.

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

**3.18.9** The safety file will be approved only after all the requirements on the checklist are met. **WITS\_LIB/RISK\_MGT/SHE** File Checklist (version 3) is attached in this regard.

**3.18.10** The contractor shall be responsible for the safety of personnel on-site. The following shall also form part of the safety plan:

- Transportation of equipment and personnel.
- Transportation, storage, and handling of hazardous equipment

- The site access certificate shall only be issued (to the successful bidder) after the evaluation and approval of the safety file.

### **3.19 BONDS AND GUARANTEES**

**3.19.1** Surety in the amount equal to ten percent of the contract price, as elected by the Contractor, shall be provided by the Contractor for the due and faithful performance by him in terms of the Contract. Such security shall be in the form of: -

**3.19.1.1** Government or approved Municipal stocks in negotiable form, or

**3.19.1.2** A deed of suretyship furnished by an approved bank, insurance or guarantee corporation in such form as may be prescribed by PRASA, provided however that the Project Manager may, upon written application by the Contractor, return to the Contractor the whole or part of such security held by PRASA when the retention money has reached an amount which the Project Manager in his sole discretion considers sufficient for the protection of PRASA. PRASA is entitled to hold all or portion of the security until the completion of the contract and the expiry of the defects liability and maintenance period.

### **3.20 PROGRAMME**

**3.20.1** The Contractor shall deliver to the Employer as part of the documentation required before commencement with Works execution, an initial programme of carrying out the Works (hereafter known as the “Project Plan”) in order to meet the Due Completion Date. Whenever the approved Project Plan no longer reflects that actual progress will meet the Due Completion Date, the Contractor shall deliver to the Employer a revised Project Plan.

**3.20.2** The initial Project Plan and all subsequent revised Project Plan shall show and, when relevant, describe in statements, the entire scope of the work to be performed including but not limited to:

**3.20.2.1** The Commencement Date, the commencement of the Works;

**3.20.2.2** the Completion Due Date, and the planned completion date;

**3.20.2.3** the sequence, timing, and resources for carrying out the Works;

**3.20.2.4** the dates for Site accesses and possessions, approvals, instructions, inspections, tests, and all information required to execute the Works;

**3.20.2.5** The events influencing the execution of the Works;

**3.20.2.6** other programming information set out in the Scope of Work; and

**3.20.2.7** on the revised Project Plan, the actual progress achieved for the various parts of the Works, and the amounts paid.

**3.20.3** In the event that the Contractor is not able to complete the Works in line with the Project Plan the Contractor shall submit the revised Project Plan to the Employer for approval indicating the changes to the initial Project Plan.

**3.20.4** The Employer shall, within 7 (seven) Business Days after the Contractor has submitted a revised Project Plan, approve such Project Plan or, giving his reasons, instruct the Contractor to amend it, failing which, the submitted Project Plan shall be deemed to be the approved Project Plan, subject to approval by CBAC.

**3.20.5** The submission to and approval by the Employer of such Project Plan or its revised Project Plan, or the delivery of any relevant particulars, shall not relieve the Contractor of any of his duties or responsibilities under the Contractor's Contract.

### **3.21 PRICING THE WORKS**

**3.21.1** The contractor is required to provide firm prices/ rates for material and labour for the duration of the contract.

**3.21.2** The contract period shall be inclusive of the delivery and installation period as well as an additional period of at least one year starting from the date of acceptance by the client of the last unit.

**3.21.3** The contractor shall make provision for the costs (direct or otherwise) associated with works on, over, or adjacent to railway lines. The Contractor is advised to study the requirements of the SPK 7/1 and ensure that all works can be completed in accordance with these requirements.

**3.21.4** The contract offer shall be based on the rates as indicated in the bill of quantities. The quantities shall be agreed upon during construction per section.

### **3.22 PENALTY FOR DELAY**

**3.22.1** If the Contractor fails to complete the Works to the extent which entitles him to receive a Certificate of Practical Completion, by the Due Completion Date, the Contractor shall be liable to the Employer for an amount calculated 0.3% of the Contract Price per delayed day, which shall be paid for every day which shall elapse between the Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum of 10% of the Contract Price.

**3.22.2** The imposition of such penalty shall not relieve the Contractor from his obligation to complete the Works or from any of his obligations and liabilities under the Contract,

**3.22.3** The Employer may set off or deduct from the fees due to the Contractor any penalty amounts due and owing by the Contractor in terms of clause 6.22.1.

**3.22.4** If, before the issue of the Certificate of Practical Completion the whole of the Works, any part of the Works has been:

**3.22.4.1** Certified by the Employer as complete in terms of a Certificate of Completion,

**3.22.4.2** Occupied or used by the Employer, his agents, employees or other contractors (not employed by the Contractor),

**3.22.5** The penalty for delay shall be reduced by an amount that is determined by the Employer to be appropriate in the circumstances.

**3.22.6** If the penalty payable by the Contractor has reached 10% of the Contract Price, then any subsequent breach shall become a material breach and the Employer shall be entitled to terminate the Contract immediately.

### **3.23 COMMISSIONING TESTS AND COMPLETION**

**3.23.1** Designated PRASA personnel, in conjunction with the Contractor, shall carry out the final commissioning test. The Contractor shall carry out any remedial work, if necessary.

### **3.24 MANDATORY SECURITY REQUIREMENTS**

**3.24.1** The Contractor shall provide security personnel for the duration of the contract.

**3.24.2** All security companies used by the Contractor shall be PSIRA registered with a valid letter of good standing.

**3.24.3** Security personnel shall all be PSIRA registered with a clear criminal record no criminal pending cases and preferably be sourced from the local community.

**3.24.4** All personnel employed by the Contractor including sub-contractors shall have undergone a Health and Safety Induction.

**3.24.5** Permits to work (in line with Covid-19 regulations) shall be issued at the cost of the contractor to all personnel on that shall be signed and stamped by the authorized PRASA Official responsible for Risk Management.

**3.24.6** The security to be provided by the contractor shall be responsible for both the appointed contractor's assets and PRASA's assets on site until the site is handed over to PRASA. A list of all functioning equipment that does not form part of this scope of work will be shared with the successful bidder and shall be signed off by both the successful bidder and PRASA's representative.

**3.24.7** PRASA assets that shall be guarded by the contracted security includes Permanent way assets, All Train Authorisation on track elements, all train stations (with all assets included) along the section, and all functioning equipment along the corridor.

**3.24.8** Any lost or stolen material shall be replaced by the contractor at his own cost.

**3.24.9** The contractor shall provide on-site security for personnel and material stock and should ensure that patrols are in place at the section handed over to the contractor and until the completed work is handed over to PRASA. No claims of material or losses shall be lodged with the client for stolen goods during the construction before the completed work is handed over to PRASA.

**3.24.10** Furthermore, it is the contractor's responsibility to ensure that valuable metal i.e., copper is adequately protected while in transit to and from the site.



**3.24.11** The contractor shall make sure that all material removed from the site is quantified, counted, and logged in the site diary and that it is co-signed by a PRASA representative on site before it is removed from site.

**3.24.12** Scrap metal removed from the section shall be adequately protected until it is delivered to PRASA's stores.

**3.24.13** PRASA reserves the right to conduct ad-hoc inspections to ensure Compliance

### **3.25 RISKS**

**3.25.1** Tabulated below are the associated security Risks and proposed mitigation measures. It should be noted that this are minimum risks identified and bidders shall be responsible for conducting their own risk assessment that will influence their quotations.

<b>Risk</b>	<b>Probability</b>	<b>Mitigation</b>
Project Hi-jacking – Regulation 9 30% Subcontracting. This includes the provision of security.	High	Social Facilitation to ensure community involvement and buy in. PRASA recommends an approach that involves the local community. Failure to ensure local involvement can result in serious work stoppages.
Theft of Installed equipment	High	Fit for purpose security with an integrated plan for assets installed and physical security at site office. Ensure protective measures for site with access gate.
Hi-jacking of site personnel vehicles	High	Armed Escorts to and from the site
Armed Robbery of personnel on site and Storage Facility at site	High	Armed Guarding at site and site office with an armed response for mobilisation

### **3.26 SCRAPPING OF MATERIALS**

- 3.26.1** PRASA personnel to identify scrap, usable materials for proper storage and scrapping process.
- 3.26.2** All materials which are identified as scrap shall be delivered to Driehoek store for the scrapping process.
- 3.26.3** The contractor shall ensure that the derecognition of assets process is initiated by PRASA authorized person before decommissioning of assets.
- 3.26.4** The contractor shall load and offload the scrap to and from sites.
- 3.26.5** The cost for decommissioning, administration, Transportation, loading, and offloading work shall be included in the project.

### **3.27 HANDOVER**

- 3.27.1** Copies of the operator's manual shall be supplied.
- 3.27.2** Complete as-built drawings shall be supplied for Aerial fibre.
- 3.27.3** All products manuals shall be supplied.
- 3.27.4** Test and compliance certificate shall be supplied.

### **3.28 SKILL TRANSFER**

- 3.28.1** The contractor shall provide on-site skill transfer on the installation of an optic fibre network to 7 PRASA Telecoms personnel.
- 3.28.2** Skill transfer shall comply with the Outside Plant (OSP) for installation of aerial optic fibre network to telecoms personnel.