



Provisional Bills of Quantities for the Proposed Refurbishment of Trans Kalahari Border to a One Stop Border Post, at Buitepos, in Omaheke Region

for

NAMIBIA REVENUE AGENCY

Bid No.: _____

ANNEXURE III: DATA AND TELECOM INSTALLATION WORKS

Name of Bidder: _____

Bid Price (N\$-Incl. VAT): _____

PROJECT TEAM

Client	Architect	Electrical/Mechanical Engineer	Structural/Civil Engineer	Quantity Surveyor
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JANUARY 2024

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SCOPE OF PROJECT SPECIFICATIONS

The Project Specifications consist of two Portions:

- PORTION 1** Covers a general description of the Works, Site, circumstances, site facilities available and aspects requiring specific attention and requirements to be met by the Contractor.
- PORTION 2** Electrical Specifications covering amendments and additions to the SABS/SANS Standardised Specifications, applicable to this Contract.

STATUS OF PROJECT SPECIFICATIONS

The Project Specifications form an integral part of the Contract Document and shall be deemed to be included in and form part of the Specifications. In case of any discrepancy or conflict with any parts of the Standardised Specifications or the Drawings, the Project Specifications shall take precedence and shall govern.

PORTION 1: THE WORKS

PS 1 GENERAL DESCRIPTION OF THE WORKS

The contract covers all the Site Works required for the construction of Medium Voltage, Low Voltage and Building Electrical infrastructure for the Transkalahari Border One Stop Border Post, Omaheke Region, Namibia, The works include the upgrade of a 50 KVA Transformer to 200 KVA, underground feeder cables, distribution kiosks, streetlights, building distribution boards and building receptacles.

The Site Works would include:

- Establishment of necessary camp, personnel, plant and equipment on site;
- Setting out of Works;
- Locate, expose, protect and survey of existing services;
- Accommodation of traffic in road reserves, access to erven, facilitation of road crossings as and where necessary during the execution of the Works;
- Ensuring and maintaining site safety at all time during the construction of the Works for all site personnel, motorists, pedestrians and the general public in accordance with the applicable safety rules and regulations;
- Clearing and grubbing of site areas as required for the construction of the Works only;
- Construction of services;
- Testing of all works;
- Additional work as instructed by the Engineer;
- Finishing and trimming of the site.

The description serves to outline the extent of the Works, but does not limit the amount of work, which may be required by the Contractor under this contract. Approximated quantities are stated.

The Contractor is responsible for protecting his Works against damages by the general public during construction. Damage can largely be prevented by not letting incomplete works remain open for long periods of time.

PS 2 DESCRIPTION OF THE SITE AND ACCESS

The site is located at the "Kalahari" border Post, 110 km east from the Town of Gobabis in the Omaheke Region outside Gobabis. Approximate GPS Coordinates:

Latitude: 22°16'30.43"S
Longitude: 19°59'22.54"E

PS 3 NATURE OF GROUND AND SUBSOIL CONDITIONS

No subsoil investigation was conducted. The Tenderer should familiarise himself with the site and the nature of the ground and sub-surface conditions. Based on visual inspections it appears as if the top section of the ground surface is covered with loose sandy material.

PS 4 DETAILS OF THE CONTRACT

This Contract covers all the work for the construction of bulk electrical services in Buite Pos Extension 8. Although this description serves to outline the extent of the Works, it does not limit the amount of work which may be required to be carried out by the Contractor under this Contract. Approximate quantities for the work to be carried out in accordance with these Contract Documents are listed in the Schedule of Quantities for this Contract (Part D).

PS 4.1 General

The general items of work to be executed under this contract include the following:

- Establishment on site of Contractor's construction camp and the moving of his plant, materials and personnel to the Site. The Contractor is obliged to remove all these items upon completion of the Contract;
- Provision of services required for construction;
- Setting out of the Works;
- Maintenance and protection of the Works under construction;
- Accommodation of traffic;
- All responsibility pertaining to the safety on site;
- Testing of materials and control over the quality of workmanship;

PS 4.2 Upgrading and Alterations of Existing Services

Care to be taken by Contractor not to damage existing services (refer to PSA 5.4).

Alterations to existing services shall only be implemented as indicated on the Drawings or as indicated by the Engineer.

Service departments of the Council and Telecom must complete alterations to their relevant services within a period of 30 days, after having been reasonably requested as such by the Contractor.

PS 4.3 Maintenance

The construction area will be handed over to the Contractor by the Employer upon the commencement of the Contract. During the construction period the Contractor will be responsible for the traffic accommodation, site safety as well as all other temporary works.

After completion of the Works, maintenance shall be as specified in the General Conditions of Contract.

PS 5 SITE FACILITIES AVAILABLE

PS 5.1 Services

The Contractor shall make his own arrangements for the acquisition of water, power and all other services for construction purposes and shall be responsible for the cost thereof. The Contractor must ascertain the position of the nearest available municipal services to the Site, from the Council.

The water used for the mixing of concrete or slurry shall be to the satisfaction of the Engineer.

PS 5.2 Camp Site

Areas that could be used for the possible establishment of the Contractor's camp will be pointed out by the Client during the official tender site inspection. Staff will not be allowed to overnight on site, except for two security guards.

PS 5.3 Survey Beacons, Bench Marks and Reference Pegs

Benchmarks with co-ordinates and levels will be indicated on the construction drawings. The Contractor is responsible for the setting out of the Works and should include it in the tendered sum in Section 1 of the Schedule of Quantities/ Priced Activity Schedule. The Contractor is also responsible to see that no reference/bench marks, beacons and erf pegs are covered up or disturbed. Should the Contractor's Surveyor identify vertical or horizontal alignment discrepancies of the design with regard to the erven and accesses, or any of the services to be constructed, he must report this to the Engineer well in advance of the commencement construction. Under this contract, the Contractor will set out the entire Works including levels and compare the data to that given as part of the design and indicated on the design drawings. The Contractor shall report any discrepancies to the Engineer well in advance of the commencement of construction.

PS 6 **SITE FACILITIES REQUIRED****PS 6.1** Laboratory Facilities

An approved laboratory shall carry out the Contractor's process control tests. The Contractor shall liaise with the Engineer on the testing procedures that are to be followed. The approved laboratory will not be the same as the laboratory used for the Engineer's Control Testing as per PS 6.2 below.

PS 6.2 Control Testing by the Engineer

Control Testing shall be carried out as instructed by the Engineer, or as amended by Notice afterwards. The Contractor shall arrange payment of such laboratory, upon clearance of such payment by the Engineer. The cost for such testing as well as a 10% handling-fee shall be paid to the Contractor under this item in the Bill of Quantities.

PS 6.3 FACILITIES FOR ENGINEER

The Contractor shall make provision for a room furnished with a table and chairs to accommodate 10 people, suitable for site meetings, and which shall be at the Engineer's disposal at any time.

The Contractor shall make provision for a measuring wheel, electrical multimeter and 100m measuring tape to be on site and which shall be at the Engineer's disposal at any time.

PS 6.4 Sanitary Facilities

The Contractor shall provide adequate toilet facilities for all personnel on site. The facilities should be kept clean and be properly maintained for the duration of the project. Under no circumstances would the Contractor or his personnel be allowed to dump or dispose of any effluent on site.

PS 7 **SITE MEETINGS**

Monthly site meetings, or more regularly if required, shall be held and attended by an authorised representative of the Contractor with delegated authority to take contractually binding decisions. The meetings will be held at the site offices of the Contractor.

PS 8 **NOTICE BOARD**

One notice board, with Employer, Contractor's and Engineer's details shall be erected. Refer to the applicable drawings for details of the notice board.

PS 9 **APPLICABLE STANDARD SPECIFICATIONS**

All material and equipment supplied and/or installed under this contract shall be new and the best of their respective kinds and shall comply with the requirements laid down in the latest editions of the relevant SABS or BS and their amendments (if any) and the requirements of this Specification.

In event of items bearing the SABS mark being available in respect of the materials and equipment required, only items bearing this mark will be acceptable.

The workmanship under this contract shall be of a high standard and to the satisfaction of the Engineer.

The work shall be carried out in accordance with the General Technical Specification laid down in Section 2 of this Specification.

These Standardised Specifications are not issued with the Contract Documents.

PS 10 PAYMENT CLAUSES

SABS/SANS payment clauses not shown in the Schedule of Quantities will not be applicable to this contract.

Only payment clauses shown in the Schedule of Quantities will prevail and the Contractor must make provision in his rates to cover all incidentals required as per the drawings to perform the task to the satisfaction of the Engineer.

PS 11 QUALITY ASSURANCE SYSTEMS

The Quality Assurance Systems shall consist of procedures, checks and balances to ensure compliance with all requirements of the Contract inclusive of the requirements to Tender: "Minimum Requirements for Contractors Quality Assurance System". Such procedures, checks and balances shall be documented in a manual for the implementation by all key staff members of the Contractor. The Contractor shall ensure that all key staff members are trained and equipped to implement the Quality Assurance System.

The Quality Assurance System shall address all requirements of the Contract, but particularly:

- Minimum requirements;
- Quality control system;
- Measurement system;
- Approval system;
- Site administration

Which sections shall all be divided into "general" and "project specific" parts. The "general" part shall contain the Contractor's standard best practice. The "project specific" part shall contain project specific requirements, especially with regard to Quality Control Systems, which shall reflect the requirements of the Standard and Project Specifications.

The Quality Assurance Manual shall further contain an Appendix, showing the responsibilities of all site staff, relating to quality control. Name, designation, experience and qualifications, as well as function and responsibility for the quality of each listed staff member shall be included.

The Quality Assurance Manual shall be kept in the site office, and shall be available to all staff members who are involved in quality assurance. Proof of relevant training of listed staff and their familiarity with the content of the manual must be provided upon notice by the Engineer.

The Contractor will be required to provide as full time on site a Site Agent dedicated only to this project for the entire duration of the project. The Site Agent should have a minimum of 5 years' experience in the Electrical Construction industry with specific reference to MV/LV Cable terminations, Laying of MV/LV cables, Kiosks installation including wiring, Streetlight installation, applicable earthworks and the setting out of electrical lines. The Site Agents appointment to the project will be subject to the Engineers approval.

The Site Agent will under no circumstances be allowed to be absent from the site without the written approval of the Engineer. Should this approval be granted the Contractor will be required to provide an equally or better qualified replacement for the duration of the Site Agents absence from the site.

A detailed Curriculum Vitae of the Contractors proposed Site Agent should be attached to Schedule 4 (Schedule of Personnel Offered) and submitted with the tender documents.

Should the Contractor fail to comply with this sub-clause, Preliminary and General payments will be withheld until such time that the Contractor does comply to the above provisions.

PORTION 2: AMENDMENTS AND ADDITIONS

1 MINIMUM REQUIREMENT FOR THE INSTALLATIONS

- 1.1 Referenced Proof of at least Three completed similar projects
- 1.2 CV of Competent and Qualified Electrician with Minimum of three Years Working Experience

2 CABLING SPECIFICATIONS FOR NETWORK INSTALLATION UTP CABLE

All copper cable installations must comply with ISO11801, EN50173 AND TIA/EIA 568A. Four pair bundled UTP of 0.51mm diameter core size must be used.

Cables installed inside cabinets are to be secured in such a manner as to ensure free movement of doors and covers.

Fly-leads and patch cables specification: 7/0.16 stranded conductors, polyolefin insulated. Must meet ISO 1101 AND en 50173.

The maximum allowed link is 100 meters. Fly-leads are not to exceed 7.5 meters.

The stripped and untwisted length of the cables to be made off for termination must comply to MOD-TAP Category 6 specifications.

The conductors must be solid copper of 26 AWG.

The cable must have 4 pairs of conductors. Multi core cables are not allowed.

The conductor colour coding must be in accordance with CAT 6 specifications.

The cable must be stamped with the following details:

Name of Manufacturer

Specification, it has been tested to (TSB 568 or ISO 11801, etc)

Name of testing laboratory that verified performance to specification, and

Cable rating.

Cables may not be terminated onto cross-connection frames. Cables may never be installed in the same duct or tray as power cables.

3 WIRING ACCESSORIES

Diameter clamps, adjustable releasable clamps and cable ties are to be used within cabinets that are not equipped with cable ducts. Adhesive wiring accessories are not to be used.

4 CONNECTORS

RJ-45 connectors must be AMP or SS type with 50 micron-inch gold plated contacts.

5 TERMINATION TOOLS

Only termination tools as specified by the specific manufacturer or termination blocks are to be used.

6 CABLE PROTECTION

Where cable re-routed through metal partitions, panels or shields, the holes are to be protected with rubber grommets or nylon protected edging.

7 CABLE SLACK

Two-meter slack plus enough slack to terminate a cable three times is to be provided per UTP cable termination point.

8 CABLE TRUNKING

In some sections of the structure, galvanized steel cable trays are used to reticulate electronic and electrical services between sections and floors of the Hangar. The Network Sub-Contractor is required to liaise with the Electrical and other Electronic Sub-Contractors as to the allocation and spacing of cables on these trays. It is necessary to ensure adequate spacing between electrical and communications (data) cables.

9 WALL OUTLETS

All outlets must conform to MOD-TAP or equivalent specifications.

Cable pairs may only be stripped and untwisted to the length that is absolutely necessary and comply to MOD-TAP or equivalent specifications.

Care must be taken not to place outlets directly under power sockets and water outlets.

10 COPPER CABLE (UTP CABLE)

At each workstation point the following numbering will apply:

At termination point the label will indicate from which hub/switch it is feeding and the room number and the patch-panel number.

At the hub or patch-panel the number will clearly indicate to which point it is feeding and the room number where that specific point is located.

Copper cables are to be marked using a printed adhesive label attached to the length of the cable and covered by a clear heat shrink sleeve 10mm longer than the label so that a minimum of 5mm overlaps each end of the label.

11 CABLING SPECIFICATIONS

A Main Distribution Frame (MDF) is to be provided by Telecom Namibia. The Sub-contractor shall provide cabling from the MDF to a Building Distribution Frame (BDF). All draw boxes and conduiting shall be supplied by the Electrical Sub-contractor. Cabling shall be provided from the BDF to telephone outlets by the PABX Sub-contractor.

All Voice copper cables are to be of the multi-core voice standard. This cable shall be supplied and installed by the PABX Sub-Contractor.

The PABX Sub-contractor will supply voice fly lead cables, which shall connect from the RJ45 sockets to the instrument.

The cable must be stamped with the following details:

- Name of Manufacturer
- Specification, it has been tested to (TSB 568 or ISO 11801, etc)
- Name of testing laboratory that verified performance to specification, and

- Cable rating.

12 WIRING ACCESSORIES

Diameter clamps, adjustable releasable clamps and cable ties are to be used within cabinets that are not equipped with cable ducts. Adhesive wiring accessories are not to be used.

13 TERMINATION TOOLS

Only termination tools as specified by the specific manufacturer or termination blocks are to be used.

14 CABLE PROTECTION

Where cable re-routed through metal partitions, panels or shields, the holes are to be protected with rubber grommets or nylon protected edging.

15 CABLE SLACK

Two-meter slack plus enough slack to terminate a cable three times is to be provided per UTP cable termination point.

16 WIREWAYS

Conduiting will be made available by the Electrical Sub-contractor.

17 WALL OUTLETS

All outlets must conform to MOD-TAP or equivalent specifications.

Cable pairs may only be stripped and untwisted to the length that is absolutely necessary and comply to MOD-TAP or equivalent specifications.

Care must be taken not to place outlets directly under water outlets.

18 PABX

A digital PABX system shall be supplied and installed. The PABX shall be installed complete with a modem for remote service and maintenance, to allow system changes, monitoring, fault analysis and correction. The PABX customer programmed functions shall be duplicated to a removable media so that after any fault condition it may be reloaded. The PABX shall have built-in diagnostic functions for fault finding, accessible via a local PC, switchboard or a remote PC via a modem. The system shall provide differentiated ring and tone signals to indicate, for example, whether a call is internal, external or call back.

19 POWER SUPPLY AND BACKUP

Power supply to the PABX is provided from a dedicated socket outlet. The PABX shall continue to function, uninterrupted by power failure, for up to four (4) hours from its own back-up battery system. In the event of a power failure incoming calls shall be switched through to pre-assigned extensions.

20 PABX CONFIGURATION

Customer configuration settings shall be programmable without interruption of system operation:

- From the switchboard, or
- By remote access via modem, or
- Via a personal computer

The system configuration shall be stored in non-volatile memory. All configuration changes shall be password protected.

The following minimum functions shall be configurable:

- Hunting facilities on extensions
- Pick-up groups
- Internal/external telephone directory features
- Night service features
- Pin codes
- Voice mailbox features

- Trunk barring by class of service (5 classes). The recommended classes of service shall be:
 - ✓ Internal only
 - ✓ Local, no cellular
 - ✓ Local, including cellular
 - ✓ Local, Namibia, including cellular
 - ✓ International with cellular

- Dedicated incoming lines to certain extensions for fax machines, directors extensions, building control, alarm system etc.
- Functions such as call pickups; group call and call diversion should be programmable for groups of extensions.
- Group hunting: a call to an extension in a group is forwarded in a predetermined sequence to other extensions of the same group, if the original extension is busy.
- Central abbreviated dialling list to provide for at least 250 speed-dial numbers.

21 SYSTEM EARTHING AND LIGHTNING PROTECTION

A separate earth, with resistance of less than 1 Ohm, will be provided by others within 5m of the PABX system. The system shall be connected to this earth by the PABX Sub-Contractor.

The PABX system shall be provided with lightning surge protection as follows:

- All lines shall be provided with low voltage surge protection with at least 10kA discharge current rating and ultra-fast response time.
- Power supply to PABX shall be provided with surge protection with 65kA discharge current rating.
- All data lines connected to the PABX shall be provided with surge protection. This includes any link to the PC-based management system or a PC-based voice mailbox system.

22 SYSTEM OPERATOR EXTENSION

The operator switchboard extension shall be provided with the same features as specified for a standard extension, with the following additional functions and features:

- An LED screen-based desktop operator console
- Identification of each call as:
 - ✓ Internal call (extension number and name of calling party identified)
 - ✓ External call (calling party identified)
 - ✓ Reverted transferred call (extension number and name of called party identified)
 - ✓ Unanswered reverted call (extension number and name of called party identified)

- Return of all unanswered calls to the operator after a programmable period.
- Transfer of calls with or without announcement. Transfer of internal calls shall also be possible.
- The operator shall be able to override a conversation. A warning tone must be sounded. Certain extensions may be excluded from this facility.
- Selection of night service facility

- Trunk line and extension line test facilities, to test if line is busy or out of order.
- Camp-on incoming calls to a busy extension with programmable call-back timing feature.

23 STANDARD EXTENSION

The following features shall be standard for all extensions; as determined / restricted by their "Class of Service".

- Call-back when free on trunk lines busy or internal extensions busy.
- Enquiry and transfer of calls
- Conference call for at least 3 parties
- Call forward always. (Follow me)
- Call forward busy
- Call forward no-reply

The above shall be individually programmable.

- At least 10 private speed-dial numbers per extension.
- Do not disturb. Users dial themselves present or absent. Incoming calls are routed to voice mail or to the switchboard.
- Call pick-up. Calls to any extension can be picked up from other extensions. (Individual, group, common.)
- Last number redial.
- Code locking of extension to prevent unauthorized use.
- Parking. Ongoing calls may be temporarily parked (on hold) for later retrieval or pick-up from another extension.

24 CORDLESS EXTENSION

Cordless extensions shall be provided where specified. The features for any cordless extension shall be identical to the "Standard Extension". The following specifications apply to cordless extensions:

- DECT digital technology/GAP compliant
- Range: 50m indoors, 300m outdoors
- Battery capacity: Talk time: 10 hours minimum
- Standby time: 90 hours minimum
- Adjustable ring signal and volume
- Weight, not more than 150 g

Cordless extensions shall be provided complete with power adaptor, base, desk stand, belt clip and full documentation. The cordless extension shall be fully compatible with the PABX system supplied.

The Bidder must please note that:

- I. **The Bidder is ultimately responsible for the detailed installation of all materials and equipment therefore he must read the drawings carefully. Should he feel that certain changes should be made he must contact the Engineer who will issue a site instruction.**
- II. **Although drawings are provided which are as accurate and complete as possible the successful Bidder will have to closely liaise with the Architect; Engineer; Main Contractor and specialist sub-contractors to confirm the exact position of each outlet and the requirements of each DB.**
- III. **The Bidder must allow for this "extra" requirement in his rates**

25 INFORMATION, DIAGRAMS, DRAWINGS AND MANUALS TO BE SUBMITTED

As part of his bid and subsequent contract, it will be required from the Bidder to submit certain documents, in accordance with the following programme:

WITH THE BID (AT CLOSING DATE):

- Marked-up copies of all drawings indicating in red all required alterations to the concrete, brickwork or whatever other aspect falling outside the scope of his contract;

- Manufacturer's pamphlets and/or brochures illustrating all equipment offered;
- Sketches/rough drawings showing the principle of the design in general and specifically where it deviates from the proposed layout and details given by the Engineer. Attention should be given to space requirements, ease of maintenance, practical problems during installation, etc. in drawing up sketches. If no such sketches are submitted or if any aspect of the design is not specifically detailed or highlighted, it will be assumed that the Engineer's proposal is acceptable, practical and economical;
- Any other information that the Bidder regards necessary to clarify his offer.

WITHIN 30 DAYS AFTER AWARD OF THE CONTRACT:

- Working drawings of all electronic boards showing layouts, equipment used and dimensions of boards for approval;
- A work programme as specified herein.

ON COMPLETION:

- A complete set of "As-Built" drawings;
- Final resistance test certificates;
- Continuity measurement results to be conducted on the completed sections of the installation;
- A certificate of acceptance by the Employer;
- Complete set of maintenance/operating manuals.

All certificates shall be completed in an orderly and logical manner, and shall be bound in booklet form with a protective cover. The text of instructions, diagrams and drawings shall be "English".

26 APPROVED MATERIAL

In the Bill of Quantities, the material is set out in detail to assist the contractor. The preferred manufacturer and code/type are indicated in Part C2. If the materials of other manufacturers are offered, these materials have to be approved by the Engineer.

All inferior work or work containing inferior material, shall be rejected by the Engineer at his discretion, where upon the Electrical Contractor shall immediately remove and rectify the works as required and bear all costs in connection therewith.

27 COMPLETENESS OF BID

The Bidder shall allow in his bid price for all material, labour, supervision, transport, tests and all other items necessary to complete the contract in its entirety and to the satisfaction of the Engineer.

In the event where the supply and/or installation of any item, material or equipment does not form part of this Contract, it will be specifically indicated as such in this specification and/or on the accompanying drawings.

28 RESPONSIBILITY OF THE CONTRACTOR

Until the Contract Works have been completed or deemed to have been completed the Contractor shall be responsible (subject to the Memorandum of Agreement and the Conditions of Contract), for the Contract Works, where under construction, during tests, or in use by the Employer.

The Contractor shall nominate a full-time contract manager, with a minimum of a telecoms / IT artisan's qualification, properly introduced and approved by the Engineer to manage the contract for the full duration of the contract.

During the period of maintenance, the Contractor shall make such arrangements as to ensure the attendance on Site within twenty-four hours of his being called upon to do so, of a competent representative for the purpose of carrying out any work

or maintenance for which the Contractor shall be liable, and during such part of parts of the said period as the Engineer may deem it necessary the said representative shall be continuously available on the Site.

Work onsite shall be carried out at such times and during such hours as the Engineer may require.

29 INSPECTIONS AND TESTS

All equipment will be inspected and tested, both in the factory during manufacturing and on-site during installation. The tests required are prescribed in the standard and detail specification. The engineer will do all inspections accompanied by the contractor and the contractor shall perform all tests with the engineer as witness.

The engineer will require seven (7) days notification to avail himself for any tests or inspection. The contractor shall arrange for the maximum number of tests and inspections to be done on the same day.

The contractor shall provide all testing facilities and instruments and all equipment and labour required for a test or inspection. All instruments shall be adequately scaled for the application. All testing facilities and instruments remain the property of the contractor.

All instruments used shall have a valid test certificate issued by an accepted testing authority. The engineer reserves the right to call for a calibration test on any instruments used during the test.

The contractor shall record all results of the tests done on a test certificate, of which the engineer must receive two (2) copies.

The contractor shall ensure that the equipment is ready for testing or inspection and that the equipment conforms to the specifications before the engineer is requested to witness tests or inspections. Should it be found that the equipment or contract works is not ready for testing/inspection, or does not conform to the specification, the client reserves the right to charge the contractor for any re-tests or subsequent costs.

30 COMMISSIONING

The Contractor shall be responsible for commissioning all sections of the works and shall perform the tasks set out below:

- a) Prior notice of and proper arrangements for the commissioning shall be made with the Employer, Engineer, Supply Authority, and all contractors and suppliers of equipment which will be affected by the commissioning operation.
- b) If plant and equipment which has been supplied by others has to be commissioned, the supplier's specific permission thereto, together with any specific requirements relating to commissioning shall be obtained prior to commissioning.
- c) All sections of the works shall be carefully inspected by a responsible representative of the Contractor to ensure that all construction and installation work has been properly completed.
- d) In particular the following pre-commissioning checks shall be done:
 - circuit breaker, fuse, cable and protective device settings and ratings
 - wiring connections
 - earthing conductors, connections and terminations
 - removal of transport clamps and supports
 - identification of all equipment
- e) During commissioning the following shall be checked and the results entered into a written report, which shall be handed to the Engineer within 7 days from completion of commissioning of any section of the works:
 - equipment nameplate details including serial numbers, kVA rating, voltage rating, current rating, frequency, full load current and number of phases.

The Contractor shall carry out the test specified in the Manufacturer's Works, on the site or elsewhere in accordance with the conditions thereof and such additional tests as in the opinion of the Engineer necessary to determine that the Contract Works comply with the conditions of this Specification, where under test or ordinary working conditions.

All materials used shall also be subjected to and shall withstand satisfactorily such routine tests as are customary in the manufacture of the types of plant or material included in the Contract Works.

Where, at the direction of the Engineer, tests and/or analyses are effected elsewhere than at the Works of the Contractor or a Sub-Contractor, or on the Site the costs incurred will be borne by the Employer should such tests prove satisfactory, but the Contractor will be called upon to pay all expenses incurred by the Employer in respect of any work or materials found to be defective, or of inferior quality, adulterated or otherwise unacceptable.

The Engineer shall be given two weeks written notice of tests.

All tests shall be carried out in the presence of, and to the satisfaction of the Engineer and at such times as they may require. The Contractor shall supply suitable test pieces of all materials as required by the Engineer.

All labour, materials, fuel, stores, apparatus, instruments and connections required for the above tests shall be provided by the Contractor. All apparatus and materials supplied under the Contract are subject to inspection by the Engineer, who shall be notified 14 days in advance when the material is ready for inspection.

Tests to be carried out on site:

- Such other tests as are required by the Engineer to prove compliance with the Specification independently of any test which may already have been carried out at the Manufacturer's Works, or elsewhere.
- Such tests as may be required by the Engineer to prove the load bearing capacity of foundations and stay anchors.
- Soil resistivity test
- Insulation resistance test
- Continuity test
- Polarity test
- Voltage test

31 HANDING OVER

The handing over of completed sections of the works to the employer and the energising/putting into operation of the completed sections of the works will only take place once the following documents and drawings have been submitted to the engineer:

- a certificate of compliance in terms of the relevant Act applicable
- a certificate issued by the contractor that the installation complies with the contract and specifications
- a certificate of acceptance which shall be specified and signed by the employer after the inspection, acceptance and approval of the completed sections of the works has taken place
- "as-built" drawings of the installation on 0,08 mm thick polyester film
- written application to energise the completed sections of the works.

The contractor shall be responsible for timeously arranging for all tests and inspections with the employer and engineer, submitting the necessary documents and drawings to the engineer and applying for the energising of the completed sections of the works.

32 "AS-BUILT" DRAWINGS

On completion of the contract, all drawings required for the manuals shall be prepared and included in the manuals as specified in hard copy as well as electronic copy. In addition, a set of drawings on 0,08-mm-thick polyester film shall be handed to the engineer to form the "as-built" records. The "as-built" drawings must also be submitted in AutoCad format, version 2018 or as specified by the engineer.

PORTION 3: FORMS TO BE COMPLETED BY BIDDERS

3.1 SPECIFICATIONS AND COMPLIANCE SHEET

[Bidders should complete columns C and D with the specification and performance of the Works offered. Also, state "comply" or "not comply" and give details of any non-compliance/deviation to the specification required. Attach detailed technical literature if required. Authorise the specification offered in the signature block below]

Item No	Specifications and Performance Required	Compliance of Specifications and Performance Offered	Details of Non-Compliance/ Deviation (if applicable)
A*	B*	C	D
1	PABX		
2	Distribution Board		
3	Data Cabinet		
4	Switches		
5	UTP Cables		
6	RJ45 Connectors		

3.2 SCHEDULE OF WORK EXECUTED BY BIDDER

The bidder shall insert in the spaces provided below; a list of work completed by his firm during the past five (5) years under construction by his firm. Contact names at the various Employers and Consultants must be provided. Additional project sheets with the required information may be inserted.

EMPLOYER (NAME, TEL. NO)	CONSULTING ENGINEER (NAME, TEL. NO)	DESCRIPTION OF WORK	VALUE OF WORK	YEAR OF COM- PLETION

3.3 SCHEDULE OF WORK CURRENTLY BEING EXECUTED BY BIDDER

The bidder shall insert in the spaces provided below work at present under construction by his firm. Contact names at the various Employers and Consultants must be provided. Additional project sheets with the required information may be inserted.

EMPLOYER (NAME, TEL. NO)	CONSULTING ENGINEER (NAME, TEL. NO)	DESCRIPTION OF WORK	VALUE OF WORK	YEAR OF COM- PLETION

3.4 SCHEDULE OF CONSTRUCTION EQUIPMENT

The Bidder must state below which construction equipment will immediately be available for this contract, which construction equipment will be available from outstanding orders and which additional construction equipment will be acquired or hired for the work if the contract is awarded to him.

After the award of the Contract, the contractor must satisfy the Engineer that all equipment listed hereunder is available on the site when required. The Contractor must maintain the equipment in good working order for the duration of the Contract.

(a) CONSTRUCTION EQUIPMENT WHICH IS IMMEDIATELY AVAILABLE

DESCRIPTION	TYPE/ MODEL	POWER	MASS	CAPACITY	QUAN-TITY

CONSTRUCTION EQUIPMENT WHICH WILL BE BOUGHT OR HIRED FOR THE CONTRACT

(Statements must reflect particulars of delivery arrangements)

DESCRIPTION	DELIVERY DATE	TYPE/ MODEL	POWER	MASS	CAPACITY	QUAN- TITY

3.4 BID CHECKLIST SCHEDULE

[Public Entity to update this Checklist to ensure that it contains the documents required from Bidders for the specific procurement]

Description	Attached (please tick if submitted and cross if not)
Priced Activity Schedules	
Specification and Compliance Sheet	
Eligible or have a valid Registration Certificate with Electricity Service Provider authorising the bidder to operate up to 400V	
Form A: Schedule of Work executed by Bidder	
Form B: Schedule of Work currently being executed by Bidder	
Form C: Schedule of Construction Equipment	

Disclaimer: *The list defined above is meant to assist the Bidder in submitting the relevant documents and shall not be a ground for the bidder to justify its non-submission of major documents for its bid to be responsive. The onus remains on the Bidder to ascertain that it has submitted all the documents that have been requested and are needed for its submission to be complete and responsive.*

PORTION 4: PRICED ACTIVITY SCHEDULE

The quantities in this Bill of Quantities are provisional and shall be measured as executed and paid for according to prices in the Bill of Quantities and any unexpended amounts shall be deducted from the amount of the contract sum.

The quantities in this Bill of Quantities are not to be used for ordering materials.

The Bill of Quantities form part of and must be read in conjunction with the specification, which document contains the full description of the work to be done and material and equipment to be used and unless otherwise described in the Bill of Quantities, reference should be made to the specification for the full meaning or description of work to be done and materials and equipment to be used in this service.

The total bid price on the bidder form shall constitute the contract price of the successful bidder. bidders are advised to check their item extensions and total additions, as no claim for arithmetical errors will be considered.

No alteration, erasure or addition is to be made in the text of the Bill of Quantities. Should any alteration or erasure be made, it will not be recognized but the original wording of the Bill of Quantities will be adhered to.

The priced Bill of Quantities of the successful bidder will be checked and the Engineer reserves the right to call for adjustment to any individual price and to rectify the discrepancy.

Variations in the scope and extent of the work included in the Bill shall be allowed to meet the employer's requirements and shall be measured and costed at rates entered in the Bill, where appropriate, and shall form additions to or deductions from the total of the Bill.

Any items or variations for which rates have not been included in the Bill shall be agreed and priced as non-scheduled items in accordance with the provisions of the contract.

The rules covering the extent and costing of the variation shall be those provided for in the form of conditions of contract.

Unless a separate rate for the supply and for the installation of any item is specifically called for, the supply and installation cost of any item shall be fully included in the unit price.

The description of each item shall, unless otherwise stated herein, be held to include making, conveying and delivering, unloading, storing, unpacking, hoisting, waste, patterns, models and templates, plant, temporary works, return of packing, establishment charges, profit and all other obligations arising out of the conditions of contract.

All fittings and accessories always include the connections thereto. All measurements are nett, unless otherwise stated, and bidders must allow in their rates for wastage.

The quantities and rates included for daywork shall form part of the bidder price, but bidders shall note that this item must be regarded as provisional and will only be payable to the contractor if and when a written order to this effect has been issued. All provisional sums shall be expended as directed by the Engineer and any balance remaining shall be deducted from the amount of the contract sum

PORTION 5: DRAWINGS



Item	Description	Unit	QTY	Labour Rate	Material Rate	Total Rate	Amount (N\$)
1	<p>SECTION A1 : PRELIMINARY AND GENERAL</p> <p>Tenderers shall allow for all preliminary and general expenses and items not covered in the provisional Schedule of Quantities whatever cost they may consider necessary for carrying out and observance of the items - such as: compliance to General Conditions of Contract, Special Conditions of Contract, attendance, supervision & travelling, establishment of site, storage and clearing, workshop drawings where applicable, drawings for approval, temporary power and accommodation, administrative costs, transport, performance guarantee, commissioning, attendance of site meetings and ad-hoc meetings, etc.</p> <p>The Tenderer acknowledges by submission that the Employer reserves the right to adjust the scope of work to any degree, without recourse for renegotiation of rates (however, the Employer also reserves the right negotiate the rates in case of a variation)</p> <p>Fixed Charged Items:</p>						
1.1	Compliance: General and Special Conditions, Technical Spec.	Sum	1				
1.2	Performance guarantee / surety	Sum	1				
1.3	Programming of work	Sum	1				
1.4	Transport	Sum	1				
1.5	Site Establishment	Sum	1				
1.6	Setting Out & Survey (line routes, pole positions, kiosks, manholes, Distribution boards, electrical receptacles and etc. to verify position on planning and avoid conflicts with other services)	Sum	1				
1.7	Progress Meetings	Sum	1				
1.8	Attendance at Site Meetings and for Measurement	Sum	1				
1.9	Site Supervision: during operations the contractor shall have on site a suitably experienced and qualified technician who shall supervise the works. Details of the site supervisor shall be submitted to the Engineer for approval prior to his assumption.	Sum	1				
1.10	Test and inspection prior to completion	Sum	1				
1.11	Marking-up of record drawings	Sum	1				
1.12	Insurance (theft, damage, liability, etc.)	Sum	1				
1.13	Certificates & Payment.	Sum	1				
1.14	Tools & Equipment including tester to conduct commissioning at practical completion.	Sum	1				
1.15	A Minimum of Four Free Maintenance Visits during the 12 month guarantee period	Sum	1				
1.16	Co-ordination with Telecom / Power Utility at tie-in and as required by the Engineer.	Sum	1				
	Time Related Items: Quantities for the following items shall be as per the Tenderer's proposed contract completion period.						
1.17	Office & Storage facilities.	Sum	1				
1.18	Living Accommodation, Ablution & Latrine facilities	Sum	1				
1.19	Tools & Equipment	Sum	1				
1.20	Water supplies, Electrical Power, Communications & access.	Sum	1				
1.21	Supervision	Sum	1				
1.22	Company & Office overhead costs	Sum	1				
1.23	Transport	Sum	1				
	Tenderer to specify and price other relevant items						
Total for section carried to Summary							

Refurbishment of Trans Kalahari Border to a One Stop Border Post

ITEM	DESCRIPTION	UNIT	QTY	LABOUR RATE	MATERIAL RATE	TOTAL RATE	AMOUNT
2	DATA AND TELEPHONE INSTALLATION PASSENGER TERMINAL						
2.1	Supply of cat6 UTP highwire grey cable 500m drum cat6	No	4				
2.2	Supply and Installation of single cat6 Points	No	60				
2.3	Supply and Installation of all labels + Testing	No	60				
2.4	Supply and Installation of Flylead 3M Long	No	60				
2.5	Supply and Installation of Patch cord 1M Long (Grey)	No	60				
2.6	Supply and Installation of Patch cord 1M Long (Yellow)	No	0				Rate Only
2.7	Supply and Installation of Floor Mounted Data Cabinet, 42U, complete with required Fans,Blank-in Plates	No	2				
2.8	Supply and installation of a 27U Panel Cabinet - stand alone complete with plinth and shelves - 600 x 800	No	0				Rate Only
2.9	H3C WA6320 Internal Antennas 4 Streams Dual Radio 802.11ax/ac/n Access Point,FIT	No	5				
2.1	H3C S5048PV3-EI-PWR L2 Ethernet Switch with 48*10/100/1000Base-T PoE+ Ports(AC 370W) and 4*1g Base-X SFP Ports	No	2				
2.11	H3C S5130S-28S-PWR-EI L2 Ethernet Switch with 24*10/100/1000BASE-T PoE+ Ports(AC 185W) and 4*1G/10G	No	0				
2.12	Supply and Installation of Patch Panel 48Port	No	2				
2.13	Supply and Installation of Patch Panel 24Port	No	0				
2.14	Supply and Installation of Brush Panel 1U Long Base	No	5				
2.15	Supply and installation of 10 way PDU	No	1				
2.16	Supply and install 4 core Fiber Optic cable om3	No	100				
2.17	ENTRY GLAND 6MM-12MM BLACK 13.5MM	No	2				
2.18	60MM HEAT SHRINK SPLICE PROTECTOR	No	2				
2.19	1M ST UNJACKETED PIGTAIL (OM3) 50/125	No	2				
2.20	ST-ST MIDCOUPLER MULTI-MODE SIMPLEX	No	2				
2.21	Fiber optic patch panel	No	1				
2.22	Fiber optic patchcords 2m	No	2				
2.23	Optic Fibre Splicing & Testing	No	2				
2.24	Gbics	No	1				
2.25	IP PABX						

Refurbishment of Trans Kalahari Border to a One Stop Border Post

ITEM	DESCRIPTION	UNIT	QTY	LABOUR RATE	MATERIAL RATE	TOTAL RATE	AMOUNT
2.25.1	IP PABX suitable to handle 100 Telephone Lines	No	1				
2.25.2	IP Phones	No	20				
2.25.3	SwitchBaord Suitable to handle 100 Telephone Lines	No	1				
2.25.4	PBX-BRI 2 Channel ISDN	No	2				
2.25.5	100 Pair	No	100				
TOTAL CARRIED TO SUMMARY							

Refurbishment of Trans Kalahari Border to a One Stop Border Post

ITEM	DESCRIPTION	UNIT	QTY	LABOUR RATE	MATERIAL RATE	TOTAL RATE	AMOUNT
3	DATA AND TELEPHONE INSTALLATION COMMERCIAL TERMINAL						
3.1	Supply of cat6 UTP highwire grey cable 500m drum cat6	No	3				
3.2	Supply and Installation of single cat6 Points	No	50				
3.3	Supply and Installation of all labels + Testing	No	50				
3.4	Supply and Installation of Flylead 3M Long	No	50				
3.5	Supply and Installation of Patch cord 1M Long (Grey)	No	50				
3.6	Supply and Installation of Patch cord 1M Long (Yellow)	No	0				Rate Only
3.7	Supply and Installation of Floor Mounted Data Cabinet, 42U, complete with required Fans,Blank-in Plates	No	1				
3.8	Supply and installation of a 27U Panel Cabinet - stand alone complete with plinth and shelves - 600 x 800	No	0				Rate Only
3.9	H3C WA6320 Internal Antennas 4 Streams Dual Radio 802.11ax/ac/n Access Point,FIT	No	3				
3.1	H3C S5048PV3-EI-PWR L2 Ethernet Switch with 48*10/100/1000Base-T PoE+ Ports(AC 370W) and 4*1g Base-X SFP Ports	No	2				
3.11	H3C S5130S-28S-PWR-EI L2 Ethernet Switch with 24*10/100/1000BASE-T PoE+ Ports(AC 185W) and 4*1G/10G	No	0				
3.12	Supply and Installation of Patch Panel 48Port	No	2				
3.13	Supply and Installation of Patch Panel 24Port	No	0				
3.14	Supply and Installation of Brush Panel 1U Long Base	No	5				
3.15	Supply and installation of 10 way PDU	No	1				
3.16	Supply and install 4 core Fiber Optic cable om3	No	100				
3.17	ENTRY GLAND 6MM-12MM BLACK 13.5MM	No	2				
3.18	60MM HEAT SHRINK SPLICE PROTECTOR	No	2				
3.19	1M ST UNJACKETED PIGTAIL (OM3) 50/125	No	2				
3.20	ST-ST MIDCOUPLER MULTI-MODE SIMPLEX	No	2				
3.21	Fiber optic patch panel	No	1				
3.22	Fiber optic patchcords 2m	No	2				
3.23	Optic Fibre Splicing & Testing	No	2				
3.24	Gbics	No	1				

Refurbishment of Trans Kalahari Border to a One Stop Border Post

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3.25	IP PABX						
3.25.1	IP PABX suitable to handle 100 Telephone Lines	No	1				
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3.25.3	SwitchBaord Suitable to handle 100 Telephone Lines	No	1				
3.25.4	PBX-BRI 2 Channel ISDN	No	1				
3.25.5	100 Pair	No	100				
TOTAL CARRIED TO SUMMARY							

