Technical Requirements

SANReN Backbone Network Meshing
RFP No. 3397.1/14/04/2021

Project 6b: Port Elizabeth to Makhanda to East London Links

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Glossary

Abbreviation	Term	Description
CAC	Customer Acceptance Certificate	Certificate of Acceptance that the SANReN customer needs to sign off on when civil work is done on the SANReN customer's premises.
CSIR	Council for Scientific and Industrial Research	A statutory body established in terms of Scientific Research Council Act 46 of 1988, as amended.
IETF	Internet Engineering Task Force	A body that defines standard Internet operating protocols such as TCP/IP.
PoP	Point of Presence	A location where networking equipment may be accessed.
RFP	Request for Proposal	A request for organisations and companies to submit a proposal to supply goods and services to CSIR
GIS	Geographic Information System	A system designed to capture, store, manipulate and visualise spatial or geographic data.

Abbreviation	Term	Description
ITU	International Telecommunication Union	The International Telecommunication Union, originally the International Telegraph Union, is a specialized agency of the United Nations that is responsible for issues that concern information and communication technologies. It is the oldest global international organization. Headquarters: Geneva, Switzerland Founded: 17 May 1865
LC/APC	Lucent/Little/Local Connector - Angled Physical Contact	Fibre optic connector of the LC type with angle-polishing on fibre end-face.
RU	Rack Unit	Unit of measure describes the height of electronic equipment designed to mount in a 19-inch rack. One rack unit is 1.75 inches (44.45 mm) high.[1]
SANReN	South African National Research Network	The South African National Research Network (SANReN) is a high-speed network dedicated to science, research, education and innovation traffic.

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Project 6b: Port Elizabeth to Makhanda to East London Links

This document provides the technical requirements that bidders must comply with. These requirements will be evaluated in the Technical Compliance Matrix. Bidders that wish to respond with a solution for this project must complete the tab labelled "**P6b - PLZ to GRH to ELS**" in the Technical Compliance Spreadsheet. Failure to complete this tab will exclude the bidder from being considered for this Project.

1 Requirement Level Keywords

To eliminate ambiguity, tenderers are to interpret the meaning of functional (technical) requirements using the keywords; "must", "must not", "required", "shall", "shall not", "should", "should not", "recommended", "may", and "optional", as defined by the IETF RFC (Request For Comments) document designated as RFC2119. A copy of RFC 2119 is attached as Annexure J - RFC 2119.

2 Technical Compliance

Tenderers shall note the evaluation criteria applicable and the weights attached to each criterion and complete the Technical Compliance Matrix accordingly. Tenderers are required to complete the tab labelled "**P6b - PLZ to GRH to ELS**" in the "Technical Compliance Matrix.xlsx" spreadsheet in response to this RFP.

2.1 Technical Evaluation Criteria

- The evaluation of the technical detail of the proposal will be based on the Technical Compliance Matrix (in spreadsheet format).
- The tenderer must complete the Technical Compliance Matrix in accordance with the instructions tabled in the Technical Compliance Matrix spreadsheet. The Technical Compliance Matrix is a mandatory submission designed to facilitate evaluation.
- Tenderers will be eliminated from further evaluation if their technical evaluation yields a score of less than 70 overall percentage points or less than 50% on any individual criteria.

3 Link specifications

Proposals are hereby invited for the supply of a fixed-line fibre managed circuits with 100Gbps committed rates between the SANReN sites identified in the sections below.

3.1 End Points

The tenderer must provide a 100Gbps managed bandwidth links between the endpoints specified below in *Table 1*. The name, address and, coordinates for each endpoint are provided. The required links are schematically shown in section 3.4 below.

Table 1: Site Details

Site Name	Address	Co-ordinates
Site A: NMU South Campus	Building 07, South Campus, University Way, Summerstrand, Port Elizabeth	Latitude: -34.009574 Longitude: 25.667986
Site B: Rhodes University, Makhanda (Grahamstown)	Struben Building Artillery Road Makhanda	Latitude: -33.312900 Longitude: 26.519300
Site C: UFH Main Campus, East London	Administration Building, 50 Church Street, East London	Latitude: -33.020480 Longitude: 27.907100

3.2 Network Design Philosophy

Tenderers are requested to take note that network descriptions (including diagrams) serve to communicate to the tenderers the CSIR's intent from a logical networking point of view. The mapping of a logical topology onto physical infrastructure may introduce common failure points that are not obvious from the logical design. The 100Gbps circuits must be provisioned on optic fibre end-to-end.

The CSIR is aware that it is not always feasible (in terms of cost and time constraints) for tenderers to offer services that map cleanly from the logical design to physical infrastructure (in other words, without introducing common failure points), and it is therefore necessary to find a compromise on the acceptable level of failure risk.

In order to make the above determination, the CSIR requires detailed information about the underlying physical infrastructure over which the required links will be provisioned. Tenderers must avoid provisioning circuits using shared infrastructure between any two (2) links in this tender. All instances of shared infrastructure must be clearly identified and communicated to the CSIR as part of the tenderer's response. Tenderers shall disclose this information with at least the level of detail necessary to identify any and all shared infrastructure within the scope of the bid, including the physical routing of cable infrastructure, shared equipment and shared exchange points. This will be used by the CSIR to independently determine where infrastructure is shared between links or with other providers that the CSIR could be obtaining services from. If overlapping infrastructure exists, the CSIR may request, during negotiations, that the tenderer revise the physical routing of their solution to provide a solution without any overlapping infrastructure that may cause single points of failure on the network.

Partnership solutions must be specified and completed as one bid, identifying the partnership members and their individual responsibilities for service delivery.

3.3 Leased or otherwise shared infrastructure

Tenderers that lease the underlying infrastructure offered as part of this bid with other downstream providers must disclose such information as part of their response. Tenderers will not be penalised for offering solutions based leased infrastructure as long as this is disclosed.

Tenderers that have provided SANReN with services that are not part of this bid must clearly indicate if their proposed solution shares any infrastructure with any such service already offered to SANReN.

3.4 Network Diagram

The network diagram below, i.e. *Figure 1: Network Diagram,* illustrates the envisioned network. This diagram is for illustration purposes only and tenderers must design the network to optimize their available infrastructure. Tenderers must wherever possible provide a reasonably direct route between the endpoints.

Tenderers must provide a diagram or detailed text description illustrating how the circuit is provisioned over their core infrastructure. This diagram or description must be detailed enough to understand the physical routing of each of the links and any shared infrastructure as described in section 3.2 above. A high-level diagram or detailed text description is sufficient, but a KML file showing the physical routing will be preferred. In the event that the winning tenderer does not provide a KML file with detailed physical routing information, they will be required to provide it during negotiations.

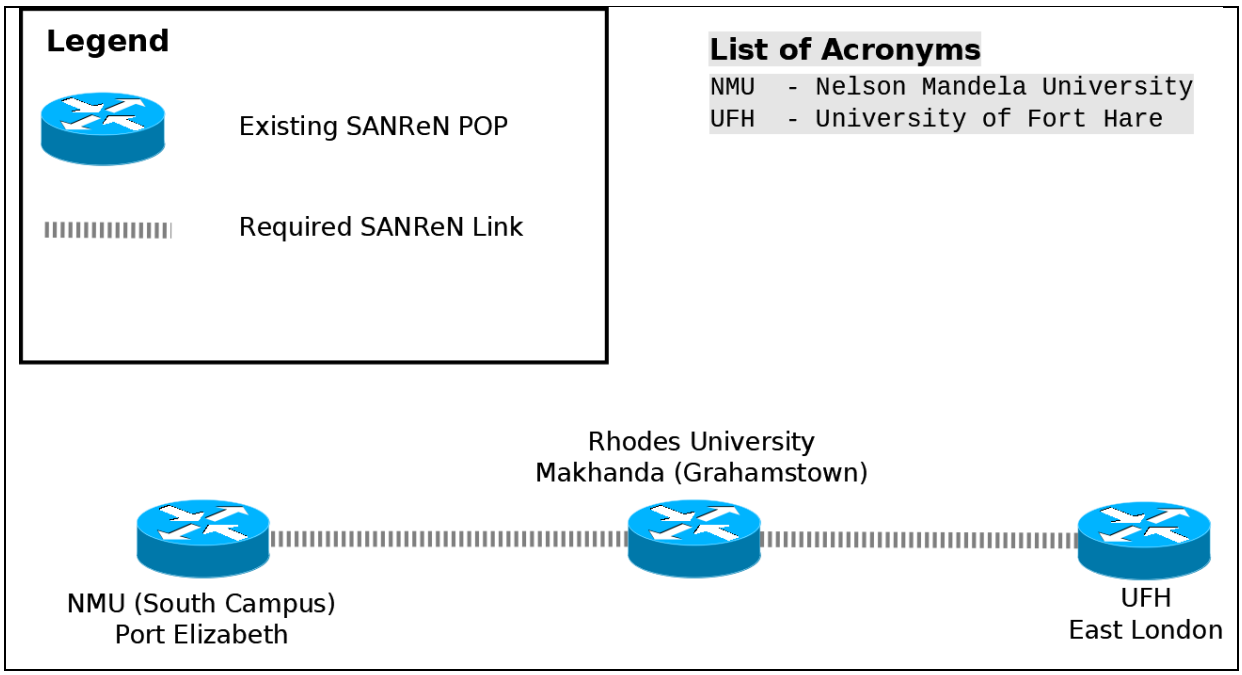

Figure 1: Network Diagram

3.5 Build Specifications

The bid is for end-to-end connectivity between the SANReN PoPs (this must include any “last mile builds” or links from the Bidder’s PoP to the endpoints). Should additional infrastructure be required in order to meet the specification, provisioning of the link must be delivered within the timelines stated in section 6 below.

4 Link Requirements

The link must comply with the following requirements:

1. The link must be provisioned on fixed-line fibre infrastructure.

2. The link must terminate on active equipment at the sites specified.
3. All equipment deployed at the specified sites must be AC powered (220V 50Hz).
4. All equipment used must have their dimension requirements specified.
5. The link must support Link Loss Forwarding
6. The link must support Jumbo Frames
7. The link handoff must be an Ethernet handoff on a 100GBASE-LR4 PHY interface
8. The client hand-off must terminate on a patch panel.

5 Reliability

5.1 Service Requirements

The CSIR requires that a minimum end-to-end up-time of 98% (calculated per quarter) to be maintained for each circuit that is part of this tender. To manage these requirements, the CSIR encourages all tenderers to include a standard SLA (Service Level Agreement) as part of its response. The tenderer must commit, as a minimum, to comply to the following criteria to pass the evaluation:

1. 24/7 access to a Network Operations Centre (NOC) to log support requests;
2. Maximum response time of 4 hours during office hours;
3. Maximum service restoration time of 8 hours during office hours; and
4. Quarterly end-to-end up-time reports for each circuit that is part of this tender.

5.2 Maintenance

Details about the following aspects of the tenderer's maintenance and support capabilities are required in order to evaluate the quality of the maintenance that the tenderer will provide with respect to this link:

1. Mean Time To Repair;
2. Same day response, Working day response only, etc;
3. Fault Logging Procedures;
4. Maintenance down time procedures and advance warning procedures;
5. Fault Monitoring and Alerting capability;
6. Scheduled reporting of incidents & performance measurements; and

7. Customer responsibilities indicated;

The tenderer must specify whether the link being provided in this tender will be actively monitored or not. If the link is actively monitored, the tenderer to provide The CSIR, or a CSIR designated party, regular notifications on the status of the link and other specific details when requested.

6 Project Plan

Tenderers who plan to deliver all links of the project within 9 months from the date of award will obtain full marks in the project plan section of the Technical Compliance Matrix. Tenderers who plan to deliver all links of the project between 9 and 12 months from the date of award will only obtain partial marks in the project plan section of the Technical Compliance Matrix. Tenderer's who plan to deliver any link after 12 months will not obtain any points for the project plan section in the Technical Compliance Matrix and will fail the evaluation. Tenderers must submit a project plan and schedule for this Project. The project plan must, at a minimum, cover the following items:

1. Planning Planned activities
2. Last Mile Civil Works (if applicable)
    a. Way Leaves
    b. Trenching
    c. Blowing Fibre
3. Circuit Provisioning
    a. Equipment procurement
    b. Equipment deployment
    c. Equipment configuration
4. Link Testing
5. Handover

7 Acceptance Documentation

In accepting a link, the CSIR will require a number of documents:

1. Test results for the link

2. CACs for the access builds at the end points (if applicable)
3. As-deployed documentation

7.1 Test results

The test results are to be provided for each link tested. The following information must be included on the Test Result Sheet / Acceptance Test Sheet:

1. 24-hour soak test results
2. BER Test results
3. Routing maps (Logical or Physical) of the actual service that was provisioned.

7.2 Customer Acceptance Certificates

For access builds, CACs need to be signed off to ensure that all involved parties are satisfied with the work done by the supplier.

7.3 As-deployed documentation

A handover report is required by the CSIR. This should contain the following:

1. Photographs of the deployed equipment at each end-point with clearly identifiable and labelled demarcation points.
2. All of the test results as indicated in the section above
3. Any applicable CACs

8 References

All tenderers must provide details for three (3) references for similar projects. The references must cumulatively be able to testify to the tenderer's capability in:

1. Provisioning high speed (at least 10Gbps) point-to-point cross country services on Fibre; and
2. Providing support and maintenance of provisioned cross country services.

The following details need to be available per reference:

1. Name of Company
2. Name of account manager that the tenderer has dealt with (optional)
3. Contact detail for company/account manager (email or telephone number)
4. Reference letter from company/account manager (optional)