a world class African city

REFERENCE REV

TITLE **STANDARD FOR ENGINEERING CP_ TSSTAN_155** **1**
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FOREWORD

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1. INTRODUCTION

As part of City Power's continuing efforts to expand, strengthen, refurbish, and upgrade to SMART and energy mix for its electrical infrastructure, a need has arisen for a single panel of consultants to be appointed to support this objective. To realize the above objective, it is crucial for City Power to source world-class engineering consultants to assist in providing professional engineering services.

2 SCOPE

The purpose of this standard is to detail the requirements in the appointment of Engineering Services Strategic Partners in line with City Power's standards.

3 NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this standard. At the time of publication, the editions indicated were valid. All standards and specifications are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

Reference	Description
Constitution	The Constitution of the Republic of South Africa, 1996
SANS ISO 9001:2015	Quality management systems — Requirements
SANS OHSAS 18001:2011	Occupational health and safety management systems — Requirements
SANS ISO 14001:2015	Environmental management systems — Requirements with guidance for use
(Act no 56 of 2001).	The Private Security Industry Regulation Act and its regulations
Act no 103 of 1993	The Compensation for Occupational injuries and diseases Act
Act no 85 of 1993	Occupational Health and Safety Act
Act no 51 of on 1977	Criminal Procedures Act
Act no 60 of 2000	The Firearms Control Act

Act 08 of 2019	Critical Infrastructure Protection Act [previously NKP Act (Act 102 of 1980).

4 REQUIREMENTS

In order to supplement the existing City Power in house project engineering and management capacity, the following skills shall be required for City Power to successfully execute the short, medium and long-term Capital Infrastructure and Energy Sustainability Plans.

4.1 Project Proposals (Report Stage)

As part of the project feasibility study, consultants shall be expected to compile a high-level project development for presentation before City Power internal governance structure, such as Group Management Commission (GMC), Planning Evaluation Committee (PEC) and detailed designs to the Technical Evaluation Committee (TEC). The consultants will also be requested to do ad-hoc investigation or research on network related matters.

4.1.1. The project proposal shall entail the following as minimum requirements.

4.1.1.1 Project Name

4.1.1.2 Project Cost

4.1.1.3 City Power area of supply

4.1.1.4 Political Region

4.1.1.5 Project summary

4.1.1.6 Project description

4.1.1.7 Project need analysis and benefits

4.1.1.7.1 Reduction of outages

4.1.1.7.2 Feasibility studies

4.1.1.7.3 NRS 047 and NRS 048 requirements

4.1.1.7.4 Lease life cycle in accordance with Nersa requirements

4.1.1.7.5 Availability of spares or establishment of contingencies

4.1.1.7.6 Asset renewal programme to replace obsolete equipment

4.1.1.7.7 Network strengthening to meet future load growth

4.1.1.7.8 Alternative energy or mix energy

4.1.1.7.9 SMART Grid Integration

4.1.1.7.10 Safety and security

4.1.1.8 Scope of work

4.1.1.9 Initial scope for Environmental Impact Assessment (EIA) studies

4.1.1.10 Business operational risk assessment (consequences if project is not implemented)

4.1.1.11 Other related documentation (e.g. National Development Plan, Integrated Development Planning etc.)

4.1.1.12 Validation needs

4.1.1.12.1 Economic analysis

4.1.1.12.2 Life expectancy of the equipment

4.1.1.12.3 Future load prediction and expansion

4.1.1.12.4 Maintenance cost

4.1.1.12.5 Loss of power sales due to equipment failure

4.1.1.12.6 Performance report on networks

4.1.1.12.7 Any additional detailed study required by City Power to support or inform the need for capital investment

4.1.1.12.8 Revenue benefits

4.1.1.12.9 SWOT analysis

4.1.1.13 Proposed options evaluation against

4.1.1.13.1 Technical, financial and environmental requirements

4.1.1.14 Recommendations for the best option

4.1.1.15 Development of any technical specification in addition to City Power standards and specifications

4.1.1.16 Energy saving, alternative sources and energy storage initiatives

4.1.1.17 Grid integration and feasibility studies

4.1.1.18 Technical information

4.1.1.19 Support and advisory representation at all external stakeholder forums, meetings or any public gatherings

4.1.1.20 Where necessary and possible seek funding on behalf of City Power.

4.2 Preliminary, Functional and Detailed Design Stage

4.2.1 The appointed consultants shall be expected to perform the following functions:

4.2.1.1 Develop detailed project scope and design in terms of OHSA (Occupational Health and Safety Act) and GMA (General Machinery Act)

4.2.1.2 Develop detailed project scope as per PEC and TEC recommendations

4.2.1.3 Develop preliminary designs by applying appropriate technologies in a cost effective and technical sustainable manner as approved by City Power's Research and Development Section.

4.2.1.4 Conduct network studies, system grading, fault level calculations and relay settings

4.2.1.5 Conduct specialized studies on clearances, structural and earthing integrity

4.2.1.6 Quantity surveying

4.2.1.7 Structural Assessments and recommendations on existing structures

4.2.1.8 Detail security installations and fire detection and prevention designs

4.2.1.9 Co-ordinate all technical inputs to ensure the production of comprehensive detail design

i.e. input from internal departments such as Research and Development Department, Maintain Availability of Supply (MAOS), Secondary Plant, Information and Communication Technology (ICT) and Primary Plant

4.2.1.10 Higher level of Information Technology (IT) and Operation Technology (OT) system designs and integration

4.2.1.11 Compile design packages and produce bill of quantities in line with City Power approved commodity codes and/or Labour contracts rates

4.2.1.12 Identify critical material and labour requirements, which will enable the Project Manager to implement the project

4.2.1.13 Revise and firm up the project cost

4.2.1.14 Produce high-level project plans and cash flows

4.2.1.15 Produce technical drawings as per City Power approved drawing standards and specifications

4.2.1.16 Facilitate the wayleave application and approval process

4.2.1.17 Facilitate all building approvals with the local authority

4.2.1.18 Facilitate applications to utilities to acquire additional services including water and sanitation connection to various sites, as and when required

4.2.1.19 Facilitate the environmental impact assessment application and approval process.

4.2.1.20 Facilitate all land negotiations and valuations of required servitudes

4.2.1.21 Liaise with Eskom and/or any other energy provider, to ensure smooth interface between their infrastructure and City Power. Where necessary, obtain approval from the energy provider during the design stage to ensure that both utilities needs are achieved

4.2.1.22 Conduct all negotiations with external parties as required by City Power

4.2.1.23 Professional sign off on all designs.

4.3 Project Management and Construction Stage

4.3.1 The day-to-day management of the project activities includes but not limited to the following functions:

4.3.1.1 Provide an independent management service of New Engineering Contract (NEC3).

4.3.1.2 Review and acknowledge the scope to be executed

4.3.1.3 Review and evaluate designs and technical schedules and approve or make amendments to all design drawings done by the contractor. (This shall be done in conjunction with City Power's relevant department and any amendments or changes shall be re-submitted to PEC & TEC)

4.3.1.4 Issue construction documentation in accordance with the documentation schedule as per the detail specification

4.3.1.5 Attend site hand over sessions

4.3.1.6 Attend all design meetings required by the contractor or client

4.3.1.7 Ensure that all statutory approvals are complied with prior to commencement of construction

4.3.1.8 Ensure all minutes are captured, distributed, recorded and filed

4.3.1.9 Carry out contract administration procedures in terms of the contract

4.3.1.10 Ensure all duties by affected parties within the project comply with the municipal finance management act and City Power policies applicable

4.3.1.11 Provide a contingency plan for the project

4.3.1.12 Prepare schedules of predicted cash flow

4.3.1.13 Prepare pro-active estimates of proposed variations and recommendations on the validity

4.3.1.14 Arrange, conduct of all sites, technical and progress meetings. Align required personal from all parties to attend relevant meetings.

4.3.1.15 Review the Contractor's quality control programme and advice and agree a quality assurance plan

4.3.1.16 If required, provide the services of an independent Environmental Officer

4.3.1.17 If required, provide "Clerk of Works" services

4.3.1.18 Inspect the work for quality and conformity to contract documentation once a week

4.3.1.19 Review the outputs of the quality assurance procedures, advise the contractor and client on the adequacy, and need for additional controls, inspections and testing

4.3.1.20 Monitoring compliance with the specifications, quality of equipment installed and workmanship of the said contractor/s

4.3.1.21 Active site administration to ensure City Power receives true value for cost incurred, scrutinize all work and identify cost saving opportunities

4.3.1.22 Minimizing project cost and schedule overrun by identifying and investigating project risks proactively.

4.3.1.23 Adjudicate and resolve financial claims by the contractor. Such verification shall be done for work performed on site against claims produced by a contractor

4.3.1.24 Assist with the resolution of contractual claims by the contractor

4.3.1.25 Confirm and provide assurance by an authorized person/s that payment against milestone progress has been achieved and in order

4.3.1.26 Establish and maintain a financial control system

4.3.1.27 Develop and maintain a risk register, ensuring compliance and identification of all risks to the project and City Power

4.3.1.28 Identifying and proposing solutions to eliminate risks both commercial and technical encountered during scope implementation

4.3.1.29 Clarify details and descriptions during construction as required

4.3.1.30 Prepare and submit any details, designs and documentation if an error in design is encountered from the original scope

4.3.1.31 Witness and review all tests carried out both on and off site

4.3.1.32 Witness and approve the commissioning of all plant installed

4.3.1.33 Update and issue drawing register

4.3.1.34 Issue contract instructions as and when required

4.3.1.35 Review and comment on operation and maintenance manuals, guarantee certificates and warranties

4.3.1.36 Inspect the works and issue practical completion and defect lists

4.3.1.37 Provide regular progress of scope implementation by the appointed Contractor

4.3.1.38 Devise and implement project communication platform for regular communication related to project progress, risks, opportunities, deviations and costs

4.3.1.39 Upholding the highest standards and ethical behavior of all parties involved

4.3.1.40 Reporting on any changes and subsequent risk to City Power

4.3.1.41 Arrange for the delivery of all test certificates, statutory (regulatory) and other approvals, as built drawings and operation manuals

4.3.1.42 Archiving project documents (alignment between Planning, SCM and Construction)

4.3.1.43 Professional supervision and sign off.

4.4 Specialized Technical Studies

4.4.1 The appointed consultants shall be expected to perform the following functions:

4.4.1.1 Network performance and grid connection studies inclusive of power factor correction studies

4.4.1.2 Network condition studies, onsite audits and the collection of asset data on site

4.4.1.3 Cost of supply studies and cost of unserved energy.

4.4.1.4 Conduct studies on renewables or mix energy and its profitability to City Power

4.4.1.5 Geographic Information System (GIS) mapping of City Power assets, updating and integration of data on all systems and databases

4.4.1.6 Coordinating, testing and evaluation of results of overhead line hardware specimens (steel members, earthing, conductor, insulators etc.) as well as the testing of underground cables

4.4.1.7 All other techniques and best practices used to test and evaluate other existing equipment within the City Power network

4.4.1.8 Assessments of financial revenue leakages, existing and future tariff modelling and system analysis

4.4.1.9 Verifying protection settings, network configuration studies and protection grading

4.4.1.10 Conduct fault level studies on Dig-silent for the entire network

4.4.1.11 Complete auditing of existing buildings to determine the energy consumption usage footprint and detailing proposals to reduce such energy footprint

4.4.1.12 To provide energy efficiency and DSM measurement and verification services

4.4.1.13 Compiling of technical specifications and providing technical expertise to the bid evaluation committees

4.4.1.14 Quality inspection for major equipment during the design, manufacturing process, and inclusive shall be all Factory Acceptance Tests, Site Acceptance Tests as well commissioning

4.4.1.15 Compilation of technical documentation and performing research to address and resolve technical problems

4.4.1.16 Supporting City Power in its efforts to introduce renewable energy options

4.4.1.17 Propose models to support smart grid and the security of supply priorities

4.4.1.18 Evaluating business support systems such as Advance Distribution System (ADMS), Outage Management System (OMS), Metering Device Management System (MDMS) and other relevant technical support systems.

5 CATEGORIES

5.1 Capital Infrastructure Projects:

5.1.1 The appointment of consultants shall include all the above as well as:

5.1.1.1 Preparation of detailed designs and working drawings

5.1.1.2 Assist with any scope or design change during the Execution Stage

5.1.1.3 Assist City Power with Technical studies and research

5.1.1.4 Provide relay configurations & settings for protection equipment

5.1.1.5 Design and compile documentation for the complete end-to-end solutions for telecommunication systems within the City Power network

5.1.1.6 Integration of new equipment into SCADA and other remote systems

5.1.1.7 Perform and get approval on basic and detailed Environmental Impact Assessment requirements as outlined in the Environmental Impact Assessment (EIA) Regulations

5.1.1.8 Approve all technical drawings, calculations and technical specifications produced by the appointed contractor before implementation

5.1.1.9 Construction Monitoring (on site Clerk of Works)

5.1.1.10 Project Management

5.1.1.11 Ensuring Compliance with all statutory and environmental laws

5.1.1.12 Regular feedback on Projects to all Statuary Committees

5.1.1.13 Complete FAT and SAT evaluation and approval of all equipment

5.1.1.14 Witness and/or commissioning of all plants and installations

5.1.1.15 Manage all parties (client and contractor) in accordance with relevant NEC Contract

5.1.1.16 Final handover of the complete installation to City Power including as built drawings (hard copies and soft copies)

5.1.1.17 Provide detailed training to City Power staff in design, implementation and commissioning standards and specifications

5.1.1.18 Monitor Service Connections KPIs.

5.2 Master Planning and Network Investigations

5.2.1 The appointed consultants shall be expected to perform the following functions:

5.2.1.1 Develop the 20-year network expansion master plan using the latest zoning data together from the City of Johannesburg to determine the Geographical Load Forecast (GLF) together with input from City Power Personnel

5.2.1.2 Develop Short Term rolling plan from the long-term master plan

5.2.1.3 Develop the 10 to 15 year network refurbishment plan

5.2.1.4 Develop a 5 year Network Development Plan for Medium Voltage and Low Voltage Networks using the latest zoning data from the City of Johannesburg to determine the Geographical Load Forecast (GLF) together with the input from the City Power staff

5.2.1.5 Prepare network models using the DIGSILENT software package

5.2.1.6 Investigate network deficiencies (Stability, reliability), recommend, and design suitable solutions

5.2.1.7 Develop Telecommunication strategy of the network

5.2.1.8 Develop SMART Grid road map and requirements to achieve SMART infrastructure

5.2.1.9 Develop standard DC system philosophies for (major substations, switching substations etc.) and create standard template for calculations

5.2.1.10 Develop standard for secondary plant system in a substation and switching station etc. (stats & quality of supply meter standard, Intergraded Security System, SCADA, protection, DC system, multiplexer etc.) to assist with the planning such network

5.2.1.11 Develop protection settings philosophy document

5.2.1.12 Improving network connectivity to optimised on redundancy

5.2.1.13 Integrating the various alternative energy and Smart Grid technologies including renewable and energy storage options into our network

5.2.1.14 Each individual master plan will have its own Terms of Reference (TOR).

5.3 Research and Development or Engineering Standards

5.3.1 The appointed consultants Shall be expected to perform the following functions:

5.3.1.1 The appointed consultants will be required to assist with research and development of specification documents typically used within City Power. The scope will include the evaluation and updating of existing documents and/or the development of new specification documents

5.3.1.2 On ad-hoc basis, the services of highly experienced and qualified specialists in a field may be required to support City Power with the approval of designs and manufacturing equipment. These individual cases will be evaluated on a City Power and respective Strategic Partner

5.3.1.3 Develop standard protection philosophies and functional designs specifications for the entire network schemes (i.e. transmission line scheme, transformer scheme, incomer scheme, feeder scheme etc.) in line with SMART Grid infrastructure

5.3.1.4 Where standard designs and drawings are available, updating of the existing will be required and where not available, development of the new standard designs and drawings will be required

5.3.1.5 Updating of the equipment specifications were available and developing new specifications were not available

5.3.1.6 Profitability of new energy mix and model for City Power.

5.3.1.7 Develop policy and standard planning philosophy on new energy mix for service connection

5.3.1.8 Embedded generation and City Power network

5.3.1.9 Evaluation of new technologies

5.3.1.10 Market research

5.4 GIS, DigSilent and Drafting Services

5.4.1 The appointed consultants shall be expected to perform the following functions:

5.4.1.1 All existing network data to be obtained from City Power (SOC) LTD Planning GIS. (The format required to be agreed upon)

5.4.1.2 Verification of existing network to be undertaken

5.4.1.3 Designs to be done in shape to World Geodetic System WGS 84 LO29 projection or Drawing Exchange Format (DXF) with reference data

5.4.1.4 Wayleave approval, emergency and standards

5.4.1.5 Applications for service providers, i.e. User Account Controls (UAC's), Provincial Roads, National Roads Agency to be undertaken by consultants

5.4.1.6 Collection of technical data and management where required

5.4.1.7 Develop a proper network model or DigSilent network mapping (Official network model for City Power)

5.4.1.8 Mapping City Power network into a DigSilent(HV/MV/LV), including alternative energy sources (such as Small Scall Embedded Generator (SSEG) and Independent Power Producers (IPP's)

5.5 Civil Services

5.5.1 The appointed consultant shall undertake Architectural, Building, Structural Designs, Land Surveying, Earthworks and Road Design Services. The consultant will also be expected to perform or arrange amongst other things the following Site Inspection & Pre-engineering Tests:

5.5.1.1 Geotechnical Studies – Determine the nature of the soil at various depths and to detect any weak layers that may impact the load carrying capacity of the soil

5.5.1.2 Compaction Tests – Do soil Particle Tests

5.5.1.3 Inspection of the site to determine nature of the ground and safe bearing pressure of the soil

5.5.1.4 Design retaining and boundary walls

5.5.1.5 Design yard platform and access roads

5.5.1.6 Design substation earthing systems including all soil and underground water influences

5.5.1.7 Design storm water and natural water drainage systems

5.5.1.8 Design all foundations to transfer and distribute loads from the structure/equipment to ground safely

5.5.1.9 Design the substation foundations, oil catchments facilities and the substation buildings. This includes Roof structure analysis for PV systems

5.5.1.10 Social compacting

5.5.1.11 Professional registered town and regional planning engineer, Quantity Surveyor, Architecture, Civil engineer and other professionals to sign off on designs, implementation and so forth.

5.6 Gas Compliance (Distribution & Bottled gas)

5.6.1 Develop material to educate customers on handling and usage of gas

5.6.2 Provide legal support to City Power in developing agreements and contracts

5.6.3 Assist in supporting Licence application and registration of use of gas

5.6.4 Advice the business on how to compliance with Health and Safety requirements

5.6.5 Provide advice on how to compliance with Quality Assurance requirements

5.6.6 Advice to compliance with Environmental Management requirements

5.6.7 Consultation with City of Johannesburg Emergency Management Services (EMS) on Standard Operating Procedures (SOP).

5.7 Alternative Energy

The appointed consultants shall be expected to perform the following functions:

5.7.1 **Energy Efficiency**

5.7.1.1 Conduct technical feasibility studies and implementation plans for CoJ infrastructure targeted for energy efficiency.

5.7.1.2 Conduct financial feasibility studies on the capital requirements, procurement plans, expected savings, payback period (i.e. Return on Investment (ROI)) and bankability studies with a business case.

5.7.1.3 Conduct analysis on energy efficiency legal requirements.

5.7.1.4 Compile policies, standards, strategies, specifications, procedures and guidelines for energy efficiency projects.

5.7.1.5 Provide a report and a presentation on how the project can be implemented best.

5.7.1.6 Execute and manage energy efficiency implementation until the project is fully functional and skills are transferred to City Power employees.

5.7.2 **Battery Energy Storage Systems and Rooftop Solar PV**

5.7.2.1 Conduct technical feasibility studies of all City Power and CoJ infrastructure targeted for BESS and

solar PV deployment.

5.7.2.2 Conduct detailed designs of the battery energy storage systems and solar PV to be implemented at City Power sites and its stakeholders (CoJ) based on the feasibility studies.

5.7.2.3 Conduct financial feasibility studies on capital requirements, procurement plans, expected savings, payback period (i.e. Return on Investment (ROI)) and bankability studies with business cases.

5.7.2.4 Conduct analysis on BESS and solar PV legal requirements.

5.7.2.5 Compile policies, standards, strategies, specifications, procedures and guidelines required for BESS and solar PV.

5.7.2.6 Conduct electric network impact assessment for projects.

5.7.2.7 Provide a report and a presentation on how best the project can be conducted.

5.7.2.8 Provide project management on solar PV and BESS implementation until the project is fully functional and skills are transferred to City Power employees.

5.7.3 **Gas to Electricity Generation**

5.7.3.1 Conduct market analysis on the volume of scrap value for the existing City Power gas turbines.

5.7.3.2 Conduct financial studies which include capital cost, operational cost and return on investment (ROI) on gas to electricity generation.

5.7.3.3 Conduct analysis on best ownership or partnership (Independent Power Producers (IPP)) models.

5.7.3.4 Conduct a detailed design for gas to electricity generation based on the feasibility studies.

5.7.3.5 Conduct analysis on gas to electricity generation legal requirements.

5.7.3.6 Compile policies, standards, strategies, specifications, procedures and guidelines for gas generation.

5.7.3.7 Provide a report and presentation on how best the project can be conducted.

5.7.3.8 Execute and manage gas generation implementation until the project is fully functional and skills are transferred to City Power employees.

5.7.4 **Natural Gas Reticulation**

5.7.4.1 Conduct feasibility studies, impact and financial analysis including capital cost, operational cost and ROI based on the following natural gas reticulation ownership options:

5.7.4.1.1 Egoli gas natural gas reticulation licence review.

5.7.4.1.2 City Power to pay for natural gas reticulation.

5.7.4.2 Conduct assessment of the gas quality and regulatory compliance.

5.7.4.3 Conduct detailed designs to deploy gas reticulation based on feasibility studies.

5.7.4.4 Compile policies, standards, strategies, specifications, procedures and guidelines for natural gas reticulation.

5.7.4.5 Provide a report and presentation on how best the project can be conducted.

5.7.4.6 Execute and manage natural gas reticulation implementation until the project is fully functional and skills are transferred to City Power employees.

5.7.4.7 Where necessary and possible seek funding on behalf of City Power.

5.7.5 **Liquefied Petroleum Gas (LPG) Deployment**

5.7.5.1 Conduct feasibility studies and financial analysis which includes capital cost, operational cost and ROI on LPG deployment.

5.7.5.2 Conduct analysis of the impact of LPG being used for cooking and space heating and the impact on electricity peak demand (AMD).

5.7.5.3 Construct a detailed methodology for the deployment of LPG based on feasibility studies.

5.7.5.4 Conduct analysis on LPG legal requirements.

5.7.5.5 Compile policies, standards, strategies, specifications, procedures and guidelines for LPG.

5.7.5.6 Provide a report and presentation on how best the project can be conducted.

5.7.5.7 Execute and manage LPG implementation until the project is fully functional and skills are transferred to City Power employees.

5.7.6 **Waste of Energy**

5.7.6.1 Conduct feasibility studies and financial analysis including capital cost, operational cost and ROI for solid waste to energy and conversion of wastewater to energy.

5.7.6.2 Conduct assessment on the best location to deploy waste to energy systems (stakeholders: Pickitup and Johannesburg Water).

5.7.6.3 Compile policies, standards, strategies, specifications, procedures and guidelines on waste to energy.

5.7.6.4 Provide a report and presentation on how best the project can be conducted.

5.7.6.5 Execute and manage waste to energy implementation until the project is fully functional and skills are transferred to City Power employees.

5.7.7 **Electric Vehicles**

5.7.7.1 Conduct analysis on how much energy capacity will be required for EV charging stations deployment.

5.7.7.2 Conduct network and infrastructure impact studies.

5.7.7.3 Conduct analysis on best ownership or partnership (Independent Power Producers (IPP)) models.

5.7.7.4 Conduct analysis on electric vehicles legal requirements.

5.7.7.5 Compile policies, standards, strategies, specifications, procedures and guidelines for procuring electric vehicles, buses and charging stations.

5.7.7.6 Provide a report and presentation on how best the project can be implemented.

5.7.7.7 Execute and manage EV implementation until the project is fully functional and skills are transferred to City Power employees.

5.8 GRID ACCESS CONSULTING

5.8.1 Develop the online applications portal and tool to manage and track embedded generation registration process

5.8.2 Provide advisory services for Energy Export Credit Methodology

5.8.2 Develop policies and guidelines for implementing a fair compensation methodology for energy exports Revenue Impact studies

i. NERSA report on export credits for compliance ii.

Manage credit allocation and settlement processes

5.8.3 Embedded Generation, IPP and Wheeling Methodology

i. Policy alignment in line with NERSA requirements ii.

Develop a billing methodology (SAP billing rules)

5.8.4 Roof Top Solar PV Systems Monitoring System and Tools

5.8.4.1 Design and implement a monitoring system for rooftop solar PV systems

5.8.5 Provide expert advice on Power Purchase Agreements (PPAs) Project implementation

5.8.5.1 Ensure compliance with regulatory requirements and industry standards

5.8.5.2 Support negotiation and contract management

5.8.6 Infrastructure Strengthening and Readiness Studies for Integration of Renewable Energy

5.8.6.1 Conduct studies to assess grid infrastructure readiness for renewable energy integration

5.8.6.2 Identify areas for infrastructure strengthening and upgrades

5.8.6.3 Develop plans for grid modernization and resilience enhancement

5.8.7. Guidelines Development for Renewable Energy Services

5.8.7.1 Develop comprehensive guidelines for all renewable energy services

5.8.7.2 Guidelines are aligned with regulatory requirements and industry standards

5.8.7.3 Provide clear procedures for implementation and maintenance of services

5.9 GRID ACCESS IMPLEMENTATION AND MAINTENANCE

5.9.1 Network Studies

5.9.1.1 Network modeling Mapping of City power network on DigSilent power factory

5.9.2 Embedded Generation, IPP & Wheeling Online portal applications Management

5.9.2.1 Develop the online applications portal, tool to manage and track embedded generation registration process

5.9.3 Embedded Generation, IPP and Wheeling Methodology

5.9.3.1 Policy alignment in line with NERSA requirements and develop a billing methodology (SAP billing rules)

5.9.4 Roof Top Solar PV Systems Monitoring System and Tools

5.9.4.1 Design and implement a monitoring system for rooftop solar PV systems

5.9.5 Demand Side Management Projects

5.9.5.1 Project managed the following, load Control: Implement a remote monitoring system for Ripple Receivers

5.9.5.1.1 Generating performance reports

5.9.5.1.2 Feasibility studies for expansion of deployment of ripple control system

5.9.5.2 Load Limiting Projects

5.9.5.2.1 Site Audits

5.9.5.2.2 Provide project management services for maintenance of the load limiting system

5.9.5.2.3 Energy Management System Deployment Project (Aligning with DERMS)

5.9.5.2.4 Develop a platform and integrate with existing systems for real-time monitoring and control of distributed energy management

5.9.5.2.5 Ensure data analytics for energy optimization and efficiency

5.9.6 Power System Management (Network performance)

i. Technical Losses initiatives ii.

Quality of supply initiatives

5.9.7 Quality of Supply (QoS) Compliance and Monitoring

5.9.7.1 Deployment of QoS monitoring system

5.9.7.2 Use the system to monitor key customers, SSEG's and IPP's plants, in collaboration with Grid System Planning section

5.9.7.3 Incorporate the proposed system into the Grid System Planning technical losses data center or nerve center.

5.9.7.4 Project management of the installation of recorders

5.9.7.5 Use the generated data to access impact of renewable energies on power quality and grid stability

5.9.7.6 Develop strategies to mitigate potential issues and ensure compliance

5.9.7.7 Ensure that QoS reporting is proper and supports the business requirements

5.9.87.8 Assist in conducting audit Investigations and develop a business report which covers all technical requirements within the business

5.9.8. Develop an Energy Wheeling trading methodology

5.9.8.1 Design and implement a platform for energy trading and market participation

5.9.8.2 Integrate with existing systems for seamless trading and settlement

5.9.8.3 Ensure compliance with regulatory requirements and market rules.

6 SCHEDULE OF RATES

6.1 In order to ensure that appointed consultants comply with the necessary Legislation City Power wishes to standardize on the utilization of gazetted Professional tariffs (ECSA) where applicable. However, in areas where a detailed proposal is requested the companies are expected to provide a detailed costing structure coupled with the personnel to be deployed on site. Companies are requested to fill in Annexure A, provided for their individual resources rates.

City Power reserves the right to select either ECSA Gazette Rates or Rates offered per individual project as requested. Depending on the scope of Works, City Power will determine whether fees will be based on Percentage Fees or Time-Based fees. The lower percentage curve for a specific project type will always be applicable as the default calculation. Where time-based rates are applicable, a standard rate for a specific service will apply by averaging the rates for all strategic partners within the appointment.

6.2 City Power reserves the right to obtain quotes for a specific assignment from multiple service providers and select the best quote based on cost and proposed technical Solution.

7 TECHNICAL DATA AND REQUIREMENTS

7.1 In order for City Power to select suitable consultants, the companies must reflect the following information and competences with their submissions:

7.1.1 Value proposition to City Power

7.1.2 Qualification of Personnel

7.1.2.1 Number of Engineers (PrEng)

7.1.2.2 Number of Technologists (PrTech)

7.1.2.3 Number of Technicians (PrTechni)

7.1.2.4 Number of Project Managers (PrCPM)

7.1.3 Number of projects completed per resource in relevant areas

7.1.3.1 Number of Engineers (PrEng)

7.1.3.2 Number of Technologists (PrTech)

7.1.3.3 Number of Technicians (PrTechni)

7.1.3.4 Number of Project Managers (PrCPM)

7.1.4 Company Experience

7.1.4.1 Number of relevant projects

7.1.4.2 Provide references of projects, including contact details

7.1.5 In-house quality assurance system

7.1.6 Available design tools and engineering software for:

7.1.6.1 Network modelling and system studies

7.1.6.2 Substation designs

7.1.6.3 Earthmat designs

7.1.6.4 Overhead line designs

7.1.6.5 Lighting designs

7.1.6.6 Reticulation designs

7.1.6.7 Civil designs

7.1.6.8 Renewables/Mix Energy

7.1.6.9 Smart Grid Integration

7.1.6.10 City Power Network (Assets) Mapping

8 STRATEGIC PARTNERS CATEGORIES

8.1 Master Planning (NDP)

8.2 System Designs

8.3 Project Management

8.4 Renewables

8.5 Power System Performance, Network Grid Impact Studies and Grid Connection (QoS & Technical Losses)

8.6 Research and Development or Engineering Standards

Note: Refer to the annexure B, for ECSA Fees Guidelines. The pricing schedules shall be fixed for a period of three years from date to contract award.

Annexure C: Summary table of all Professional Resources required within the scope of contract must be completed. Any successful bid will ensure that personnel indicated within Annexure C is always available to City Power.

9 DOCUMENTATION

Consultants shall keep project file of the work completed and provide City Power with the warranty/guarantee clearly indicated. The documentation shall contain details of the work done including dates and warranty period. The documentation shall be in both electronic and paper format.

10 QUALITY MANAGEMENT

A quality management system shall be set up in order to assure the quality during services of strategic partners. Guidance on the requirements for a quality management system shall be found in the following standards: ISO 9001:2015. The details shall be subject to agreement between the purchaser and supplier.

11 HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management and compliance during services of strategic partners. Guidance on the requirements of a health and safety plan shall be found in ISO 45001:2018 standards. The details shall be subject to agreement between City Power and the Supplier.

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12 ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up in order to ensure the proper environmental management and compliance is adhered to during services of strategic partners. Guidance on the requirements for an environmental management system shall be found in ISO 14001:2015 standards. The details shall be subject to agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHERQ Policy.

Annexure A – Bibliography

None

Annexure B – PRICING SCHEDULE OF ENGINEERING SERVICES STRATEGIC PARTNERS

It is the intention of City Power to appoint Engineering Services Strategic Partners. See ECSA Fees Guidelines

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Annexure C – PROFESSIONAL RESOURCES

See sub-clause 10 for guidance

Annexure D – Revision information

DATE	REV. NO.	NOTES
May 2022	0	First issue
March 2026	1	General editing Inclusion of 5.8 Inclusion of 5.9