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FOREWORD

Recommendations for corrections, additions or deletions should be addressed to;

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INTRODUCTION

City power has deployed a wide range of meters with varying capabilities to accommodate different consumers in different areas. These meters are intended to provide City Power Johannesburg with means of monitoring and controlling consumption of electricity and billing.

A meter should provide accurate data and information to aid in the administration of the bills and it should provide safeguards against fraud. It has become necessary to standardise and rationalise on electronic single and three phase Electricity meters and associated components which will improve the accuracy of meter readings, and also reduce maintenance and installation times.

1 SCOPE

This specification deals with single and three phase Electricity meters, with the capability to measure and record import and export energy in all four quadrants, instantaneous values and programmable for Time Of Use (TOU) tariffs. Although this document, covers minimum requirements for meters, it has been compiled with a view to effectiveness and simplicity, it is recommended that it be used as a basis for specifying for an advance meter that incorporate additional latest features that are compatible with City Power's Environment and can be used to advance smart grid.

2 NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this specification. 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.

SANS 474:2018 Electricity Metering – Standard requirements

SANS/IEC 62052-11: *Electricity metering equipment (a.c.) – General requirements, tests and test conditions – Part 11: Metering equipment.*

SANS/IEC 62053-11: *Electricity metering equipment (a.c.) – Particular requirements – Part 11: Electromechanical meters for active energy (classes 0,5, 1 and 2).*

SANS/IEC 62053-21, *Electricity metering equipment (a.c.) – Particular requirements – Part 21: Static meters for active energy (classes 1 and 2).*

SANS/IEC 62053-22, *Electricity metering equipment (a.c.) – Particular requirements – Part 22: Static meters for active energy (classes 0,2 S and 0,5 S).*

SANS/IEC 62053-23, *Electricity metering equipment (a.c.) – Particular requirements – Part 23: Static meters for reactive energy (classes 2 and 3).*

IEC 61968-9: *Application integration at electricity utilities system interfaces for distribution management – Part9 Interfaces for meter reading control*

SANS 1524-1: *Electricity payment systems Part 1: Payment meters*

SANS/IEC 62055-31*: Electricity metering — Payment systems Part 31: Particular requirements — Static payment meters for active energy (classes 1 and 2)*

SANS/IEC 62055-41*:2018 Electricity metering – Payment systems – Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems*

SANS 9001:*Quality Systems – Model For Quality Assurance In Design/Development, Production, Installation And Servicing.*

SANS 60529:*Enclosures for electrical equipment (classified according to the degree of protection that the enclosure provides.*

SANS/IEC 62056-21: *Electricity metering — Data exchange for meter reading, tariff and load control Part 21: Direct local data exchange*

SANS IEC 61036:*Alternating-current static watt-hour meters for active energy (Classes 1 and 2).*

NRS 057:2009: *Code of practice for electricity metering*

NRS 009:*Electricity Sales Systems*.

NRS 071, *Automated meter reading for large power users.*

STS600 Edition 2 It's a general term used to refer to the latest suite of STS specifications and IEC Standards, which include security upgrades as specified in STS600-4-2 standards, which includes the security upgrades as specified in STS600-4-2 and IEC 62055- 41 Ed3.

3 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

Definition	Description
Accuracy class index	A number that gives the limits of the permissible percentage error as defined in the applicable specification for a meter when the meter is tested under reference conditions. **Note:** Multi-range and multi-purpose instruments may have more than one accuracy class index.
Accuracy class	A designation assigned to an instrument transformer, the current or voltage error and phase displacement of which remain within specified limits under prescribed conditions of use.
Active energy meter	An instrument intended to measure active energy by integrating active power with respect to time. For metering purposes, the unit of active energy is kWh
Basic current (Ib)	Basic current is that value of the current in accordance with which the relevant performance of the meter is fixed.
Calibration	Comparison of the indication of an instrument under test, or registration of the meter under test, with an appropriate standard.
Electronic meter	A device in which the measurements are made by means of an electronic technique.
Maximum current (I_{max})	Highest value of the current at which the meter purports to meet the accuracy requirements.
Meter constant	Value expressing the relation between the energy registered by the meter and the corresponding value of the test output. If the test output is pulses, the constant should be either pulses per kilowatt-hour (imp/kWh) or watt-hours per pulse (Wh/imp).
Non-volatile memory	An electronic medium for storage of information which retains the information in the event of loss of auxiliary power supply. The information shall be retained for a period of at least four months in the event of a power failure.
Register	This term was derived from the visible dial on the faceplate of the electro-mechanical meters, where the register provided an indication of the energy usage. In electronic meters, this term refers to the non-volatile memory locations within the metering device where similar energy usage information is stored.
Starting current (Ist)	The lowest value of the current at which the meter starts and continues to register.
"Tested" sticker	A sturdy label applied to the side of the meter cover, indicating that the meter was calibrated by whom, and when.
Overcurrent Protection	A function provided by ECU to serve as a fault protection feature by disconnecting the load when a fault current is detected.

Prepayment Meter	A generic term for prepayment devices encompassing ED, ECU, split ED and other metering devices. This term is also interchangeably used with the word "meter" in the same context.
Split Meter	Meter where the Measurement Unit and Customer interface Unit are contained in separate enclosures.

3.2 Abbreviations

Abbreviation	Description
AC	Alternating current
DC	Direct current
Hz	Hertz
HES	Head End System
I	Current.
Ib	The basic current of the meter (direct connect or whole current meters).
Imax	The maximum current of the meter.
IEC	International Electrotechnical Commission
Imp/kWh	Impulse per kilo-watt hour
kWh	Kilowatt hour
LCD	Liquid crystal display
pf	Power factor
RCC	Regulatory compliance certificate
SABS	South African Bureau of Standards
SANAS	South African National Accreditation System.
V	Voltage
VA	Volt-ampere
Vnom	Nominal voltage. For the purpose of this specification the voltage is 230V
CIU	Customer Interface Unit
HHU	Hand Held Unit.
ISO	International Organization for Standardization
SANS	SANS South African National Specification
SGC	SGC Supply Group Code
STS	STS Standard Transfer Specification
LPU	Large Power Users

4 REQUIREMENTS

Nothing in this specification shall lessen the obligations of the supplier. The supplier shall be fully responsible for the design and supply of single and three phase meters; and its satisfactory performance in service. Approval by City Power shall not relieve the supplier of the responsibility for the adequacy of the design. The following requirement shall cater for LPU and residential customer meters

4.1 GENERAL

4.1.1 The meters shall provide all the functions of measurement, registration and multiphase recording required for the metering of a balanced and unbalanced, single or polyphase feeder.

4.1.2 The meter shall be self-contained with the communication module(s) internal to the meter

4.1.3 For the purposes of meeting the requirements of SANS 1524-1, the Meter shall always be regarded as a payment Meter, regardless of whether it is in prepayment mode or in post-payment mode, and both modes shall be tested.

4.1.4 The meters shall be of Class accuracy as prescribed by SANS/IEC 62053 -11, 22 and 23.

4.1.5 Voltage and current terminals shall satisfy the relevant requirements of SABS/IEC 1036.

4.1.6 The meter shall be equipped for following time of use requirements:

a) Number of tariffs per season - > 3,

b) Number of tariff periods per day - >8,

c) Number of day types per week - >4 (Monday to Thursday, Friday, Saturday, Sunday),
d) Number of seasons - > 2,
e) Number of month-end resets (auto-reset) - > 13,
f) Number of public holidays - > 24,

4.1.7 It shall be possible to enter into the meter all tariff data, as well as the activation date for a future season.
4.1.8 It shall be possible to change tariff tables (active times) on a batch basis by means of instructions programmed into the hand held unit/master station system.
4.1.9 The meters shall be capable of measuring quantities in all four quadrants.
4.1.10 Terminal covers shall be in accordance with SANS/IEC 62052 part 11
4.1.11 The terminal cover shall enclose the actual terminals and the conductor fixing screws.
4.1.12 The meter shall have a load limiting capability and be programmable both local and remotely.
4.1.13 The meter shall be able to connect and disconnect load both local and remotely
4.1.14 The meter shall be supplied with a built-in surge protection.
4.1.15 The meter shall be design with tamper proof fasteners.
4.1.16 Meter serial number provided shall be unique only to City Power
4.1.17 All meters shall be DLMS COSEM compliant as to SANS 62056-21
4.1.18 Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.
4.1.19 The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh and kVAr.
4.1.20 The pulse rates for the LED's shall be marked on the nameplate.
4.1.21 Display indicators for different meter scenarios such as tamper, quadrants, and voltage phases shall be available and programmable.
4.1.22 The meter shall have the capability to remotely accept a complete configuration file change.
4.1.23 The terminals position and spacing shall be according to the same BS requirements with the addition that screw clamp terminals to be used.
4.1.24 The meter shall reset to zero and restart whenever it reaches the maximum reading.
4.1.25 All meters shall be compatible and be able to integrate with current City power's System (HES).
4.1.26 Meter shall be able to detect, record and send alarms to the HES.

4.2 METER DESIGN

4.2.1 The measurement unit shall be in a high impact resistant case. The meter cover shall be dust-proof and sealable.
4.2.2 A terminal block cover shall be provided; the cover shall be sealable independently from the meter cover.
4.2.3 Meters shall comply with the requirements for indoor meters as specified in SANS IEC 631036.
4.2.4 The meter shall be resistant to impact damage and should withstand, without functional failure, a drop of 1 m at any orientation in its original packaging, onto a concrete surface
4.2.5 The meter shall be fitted with a replaceable non-volatile memory backup battery that is available off the shelf and that is not proprietary to the meter.
4.2.6 Provision shall be made for the meter to plug into a standard socket as defined in SANS 1524-1-1.
4.2.7 The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.
4.2.8 When the meter is installed, no access to the terminals shall be possible without breaking a mechanical seal on the cover.
4.2.9 For MV systems/configurations, the meter should be able to extrapolate consumption for all phases even when certain phases are missing.
4.2.10 The design and construction of the meter shall be suitable for the following conditions as to IEC62052-11
a) Altitude above sea level: at 1800m
b) Ambient temperature: 35 °C ± 2 °C;
c) Relative humidity: 40 % to 60 %; and
d) Atmospheric pressure: 80 kPa to 106 kPa.

e) Lighting: Severe
f) Operating range: −10 °C to 55 °C
g) IP rating: 54

4.2.11 Meter shall be able to detect, record and send alarms to the HES, which include but not limited to Meter temper

4.3 METER DISPLAY

4.3.1 The meters shall have a Liquid Crystal Display.

4.3.2 The registers of the meters shall have at least 8 (eight) digits. The last digit shall not represent a decimal point, but a unit (kWh) in the normal operating mode.

4.3.3 The meters shall be able to sequentially display, using a manual and automatic stepping facility, at least 100 functions selectable from the following:

4.3.3.1 Current time and date.

4.3.3.2 Current and historical billing register values including time and date of reset.

4.3.3.3 Active tariff.

4.3.3.4 Programmed VT and CT ratios with error compensation values.

4.3.3.5 Diagnostic registers including battery age.

4.3.3.6 Display test pattern.

4.3.3.7 Instantaneous input voltages, currents, Watts, VArs, VA and power factor with an indication of which type of quantity is being displayed.

4.3.3.8 Instantaneous Watts and VArs per connected phase, and/or phase angle between the input voltage and input current per connected phase such that it can be determined whether the input current is leading or lagging with respect to the relevant input voltage.

4.3.4 It shall be possible to set the display for the following display modes, each of which shall be programmable.

4.3.4.1 Meter reader mode, initiated by resetting of the meter.

4.3.4.2 Engineering mode for service personnel use shall be set as default mode.

4.3.4.3 The meter display may default to the meter reader mode, with a facility to switch to the engineering mode, defaulting back to the meter reading mode after a preset time period.

4.4 COMMUNICATIONS

4.4.1 Optic-Electronic Communications Port

4.4.1.1 A bi-directional infra-red communications port shall be provided which complies with SANS/IEC 1107 or IEC 62056-21.to allow reading of all stored data, programming of meter configuration data and checking of diagnostic registers.

4.4.1.2 The interface between the meter and programming device shall also comply with SANS/IEC 1107.

4.4.1.3 The infra-red communication port shall be accessible from the front of the meter main cover.

4.4.1.4 It shall be possible to interface to a hand held unit, as well as a personal computer (PC).

4.4.2 Serial Communication port

4.4.2.1 A RS232/RS485 or equivalent port shall be provided to enable the meter to communicate with a modem for direct interrogation from a remote point.

4.4.2.2 The port shall only be accessible via a sealable cover.

4.4.2.3 The port shall be isolated from the rest of the meter circuitry as required in SANS/IEC1036.

4.4.3 LTE-GPRS MODEM AND ANTENNA investigate fiber

4.4.3.1 The manufacturer shall make provision, in their pricing for LTE-GPRS modem and antenna
4.4.3.2 The LTE-GPRS modem and antenna shall be self-contained and internal to the meter
4.4.3.3 The LTE-GPRS modem and antenna shall be powered by the meter
4.4.3.4 The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose
4.4.3.5 Modem shall be fitted with a chip SIM that will be provided by City Power
4.4.3.6 Modem shall have an extra slot that can accommodate a plastic SIM
4.4.3.7 Modem shall be programmable for different IP addresses on side in the meter and off site outside the meter
4.4.3.8 Modem shall have a GPS module
4.4.3.9 Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment
4.4.3.10 GPRS module shall be ICASA approved
4.4.3.11 Meter shall be configurable remotely and be able to accept remote configuration for a complete meter setup change

4.4.4 G3PLC Communication

4.4.4.1 G3PLC shall communicate up to a minimum range of 120m
4.4.4.2 The meter shall be able to communicate remotely via G3PLC as to IEEE P1901.2, IPv6, for meter data exchange and programming.

5 RESIDENTIAL SMART METER (Post and Prepaid Smart Meters)

5.1 Functional Requirements

5.1.1 Smart meter shall be of a split meter design such that the meter and the CIU are separate.
5.1.2 Reverse energy shall not open a meter contact unless authorised through configuration template.
5.1.3 Smart meter shall be convertible from post-paid to pre-paid and vice versa.
5.1.4 The conversion shall be done locally through an optical eye or token and remotely through atoken via HES.
5.1.5 Smart meter shall have built-in keypad – except for DIN rail meters
5.1.6 The meter shall have an optical communication port according to IEC 62056-21.
5.1.7 The meter shall continue to operate normally even if the CIU is disconnected.
5.1.8 Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid
5.1.9 Smart Meter shall not switch off due to multiple power cuts
5.1.10 Smart Meter shall have a remote Load limiting capability
5.1.11 The smart Meter shall not open contact or tamper if one or two of the three phases supply is off
5.1.12 The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication
5.1.13 The accuracy rating shall be of a class1 or better as to SANS/IEC 62053 -11 and 22

5.2 Single Phase

5.2.1 The meter shall be 230 V and directly connected
5.2.2 The meter shall have maximum ampere rating of 80 A
5.2.3 The single phase shall be of MAX:130mm width and 200mm Length

5.3 Three Phase

5.3.1 The meter shall be a three phase 4-wire 400 V and directly connected
5.3.2 The meter shall have maximum ampere rating of 100 A
5.3.3 The single phase shall be of MAX:180mm width and 300mm

5.4 Prepaid Smart Meter

5.4.1 All meters shall comply with the STS /prepayment requirements as defined by IEC 62055-41, IEC 62055-51 and IEC 62055-52 for kWh based credit tokens unless where differences are

defined in this specification.

5.4.2 It shall be possible to inject all the supported STS tokens and read the results via an optical port

5.4.3 It shall also be possible to read and/or write all the mandatory registers directly through the port as defined in STS Companion specification, STS 201-1.

5.4.4 The Smart Meter shall display the available credit on a LCD unit.

5.4.5 Smart Meter units shall decrease in relation to consumption when in prepaid mode.

5.4.6 The cover being open while the meter is on or off shall activate temper mode.

5.4.7 When in prepaid mode the meter shall have clear temper indicator.

5.4.8 When units are depleted, the contact shall open.

5.4.9 At the end of each billing period all billing register data and vending data (this is for prepaid),shall be transferred to historical registers which shall retain the data for at least the 36 most recent completed billing periods.

5.4.10 Meter shall be TID roll over ready, and compliant with STS600-4-2 or later.

5.4.11 DINRAIL single phase meter

5.4.11.1 The DIN rail Meter shall have the following dimensions

a) Maximum height: 140 mm
b) Maximum width: 65 mm
c) Maximum Depth (from base plate): 110 mm
d) The terminal block shall have four connectors

5.4.11.2 The meter enclosure shall conform to the standard circuit breaker enclosure format that is suitable for mounting on a 35 mm DIN rail or alternatively with dual-rail mounting capability.

5.5 CUSTOMER INTERFACE UNIT

5.5.1 The housing of the CIU shall be manufactured from UV-stable, Polycarbonate material with flame-retardant properties

5.5.2 The Customer Interface Unit (CIU) housing shall have a degree of protection rating of IP 52.

5.5.3 Data (credit) in the meter shall be stored in a non-volatile memory to prevent information loss in the event of an extended loss of mains supply or low supply voltage.

5.5.4 The CIU shall provide a “low credit” indicator.

5.5.5 The CIU for a split meter shall provide a unique indication that the communication to the Meter is active and working correctly.

5.5.6 Keys on the CIU used for data entry shall be of sufficient size to permit ease of use, shall be indelible, resistant to dust and household cleaning solvents.

5.5.7 The CIU shall provide a 12 key type keypad for entering the pre-payment token, with a backspace for corrections and information keys for accessing additional meter registers.

5.5.8 The numbers entered on the keypad shall be echoed on the LCD. Mistakes shall be correctable using a backspace or clear key.

5.5.9 The CIU shall be mains and battery powered.

5.5.10 The CIU shall be fitted with a replaceable memory backup battery that is available off the shelf.

5.5.11 Communication between the meter and the CIU shall be via G3PLC.

5.5.12 The CIU shall have the capability of receiving data from the meter at programmable interval.

5.5.13 Paired CIUs shall be able to be unpaired and paired with a different meter.

5.5.14 Display indicators for different meter scenarios such as tamper, quadrants, and voltage phases shall be programmable to the CIU.

5.5.15 Different short codes shall be available for customers to check but not limited to:

a) Available units
b) Last recharge voucher
c) Date of last recharge
d) Time

5.6 Data Concentrator Unit

5.6.1 The DCU shall be compatible and comply with requirements of COSEM 62056, part 4,5 and

5.6.2 The equipment shall comply with tests and test conditions as stated IEC 62052-11,

5.6.3 The DCU shall be compatible with both meter and City Power’s Head End System

5.6.4 Commination between DCU and meter shall be via G3 PLC or equivalent
5.6.5 Communication between DCU and Head End System shall be via one of the GSM platforms, preferably LTE
5.6.6 DCU shall be equipped with both Ethernet and serial port to enable direct connection.
5.6.7 The GSM modem shall be easy to unplug and replace
5.6.8 A detachable GSM antenna with and SMA connector shall be provided with the DCU in accordance with CP_TSSPEC_239 4.The
5.6.9 DCU shall automatically register meters connected to the same feeders
5.6.10 It shall be possible to remotely program the DC from the HES and using the applicable DC software's

6 LPU SMART METERS

6.1 LPU meters shall have the following functional requirements,
6.1.1 Accuracy shall be class 1 on reactive energy, class 0.5 on active energy and Class 0.2 as prescribed by SANS/IEC 62053 -11 and 22
6.1.2 The meter shall be configurable for both three phase 3 wire or three phase 4 wire connection
6.1.3 The meter shall be VT operated with operational voltage ratings of (3phase 53V – 480V at 50Hz).
6.1.4 The meter shall be CT operated with operational current ratings of (1A - 10A/phase).
6.1.5 The single phase shall be of min:170mm width, Height 240mm and 60mm depth

7 LOAD PROFILE RECORDING

7.1 In addition to the memory required for billing data, the meters shall be fitted with sufficient memory to record up to four half-hourly load profile quantities more than 240 days, for subsequent retrieval via the optical or RS232 communications ports.
7.2 Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. The active time interval shall be the same as the programmed integration period for maximum demand measurement.
7.3 Record of voltages, currents and power factor load profile shall be possible
7.4 It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values from the meter via the optical port by using a hand held unit or a personal computer, as well as remotely.
7.5 In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter at the time, or only that part of the load profile that has not been downloaded previously.
7.6 It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, irrespective of which data has been programmed to be displayed on the meter.

8 SOFTWARE, PROGRAMMING AND SECURITY

8.1 Meter software shall be provided free of charge which shall include but not limited to meter reading, programming, configuration and firmware upgrades.
8.2 The configuration template for meters shall be agreed upon with City Power once the service provider has been appointed.
8.3 To enable programming or resetting of registers, meters shall perform security checks which verify that the programming is authorized.
8.4 Programming shall be disabled if this verification fails.
8.5 The meter software shall be password protected and licensed individually.
8.6 The password protection shall be unique to City Power and linked to officials authorized to do so.
8.7 The meter software license shall be free and shall not expire.
8.8 The meter shall keep all records of the following events;
8.8.1 Configuration changes.
8.8.2 Time and date changes.
8.8.3 Resetting of billing and accumulative registers that are not reset by the normal end of billing

period reset signal.

8.8.4 Changing of passwords

8.8.5 Downloading of configuration setup file.

8.9 The meter shall keep record of all the changes in 8.6 per user.

8.10 It shall be possible to reset all billing registers (including accumulative registers) on the meter by means of a software function using the HES or meter system. This reset function shall not alter the meter password or set-up data.

8.11 The end of integration period shall be programmable to be initiated by any of the following means automatically by an internal timer.

8.12 Meters shall be provided with a crystal controlled real time clock that will not drift by more than ± 3, 5 seconds per day over the full temperature range specified for the meters.

8.13 The service provider shall state the accuracy of the real time clock.

8.14 The calendar shall automatically cater for leap years.

8.15 The service provider shall state up to which year the calendar will be programmed for.

8.16 It shall be possible to synchronize the clock and calendar via the optical and serial ports, as well as remotely via a HES and meter software, as a specific operation as well as part of the operation of extracting data from the meter without resetting any other parameters in the meter.

8.17 Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.

8.18 All meter related software shall be provided for the equipment offered in terms of this specification

8.19 Two auxiliary inputs shall be provided for the purpose of resetting the integration period and end of billing period when the meters are so programmed.

8.20 Four programmable auxiliary outputs are required for synchronization of other meters, indication of active season, active tariff period, and output of active and reactive energy pulses for energy management use

9 POWER SUPPLY

9.1 The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.

9.2 Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.

9.3 Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years.

10 ANTI-TEMPER SEALS

10.1 The meters shall be sealable using standard anti-tamper seals.

10.2 Provision shall be made for sealing of the measurement unit with specified City Power seal in accordance with the relevant specification NRS057. Where the terminals are contained inside the enclosure, they may be sealed with the same seal(s) as the enclosure.

10.3 The seals shall be applied in such a way that they will be easily visible when viewing an installed meter from the front.

11 MARKING AND LABELLING

11.1 Marking of meter (Name-plates)

11.1.1 All rating plates shall be in accordance with SANS/IEC 62052 part 11.

11.1.2 Markings shall be indelible, distinct and legible on the outside of the meter.

11.1.3 Terminal markings shall be clearly indicated on the meter itself.

11.1.4 The meter shall be clearly marked that it is a property of City Power

11.1.5 Designation of type and space for approval mark shall also be provided

11.1.6 The number of phases and the number of wires for which the meter is suitable (for example, single phase 2-wire, three-phase 3-wire, three-phase 4-wire); these markings may be replaced by the graphical symbols given in SANS/IEC 60387;

11.1.7 The meter's serial number shall comply with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.

11.1.8 The serial number and year of manufacture. If the serial number is marked on a plate fixed to the cover, the number shall also be marked on the meter base and stored in the meter's non-volatile memory;

11.1.9 The reference voltage in one of the following forms:

11.1.10 The number of elements if more than one, and the voltage at the meter terminals of the voltage circuit(s);

11.1.11 The rated voltage of the system or the secondary voltage of the instrument transformer to which the meter is intended to be connected.

11.1.12 For direct connected meters, the basic current and the maximum current expressed, for example: 10-40 A or 10(40) A for a meter having a basic current of 10 A and a maximum current of 40 A; for transformer-operated meters, the rated secondary current of the transformer(s) to which the meter should be connected, for example: /5 A; the rated current and the maximum current of the meter may be included in the type designation;

11.1.12.1 The reference frequency in Hz;

11.1.12.2 The meter constant;

11.1.12.3 The class index of the meter;

11.1.13 Information in clause 11.1.3 to 11.1.6 shall may be marked on an external plate permanently attached to the meter cover.

11.1.14 Information in clause 11.1.12 shall be marked on a name-plate preferably placed within the meter. The marking shall be indelible, distinct and legible from outside the meter.

11.2 Connection diagrams and terminal marking

11.2.1 Every meter shall preferably be indelibly marked with a diagram of connections. If this is not possible reference shall be made to a connection diagram. For polyphase meters, this diagram shall also show the phase sequence for which the meter is intended. It is permissible to indicate the connection diagram by an identification figure in accordance with national standards.

11.2.2 If the meter terminals are marked, this marking shall appear on the diagram.

11.2.2.1 The meter shall be indelibly and legibly marked "PROPERTY OF CITY POWER".

11.2.2.2 Serial numbers provided to CP shall be unique to CP

11.2.2.3 The serial numbers of the meters shall be easily read.

11.2.2.4 The serial numbers for single phase meters shall be different to those of three phase residential and LP meters

12 TESTING

12.1 The meters shall be brought for in-house system integration testing as and when required.

12.2 The type test shall be made on one or more specimens of the meter, selected by the manufacturer, to establish its specific characteristics and to prove its conformity with the requirements of the relevant standard.

12.3 The meters shall be type tested according to the requirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21. The type tests shall be done at an approved test facility (test facility accredited by a full member facility that is listed at International Laboratory Accreditation Cooperation (ILAC)).

12.4 The following test shall be performed and each test shall be accompanied by test certificates, detail report of tests performed and the RCC approval certificates.

12.4.1 Test of insulation properties

12.4.2 Test of Accuracy

12.4.3 Test of Electrical

12.4.4 Test of Electromagnetic compatibility (EMC)

12.4.5 Test of Climatic influence

12.4.6 Mechanical

12.4.7 Test of load switching

13 DOCUMENTATION

13.1 Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format

13.2 All instruction manuals shall be provided for the equipment offered in terms of this specification.

13.3 The manuals shall be in English and sufficiently detailed to enable metering staff to install, maintain, test, configure and use each item of equipment.

13.4 The supplier of the meters shall obtain a Regulatory Compliance Certificate (RCC) certification to indicate that the type tests are suitable for South African conditions in cases where the type testing was done at an international facility.

13.5 A copy of all test certificates, detailed test reports of tests performed and the RCC approval certificates shall be submitted.

13.6 The following documentation shall be provided with the meter on delivery;

13.4.1 Factory Quality test report for total meter batch

13.4.2 Calibration certificates for each meter shall be in both electronic and hard copy format.

14 MAINTENANCE

A maintenance plan shall be included with the documentation of the equipment offered in terms of this specification, guaranteeing that they are able to provide full repair and calibration services for the equipment offered in case the equipment malfunctions before warranty period elapses.

15 SPARES

OEM's shall include documentation of the equipment offered in terms of this specification, guaranteeing the availability of spares for the equipment supplied up to 10 years after the expiry date of the contract.

16 SAMPLES

16.1 Sample shall be lodged within two working days on request, at City Power Head Office, 40 Heronmere Rd, Booysens Johannesburg.

16.2 Samples shall be properly labeled with;

16.2.1 Contract number

16.2.2 Item number

16.2.3 Name of bidder.

17 TRAINING REQUIREMENTS

17.1 Training shall be provided to all City Power's resources for the duration of the contract.

17.2 The supplier shall provide the following details with regard to certified staff training offered:

17.2.1 The available training courses and their duration;

17.2.2 The minimum number of delegates required;

17.2.3 The certification of delegates;

17.2.4 On-site training, and

17.2.5 Training course content.

18 QUALITY MANAGEMENT

A quality management system shall be set up in order to assure the quality of single or three phase meter during design, development, production and servicing. Guidance on the requirements for a quality management system may be found in the following standards: ISO 9001. The details shall be subject to agreement between the purchaser and supplier.

19 ENVIRONMENTAL MANAGEMENT

An environmental management system shall be set up in order to assure the environmental compliance of single or three phase meter throughout its entire life cycle (i.e. during design, development, production, installation, operation and maintenance, decommissioning and disposal phases). Guidance on the requirements for an environmental management system may be found in SANS 14001 and City Power Policy. The details shall be subject to agreement between the purchaser and supplier.

20 HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management and compliance of single or three phase meters during operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan shall be found in OHSAS 18001:2007 standards. The details shall be subject to agreement between City Power and the Service Provider.

Annexure A - Bibliography

Annexure B - Revision information

DATE	REV. NO.	NOTES
JUNE 2021	0	Replace CP_TSSPEC_087 Reworked entire document

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 1 – LARGE POWER USERS SMART METER 3 PHASE 4 WIRE 400V
SAP no4671

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
1.		Name of OEM	XXXX	
2.		Country	State	
3.	**4**	**GENERAL REQUIREMENTS**		
4.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
5.	4.1.6	Equipped for time of use requirements as to 4.1.6	Required	
6.	4.1.8	Possible to change tariff tables (as to 4.1.8	Required	
7.	4.1.9	Capable of measuring quantities in all four quadrants.	Required	
8.	4.1.15	Design with tamper proof fasteners.	Required	
9.	4.1.16	Meter serial number provided, unique only to City Power	Required	
10.	4.1.17	DLMS COSEM compliant as to SANS 62056-21	Required	
11.	4.1.18	Two energy proportional visible red LED's provided for test purposes, one for active energy and one for reactive energy.	Required	
12.	4.1.19	State the number of LED pulses per kWh and kVAr.	State	
13.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
14.	4.1.22	Capability to remotely accept a complete configuration file change.	Required	
15.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading	Required	
16.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
17.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
18.	**4.2**	**METER DESIGN**		
19.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	
20.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
21.	4.2.9	The configuration template for meters shall be agreed upon with City Power once the service provider has been appointed.	Required	
22.	**4.3**	**METER DISPLAY**		
23.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
24.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
25.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, as to 4.3.3	State	
26.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	

27.	4.1	GENERAL		
28.	4.1.1	The meters shall provide all the functions of measurement, registration and multiphase recording required for the metering of a balanced and unbalanced, single or polyphase feeder.	Required	
29.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
30.	4.1.3	For the purposes of meeting the requirements of SANS 1524-1, the Meter shall always be regarded as a payment Meter, regardless of whether it is in prepayment mode or in post-payment mode, and both modes shall be tested.	Required	
31.	4.1.4	The meters shall be of Class accuracy as prescribed by SANS/IEC 62053 -11, 22 and 23.	Required	
32.	4.1.5	Voltage and current terminals shall satisfy the relevant requirements of SABS/IEC 1036.	Required	
33.	4.1.6	The meter shall be equipped for following time of use requirements:	Required	
34.	a)	Number of tariffs per season - > 3,	Required	
35.	b)	Number of tariff periods per day - >8,	State	
36.	c)	Number of day types per week - >4 (Monday to Thursday, Friday, Saturday, Sunday),	State	
37.	d)	Number of seasons - > 2,	Required	
38.	e)	Number of month-end resets (auto-reset) - > 13,		
39.	f)	Number of public holidays - > 24,	Required	
40.	4.1.7	It shall be possible to enter into the meter all tariff data, as well as the activation date for a future season.	Required	
41.	4.1.8	It shall be possible to change tariff tables (active times) on a batch basis by means of instructions programmed into the hand held unit/master station system.	Required	
42.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
43.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
44.	4.1.11	The terminal cover shall enclose the actual terminals and the conductor fixing screws.	Required	
45.	4.1.12	The meter shall have a load limiting capability and be programmable both local and remotely.	Required	
46.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
47.	4.1.25	All meters shall be compatible and be able to integrate with current City power's System (HES).		
48.	4.1.26	Meter shall be able to detect, record and send alarms to the HES, which include but not limited to		
49.	6.1.4	The meter shall have maximum ampere rating of	5(1 - 10A).	
50.	6.1.5	The single phase shall be of MIN:170mm width and 270mm height	State	
51.	**7**	**LOAD PROFILE RECORDING**		
52.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
53.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
54.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
55.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	

56.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
57.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
58.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
59.	8.1	The configuration template for meters shall be agreed upon with City as to 8.1	Required	
60.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	
61.	8.4	Software shall be password protected and licensed individually.	Required	
62.	8.5	The meter software shall be password protected and licensed individually.	Required	
63.	8.6	The meter software license shall be free and shall not expire.	Required	
64.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
65.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
66.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.9	Required	
67.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
68.	8.12	The accuracy of the real time clock.	State	
69.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
70.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
71.	**9**	**POWER SUPPLY**	Required	
72.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
73.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	
74.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
75.	**10**	**ANTI-TEMPER SEALS**		
76.	10.2	Provision shall be made for sealing of the measurement unit with specified City Power seal in accordance with the relevant specification NRS057	Required	
77.	**11**	**MARKING AND LABELLING**		
78.	11.1.1	All rating plates shall be in accordance with Clause 11	Required	
79.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
80.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
81.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
82.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	

83.	11.2	Connection diagrams and terminal marking	Required	
84.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
85.	**12**	**TESTING**	Required	
86.	12.1	Brought for in-house system integration testing as and when required	Required	
87.	12.3	Type tested according to the requirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
88.	12.4	Test shall be performed as to 12.4	Required	
89.	**13**	**DOCUMENTATION**		
90.	13.1	Full technical and functional details for all items in both electronic and hard copy format as to clause13	Required	
91.	13.3	The manuals shall be in English as to 13.3	Required	
92.	13.4	The supplier of the meters shall obtain a (RCC) as to 13.4	Required	
93.	13.5	Copies of all test certificates, detailed test reports as to 13.5	Required	
94.	**14**	**MAINTENANCE**		
95.		A maintenance plan shall be included as to clause 14	Required	
96.	**15**	**SPARES**		
97.		Availability of Spares as to clause 15	Required	
98.	**16**	**SAMPLES**		
99.	16.1	Sample shall be lodged as to clause 16	Required	
100.	**17**	**TRAINING REQUIREMENTS**		
101.	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
102.	**18**	**QUALITY MANAGEMENT**		
103.		Quality management system as to clause 18	Required	
104.	**19**	**ENVIRONMENTAL MANAGEMENT**		
105.		Environmental management system as to clause 19	Required	
106.	**20**	**HEALTH AND SAFETY**		
107.		Health and safety plan as to clause 20	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____
Name in block lettersSignature

Full name of company: _____

Item No. 1 – LARGE POWER USERS SMART METER 3 PHASE 4 WIRE 400V SAP no4671

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_316	Proposed deviation

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 2 – LARGE POWER USERS INTAKE METERS 3 PHASE 4 WIRE 400V
SAP no4672

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
108.		Name of OEM	XXXX	
109.		Country	State	
110.	**4**	**GENERAL REQUIREMENTS**		
111.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
112.	4.1.6	Equipped for time of use requirements as to 4.1.6	Required	
113.	4.1.8	Possible to change tariff tables (as to 4.1.8	Required	
114.	4.1.9	Capable of measuring quantities in all four quadrants.	Required	
115.	4.1.15	Design with tamper proof fasteners.	Required	
116.	4.1.16	Meter serial number provided, unique only to City Power	Required	
117.	4.1.17	DLMS COSEM compliant as to SANS 62056-21	Required	
118.	4.1.18	Two energy proportional visible red LED's provided for test purposes, one for active energy and one for reactive energy.	Required	
119.	4.1.19	State the number of LED pulses per kWh and kVAr.	State	
120.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
121.	4.1.22	Capability to remotely accept a complete configuration file change.	Required	
122.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading	Required	
123.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
124.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
125.	**4.2**	**METER DESIGN**		
126.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	
127.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
128.	4.2.9	The configuration template for meters shall be agreed upon with City Power once the service provider has been appointed.	Required	
129.	**4.3**	**METER DISPLAY**		
130.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
131.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
132.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, as to 4.3.3	State	
133.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	
134.	**4.4**	**COMMUNICATIONS**		
135.	4.4.1.1	Provision of communications port which complies with SANS/IEC 1107 or IEC 62056-21.	Required	

136.	4.4.2.1	A RS232/RS485 or equivalent port provided	Required	
137.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
138.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
139.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
140.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
141.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
142.	4.4.3.8	Modem shall have a GPS module	State	
143.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	State	
144.	4.4.3.10	GPRS module shall be ICASA approved	Required	
145.		**LPU functional requirements,**		
146.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
147.	5.1.5	Meter shall have built-in keypad	Required	
148.	5.1.9	Meter shall not switch off due to multiple power cuts	Required	
149.	5.1.10	Meter shall have a remote Load control capability	Required	
150.	5.1.11	Meter shall not open contact or tamper if one or two of the three phases supply is off	Required	
151.	6.1.1	Accuracy shall be class 0.2 as to 6.1.1	Class 0.2	
152.	6.1.2	The meter shall be configurable as three phase 3-wire or three phase 4-wire 400 V.	Required	
153.	6.1.3	The meter shall be CT operated.	Required	
154.	6.1.4	The meter shall have maximum ampere rating of	5(1 - 10A).	
155.	6.1.5	The single phase shall be of MIN:170mm width and 260mm height	State	
156.	**7**	**LOAD PROFILE RECORDING**		
157.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
158.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
159.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
160.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
161.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
162.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
163.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
164.	8.1	The configuration template for meters shall be agreed upon with City as to 8.1	Required	
165.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	
166.	8.4	Software shall be password protected and licensed individually.	Required	

167.	8.5	The meter software shall be password protected and licensed individually.	Required	
168.	8.6	The meter software license shall be free and shall not expire.	Required	
169.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
170.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
171.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.9	Required	
172.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
173.	8.12	The accuracy of the real time clock.	State	
174.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
175.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
176.	**9**	**POWER SUPPLY**	Required	
177.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
178.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	
179.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
180.	**10**	**ANTI-TEMPER SEALS**		
181.	10.2	Provision shall be made for sealing of the measurement unit with specified City Power seal in accordance with the relevant specification NRS057	Required	
182.	**11**	**MARKING AND LABELLING**		
183.	11.1.1	All rating plates shall be in accordance with Clause 11	Required	
184.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
185.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
186.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
187.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
188.	11.2	Connection diagrams and terminal marking	Required	
189.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
190.	**12**	**TESTING**	Required	
191.	12.1	Brought for in-house system integration testing as and when required	Required	
192.	12.3	Type tested according to the requirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
193.	12.4	Test shall be performed as to 12.4	Required	
194.	**13**	**DOCUMENTATION**		
195.	13.1	Full technical and functional details for all items in both electronic and hard copy format as to clause13	Required	
196.	13.3	The manuals shall be in English as to 13.3	Required	

197.	13.4	The supplier of the meters shall obtain a (RCC) as to 13.4	Required	
198.	13.5	Copies of all test certificates, detailed test reports as to 13.5	Required	
199.	**14**	**MAINTENANCE**		
200.		A maintenance plan shall be included as to clause 14	Required	
201.	**15**	**SPARES**		
202.		Availability of Spares as to clause 15	Required	
203.	**16**	**SAMPLES**		
204.	16.1	Sample shall be lodged as to clause 16	Required	
205.	**17**	**TRAINING REQUIREMENTS**		
206.	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
207.	**18**	**QUALITY MANAGEMENT**		
208.		Quality management system as to clause 18	Required	
209.	**19**	**ENVIRONMENTAL MANAGEMENT**		
210.		Environmental management system as to clause 19	Required	
211.	**20**	**HEALTH AND SAFETY**		
212.		Health and safety plan as to clause 20	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 2 – LARGE POWER USERS INTAKE METERS 3 PHASE 4 WIRE 400V SAP no4672

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_316**	**Proposed deviation**

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 3 – RESIDENTIAL POSTPAID SMART METER 1 PHASE 2-WIRE 230V
SAP no4673

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
213.		Name of OEM	XXXX	
214.		Country	XXX	
215.	**4**	**GENERAL REQUIREMENTS**	Required	
216.	4.1.1	The meters shall provide all the functions of measurement as to clause 4.1.1	Required	
217.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
218.	4.1.3	The Meter shall always be regarded as a payment Meter,	Required	
219.	4.1.6	Equipped for time of use requirements as to 4.1.6	State	
220.	4.1.8	It shall be possible to change tariff tables on a batch basis as to 4.1.8	Required	
221.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
222.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
223.	4.1.12	The meter shall have a load limiting capability and programmable both local and remotely.	Required	
224.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
225.	4.1.14	The meter shall be supplied with a built-in surge protection.	Required	
226.	4.1.15	The meter shall be design with tamper proof fasteners.	Required	
227.	4.1.16	Meter serial number provided shall be unique only to City Power	Required	
228.	4.1.17	All meters shall be DLMS COSEM compliant as to SANS 62056-21	Required	
229.	4.1.18	Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.	Required	
230.	4.1.19	The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh and kVAr.	Required	
231.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
232.	4.1.22	The meter shall have the capability to remotely accept a complete configuration file change.	Required	
233.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading.	Required	
234.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
235.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
236.	**4.2**	**METER DESIGN**		
237.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	

238.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
239.	**4.3**	**METER DISPLAY**		
240.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
241.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
242.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, as to 4.3.3	State	
243.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	
244.	**4.4**	**COMMUNICATIONS**		
245.	4.4.1.1	Provision of communications port which complies with SANS/IEC 1107 or IEC 62056-21.	Required	
246.	4.4.2.1	A RS232/RS485 or equivalent port provided	Required	
247.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
248.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
249.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
250.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
251.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
252.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	Required	
253.	4.4.3.10	GSM module shall be ICASA approved	Required	
254.	4.4.4.1	G3PLC shall communicate up to a minimum range of 120m	Required	
255.	4.4.4.2	The meter shall be able to communicate remotely via G3PLC as to 4.4.4	Required	
256.	5.1.1	Smart meter shall be of a split meter design such that the meter and the CIU are separate.	Required	
257.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
258.	5.1.3	Smart meter shall be convertible from post-paid to pre-paid and vice versa.	Required	
259.	5.1.4	The conversion shall be done locally though an optical eye or token and remotely trough a token via HES.	Required	
260.	5.1.5	Smart meter shall have built-in keypad	Required	
261.	5.1.7	The meter shall continue to operate normally even if the CIU is disconnected	Required	
262.	5.1.8	Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid	Required	
263.	5.1.9	Smart Meter shall not switch off due to multiple power cuts	Required	
264.	5.1.10	Smart Meter shall have a remote Load limiting capability	State	
265.	5.1.11	The smart Meter shall not open contact or tamper if one or two of the three phases supply is off	Required	
266.	5.1.12	The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication	Required	
267.	5.1.13	The accuracy rating shall e of a class1 or better.	class1	

268.	5.2.2	The meter shall have maximum ampere rating of	80 A	
269.	5.2.3	The single phase shall be of MAX: width, Height as to 5.2.3	S	
270.	**7**	**LOAD PROFILE RECORDING**		
271.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
272.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
273.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
274.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
275.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
276.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
277.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
278.	8.1	The configuration template for meters shall be agreed upon with City Power as to 8.1	Required	
279.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	
280.	8.4	The meter software shall be password protected and licensed individually.	Required	
281.	8.6	The meter software license shall be free and shall not expire.	Required	
282.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
283.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
284.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.8.	Required	
285.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
286.	8.14	The accuracy of the real time clock.	State	
287.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
288.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
289.	**9**	**POWER SUPPLY**		
290.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
291.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	
292.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
293.	**10**	**ANTI-TEMPER SEALS**		
294.	10.2	Provision shall be made for sealing in accordance with the relevant specification NRS057	Required	
295.	**11**	**MARKING AND LABELLING**		

296.	11.1.1	All rating plates shall be in accordance with 11.1.1	Required	
297.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
298.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
299.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
300.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
301.	11.2	Connection diagrams and terminal marking	Required	
302.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
303.	**12**	**TESTING**		
304.	12.1	The meters shall be brought for in-house system integration testing as and when required	Required	
305.	12.3	The meters shall be type tested according to the requirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
306.	12.4	Test shall be performed as to 12.4	Required	
307.	**13**	**DOCUMENTATION**		
308.	13.1	Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format	Required	
309.	13.3	The manuals shall be in English as to 13.3	Required	
310.	13.4	The supplier of the meters shall obtain a Regulatory Compliance Certificate (RCC) certification as to 13.4	Required	
311.	13.5	Copies of all test certificates, details of tests performed and the RCC approval certificates shall be submitted with the tender	Required	
312.	**14**	**MAINTENANCE**		
313.		A maintenance plan shall be included as to clause 14	Required	
314.	**15**	**SPARES**		
315.		Availability of Spares as to clause 15	Required	
316.	**16**	**SAMPLES**		
317.	16.1	Sample shall be lodged as to clause 16	Required	
318.	**17**	**TRAINING REQUIREMENTS**		
319.	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
320.	**18**	**QUALITY MANAGEMENT**		
321.		Quality management system as to clause 18	Required	

322.	**19**	**ENVIRONMENTAL MANAGEMENT**		
323.		Environmental management system as to clause 19	Required	
324.	**20**	**HEALTH AND SAFETY**		
325.		Health and safety plan as to clause 20	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 3 – RESIDENTIAL POSTPAID SMART METER 1 PHASE 2-WIRE 230V SAP no4673

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_316**	**Proposed deviation**

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 4 – RESIDENTIAL POSTPAID SMART METER 3 PHASE 4-WIRE 230V
SAP no4674

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
326.		Name of OEM	XXXX	
327.		Country	XXX	
328.	**4**	**GENERAL REQUIREMENTS**	Required	
329.	4.1.1	The meters shall provide all the functions of measurement as to clause 4.1.1	Required	
330.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
331.	4.1.3	The Meter shall always be regarded as a payment Meter,	Required	
332.	4.1.6	Equipped for time of use requirements as to 4.1.6	State	
333.	4.1.8	It shall be possible to change tariff tables on a batch basis as to 4.1.8	Required	
334.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
335.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
336.	4.1.12	The meter shall have a load limiting capability and programmable both local and remotely.	Required	
337.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
338.	4.1.14	The meter shall be supplied with a built-in surge protection.	Required	
339.	4.1.15	The meter shall be design with tamper proof fasteners.	Required	
340.	4.1.16	Meter serial number provided shall be unique onlyto City Power	Required	
341.	4.1.17	All meters shall be DLMS COSEM compliant as to SANS 62056-21	Required	
342.	4.1.18	Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.	Required	
343.	4.1.19	The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh andkVAr.	Required	
344.	4.1.20	The pulse rates for the LED's shall be marked onthe nameplate.	Required	
345.	4.1.22	The meter shall have the capability to remotely accept a complete configuration file change.	Required	
346.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading.	Required	
347.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
348.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
349.	**4.2**	**METER DESIGN**		
350.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	

351.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
352.	**4.3**	**METER DISPLAY**		
353.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
354.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
355.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, asto 4.3.3	State	
356.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	
357.	**4.4**	**COMMUNICATIONS**		
358.	4.4.1.1	Provision of communications port which complieswith SANS/IEC 1107 or IEC 62056-21.	Required	
359.	4.4.2.1	A RS232/RS485 or equivalent port provided	Required	
360.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
361.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
362.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
363.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
364.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
365.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	Required	
366.	4.4.3.10	GSM module shall be ICASA approved	Required	
367.	4.4.4.1	G3PLC shall communicate up to a minimum rangeof 120m	Required	
368.	4.4.4.2	The meter shall be able to communicate remotelyvia G3PLC as to 4.4.4	Required	
369.	5.1.1	Smart meter shall be of a split meter design suchthat the meter and the CIU are separate.	Required	
370.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
371.	5.1.3	Smart meter shall be convertible from post-paid topre-paid and vice versa.	Required	
372.	5.1.4	The conversion shall be done locally though an optical eye or token and remotely trough a tokenvia HES.	Required	
373.	5.1.5	Smart meter shall have built-in keypad	Required	
374.	5.1.7	The meter shall continue to operate normally evenif the CIU is disconnected	Required	
375.	5.1.8	Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid	Required	
376.	5.1.9	Smart Meter shall not switch off due to multiple power cuts	Required	
377.	5.1.10	Smart Meter shall have a remote Load limiting capability	State	
378.	5.1.11	The smart Meter shall not open contact or tamperif one or two of the three phases supply is off	Required	
379.	5.1.12	The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication	Required	
380.	5.1.13	The accuracy rating shall e of a class1 or better.	class1	

381.	5.2.2	The meter shall have maximum ampere rating of	80 A	
382.	5.2.3	The single phase shall be of MAX: width, Heightas to 5.2.3	S	
383.	**7**	**LOAD PROFILE RECORDING**		
384.	7.1	sufficient memory to record up to four half-hourlyload profile quantities more than 240 days, as to7.1	Required	
385.	7.2	Load profile recording shall be possible in 15, 30and 60 minutes' time intervals. As to 7.2	Required	
386.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
387.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
388.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
389.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
390.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
391.	8.1	The configuration template for meters shall be agreed upon with City Power as to 8.1	Required	
392.	8.2	Meters shall perform security checks which verifythat the programming is authorized as to 8.2	Required	
393.	8.4	The meter software shall be password protectedand licensed individually.	Required	
394.	8.6	The meter software license shall be free and shallnot expire.	Required	
395.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
396.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
397.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.8.	Required	
398.	8.11	Meters shall be provided with a crystal controlledreal time clock that will not drift as to 8.11	Required	
399.	8.14	The accuracy of the real time clock.	State	
400.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
401.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
402.	**9**	**POWER SUPPLY**		
403.	9.1	The auxiliary power supply shall be derived fromall three phase to phase voltages or all three phases to neutral voltages.	Required	
404.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	
405.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendarin the event of an AC power failure with a battery life of at least 10 years	Required	
406.	**10**	**ANTI-TEMPER SEALS**		
407.	10.2	Provision shall be made for sealing in accordancewith the relevant specification NRS057	Required	
408.	**11**	**MARKING AND LABELLING**		

409.	11.1.1	All rating plates shall be in accordance with 11.1.1	Required	
410.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
411.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
412.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
413.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
414.	11.2	Connection diagrams and terminal marking	Required	
415.	11.2.1	Every meter shall preferably be indelibly markedwith a diagram of connections as to 11.2.1	Required	
416.	**12**	**TESTING**		
417.	12.1	To be brought for in-house system integration testing as and when required	Required	
418.	12.3	Type tested according to therequirements specified in SANS/IEC 62052 part11 and SANS/IEC 62053 part 21 as to 12.3	Required	
419.	12.4	Test shall be performed as to 12.4	Required	
420.	**13**	**DOCUMENTATION**		
421.	13.1	Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format	Required	
422.	13.3	The manuals shall be in English as to 13.3	Required	
423.	13.4	The supplier of the meters shall obtain a Regulatory Compliance Certificate (RCC) certification as to 13.4	Required	
424.	13.5	Copies of all test certificates, details of tests performed and the RCC approval certificates shallbe submitted with the tender	Required	
425.	**14**	**MAINTENANCE**		
426.		A maintenance plan shall be included as to clause14	Required	
427.	**15**	**SPARES**		
428.		Availability of Spares as to clause 15	Required	
429.	**16**	**SAMPLES**		
430.	16.1	Sample shall be lodged as to clause 16	Required	
431.	**17**	**TRAINING REQUIREMENTS**		
432.	17.1	Training shall be provided to all City Power'sresources for the duration of the contract.	Required	
433.	**18**	**QUALITY MANAGEMENT**		
434.		Quality management system as to clause 18	Required	
435.	**19**	**ENVIRONMENTAL MANAGEMENT**		
436.		Environmental management system as to clause19	Required	

	20	**HEALTH AND SAFETY**		
		Health and safety plan as to clause 20	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 4 – RESIDENTIAL POSTPAID SMART METER 3 PHASE 4-WIRE 230V SAP no4674

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_316	Proposed deviation

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 5 – RESIDENTIAL PREPAID SMART METER – DIN-RAIL 1 Phase 230v
SAP no4675

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
437.		Name of OEM	XXXX	
438.		Country	XXX	
439.	**4**	**GENERAL REQUIREMENTS**	Required	
440.	4.1.1	The meters shall provide all the functions of measurement as to clause 4.1.1	Required	
441.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
442.	4.1.3	The Meter shall always be regarded as a payment Meter,	Required	
443.	4.1.6	Equipped for time of use requirements as to 4.1.6	State	
444.	4.1.8	It shall be possible to change tariff tables on a batch basis as to 4.1.8	Required	
445.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
446.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
447.	4.1.12	The meter shall have a load limiting capability and programmable both local and remotely.	Required	
448.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
449.	4.1.14	The meter shall be supplied with a built-in surge protection.	Required	
450.	4.1.15	The meter shall be design with tamper proof fasteners.	Required	
451.	4.1.16	Meter serial number provided shall be unique only to City Power	Required	
452.	4.1.17	All meters shall be DLMS COSEM compliant as to SANS 62056-21	Required	
453.	4.1.18	Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.	Required	
454.	4.1.19	The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh and kVAr.	Required	
455.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
456.	4.1.22	The meter shall have the capability to remotely accept a complete configuration file change.	Required	
457.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading.	Required	
458.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
459.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
460.	**4.2**	**METER DESIGN**		
461.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	

462.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
463.	**4.4**	**COMMUNICATIONS**		
464.		Pre-paid functional requirements,	Required	
465.	5.1.1	Smart meter shall be of a split meter design such that the meter and the CIU are separate.	Required	
466.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
467.	5.1.3	Smart meter shall not be convertible from pre-paid to post-paid and vice versa.	Required	
468.	5.1.7	The meter shall continue to operate normally even if the CIU is disconnected	Required	
469.	5.1.8	Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid	Required	
470.	5.1.9	Smart Meter shall not switch off due to multiple power cuts	Required	
471.	5.1.10	Smart Meter shall have a remote Load limiting capability	Required	
472.	5.1.11	The smart Meter shall not open contact or tamper if one or two of the three phases supply is off	Required	
473.	5.1.12	The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication	Required	
474.	5.1.13	The accuracy rating shall e of a class1 or better.	class1	
475.	5.4.1	All meters shall comply with the STS /prepayment requirements as defined by IEC 62055-41,	Required	
476.	5.4.6	Meter shall go into temper mode when the cover is opened; when the meter is powered on or off.	Required	
477.	5.4.7	Clear temper indicator. prepaid mode	Required	
478.	5.4.8	the contact shall open when units are depleted.	Required	
479.	5.4.9	All billing register data and vending data shall be transferred to historical registers as to 5.4.9	Required	
480.	5.4.10	Meter shall be TID roll over ready, and compliant with STS600-4-2 or later	Required	
481.	5.4.11	The meter enclosure shall conform to the standard circuit breaker enclosure format as to 5.4.10	Required	
482.	**7**	**LOAD PROFILE RECORDING**		
483.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
484.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
485.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
486.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
487.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
488.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
489.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
490.	8.1	The configuration template for meters shall be agreed upon with City Power as to 8.1	Required	
491.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	

492.	8.4	The meter software shall be password protected and licensed individually.	Required	
493.	8.6	The meter software license shall be free and shall not expire.	Required	
494.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
495.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
496.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.8.	Required	
497.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
498.	8.14	The accuracy of the real time clock.	State	
499.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
500.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
501.	**9**	**POWER SUPPLY**		
502.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
503.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	
504.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
505.	**10**	**ANTI-TEMPER SEALS**		
506.	10.2	Provision shall be made for sealing in accordance with the relevant specification NRS057	Required	
507.	**11**	**MARKING AND LABELLING**		
508.	11.1.1	All rating plates shall be in accordance with 11.1.1	Required	
509.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
510.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
511.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
512.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
513.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
514.	**12**	**TESTING**		
515.	12.1	The meters shall be brought for in-house system integration testing as and when required	Required	
516.	12.3	The meters shall be type tested according to the requirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
517.	12.4	Test shall be performed as to 12.4	Required	
518.	**13**	**DOCUMENTATION**		
519.	13.1	Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format	Required	

520.	13.3	The manuals shall be in English as to 13.3	Required	
521.	13.4	The supplier of the meters shall obtain a (RCC) certification as to 13.4	Required	
522.	13.5	Copies of all test certificates, details of tests performed and the RCC approval certificates shall be submitted with the tender	Required	
523.	**14**	**MAINTENANCE**		
524.		A maintenance plan shall be included as to clause 14	Required	
525.	**15**	**SPARES**		
526.		Availability of Spares as to clause 15	Required	
527.	**16**	**SAMPLES**		
528.	16.1	Sample shall be lodged as to clause 16	Required	
529.	**17**	**TRAINING REQUIREMENTS**		
530.	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
531.	**18**	**QUALITY MANAGEMENT**		
532.		Quality management system as to clause 18	Required	
533.	**19**	**ENVIRONMENTAL MANAGEMENT**		
534.		Environmental management system as to clause 19	Required	
535.	**20**	**HEALTH AND SAFETY**		
536.		Health and safety plan as to clause 20	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 5 – RESIDENTIAL PREPAID SMART METER – DIN-RAIL 1 Phase 230v SAP no4675

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_316**	**Proposed deviation**

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 6 – RESIDENTIAL PREPAID SMART METER: BS FOOTPRINT 1Phase 230v
SAP no4677

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
		Name of OEM	XXXX	
		Country	XXX	
537.	**4**	**GENERAL REQUIREMENTS**	Required	
538.	4.1.1	The meters shall provide all the functions of measurement as to clause 4.1.1	Required	
539.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
540.	4.1.3	The Meter shall always be regarded as a payment Meter,	Required	
541.	4.1.6	Equipped for time of use requirements as to 4.1.6	State	
542.	4.1.8	It shall be possible to change tariff tables on a batch basis as to 4.1.8	Required	
543.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
544.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
545.	4.1.12	The meter shall have a load limiting capability and programmable both local and remotely.	Required	
546.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
547.	4.1.14	The meter shall be supplied with a built-in surge protection.	Required	
548.	4.1.15	The meter shall be design with tamper proof fasteners.	Required	
549.	4.1.16	Meter serial number provided shall be unique only to City Power	Required	
550.	4.1.17	All meters shall be DLMS COSEM compliant as to SANS 62056-21	Required	
551.	4.1.18	Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.	Required	
552.	4.1.19	The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh and kVAr.	Required	
553.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
554.	4.1.22	The meter shall have the capability to remotely accept a complete configuration file change.	Required	
555.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading.	Required	
556.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
557.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
558.	**4.2**	**METER DESIGN**		
559.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	

560.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
561.	**4.3**	**METER DISPLAY**		
562.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
563.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
564.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, as to 4.3.3	State	
565.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	
566.	**4.4**	**COMMUNICATIONS**		
567.	4.4.1.1	Provision of communications port which complies with SANS/IEC 1107 or IEC 62056-21.	Required	
568.	4.4.2.1	A RS232/RS485 or equivalent port provided	Required	
569.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
570.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
571.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
572.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
573.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
574.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	Required	
575.	4.4.3.10	GSM module shall be ICASA approved	Required	
576.	4.4.4.1	G3PLC shall communicate up to a minimum range of 120m	Required	
577.		Post-paid functional requirements,	Required	
578.	5.1.1	Smart meter shall be of a split meter design such that the meter and the CIU are separate.	Required	
579.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
580.	5.1.3	Smart meter shall be convertible from post-paid to pre-paid and vice versa.	Required	
581.	5.1.4	The conversion shall be done locally though an optical eye or token and remotely trough a token via HES.	Required	
582.	5.1.5	Smart meter shall have built-in keypad –	Required	
583.	5.1.7	The meter shall continue to operate normally even if the CIU is disconnected	Required	
584.	5.1.8	Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid	Required	
585.	5.1.9	Smart Meter shall not switch off due to multiple power cuts	Required	
586.	5.1.10	Smart Meter shall have a remote Load limiting capability	Required	
587.	5.1.11	The smart Meter shall not open contact or tamper if one or two of the three phases supply is off	Required	
588.	5.1.12	The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication	Required	
589.	5.1.13	The accuracy rating shall e of a class1 or better.	class1	

590.	5.4.1	All meters shall comply with the STS /prepayment requirements as defined by IEC 62055-41,	Required	
591.	5.4.4	Smart Meter shall display the available credit on a	LCD unit.	
592.	5.4.6	Meter shall go into temper mode when the cover is opened; when the meter is powered on or off.	Required	
593.	5.4.7	Clear temper indicator. prepaid mode	Required	
594.	5.4.8	the contact shall open when units are depleted.	Required	
595.	5.4.9	All billing register data and vending data shall be transferred to historical registers as to 5.4.9	Required	
596.	5.4.10	Meter shall be TID roll over ready, and compliant with STS600-4-2 or later	Required	
597.	**7**	**LOAD PROFILE RECORDING**		
598.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
599.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
600.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
601.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
602.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
603.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
604.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
605.	8.1	The configuration template for meters shall be agreed upon with City Power as to 8.1	Required	
606.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	
607.	8.4	The meter software shall be password protected and licensed individually.	Required	
608.	8.6	The meter software license shall be free and shall not expire.	Required	
609.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
610.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
611.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.8.	Required	
612.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
613.	8.14	The accuracy of the real time clock.	State	
614.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
615.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
616.	**9**	**POWER SUPPLY**		
617.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
618.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	

619.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
620.	**10**	**ANTI-TEMPER SEALS**		
621.	10.2	Provision shall be made for sealing in accordance with the relevant specification NRS057	Required	
622.	**11**	**MARKING AND LABELLING**		
623.	11.1.1	All rating plates shall be in accordance with 11.1.1	Required	
624.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
625.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
626.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
627.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
628.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
629.	**12**	**TESTING**		
630.	12.1	Brought for in-house system integration testing as and when required	Required	
631.	12.2	Type tested according to therequirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
632.	12.3	Test shall be performed as to 12.4	Required	
633.	**13**	**DOCUMENTATION**		
634.	13.1	Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format	Required	
635.	13.3	The manuals shall be in English as to 13.3	Required	
636.	13.4	The supplier of the meters shall obtain a (RCC) certification as to 13.4	Required	
637.	13.5	Copies of all test certificates, details of tests performed and the RCC approval certificates shall be submitted with the tender	Required	
638.	**14**	**MAINTENANCE**		
639.		A maintenance plan shall be included as to clause 14	Required	
640.	**15**	**SPARES**		
641.		Availability of Spares as to clause 15	Required	
642.	**16**	**SAMPLES**		
643.	16.1	Sample shall be lodged as to clause 16	Required	
644.	**17**	**TRAINING REQUIREMENTS**		
645.	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
646.	**18**	**QUALITY MANAGEMENT**		
647.		Quality management system as to clause 18	Required	

648.	**19**	**ENVIRONMENTAL MANAGEMENT**		
649.		Environmental management system as to clause 19	Required	
650.	**20**	**HEALTH AND SAFETY**		
651.		Health and Safety plan as to clause 20		

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 6 – RESIDENTIAL PREPAID SMART METER: BS FOOTPRINT 1Phase 230v SAP no4677
Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_316**	**Proposed deviation**

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____
Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 7 – RESIDENTIAL PREPAID SMART METER: BS FOOTPRINT 3 PHASE 230v SAP no4676

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
652.		Name of OEM	XXXX	
653.		Country	XXX	
654.	**4**	**GENERAL REQUIREMENTS**	Required	
655.	4.1.1	The meters shall provide all the functions of measurement as to clause 4.1.1	Required	
656.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
657.	4.1.3	The Meter shall always be regarded as a payment Meter,	Required	
658.	4.1.6	Equipped for time of use requirements as to 4.1.6	State	
659.	4.1.8	It shall be possible to change tariff tables on a batch basis as to 4.1.8	Required	
660.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
661.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
662.	4.1.12	The meter shall have a load limiting capability and programmable both local and remotely.	Required	
663.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
664.	4.1.14	The meter shall be supplied with a built-in surge protection.	Required	
665.	4.1.15	The meter shall be design with tamper proof fasteners.	Required	
666.	4.1.16	Meter serial number provided shall be unique only to City Power	Required	
667.	4.1.17	All meters shall be DLMS COSEM compliant as to SANS 62056-21	Required	
668.	4.1.18	Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.	Required	
669.	4.1.19	The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh and kVAr.	Required	
670.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
671.	4.1.22	The meter shall have the capability to remotely accept a complete configuration file change.	Required	
672.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading.	Required	
673.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
674.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
675.	**4.2**	**METER DESIGN**		
676.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	

677.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
678.	**4.3**	**METER DISPLAY**		
679.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
680.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
681.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, as to 4.3.3	State	
682.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	
683.	**4.4**	**COMMUNICATIONS**		
684.	4.4.1.1	Provision of communications port which complies with SANS/IEC 1107 or IEC 62056-21.	Required	
685.	4.4.2.1	A RS232/RS485 or equivalent port provided	Required	
686.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
687.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
688.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
689.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
690.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
691.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	Required	
692.	4.4.3.10	GSM module shall be ICASA approved	Required	
693.	4.4.4.1	G3PLC shall communicate up to a minimum range of 120m	Required	
694.		Post-paid functional requirements,	Required	
695.	5.1.1	Smart meter shall be of a split meter design such that the meter and the CIU are separate.	Required	
696.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
697.	5.1.3	Smart meter shall be convertible from post-paid to pre-paid and vice versa.	Required	
698.	5.1.4	The conversion shall be done locally though an optical eye or token and remotely trough a token via HES.	Required	
699.	5.1.5	Smart meter shall have built-in keypad –	Required	
700.	5.1.7	The meter shall continue to operate normally even if the CIU is disconnected	Required	
701.	5.1.8	Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid	Required	
702.	5.1.9	Smart Meter shall not switch off due to multiple power cuts	Required	
703.	5.1.10	Smart Meter shall have a remote Load limiting capability	Required	
704.	5.1.11	The smart Meter shall not open contact or tamper if one or two of the three phases supply is off	Required	
705.	5.1.12	The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication	Required	
706.	5.1.13	The accuracy rating shall e of a class1 or better.	class1	

707.	5.4.1	All meters shall comply with the STS /prepayment requirements as defined by IEC 62055-41,	Required	
708.	5.4.4	Smart Meter shall display the available credit on a	LCD unit.	
709.	5.4.6	Meter shall go into temper mode when the cover is opened; when the meter is powered on or off.	Required	
710.	5.4.7	Clear temper indicator. prepaid mode	Required	
711.	5.4.8	the contact shall open when units are depleted.	Required	
712.	5.4.9	All billing register data and vending data shall be transferred to historical registers as to 5.4.9	Required	
713.	5.4.10	Meter shall be TID roll over ready, and compliant with STS600-4-2 or later	Required	
714.	**7**	**LOAD PROFILE RECORDING**		
715.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
716.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
717.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
718.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
719.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
720.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
721.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
722.	8.1	The configuration template for meters shall be agreed upon with City Power as to 8.1	Required	
723.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	
724.	8.4	The meter software shall be password protected and licensed individually.	Required	
725.	8.6	The meter software license shall be free and shall not expire.	Required	
726.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
727.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
728.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.8.	Required	
729.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
730.	8.14	The accuracy of the real time clock.	State	
731.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
732.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
733.	**9**	**POWER SUPPLY**		
734.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
735.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	

736.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
737.	**10**	**ANTI-TEMPER SEALS**		
738.	10.2	Provision shall be made for sealing in accordance with the relevant specification NRS057	Required	
739.	**11**	**MARKING AND LABELLING**		
740.	11.1.1	All rating plates shall be in accordance with 11.1.1	Required	
741.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
742.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
743.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
744.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
745.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
746.	**12**	**TESTING**		
747.	12.1	The meters shall be brought for in-house system integration testing as and when required	Required	
748.	12.3	The meters shall be type tested according to the requirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
749.	12.4	Test shall be performed as to 12.4	Required	
750.	**13**	**DOCUMENTATION**		
751.	13.1	Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format	Required	
752.	13.3	The manuals shall be in English as to 13.3	Required	
753.	13.4	The supplier of the meters shall obtain a (RCC) certification as to 13.4	Required	
754.	13.5	Copies of all test certificates, details of tests performed and the RCC approval certificates shall be submitted with the tender	Required	
755.	**14**	**MAINTENANCE**		
756.		A maintenance plan shall be included as to clause 14	Required	
757.	**15**	**SPARES**		
758.		Availability of Spares as to clause 15	Required	
759.	**16**	**SAMPLES**		
760.	16.1	Sample shall be lodged as to clause 16	Required	
761.	**17**	**TRAINING REQUIREMENTS**		
762.	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
763.	**18**	**QUALITY MANAGEMENT**		
764.		Quality management system as to clause 18	Required	

765.	**19**	**ENVIRONMENTAL MANAGEMENT**		
766.		Environmental management system as to clause 19	Required	
767.	**20**	**HEALTH AND SAFETY**		
768.		Health and Safety plan as to clause 20	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 7 – RESIDENTIAL PREPAID SMART METER: BS FOOTPRINT 3 PHASE 230v SAP no4676
Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_316**	**Proposed deviation**

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 8 – RESIDENTIAL PREPAID SMART PLC METER: BS FOOTPRINT 1Phase230v
SAP no4692

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
769.		Name of OEM	XXXX	
770.		Country	XXX	
771.	**4**	**GENERAL REQUIREMENTS**	Required	
772.	4.1.1	The meters shall provide all the functions of measurement as to clause 4.1.1	Required	
773.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
774.	4.1.3	The Meter shall always be regarded as a payment Meter,	Required	
775.	4.1.6	Equipped for time of use requirements as to 4.1.6	State	
776.	4.1.8	It shall be possible to change tariff tables on a batch basis as to 4.1.8	Required	
777.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
778.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
779.	4.1.12	The meter shall have a load limiting capability and programmable both local and remotely.	Required	
780.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
781.	4.1.14	The meter shall be supplied with a built-in surge protection.	Required	
782.	4.1.15	The meter shall be design with tamper proof fasteners.	Required	
783.	4.1.16	Meter serial number provided shall be unique only to City Power	Required	
784.	4.1.17	All meters shall be DLMS COSEM compliant as to SANS 62056-21	Required	
785.	4.1.18	Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.	Required	
786.	4.1.19	The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh and kVAr.	Required	
787.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
788.	4.1.22	The meter shall have the capability to remotely accept a complete configuration file change.	Required	
789.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading.	Required	
790.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
791.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
792.	**4.2**	**METER DESIGN**		
793.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	

794.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
795.	**4.3**	**METER DISPLAY**		
796.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
797.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
798.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, as to 4.3.3	State	
799.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	
800.	**4.4**	**COMMUNICATIONS**		
801.	4.4.1.1	Provision of communications port which complies with SANS/IEC 1107 or IEC 62056-21.	Required	
802.	4.4.2.1	A RS232/RS485 or equivalent port provided	Required	
803.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
804.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
805.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
806.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
807.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
808.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	Required	
809.	4.4.3.10	GSM module shall be ICASA approved	Required	
810.	4.4.4.1	G3PLC shall communicate up to a minimum range of 120m	Required	
811.		Post-paid functional requirements,	Required	
812.	5.1.1	Smart meter shall be of a split meter design such that the meter and the CIU are separate.	Required	
813.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
814.	5.1.3	Smart meter shall be convertible from post-paid to pre-paid and vice versa.	Required	
815.	5.1.4	The conversion shall be done locally though an optical eye or token and remotely trough a token via HES.	Required	
816.	5.1.5	Smart meter shall have built-in keypad –	Required	
817.	5.1.7	The meter shall continue to operate normally even if the CIU is disconnected	Required	
818.	5.1.8	Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid	Required	
819.	5.1.9	Smart Meter shall not switch off due to multiple power cuts	Required	
820.	5.1.10	Smart Meter shall have a remote Load limiting capability	Required	
821.	5.1.11	The smart Meter shall not open contact or tamper if one or two of the three phases supply is off	Required	
822.	5.1.12	The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication	Required	
823.	5.1.13	The accuracy rating shall e of a class1 or better.	class1	

824.	5.4.1	All meters shall comply with the STS /prepayment requirements as defined by IEC 62055-41,	Required	
825.	5.4.4	Smart Meter shall display the available credit on a	LCD unit.	
826.	5.4.6	Meter shall go into temper mode when the cover is opened; when the meter is powered on or off.	Required	
827.	5.4.7	Clear temper indicator. prepaid mode	Required	
828.	5.4.8	the contact shall open when units are depleted.	Required	
829.	5.4.9	All billing register data and vending data shall be transferred to historical registers as to 5.4.9	Required	
830.	5.4.10	Meter shall be TID roll over ready, and compliant with STS600-4-2 or later	Required	
831.	**7**	**LOAD PROFILE RECORDING**		
832.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
833.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
834.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
835.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
836.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
837.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
838.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
839.	8.1	The configuration template for meters shall be agreed upon with City Power as to 8.1	Required	
840.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	
841.	8.4	The meter software shall be password protected and licensed individually.	Required	
842.	8.6	The meter software license shall be free and shall not expire.	Required	
843.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
844.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
845.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.8.	Required	
846.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
847.	8.14	The accuracy of the real time clock.	State	
848.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
849.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
850.	**9**	**POWER SUPPLY**		
851.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
852.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	

853.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
854.	**10**	**ANTI-TEMPER SEALS**		
855.	10.2	Provision shall be made for sealing in accordance with the relevant specification NRS057	Required	
856.	**11**	**MARKING AND LABELLING**		
857.	11.1.1	All rating plates shall be in accordance with 11.1.1	Required	
858.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
859.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
860.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
861.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
862.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
863.	**12**	**TESTING**		
864.	12.1	Brought for in-house system integration testing as and when required	Required	
865.	12.3	Type tested according to therequirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
866.	12.4	Test shall be performed as to 12.4	Required	
867.	**13**	**DOCUMENTATION**		
868.	13.1	Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format	Required	
869.	13.3	The manuals shall be in English as to 13.3	Required	
870.	13.4	The supplier of the meters shall obtain a (RCC) certification as to 13.4	Required	
871.	13.5	Copies of all test certificates, details of tests performed and the RCC approval certificates shall be submitted with the tender	Required	
872.	**14**	**MAINTENANCE**		
873.		A maintenance plan shall be included as to clause 14	Required	
874.	**15**	**SPARES**		
875.		Availability of Spares as to clause 15	Required	
876.	**16**	**SAMPLES**		
877.	16.1	Sample shall be lodged as to clause 16	Required	
878.	**17**	**TRAINING REQUIREMENTS**		
879.	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
880.	**18**	**QUALITY MANAGEMENT**		
881.		Quality management system as to clause 18	Required	
882.	**19**	**ENVIRONMENTAL MANAGEMENT**		

883.		Environmental management system as to clause 19	Required	
884.	**20**	**HEALTH AND SAFETY**		
885.		Health and Safety plan as to clause 20		

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 8 – RESIDENTIAL PREPAID SMART PLC METER: BS FOOTPRINT 1Phase 230v SAPno4692

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_316**	**Proposed deviation**

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 9 – RESIDENTIAL PREPAID SMART PLC METER: BS FOOTPRINT 3 PHASE
230v SAP no4678

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
886.		Name of OEM	XXXX	
887.		Country	XXX	
888.	**4**	**GENERAL REQUIREMENTS**	Required	
889.	4.1.1	The meters shall provide all the functions of measurement as to clause 4.1.1	Required	
890.	4.1.2	The meter shall be self-contained with the communication module(s) internal to the meter	Required	
891.	4.1.3	The Meter shall always be regarded as a payment Meter,	Required	
892.	4.1.6	Equipped for time of use requirements as to 4.1.6	State	
893.	4.1.8	It shall be possible to change tariff tables on a batch basis as to 4.1.8	Required	
894.	4.1.9	The meters shall be capable of measuring quantities in all four quadrants.	Required	
895.	4.1.10	Terminal covers shall be in accordance with SANS/IEC 62052 part 11	Required	
896.	4.1.12	The meter shall have a load limiting capability and programmable both local and remotely.	Required	
897.	4.1.13	The meter shall be able to connect and disconnect load both local and remotely	Required	
898.	4.1.14	The meter shall be supplied with a built-in surge protection.	Required	
899.	4.1.15	The meter shall be design with tamper proof fasteners.	Required	
900.	4.1.16	Meter serial number provided shall be unique only to City Power	Required	
901.	4.1.17	All meters shall be DLMS COSEM compliant as to SANS 62056-21	Required	
902.	4.1.18	Two energy proportional visible red LED's shall be provided for test purposes, one for active energy and one for reactive energy.	Required	
903.	4.1.19	The Original Equipment Manufacturers (OEM) shall state the number of LED pulses per kWh and kVAr.	Required	
904.	4.1.20	The pulse rates for the LED's shall be marked on the nameplate.	Required	
905.	4.1.22	The meter shall have the capability to remotely accept a complete configuration file change.	Required	
906.	4.1.24	The meter shall reset to zero and restart whenever it reaches the maximum reading.	Required	
907.	4.1.25	Compatible and be able to integrate with current City power's System (HES).	Required	
908.	4.1.26	Able to detect, record and send alarms to the HES, which include but not limited to	Required	
909.	**4.2**	**METER DESIGN**		
910.	4.2.7	The meter shall conform to the degree of protection of IP 54 in accordance to SANS/IEC 60529.	Required	

911.	4.2.8	Access to the terminals shall not be possible without breaking a mechanical seal on the terminal cover.	Required	
912.	**4.3**	**METER DISPLAY**		
913.	4.3.1	The meters shall have a Liquid Crystal Display.	Required	
914.	4.3.2	The registers of the meters shall have at least 8 (eight) digits.	State	
915.	4.3.3	The meters shall be able to sequentially display, using a manual and automatic stepping facility, as to 4.3.3	State	
916.	4.3.4	It shall be possible to set the display for all the display modes as to 4.3.4	Required	
917.	**4.4**	**COMMUNICATIONS**		
918.	4.4.1.1	Provision of communications port which complies with SANS/IEC 1107 or IEC 62056-21.	Required	
919.	4.4.2.1	A RS232/RS485 or equivalent port provided	Required	
920.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
921.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
922.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
923.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
924.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
925.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	Required	
926.	4.4.3.10	GSM module shall be ICASA approved	Required	
927.	4.4.4.1	G3PLC shall communicate up to a minimum range of 120m	Required	
928.		Post-paid functional requirements,	Required	
929.	5.1.1	Smart meter shall be of a split meter design such that the meter and the CIU are separate.	Required	
930.	5.1.2	Reverse energy shall not open a meter contact unless authorised through configuration template.	Required	
931.	5.1.3	Smart meter shall be convertible from post-paid to pre-paid and vice versa.	Required	
932.	5.1.4	The conversion shall be done locally though an optical eye or token and remotely trough a token via HES.	Required	
933.	5.1.5	Smart meter shall have built-in keypad –	Required	
934.	5.1.7	The meter shall continue to operate normally even if the CIU is disconnected	Required	
935.	5.1.8	Smart Meter shall have a clear light indication when it is post-paid and when it is prepaid	Required	
936.	5.1.9	Smart Meter shall not switch off due to multiple power cuts	Required	
937.	5.1.10	Smart Meter shall have a remote Load limiting capability	Required	
938.	5.1.11	The smart Meter shall not open contact or tamper if one or two of the three phases supply is off	Required	
939.	5.1.12	The Smart Meter shall have the capability to operate with both G3PLC and GRPS modules for communication	Required	
940.	5.1.13	The accuracy rating shall e of a class1 or better.	class1	

941.	5.4.1	All meters shall comply with the STS /prepayment requirements as defined by IEC 62055-41,	Required	
942.	5.4.4	Smart Meter shall display the available credit on a	LCD unit.	
943.	5.4.6	Meter shall go into temper mode when the cover is opened; when the meter is powered on or off.	Required	
944.	5.4.7	Clear temper indicator. prepaid mode	Required	
945.	5.4.8	the contact shall open when units are depleted.	Required	
946.	5.4.9	All billing register data and vending data shall be transferred to historical registers as to 5.4.9	Required	
947.	5.4.10	Meter shall be TID roll over ready, and compliant with STS600-4-2 or later	Required	
948.	**7**	**LOAD PROFILE RECORDING**		
949.	7.1	sufficient memory to record up to four half-hourly load profile quantities more than 240 days, as to 7.1	Required	
950.	7.2	Load profile recording shall be possible in 15, 30 and 60 minutes' time intervals. As to 7.2	Required	
951.	7.3	Record of voltages , currents and power factor load profile shall be possible	Required	
952.	7.4	It shall be possible to extract all billing, load profile, programmable set-up data, and instantaneous values as to 7.4.	Required	
953.	7.5	In the case of downloading load profile, it shall be possible to select downloading of all load profile data stored in the meter as to 7.5	Required	
954.	7.6	It shall be possible to extract all billing, load profile, programmable set-up data and instantaneous values from the meter, as to 7.6	Required	
955.	**8**	**SOFTWARE, PROGRAMMING AND SECURITY**		
956.	8.1	The configuration template for meters shall be agreed upon with City Power as to 8.1	Required	
957.	8.2	Meters shall perform security checks which verify that the programming is authorized as to 8.2	Required	
958.	8.4	The meter software shall be password protected and licensed individually.	Required	
959.	8.6	The meter software license shall be free and shall not expire.	Required	
960.	8.7	The meter shall keep all records of all the events as to 8.7.1 up to 8.7.5	Required	
961.	8.8	The meter shall keep record of all the changes in 8.7 per user.	Required	
962.	8.9	It shall be possible to reset all billing registers by means HES or meter system as to 8.8.	Required	
963.	8.11	Meters shall be provided with a crystal controlled real time clock that will not drift as to 8.11	Required	
964.	8.14	The accuracy of the real time clock.	State	
965.	8.15	It shall be possible to synchronise the clock and calendar as to 8.15	Required	
966.	8.16	Meters shall be capable of performing self-diagnostic checks to ensure correct operations of ROM, EEPROM, clock and battery.	Required	
967.	**9**	**POWER SUPPLY**		
968.	9.1	The auxiliary power supply shall be derived from all three phase to phase voltages or all three phases to neutral voltages.	Required	
969.	9.2	Meters shall remain operative in the event that a minimum of one phase is energized on a 3 wire system or a 4 wire system.	Required	

970.	9.3	Meters shall be provided with a back-up battery (Lithium battery) to support the clock and calendar in the event of an AC power failure with a battery life of at least 10 years	Required	
971.	**10**	**ANTI-TEMPER SEALS**		
972.	10.2	Provision shall be made for sealing in accordance with the relevant specification NRS057	Required	
973.	**11**	**MARKING AND LABELLING**		
974.	11.1.1	All rating plates shall be in accordance with 11.1.1	Required	
975.	11.1.4	The meter shall be clearly marked that it is a property of City Power	Required	
976.	11.1.6	The number of phases and the number of wires for which the meter is suitable for as to SANS/IEC 60387;	Required	
977.	11.1.7	The meter's serial number complies with the requirements of SANS 474/ NRS057 and shall also be presented in barcode format.	Required	
978.	11.1.8	The serial number and year of manufacture as to 11.1.8	Required	
979.	11.2.1	Every meter shall preferably be indelibly marked with a diagram of connections as to 11.2.1	Required	
980.	**12**	**TESTING**		
981.	12.1	Brought for in-house system integration testing as and when required	Required	
982.	12.3	Type tested according to the requirements specified in SANS/IEC 62052 part 11 and SANS/IEC 62053 part 21 as to 12.3	Required	
983.	12.4	Test shall be performed as to 12.4	Required	
984.	**13**	**DOCUMENTATION**		
	13.1	Full technical and functional details for all items offered in terms of this specification shall be submitted in both electronic and hard copy format	Required	
	13.3	The manuals shall be in English as to 13.3	Required	
	13.4	The supplier of the meters shall obtain a (RCC) certification as to 13.4	Required	
	13.5	Copies of all test certificates, details of tests performed and the RCC approval certificates shall be submitted with the tender	Required	
985.	**14**	**MAINTENANCE**		
		A maintenance plan shall be included as to clause 14	Required	
986.	**15**	**SPARES**		
		Availability of Spares as to clause 15	Required	
987.	**16**	**SAMPLES**		
	16.1	Sample shall be lodged as to clause 16	Required	
988.	**17**	**TRAINING REQUIREMENTS**		
	17.1	Training shall be provided to all City Power's resources for the duration of the contract.	Required	
989.	**18**	**QUALITY MANAGEMENT**		
		Quality management system as to clause 18	Required	

990.	**19**	**ENVIRONMENTAL MANAGEMENT**		
		Environmental management system as to clause 19	Required	
991.	**20**	**HEALTH AND SAFETY**		
		Health and Safety plan as to clause 20	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 9 – RESIDENTIAL PREPAID SMART PLC METER: BS FOOTPRINT 3 PHASE 230v SAP no4678
Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_316**	**Proposed deviation**

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. 10 – Customer Interface Unit
SAP no4683

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
992.		Name of OEM	XXXX	
993.		Country	XXX	
994.	5.5.2	The Customer Interface Unit (CIU) housing shall have a degree of protection rating of.	State	
995.	5.5.4	The CIU shall provide a “low credit” indicator.	State	
996.	5.5.5	Provide a unique indication that the communication to the Meter is active and working correctly.	Required	
997.	5.5.6	Keys shall be of sufficient size to permit ease of use, indelible and resistant as to 5.5.6	Required	
998.	5.5.7	The CIU shall provide a 12 key type keypad for entering the pre-payment token, with a backspace for corrections as to 5.5.7	Required	
999.	5.5.8	The numbers entered on the keypad shall be echoed on the LCD. Mistakes shall be correctable using a backspace or clear key.	Required	
1000.	5.5.9	Shall be mains and battery powered.	Required	
1001.	5.5.10	The CIU shall be fitted with a replaceable memory backup battery that is available off the shelf.	Required	
1002.	5.5.11	Communication between the meter and the CIU shall be via G3PLC.	Required	
1003.	5.5.12	Capability of receiving data from the meter at programmable interval.	Required	
1004.	5.5.13	Paired CIUs shall be able to be unpaired and paired with a different meter.	Required	
1005.	5.5.14	Programmable Display indicators for different meter scenarios such as tamper, quadrants, and voltage phases shall be to the CIU.	Required	
1006.	5.5.15	Different short codes shall be available for customers to check as to 5.5.15	Required	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA [“To Be Advice”] shall not be accepted.

Tender Number: _____

Tenderer’s Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. 10 – Customer Interface Unit SAP no4683
Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_316	Proposed deviation

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. – 11 Data Concentrator Unit
SAP no4684

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
1007.		Name of OEM	XXXX	
1008.		Country	XXX	
1009.	5.6	Data Concentrator Unit		
1010.	5.6.1	Compatible and comply with requirements of, part 4,5	COSEM 62056	
1011.	5.6.2	The equipment shall comply with tests and test conditions as stated IEC 62052-11,	Required	
1012.	5.6.3	The DCU shall be compatible with both meter and City power's Head End System	Required	
1013.	5.6.4	Commination between DCU and meter shall be via G3 PLC or equivalent	Required	
1014.	5.6.5	Communication between DCU and Head End System shall be via one of the GSM platforms, preferably LTE	State	
1015.	5.6.6	DCU shall be equipped with both Ethernet and serial port as a minimum.	State	
1016.	5.6.7	The GSM modem shall be easy to unplug and replace	State	
1017.	5.6.8	A detachable GSM in accordance with CP_TSSPEC_239	Required	
1018.	5.6.9	DCU shall automatically register meters connected to the same feeders	Required	
1019.	5.6.10	It shall be possible to remotely program the DC from the HES and using the applicable DC software's	State	

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. – 11 Data Concentrator Unit SAP no4684
Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_316	Proposed deviation

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. – 12 MODEM&ANTENNA
LTE-GPRS INTERNAL LPU
SAP no4679

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
		Name of OEM	XXXX	
		Country	XXX	
1020.	**5.6**	**LPU communication modem**		
1021.	5.6.1	Compatible and comply with requirements of, part 4,5 and 6	COSEM 62056	
1022.	5.6.2	The equipment shall comply with tests and test conditions as stated IEC 62052-11,	Required	
1023.	5.6.3	The modem shall be compatible with both meter andCity power's Head End System	Required	
1024.	5.6.5	Communication between DCU and Head End System shall be via one of the GSM platforms, preferably LTE	State	
1025.	5.6.7	The GSM modem shall be easy to unplug and replace	State	
1026.	5.6.8	A detachable GSM in accordance with CP_TSSPEC_239	Required	
1027.	5.6.9	DCU shall automatically register meters connectedto the same feeders	Required	
1028.	5.6.10	It shall be possible to remotely program the DC from the HES and using the applicable DC software's	State	
1029.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter	Required	
1030.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter	Required	
1031.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose	Required	
1032.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power	Required	
1033.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM	Required	
1034.	4.4.3.7	Modem shall be programmable for different IP addresses on site in the meter and off site outside the meter	Required	
1035.	4.4.3.8	Modem shall have a GPS module	Required	
1036.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment	Required	
1037.	4.4.3.10	GPRS module shall be ICASA approved	Required	
1038.	4.4.3.11	Meter shall be configurable remotely and be able to accept remote configuration for a complete meter setup change	Required	
1039.	4.4.4.2	The meter shall be able to communicate remotely via G3PLC as to IEEE P1901.2,	Required	

		IPv6, for meter data exchange and programming.		

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. – 12 MODEM&ANTENNA LTE-GPRS INTERNAL LPU
SAP no4679
Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_316	Proposed deviation

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number :_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

ANNEX C - TECHNICAL SCHEDULES A & B:
Item No. – 13 MODEM&ANTENNA
LTE-GPRS INTERNAL RESIDENTIAL
SAP no4680

Schedule A: City Power's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_316	Description	Schedule A	Schedule B
1040.		Name of OEM	XXXX	
1041.		Country	XXX	
1042.	5.6.1	Compatible and comply with requirements of, part 4,5 and	COSEM 62056	
1043.	5.6.2	The equipment shall comply with tests and test conditions as stated IEC 62052-11,	Required	
1044.	5.6.3	The modem shall be compatible with both meter andCity power's Head End System	Required	
1045.	5.6.5	Communication between Head End System and the meter shall be via one of the GSM platforms, preferably LTE	State	
1046.	5.6.7	The GSM modem shall be easy to unplug and replace	State	
1047.	5.6.8	A detachable GSM in accordance with CP_TSSPEC_239	Required	
1048.	5.6.9	DCU shall automatically register meters connectedto the same feeders	Required	
1049.	5.6.10	It shall be possible to remotely program the DC from the HES and using the applicable DC software's	State	
1050.	4.4.3.2	The LTE-GPRS modem and antenna shall be self-contained and internal to the meter		
1051.	4.4.3.3	The LTE-GPRS modem and antenna shall be powered by the meter		
1052.	4.4.3.4	The LTE-GPRS modem and antenna shall be detachable and directly connected to the meter for maintenance purpose		
1053.	4.4.3.5	Modem shall be fitted with a chip SIM that will be provided by City Power		
1054.	4.4.3.6	Modem shall have an extra slot that can accommodate a plastic SIM		
1055.	4.4.3.7	Modem shall be programmable for different IP addresses on site in the meter and off site outside the meter		
1056.	4.4.3.8	Modem shall have a GPS module		
1057.	4.4.3.9	Should additional equipment be required for the programming of the modems, the supplier shall provide such equipment		
1058.	4.4.3.10	GPRS module shall be ICASA approved		
1059.	4.4.3.11	Meter shall be configurable remotely and be able to accept remote configuration for a complete meter setup change		
1060.	4.4.4.2	The meter shall be able to communicate remotely via G3PLC as to IEEE P1901.2, IPv6, for meter data exchange and programming.		

Note: Ticks, Cross [√, X], Asterisk [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

Tender Number: _____

Tenderer's Authorised Signatory: _____

Name in block letters Signature

Full name of company: _____

Item No. – 13 MODEM&ANTENNA LTE-GPRS INTERNAL RESIDENTIAL SAP no4680

Deviation schedule

Any deviations offered to this specification shall be listed below with reasons for deviation. In addition, evidence shall be provided that the proposed deviation will at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_316	Proposed deviation

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] will not be accepted

Tender Number:_____

Tenderer's Authorised Signatory: _____ _____

Name in block letters Signature

Full name of company: _____

Annexure D – Stock Items

Material Group: Meters

Item	SAP No.	SAP Short Description	SAP Long Description
	LPU METERS		
1	4671	METER 3PH 400V AMR LPU SMART	METER: 3 PHASE, 4 WIRE, 400 VOLTS, AMR, LPU, SMART, CT CONNECTED 5(10A), 50 HERTZ. ITEM SPECIFICATION CP_TSSPEC_316
2	4672	METER 3PH 400V AMR LPU INTAKE SMART	METER: 3 PHASE, 4 WIRE, 400 VOLTS, AMR, LPU, INTAKE, SMART, CT CONNECTED 5(10A), 50 HERTZ. ITEM SPECIFICATION CP_TSSPEC_316
	RESIDENTIAL POSTPAID SMART METER		
3	4673	METER 1PH 230V AMI POSTPAID SMART	METER: 1 PHASE, 2 WIRE, 230 VOLTS, AMI, POSTPAID, RESIDENTIAL, SMART, DIRECTLY CONNECTED, 80 AMPERE, SPLIT TYPE, 50 HERTZ. ITEM SPECIFICATION CP_TSSPEC_316
4	4674	METER 3PH 230V AMI POSTPAID SMART	METER: 3 PHASE, 4 WIRE, 230 VOLTS, AMI, POSTPAID, RESIDENTIAL, SMART, DIRECTLY CONNECTED, 100 AMPERE, SPLIT TYPE, 50 HERTZ. ITEM SPECIFICATION CP_TSSPEC_316
	RESIDENTIAL PREPAID SMART METER		
5	4675	METER 1PH 230V AMI PREPAID SMART DIN	METER: 1 PHASE, 2 WIRE, 230 VOLTS, AMI, PREPAID, RESIDENTIAL, SMART, DIN RAIL, DIRECTLY CONNECTED, 80 AMPERE, SPLIT TYPE, 50 HERTZ. ITEM SPECIFICATION CP_TSSPEC_316
6	4677	METER 1PH 230V AMI PREPAID GPRS SMART BS	METER: 1 PHASE, 2 WIRE, 230 VOLTS, AMI, PREPAID, RESIDENTIAL, SMART, BS FOOTPRINT, DIRECTLY CONNECTED, 100 AMPERE, SPLIT TYPE, 50 HERTZ. GPRS ITEM SPECIFICATION CP_TSSPEC_316
7	4676	METER 3PH 230V AMI PREPAID GPRS SMART BS	METER: 3 PHASE, 4 WIRE, 230 VOLTS, AMI, PREPAID, RESIDENTIAL, SMART, BS FOOTPRINT, DIRECTLY CONNECTED, 100 AMPERE, SPLIT TYPE, 50 HERTZ. GPRS ITEM SPECIFICATION CP_TSSPEC_316
8	4692	METER 1PH 230V AMI PREPAID PLC SMART BS	METER: 1 PHASE, 2 WIRE, 230 VOLTS, AMI, PREPAID, PLC, RESIDENTIAL, SMART, BS FOOTPRINT, DIRECTLY CONNECTED, 80 AMPERE, SPLIT TYPE, 50 HERTZ. ITEM SPECIFICATION CP_TSSPEC_316
9	4678	METER 3PH 230V AMI PREPAID PLC SMART BS	METER: 3 PHASE, 4 WIRE, 230 VOLTS, AMI, PREPAID, PLC, RESIDENTIAL, SMART, BS FOOTPRINT, DIRECTLY CONNECTED, 100 AMPERE, SPLIT TYPE, 50 HERTZ. ITEM SPECIFICATION CP_TSSPEC_316
	CUSTOMER INTERFACE MODULE		
10	4683	CUSTOMER INTERFACE UNIT	CUSTOMER INTERFACE UNIT (CIU). ITEM SPECIFICATION CP_TSSPEC_316
	DATA CONCENTRATORS		
11	4684	DATA CONCENTRATOR UNIT	DATA CONCENTRATOR UNIT FOR COMMUNICATION BETWEEN THE HEAD END SYSTEM (HES) AND THE METERING PLC DEVICE. ITEM SPECIFICATION 316
	COMMUNICATION MODULES		
12	4679	MODEM&ANTENNA LTE-GPRS INTERNAL LPU	MODEM (AND ANTENNA): LTE-GPRS, INTERNAL, LPU. ITEM SPECIFICATION CP_TSSPEC_316
13	4680	MODEM&ANTENNA LTE-GPRS INTERNAL RESIDENT	MODEM (AND ANTENNA): LTE-GPRS, INTERNAL, RESIDENTIAL. ITEM SPECIFICATION CP_TSSPEC_316
14	4681	MODEM&ANTENNA LTE-GPRS INTERNAL FSM1	METER MODEM/MODULE: (WIDE AREA & LOCAL AREA NETWORKS) SUITABLE FOR METERS, FMS1. ITEM SPECIFICATION CP_TSSPEC_316