a world class African city

	REFERENCE	REV
TITLE **STANDARD FOR MAINTENANCE OF METERING INFRASTRUCTURE**	**CP_TSSTAN _ 208**	**0**
	DATE: **July 2025**	
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FOREWORD

The study committee was appointed by the Strategic Infrastructure Development, which, comprised of the following members:

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INTRODUCTION

City Power has embarked on a major process to upgrade, refurbish and maintain its network infrastructure on an as and when required basis. The labour contracts for the maintenance of service connections and metering are therefore required.

1. SCOPE

This standard covers City Power's requirements for the services of competent Service Providers to provide labour resources for the metering and service connections. All materials shall be supplied by City Power.

City Power reserves the right to utilize the successful Service Provider(s) to undertake a limited amount of work anywhere within City Power's area of electricity supply. It is therefore not a requirement that all contracts or contractual values shall be exhausted in full during the term of contract.

Details of the scope of work shall be indicated at the time the work instruction is issued.

All equipment pre-commissioning testing shall be carried out as per relevant standards and specifications shall be witnessed and signed off by City Power personnel.

2. NORMATIVE REFERENCE

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

2.1 Specifications

Document number	Document title
CP_TSSTAN_009	City Power's Township Electrical Reticulation Standard for Underground Systems
CP_TSSTAN_033	City Power's Operating Safety Precaution Standard
CP_TSSTAN_043	City Power's work standing instruction for the acquisition and payment procedures for Service Providers or service providers.
CP_TSSTAN_108	Electrification Standard
CP_TSSTAN_133	Standard for meter check and final reading
CP_TSSPEC_002	Low Voltage (LV) Cables
CP_TSSPEC_008	2 and 4 way CMKs
CP_TSSPEC_010	LV ABC with neutral supporting conductor
CP_TSSPEC_016	Contactors
CP_TSSPEC_017	Miniature Circuit Breakers (MCB)
CP_TSSPEC_018	LV Moulded Case Circuit Breakers (MCCB)
CP_TSSPEC_019	Split concentric single phase aerial service cable
CP_TSSPEC_020	Current carrying connectors and joints for LV ABC
CP_TSSPEC_021	Cable ties for use with ABC
CP_TSSPEC_024	Fittings for use with LV ABC
CP_TSSPEC_028	Earth leakage units
CP_TSSPEC_029	Adjustable Cable Clamps
CP_TSSPEC_030	Metal Cable Glands
CP_TSSPEC_038	Pole mounted SDB
CP_TSSPEC_041	Single and three phase meter cabinets
CP_TSSPEC_042	Load management relay box
CP_TSSPEC_043	Meter cabinets for SPLV service connections
CP_TSSPEC_051	Fittings for use with single phase aerial service cable
CP_TSSPEC_063	Electronic single and three phase meters

Document number	Document title
CP_TSSPEC_064	MV metering CT's
CP_TSSPEC_065	LV CT's
CP_TSSPEC_066	MV rackable VT's
CP_TSSPEC_260	Specification for control and monitoring of protective distribution KIOSK
CP_TSSPEC_316	Specification for single and three phase meters
OHS Act 1993	Occupational Health and Safety Act (Act 85 of 1993)
SANS 1200 D	Standardized specification for civil engineering construction Section D: Earthworks
SANS/IEC 62055-31:	Electricity metering — Payment systems Part 31: Particular requirements — Static payment meters for active energy (classes 1 and 2)
SANS 1524-1:	Electricity payment systems Part 1: Payment meters
SANS 1799,	Watt-hour meters – AC electronic meters for active energy.
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 096:	Electricity metering – Ancillary specifications – Part 1: The sealing of electricity meters.

2.2 Drawings

Reference	Title
CP_TSDRAW_003	CP6 type A meter cabinet for cluster development
CP_TSDRAW_007	SDB 2 way CMK
CP_TSDRAW_008	SDB 4 way CMK
CP_TSDRAW_011	SDB 27 way steel
CP_TSDRAW_012	Standard notices, warning and danger signs
CP_TSDRAW_013	Wall and plinth mounted meter cabinets (CP1)
CP_TSDRAW_014	Wall and plinth mounted meter cabinet (CP3)
CP_TSSDRAW_063	9 way pole mounted low voltage distribution protective kiosk

CP_TSSDRAW_064	6 way ground mounted low voltage distribution protective kiosk
CP_TSSDRAW_065	9 way ground mounted low voltage distribution protective kiosk
CP_TSSDRAW_066	18 way ground mounted low voltage distribution protective kiosk
CP_TSSDRAW_068 SHEET 1	R.A.T meter wiring
CP_TSSDRAW_068 SHEET 2	R.A.T meter wiring

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3. GENERAL REQUIREMENTS FOR LABOUR CONTRACTS

3.1 General Statutory and technical requirements

The compulsory requirements of the OHS Act of 1993 shall be complied with at all times when installing electrical equipment for City Power. Where clarity is required on subjects covered by this standard, the requirements of the OHS Act of 1993 shall be adhered to.

The technical requirements of SANS 0198 Parts 1 to 14 shall be adhered to, unless otherwise approved in writing by City Power. Any technical concessions to this standard shall be approved by the Technical Evaluation Committee before the successful Service Provider(s) is informed in writing.

The safety of all personnel performing work for City Power shall be a key deliverable and adherence to City Power's Safety Operating Precaution Standard CP_TSSTAN_033 is compulsory at all times.

The electrical equipment standards and specifications of City Power's Township Electrical Reticulation Standard for Underground Systems CP_TSSTAN_009 shall be adhered to when installing electrical equipment for City Power. Any technical concessions to this standard shall be approved by SABS 0198 before the successful Service Provider(s) is informed in writing.

All equipment shall comply with the relevant specifications as detailed in this standard and, if no City Power specification exists the SANS specification shall apply.

Generally, no equipment or cables shall be installed in common trenches where other services have been installed i.e. Telkom service and Water mains

The work standing instruction for the acquisition and payment procedures for Service Providers or service

Provider CP_TSSTAN_043 shall be applied when the services of a Service Provider or service provider is required with in City Power.

The City of Johannesburg Metropolitan Municipality: Public Road and miscellaneous BY-LAWS shall be complied with when working in the road reserves of the City of Johannesburg.

3.2 Extent of work

The service provider shall take cognisance of the fact that this is an “as and when” contract and City Power cannot guarantee the extent of work to be carried out nor the amount of money to be spent.

Quantities given are provisional and are given only for the purpose of tender evaluation. The service provider shall be paid on actual work carried out at the agreed rates.

The estimated quantities have been obtained by summating various small and large individual projects and the service provider shall gear its operations and costs to enable it to undertake the said work at various sites.

3.3 City Power’s Responsibilities.

3.3.1 City Power’s resources shall oversee and approve workmanship, ensure compliance and authorize payments.

3.3.2 City Power shall further provide identity cards, flyers, notices and drawings, seals and sealing wire to the Service Provider.

3.3.3 Information stickers detailing inspection information such as City Power's contact details, date of installation and etc., shall be supplied by City Power.

3.3.4 New and replacement meters including peripherals shall be provided by City Power as free issue subject to approval by the relevant Metering Department.

3.3.5 City Power shall ensure that stock of material is kept.

3.3.6 Replaced meters shall be returned to City Power for reverse logistics and asset retirement processes.

3.4 Service Provider’s Responsibilities

3.4.1 The Service Provider shall install new equipment in areas that are without existing installations.

3.4.2 The Service Provider shall install/ replace the equipment in accordance with the above-mentioned standards.

3.4.3 The Service Provider shall inspect existing connections and take corrective action where necessary (i.e. repair or replace).

3.4.4 Existing installations that do not comply with good practice or where the meters, network, and public lighting infrastructure have been tampered with shall be reported. Wiring shall be

repaired, meters, public lights and network infrastructure shall be replaced and sealed where necessary.

3.4.5 The service provide shall capture readings before replacing the meters.

3.4.6 Replaced meters shall be returned to City Power for the purpose of reconciling invoiced replacements and for possible repair and re-cycling.

3.4.7 The Service Provider shall provide the following:

a) Skills and labour
b) Transport to and from target areas
c) All tools and appropriate test equipment
d) Wiring, ferrules and terminals

3.4.8 Any sundry tool required to perform installation and maintenance of meters, connections, public lighting and associated equipment.

3.4.9 The Service Provider shall have more than one team and each team shall be comprised of at least two resources being an installer and a labourer.

3.4.10 The Service Provider shall not claim overtime or additional costs after rates have been accepted by City Power as it shall be generally understood that the related costs shall be factored into the pricing.

3.4.11 It is further intended that an Electrician (single phase tester minimum requirement) shall signs off on installations.

3.4.12 The Service Provider shall be held responsible for loss or damage to the new equipment from the time they are issued until they are installed and the handover documents have been signed off by all the various stakeholders.

3.4.13 The Service Provider shall capture data using the work force management tool and any other management tool requested by City Power.

3.4.14 The Service Provider shall ensure that each meter is adequately sealed and all relevant information is captured before leaving the premises.

3.4.15 The Service Provider shall ensure availability of resources for call outs during and after office hours as per service level agreement.

3.4.16 The Service Provider shall provide and operate all the necessary test instruments and equipment to perform all tests.

3.4.17 The Service Provider shall be responsible for all safety precautions prior commencement of duties which includes risk assessment and testing.

3.4.18 Up to date certificates of accuracy for the testing apparatus by recognized regulatory bodies shall be provided as and when required.

3.4.19 The service provider shall ensure a safe state of all distribution kiosks by leaving them securely closed prior to leaving site.

3.4.20 All defects of deficiencies found during an inspection shall be repaired or corrected by a qualified person no cost to City Power.

3.4.21 Under no circumstances shall any service provider or his workmen perform any function that he or she is not authorized to perform. In any case of doubt the matter shall be referred to the Supervisor, or Operations Manager.

3.4.22 Service provider's staff shall not retaliate when subjected to abuse by an irate customer. In the event of any abuse this shall be referred to the Operations Manager or Supervisor.

3.5 Service Provider employee and subcontractor details

The service provider shall provide a detailed business profile. If subcontractors are utilized by the service provider, then the subcontractor's business profile shall also be provided.

No service provider shall be allowed to use any sub-contractor without the knowledge of City Power.

The service provider shall provide the following employee and subcontractor details;

a) A detailed list of all employees and subcontractors (electrically skilled staff),
b) A detailed list of qualifications and experience of all employees and subcontractors who shall perform work on City Power's electrical distribution network,
c) A detailed list of each person's expertise for the above list of employees and subcontractors, i.e. MV jointing certification or cable laying Certification etc. and,
d) A list of previous project references, i.e. contact persons, work completed, etc.

NOTE:

1. The successful service provider shall ensure that the above information which has been supplied to City Power is continually updated monthly to ensure that City Power's record keeping is accurate and correct.

2. No service provider shall be allowed to use any sub-contractor without knowledge (provided in writing prior to commencement of any works) of City Power.

3.6 Service Provider's fleet, specialized tooling and premises details

The service provider shall provide fleet, specialized tooling and premises details currently owned by the Service provider's business and owned by the subcontractor respectively if applicable;

a) A detailed list of all roadworthy vehicles (make, model, registration number, purpose of vehicle),
b) A detailed list of all specialized tooling (make, model, serial number, purpose of specialized tool),
c) A detailed list of address(s) premises (location, capability, number of staff at each premise).

City Power shall not lease any City Power vehicles or specialized tooling to any service provider. The successful service provider shall be fully equipped to perform the work awarded to him by City Power. If the service provider(s) arrives on site and is not equipped to perform the work awarded to him by City Power, shall have his labour contract terminated by City Power.

3.7 Service provider workmanship guarantees

The service provider shall be liable for workmanship guarantees for a period of 12 months once the electrical equipment has been commissioned. If in this time period, it is proved by City Power that poor workmanship was the cause of the power failure; the 10% contract (based on a 3-year projected budgeted allocation) retention fee shall be used by City Power to repair the poor workmanship, and a noncompliance certificate shall be issued to the service provider by City Power.

3.8 Work to be undertaken

Service providers and subcontractors shall only undertake work on City Power's electrical network if they are in possession of an approved wayleave from City Power.

Any service provider caught working within City Power's area of supply without an approved wayleave or governance approvals, shall be fined R5000 by City Power or an amount or fine imposed by the relevant authority, whichever is higher. The service provider shall also be liable for any fines imposed on them by other MOE's and if any services are damaged they shall have to pay for the repair of these services. The fines and repairs shall be paid for by the service provider at no cost to City Power.

3.9 Issuing material

All material shall be issued free by City Power with the exceptions of spares as covered under the network work accessories specifications only on request by the City Power

Any service provider caught installing non-City Power issued material shall have their contract with City Power terminated.

All excess material not installed on the job shall be returned to City Power's warehouse with relevant documentation (i.e. Material Issue slip and Warehouse Credit Requisition form.

4. GENERAL - METERING SERVICES LABOUR

Metering is an important tool that enables City Power as an electricity distributor to do revenue collection. The company continues to invest in innovative techniques and technologies to extend the life of assets, increase productivity and efficiency, as well as improve audit compliance. Furthermore, the company seeks to provide its customers with accurate energy consumption data, leading to accurate billing and ensuring efficient collection of revenue.

All meters shall be installed and maintained in accordance to all relevant City Power metering specifications and standards. All workmanship shall adhere to and be in compliance with City Power's specifications and standards which includes all recognized and applicable legislation. (CP_TSSTAN_133 and CP_TSSPEC_316).

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.

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.

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.

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.

The Service Provider shall be required to install and replace the following types of metering systems supplied by city Power:

1) Max demand electronic meters,
2) Non domestic credit meter,

3) Domestic meters, and
4) Prepaid or Smart meters.

4.1.1 Metering Services Requirements

4.1.1.1 General

4.2.1.1.1 All metering hardware inspections shall be conducted in accordance with NRS 057 and the manufacturer's recommended procedures. The meters' inspection frequency shall be in accordance with NRS047 and shall not be limited to either the manufacturer's recommended intervals or the equipment failure or faults.

4.2.1.1.2 All maintenance and repairs shall be executed by competent or qualified personnel in line with stipulated response times.

4.2.1.1.3 All tools required to perform repairs and maintenance shall be supplied by and remain the property of the service provider.

4.2.1.1.4 Metering equipment shall be suitably accommodated and protected and be readily accessible to officials of the Service Provider. at all reasonable times.

4.1.1.2 Prerequisites

The following specialised equipment/tools shall be used so as to achieve required results:

a) Verification Instrument (e.g. Metes 320),
b) Clamp On CTs with a range of at least 0 - 800 Amp,
c) Phase Load Box (minimum 20 Amps per phase) and
d) HV Current Probe (Only required for HV-MV Installations) with an insulation level up to 132kV.

4.1.1.3 Resource qualifications.

Minimum competencies shall be categorized as follows;

4.1.1.3.1 (Level 1)

A Revenue Protection auditor shall;

a) Be familiar with different types of meters and have the ability to educate investigators.
b) Have knowledge of City Power's Infrastructure.
c) Be familiar with test instruments,

d) Be computer literate,

e) Have the ability to identify tampering methods and

f) Have knowledge of billing and equipment register databases.

4.1.1.3.2 (Level 2)

A Revenue Protection operator shall have;

a) Passed a Revenue Protection course in auditing (minimum qualification: qualified Electrician),

b) Experience in the removal of tampers on meters,

c) Experience in meter removal and replacement,

d) Knowledge of cut-off procedures,

e) Knowledge of switching,

f) Knowledge of utility plumbing,

g) Knowledge of safety procedures, and

h) Knowledge of first aid.

4.1.1.3.3 RP investigator (level 3)

A Revenue Protection investigator shall have;

a) Passed a Revenue Protection Auditor Course and a Revenue Protection Operator Course,

b) Knowledge of by-laws and credit control procedures,

c) Knowledge of relevant legislation (see foreword),

d) Experience in evidence collection, and

e) Experience in case preparation and court procedures.

4.1.1.3.4 Common courses

All Revenue Protection officers shall have successfully passed courses in;

a) Customer relations,

b) Problem solving,

c) Negotiating skills, and

d) Emergency handling and self-defence.

4.1.1.4 Meter Audits and associated equipment.

4.2.1.4.1 The meter auditing process has been found to be an effective revenue protection method that reduces non-technical losses.

4.2.1.4.2 There are different methods that could be utilized to audit meters. Each one could be used effectively to reach a specific goal.

4.2.1.4.3 Meter audit shall be carried out by City Power's authorized personnel as detailed under resource qualification.

4.2.1.4.4 A list of meters to be audited shall be uploaded on the workforce management tool for the service provider to download.

4.2.1.4.5 The Audit process shall be conducted in accordance with job cards or spread sheets loaded on work force management tool.

4.2.1.4.6 Meter tripping mechanisms shall be tested by using tamper pin codes or any other specific test as and when required

4.2.1.4.7 Usage rate shall be tested by switching on an appliance in the house.

4.2.1.4.8 Meters shall be checked for tampering and open meters that hare found to be tampered with shall fail the above test.

4.2.1.4.9 Supply shall be disconnected if the meter is found to have been opened or tampered with and the customer shall be issued with an attached disconnection form.

4.2.1.4.10 The installation shall be normalized for safety reasons and the anti-tamper seal shall be left in place and secured before leaving.

4.2.1.4.11 The Audit Form shall be populated with the customer's and installation data (as detailed in the template which includes customer details, record of findings and type of property).

4.2.1.4.12 In the absence of holes, the service provider shall switch off power in the service distribution box (stubby) remove meter, drill holes, attach the seal and record number.

4.2.1.4.13 The power shall be restored once everything is in place.

4.2.1.4.14 Faulty meters and tampers shall be escalated to City Power's Revenue Protection Management using appropriate channels.

4.2.1.4.15 The checklist template for the meter Audit shall also be populated using City Power's workforce management tool which includes Work Completion Certificates.

4.2.1.4.16 Any associated photographs, diagrams, GPS coordinates and related documents shall also be uploaded.

4.2.1.4.17 Once the Audit has been completed, the service provider shall close the call which shall allow finalization of the process.

4.2.1.4.18 A list of skills required to complete work

4.2.1.4.19 Step by step audit process

4.2.1.4.20 The service provider shall revisit sites where the audit could not be completed due to lack of access or inadequate information.

4.2.1.4.21 Unavailable customers shall be notified of the need to audit their premises.

4.2.1.4.22 Audit reports shall be submitted to City Power's management at stipulated intervals to be agreed upon.

4.1.1.5 Pre Installation/ Replacement Checks

4.2.1.5.1 At the completion of the installation and prior to the commencement of the commissioning tests the Service Provider shall inspect all hardware and verify that the following tasks have been completed in accordance with the installation specification in all relevant City Power standards and specifications. (CP_TSSTAN_133 and CP_TSSPEC_316)

4.2.1.5.2 All hardware devices (e.g.: meter/breakers) have been installed at the locations specified in the design documentation.

4.2.1.5.3 Electrical and communications cables have been appropriately sized and secured to protect against operational damage and ensure stability for continuous use.

4.2.1.5.4 Connections have been correctly terminated and insulated to ensure satisfactory connectivity and protection against faults and interference.

4.2.1.5.5 All devices have been provided with adequate protection against moisture and other environmental conditions

4.2.1.5.6 Communication network cables have been correctly connected to the designated points.

4.2.1.5.7 Associated equipment such as power supplies and switches have been connected correctly and secured appropriately.

4.2.1.5.8 Drawings have been updated accordingly.

4.2.1.5.9 Proper grounding or earthing on all devices.

4.1.1.6 Commissioning Check

4.2.1.6.1 The Service Provider shall be responsible for the configuration of any additional meters that are added or replaced on the network.

4.2.1.6.2 They shall be responsible for the commissioning of the new meter. The Service Provider shall be an active participant in the testing and commissioning with City Power.

4.2.1.6.3 As a minimum, the Service Provider shall confirm the following using all the relevant City Power metering commissioning form and documents.

a) All software modules specified in the design documentation or the modules required to perform all specified operation functions have been installed and configured to meet City Power's system requirements.
b) The appropriate release version of all software including drivers and upgrades shall be used for commissioning.
c) The meter protocols, system reports, screens and menus have been correctly configured.
d) The meters communication back to City Power's APN and back- end has been confirmed.

4.1.1.7 Preventative Maintenance

4.2.1.7.1 A large part of keeping a company running efficiently and profitably is ensuring that all equipment is functioning optimally. To do so, routine preventative maintenance needs to be conducted in accordance with the relevant regulatory standards.

4.2.1.7.2 Preventative maintenance shall be performed in accordance with NRS047, to extend the life of assets and increasing equipment uptime, as well as increasing productivity and efficiency.

4.2.1.7.3 It is performed while the equipment is still working so that it does not break down unexpectedly

4.2.1.7.4 The service provider shall ensure safety by wearing appropriate personal protective equipment such as glasses and gloves, etc.)

4.2.1.7.5 Each meter shall have the following information legibly marked on the front of the:

a) nameplate or register: 4027.1, S.6
b) Manufacturers' name or trademark, type designation, and serial number.
c) Voltage rating.
d) Test amperes (TA).
e) (Maximum amperes (CL) {meter class}.
f) (Watt-hour or disk constant (Kh) {expressed as watt-hours per revolution}.
g) Register ratio (Rr) and multiplier (if 10 or larger).
h) Frequency rating (Hz).
i) Number of meter stator(s) or elements (poly-phase).
j) Ratio or rating of auxiliary devices.
k) Type approval.

4.2.1.7.6 Meters shall be installed in a level and perpendicular manner in accordance with manufacturer's specifications.

4.2.1.7.7 The overall condition of meter shall be inspected which includes Terminals, seals, glass, and insulation.

4.2.1.7.8 Exposed non-current carrying metal parts of fixed equipment, metal boxes, cabinets, and fittings which are not electrically connected to grounded equipment, shall be grounded as required by National Electrical Code, Article

4.2.1.7.9 The terminals of the meter shall be arranged so that the possibility of short circuits in removing or replacing the cover, making connections and adjusting the meter is minimized.

4.2.1.7.10 The main circuit breaker or main switch and fuses and their auxiliary equipment shall be installed in the load service near its entrance as supplied which is intended to constitute the main control and means of cut-off

4.2.1.7.11 Check for ground faults; verify customer being billed is the only customer served by each meter. Verify that common use areas such as street lights are not wired into the load side of the customer circuit.

4.2.1.7.12 Any associated photographs, diagrams, GPS coordinates and et, shall be uploaded via the workforce management tool

4.1.1.8 Reactive Maintenance

4.2.1.8.1 FIRST LINE VERIFICATION FUNCTION

4.2.1.8.1.1 The first line verification function shall be conducted remotely from a quality check platform soon after the field activities related to audits & maintenance have been completed to establish the following 1st line quality checks from the meter in the field:

a) Establishment of communication
b) Retrieval of configuration data
c) Analysis of retrieved meter instantaneous parameters and data

4.2.1.8.1.2 The function is required to ensure that the meter data management system used to retrieve meter recorded data is aligned to the field configuration. The required verification shall be conducted online through a Back office infrastructure used to reach out to the meter in the field, before submission on City Power's workforce management system.

4.2.1.8.1.3 The next level quality checks shall be based on the Commissioning Sheets or Audit results submitted to the back-office before submitting to the utility.

4.2.1.8.1.4 Faults shall be referred to Service Provider by City Power's dispatchers using the workforce management tool.

4.2.1.8.1.5 Maintenance shall be undertaken by a qualified Electrician as authorized by City Power's management.

4.2.1.8.1.6 The job card shall include customer details, time and location of fault and the nature of the fault.

4.2.1.8.1.7 The service provider shall acknowledge and action fault using same platform.

4.2.1.8.1.8 Faults shall be resolved and supply shall be restored timeously in accordance with NRS 047 and NRS 048.

4.2.1.8.1.9 Once the supply has been resolved, the job card shall be closed via work force management tool with details of Service Provider and what was done to resolve the fault.

4.2.1.8.1.10 Any associated photographs, diagrams, shall also be uploaded on the workforce management tool.

4.1.2 Data Capturing/Submission of Documentation

Data shall be captured using the workforce management tool and any other management tool requested by City Power and shall be made available to Service Providers. (CP_TSSTAN_133 and CP_TSSPEC_316)

The format of the information shall be agreed prior to commencement of the work.

The service provider shall action and update the commissioning online with the required details.

The captured data shall be used by the responsible team leader to process payments.

It shall therefore be necessary for the Service Provider to have a mobile smart device with the workforce management tool installed to decreasing paperwork with mobile maintenance capability

No data recorded on paper shall be accepted by City Power.

4.1.2.1.1 Low Voltage Cables (underground)

All low voltage cables shall comply with specification CP_TSSPEC_002.

For main underground LV distributors supplying low voltage distribution boxes or CMK's 120 mm² x4 core PVC aluminum equivalence cables shall be installed.

4.1.2.1.2 LV Aerial Bundled Conductor

All LV aerial bundled conductor shall comply with CP_TSSPEC_010, shall be suspended from concrete poles complying with CP_TSSPEC_52. Installation of ABC shall be in accordance with SANS 10198-14

Table 1 : ABC for use at City Power

Items	Description	Application
1.	3 x 50 mm² phase cores plus 1 x 25 mm² street lighting core plus 1 x 54,6 mm² neutral / earth supporting conductor (aluminum alloy & insulated)	Electrification
2.	3 x 95 mm² phase cores plus 1 x 25 mm² street lighting core plus 1 x 54,6 mm² neutral / earth supporting conductor (aluminum alloy & insulated)	Electrification

LV ABC shall be installed in accordance with manufacturer's instructions.

4.1.2.1.3 General (Aerial Bundle conductor)

The 50/95/120mm ² ABC shall have a separate 25mm² aluminium core for Street lighting. Alternatively, a 25mm² x 2c ABC can be used for street lighting where no provision has been made in the LV overheads or ABC.

All ABC is to be pulled with the aid of a Dyno Meter to the correct tension.

Strain and suspension brackets shall be secured either with stainless steel strapping or bolted with a M12 bolts. Drilling of wooden or steel poles is not allowed. Pre-cast holes in concrete poles may be used to bolt suspension and strain clamps.

The power shall be controlled by a photocell complaint with CP_TSSPEC_012 and in a pole box top compliant with CP_TSSPEC_072 control circuit mounted in a pole-top box on the first pole of every LV feeder, where applicable.

The supply to the Public lightings shall be via a separate core of the ABC (25mm² aluminium) twisted with the rest of the phase cores. Connection of the Public lighting to the ABC shall be by means of AERIAL SERVICE CABLE (ASC) or similar connected with suitable Insulation Piercing Clamps (IPC) of the bimetal type ABC- to - service tap-off.

Where underground network is considered for public lighting only aluminium cables shall be used.

4.1.2.2 Dumping site

The Service Provider shall be responsible to make the necessary arrangements for dumping all rubbish at an official local government dumping site. No dumping of rubbish shall be permitted on site.

All trees, plants, rubbish and structures which are found on the cable route shall be removed by the Service Provider and shall be dumped at the approved dumping site.

All surplus excavated material which is not suitable for backfilling shall be removed by the Service Provider and dumped at the approved dumping site.

If Service Providers staff have left the work site in an unacceptable state, a fine of R 50 000-00 shall be levied per location per project.

4.1.2.3 Inspection

Cable trenches shall be approved by City Power's representative assigned to the project before any cables are installed and the installation of the cables shall be approved before backfilling is commenced.

4.1.3 Low Voltage Control Pillar Boxes

Only low voltage distribution boxes (protective structures) complying with CP_TSSPEC_208 shall be used.

Where it is apparent to the Service Provider that the installation of an item of equipment in the position indicated on the relevant plans shall obstruct or interfere with an existing service, driveway or other item he shall refer this matter back to the Clerk of Works or City Power Official for attention and possible relocation of the item.

The Service Provider shall be required to install various sizes of MCBs and MCCBs in Miniature Substations, Transformer Substations, distribution boxes, Central Metering Kiosks (CMKs) and customer boundary meter boxes. All cables connected in the box shall be designated with the house and stand number.

4.1.4 Documentation

4.1.4.1 Photographs

A photograph of before and after each installation shall be taken to determine the correctness and neatness as well as close-ups of strategic equipment (e.g. Meters to show sealing, Test Blocks, Customer cable connections and Current transformers).

4.1.5 Normalisation

Electrical Network normalisation is to improve safety, network performance and the quality of supply. It addresses issues of non-technical losses by removing any bridged meters.

4.2.6.1 The installation shall be normalised;

a) If MCB's on metering circuits found in the off position, wiring shall be checked to ensure no faultexists before switching on

b) If polarity swopped, normalise as per meter connections.

4.2.6.2 The work performed shall be included in the comments field of the first page of the standard report.

4.2.6.3 All work shall be performed as per the relevant City Power Procedure unless specifically stated.

4.6.7 Sealing

Standard City Power sealing shall be adhered to so as to clearly denote: Installation; Audit inspection and Cut-Off levels. The use of an acceptable safety seal on cover screws shall be a manner that prevents tampering or indicate no tampering has taken place without breaking the seal.

4.6.8 Performance

4.6.8.1 Audit, Inspection and Testing Performance

City Power may inspect and test the various portions of the work at all times and shall have full power to reject all or any portion of the work that they may consider to be defective or inferior in quality of material and workmanship with respect to the original design. Any portion of the work so rejected shall be corrected immediately by the Service Provider, unless in the opinion of City Power the work rejected can be so treated and repaired as to render it fit for incorporation in the contract. In this event the Service Provider shall, at his own risk and expense be at liberty to repair the work to the satisfaction of City Power.

The Service Provider shall carry out such work/tests as are necessary in the opinion of City Power to prove that the contract requirements are being complied with.

The cost of all tests and/or analyses shall be borne by the Service Provider.

4.6.8.2 Response and repair time to performance

It shall be expected of the Service Provider to relate his actions in respect of call-outs, repairs and general maintenance to specific prescribed response and repair times.

Depending on the criticality of the site and the urgency of the call-out the response times may vary and the table below indicates maximum time-spans.

Table 2: Response and repair time to performance

Call-out Type	**Response Time**	**Repair Time**
Emergency Corrective Maintenance	1 hour	Refer definition below
Planned Corrective Maintenance	8 hours	
Routine Preventive Maintenance	As per agreed schedule	

Response Time shall mean the time lapsed from the time the call-out is logged by the system operator or person making the call, until the Service Provider responds on site. A record shall be kept in the control logbook.

Repair Time shall mean the maximum time taken by the Service Provider to repair the fault in order to limit the downtime of the system to a minimum. Repair time shall be measured from the time the Service Provider's response on site is logged until such time as the fault is rectified and signed off in the control logbook.

Downtime with respect to call-outs shall mean the total time for which the system is not 100% operational, i.e. Response time plus Repair time.

4.6.9 Description of Inspections and Tests

Table 3 : Description of inspections and tests

Description of the service	Inspection and Maintenance
DIN Rail (LV) metering installations	50kVA (No CTs)
Domestic Pre or Post paid (LV) metering installations	100-500kVA
Bulk metering installations (MV and HV)	On Load

4.6.9.1 Customer information

The below Installation Information shall be provided by City Power

4.6.9.1.1 Customer Name
4.6.9.1.2 Account Number
4.6.9.1.3 Premise ID
4.6.9.1.4 Pole No
4.6.9.1.5 GPS Coordinates
4.6.9.1.6 Size of installation (NMD)
4.6.9.1.7 Tariff

These are the items from the applicable procedures that need to be performed.

4.6.9.2 LV (Domestic) metering installations

Applicable procedure:

4.6.9.2.1 Voltage circuit functionality check

4.6.9.2.2 Cabling connections

4.6.9.2.3 Meter panel functional tests:

a) Equipment with batteries – Only Check for alarm on display (where applicable)

b) Accuracy verification (on load testing)

I. No Meter Replacement (as part of the Meter Verification) shall be required.

II. If the Customer is not taking load, a three phase load box shall be used.

c) Test

d) Installation verification check

I. Power Calculations

II. Time accuracy on meters – Should be noted on the Report

e) Meter configuration and programming

4.6.9.2.4 Meter data verification required. (Shall be performed by SAP or Meter Vending)

4.6.9.2.5 Sealing

4.6.9.3 MV and HV metering installations

Applicable Procedure:

4.6.9.3.1 Voltage circuit functionality check. Due to live installation, CT/VT Unit Specifications shall be obtained where possible, by means of binoculars.

4.6.9.3.2 Current instrument transformer ratio check. Perform on-load CT ratio verification – If there is no load, it should be noted on the report.

4.6.9.3.3 The checking of summation CT's where applicable shall be noted under comments of report.

4.6.9.3.4 Checking of Cabling connections

4.6.9.3.5 Measurement of instrument voltage and current transformer installed circuit burdens and volt drop measurement – Required for customers with greater than 10MVA.

4.6.9.3.6 Meter panel functional tests

4.6.9.3.7 Equipment with batteries – Only check for alarm on display (where applicable)

4.6.9.3.8 Accuracy verification (on load testing).

4.6.9.3.9 Phasor test

4.6.9.3.10 Installation verification check

4.6.9.3.11 Power Calculations
4.6.9.3.12 Time accuracy on meters – Should be noted on Report
4.6.9.3.13 Meter configuration and programming
4.6.9.3.14 Display sequence
4.6.9.3.15 Meter data verification required. (Shall be performed by SAP or Meter Vending).
4.6.9.3.16 Sealing

4.6.10 Low Voltage Distribution Boxes (Protective Structure) And Isolating Pillars

The Service Provider shall position low voltage pillar boxes and isolating pillars adjacent to and at right angles to street boundaries in the positions indicated on the pertinent drawings. The pillar boxes shall be installed such that the concrete foundation plinth base is between 250 and 300 mm proud of the final pavement level and such that free access may be obtained to both sides of the pillar through the appropriate access doors – the fibreglass base shall be 150 mm above the final pavement level.

Where it is apparent to the Service Provider that the installation of an item of equipment in the position indicated on the relevant plans shall obstruct or interfere with an existing service, driveway or other item they shall refer this matter back to the Clerk of Works or City Power Official for attention and possible relocation of the item.

1.1 LV network earthing

LV earthing shall be in accordance with the TN-C-S Earthing System as described in the latest revision of the SANS_ 0292.

The neutral core of the low voltage conductor or Protective Earth conductor is to be earthed at the following points for the TN-C-S system at or close to the star point of the transformer.

The armour wires of all LV cables shall be glanded and the gland plate shall be connected to the Neutral bar.

6.1 Testing apparatus

The Service Provider shall provide and operate all the necessary test plant and equipment to perform the above-mentioned tests. The Service Provider shall also be responsible for all safety precautions during testing and provide up to date certificates of accuracy for the testing apparatus from an independent standards authority when required by the Clerk of Works or City Power Official. Where possible City Power shall provide, free of charge, a single phase 230 V 50 Hz supply for test purposes but where this is not

feasible the Service Provider shall be responsible for providing the necessary portable generating plant for this purpose.

5 SKILLS

The Service Provider shall utilise staff who are qualified electricians i.e. have passed a recognised trade test. In addition, the Service Provider shall be registered with the Department of Labour. At any stage during the contract term, City Power may request details of all qualified electricians that are employed by the Service Provider. The Service Provider should also run regular in-house training courses for all of their staff to ensure the proper skilled staff are utilized on this contract.

All jointers utilized to do medium voltage joints and terminations shall be registered with City Power. They shall also be trained and certified by a reputable supplier of cable accessories. A valid jointer accreditation certificate shall be produced at tendering stages for all jointers and when so required during the contract in the field. City Power shall also conduct in house training for all jointers during the course of the contract.

The training attended by the jointer shall be E-SETA accredited and shall be accordance with SANS 10198. The jointer shall be trained on both PILC and XLPE cable systems. All cable accessories installed shall be in accordance's with NRS 012 and NRS 053 requirements.

The jointer shall be equipped with all the necessary tools as per the training received when working on City Power's network.

If poor workmanship can be proved before the end of the guarantee, the jointer shall replace the affect joint or termination at their cost.

Failure to perform a presence of moisture test on a PILC cable prior to jointing or terminating should also be regarded as poor workmanship and the above clause shall apply.

The jointer shall always put their name on the finished joint or terminations as per the installation instruction of the respective cable accessory.

6 CONTRACT LIABILITIES

The contactor shall take note of the following:

- Any damage to City Power's or any customer property
- Damage to City Power's or any other Services

That they shall be held liable to rectify or fix such damage at reasonable time frames given by the relevant City Power Official. Failing to comply with this shall lead to City acquiring services of another service provider or Service Provider and payment of such being the responsibility of original Service Provider.

7 TRANSPORTATION OF CITY POWER EQUIPMENT

The Service Provider shall ensure that the transportation of all equipment and free issued material complies with all Transportation and Safety Standards. City Power officials including City Power Manager: Logistics & Warehouse has a right to refuse entry or loading of City Power equipment and material to unsafe transportation and or Service Provider's trucks. Security Risk Management shall ensure that compliance takes place before the Service Provider enters City Power premises.

8 DISPUTE RESOLUTION

If at any stage a disagreement exists between the Relevant Manager or his representative and the Service Provider, the matter shall be reported to the Engineering Services Contracts Manager for resolution and a way forward. If the matter requires further mediation, a mediator shall be mutually agreed upon to mediate and the decision of this party shall be final. The details of dispute resolution shall be covered on the actual contract between City Power (Legal Department) and appointed Service Provider.

9 QUALITY MANAGEMENT

A quality management system shall be set up in order to assure quality work during development, production and servicing of the City Power Infrastructure. Guidance on the requirements for a quality management system may be found in the following standards: ISO 9001:2015. The details shall be subject to agreement between City Power and supplier.

10 HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management and compliance of the meters and service connections during installation, 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 Supplier.

11 ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up in order to ensure the proper environmental management and compliance of the City Power Infrastructure during their entire life cycle (i.e. during design, development, production, installation, operation and maintenance, decommissioning as well as disposal phases). Guidance on the requirements for an environmental management system shall be found in ISO 14001:2015 standards. The details shall be subject to agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHEQ Policy.

ANNEX A - BIBLIOGRAPHY

None

ANNEX B - REVISION INFORMATION

DATE	REV. NO.	NOTES
July 2025	0	First issue