INTRODUCTION

City Power utilise traditional with-drawable metalclad switchgear complying with CP_TSSPEC_035 in their second tier distribution substations. These units have generally performed well, but a move towards the smaller fixed pattern non-with-drawable switchgear could result in significant savings in terms of the dimensions of the switchbay required. This should, in turn, result in cost savings in terms of civils. Maintenance will be reduced due to fewer moving parts in the fixed pattern, non-withdrawable switchgear as opposed to withdrawable metal clad type switchgear.

No oil-insulated metal enclosed switchgear shall be installed on City Power's network.

It is important to ensure that switchgear complies with the required specifications and is of acceptable quality.

1 SCOPE

This specification covers City Power's requirements for fixed pattern, non-withdrawable switchgear.

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 specification are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

SANS 62271-200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV

SANS 556 -1, Moulded case circuit breakers

SANS 60947- 2: Low Voltage Switchgear and Controlgear Part 2: Circuit-*breakers*

SANS 876: Cable terminations and live conductors within air insulated enclosures for rated a.c. voltages of 7,2 kV and up to and including 36 kV

CP_TSSPEC_002:Specification for low voltage insulated wires, power and multi-core control cables

CP_TSSPEC_053: Accessories for medium voltage power cables for systems with nominal voltages of 11 kV to 33 kV

EN 50181: Plug in type bushings above 1 kV up to 36kV and from 250A 1,25kA for equipment other than liquid filled transformers

3 DEFINITIONS AND ABBREVIATIONS

The definitions and abbreviations in the above documents shall apply to this specification. In addition, the following abbreviations shall apply.

IED – Intelligent Electronic Device capable of serial communications to a remote device

IDMT – inverse definite minimum time

DT – definite time

VPIS – voltage presence indicating system

4 REQUIREMENTS

4.1 General

4.1.1 Nothing in this specification shall lessen the obligations of the supplier. The supplier shall be fully responsible for the design and its satisfactory performance in service. Approval by City Power shall not relieve the supplier of the responsibility for the adequacy of the design.

4.1.2 This specification covers the requirements for fixed pattern, non-withdrawable, metal-clad switchgear. Switchgear shall be manufactured in accordance with SANS 62271-200. Where conflicting requirements with SANS 62271-200 occur, this specification shall take precedence.

4.2 Ratings

4.2.1 Rated Voltage

The rated voltage shall be 12 kV.

4.2.2 Rated normal current

Preferred rated normal currents shall be:

a) 1250 or 800 or 630 A for feeders, and

b) 2500 or 1250 A for incomers, bus-sections / couplers (see tender document)

4.2.3 Rated insulation level

4.2.3.1 The rated peak insulation level of switchgear shall be 95 kV.

4.2.3.2 The rated r.m.s. short-duration power frequency shall be 28 kV.

4.2.4 Rated short time and peak withstand currents

4.2.4.1 The rated r.m.s. short-time withstand current shall be 31,5 or 25 kA for 3 seconds.

4.2.4.2 The rated peak withstand current shall be 63 kA.

4.2.4.3 Internal arc withstand current shall be 31,5 or 25 kA for 0, 5 seconds. Internal arc classification shall be type A - FLR.

4.2.4.4 Tenderer shall advise as to whether arc chutes should be utilised for the expulsion and dissipation of internal arc. Full details shall be provided.

4.3 Circuit-breaker panels

4.3.1 General

4.3.1.1 Only fixed pattern, non-withdrawable type circuit breaker panels are required as per SANS 556-1.

4.3.1.2 A single main busbar system is required.

4.3.1.3 Circuit breaker spring charge motors shall be provided.

4.3.1.4 Maximum panel width shall be 500mm.

4.3.2 Switch disconnector, earth switch and load break switch

4.3.2.1 Earthing facilities for all main circuits shall be provided.

4.3.2.2 Busbar or bus section earthing facility shall not be provided.

4.3.2.3 No specially designed earth truck shall be required. Earthing shall be integral.

4.3.2.4 Switch disconnector and earth switch combination shall be provided to enable the following switching positions:

a) service position

b) isolated position, and

c) earth position

4.3.2.5 Segregation between busbar and feeder cable compartment shall be provided.

4.3.2.6 Switch disconnectors shall be mechanically interlocked with earth switches. It shall not be possible to close the switch disconnector with the earth switch in the closed position and vice versa.

4.3.2.7 Switch disconnector used in conjunction with circuit breaker shall be hand operated.

4.3.3 Remote control hand-held units

Remote control hand-held units shall be provided for circuit breaker open and close operation. This shall be in situations where a separate control room cannot be provided.

4.3.4 Auxiliary contacts

Auxiliary contacts shall be provided for each switch. A minimum of 2 N/O and 2 N/C contacts over and above the contacts required for circuitry design shall be provided.

4.3.5 Interlocks

4.3.5.1 The circuit breaker interlock shall be designed so that the circuit breaker, when in the service position, can only be operated if the auxiliary supply is connected.

4.3.5.2 The cable box interlock shall be designed so that the cable box cannot be opened without the cable isolated and the cable earth switch in the closed position.

4.3.6 Switchgear transporting devices

Switchgear shall not require external transporting devices and shall be supplied with lifting eyes. It shall be clearly marked with any specialized lifting requirements.

4.3.7 Cable interface

4.3.7.1 All outgoing and incoming panels shall be provided with suitably rated type C bushings in accordance with EN 50181. All connections shall be supplied fitted with stainless steel M16 bolts. Cable connections shall accommodate cable terminations outlined in 4.4.

4.3.7.2 All outgoing and incoming panels shall be provided with front access cable compartments.

4.3.8 Circuit breaker interrupting medium

The medium of interruption shall be vacuum.

4.3.9 Switchgear configuration

Switchgear configuration shall be as specified in the relevant tender document.

4.3.10 Protection

4.3.10.1 Incoming and outgoing circuit breakers shall be fitted with IDMT and DT overcurrent and IDMT and DT sensitive earth fault protection, operating a trip coil shunted by a relay.

4.3.10.2 Incoming switchgears shall have facility for differential protection if so stated in tender. It may be necessary to adapt to existing systems.

4.3.10.3 Either self-powered integrated protection relays or relays operating from auxiliary station DC supply shall be utilised. This will depend on the arrangement at the substation concerned and shall be clarified in the tender. The station DC supply shall be as specified in relevant tender document.

4.3.10.4 The cable box compartment shall be protected using arc protection. Only the circuit breaker associated with the cable box must trip for a fault within the cable box. A trip shall be initiated by the detection of arc light AND current.

4.3.10.5 The busbar and circuit breaker compartment shall be protected using arc protection. The entire switchgear zone associated with the busbar or circuit breaker compartment arc fault must trip. A trip shall be initiated by the detection of arc light AND current.

4.3.10.6 Each circuit breaker shall have a single IED that will incorporate protection, control, interlocking and SCADA.

4.3.10.7 Incomers and parallel feeders shall have unit protection of the differential type.

The detailed Incomer, Bus Section and Feeder protection requirements shall be as specified in relevant tender document.

4.4 Power cable termination

4.4.1. The power cable compartment shall be accessible from the rear or the front of the switchboard.

4.4.2. Power cable terminations for feeder and distribution transformer panels shall be suitable for three-core XLPE insulated cables that comply with City Power cable specification (CP_TSSPEC_053).

4.4.3. Only type 2 terminations with fully shrouded cable terminals shall be acceptable.

4.4.4. Power cable terminations and live conductor arrangements in air-filled enclosures shall comply with the minimum clearances c and d of SANS 876.

4.4.5. No surge arresters shall be installed in feeder panels.

***Note**: Possible connection for incomer 12 x 630mm² (4x630mm² per phase) for copper and 12 x 1000mm2(4x1000mm2 per phase) for aluminium single core XLPE insulated cables.*

***Note**: Type 2 termination: lugs connected onto bushings or post insulators with a shrouded insulation termination.*

4.5 Mimic board

All switchgear shall have a mimic board display unit, showing switch circuit layout and indication of switch status.

4.6 Auxiliary Circuits

4.6.1 Wiring

4.6.1.1 Current transformer wiring shall be 2,5 mm^2 and voltage transformer wiring shall be 1,5 mm^2, both being colour coded according to the phase colours.

4.6.1.2 All auxiliary wires shall be 1,5 mm^2.

4.6.1.3 All wiring shall comply with the requirements of CP_TSSPEC_002.

4.6.2 Protection of auxiliary circuits

All dc circuits and LV ac circuits shall be protected by double pole MCBs.

4.6.3 Current and voltage measuring facilities

It shall be possible to read the circuit breaker voltage, current and power demand via a LCD display on the protection and control IED. Statistical metering shall be provided in order to allow the monitoring of load on each individual circuit as well as the board as a whole. Full details of statistical metering system shall be provided.

The detailed current transformer (TSSPEC_064) and voltage transformer (TSSPEC_158) requirements shall be as specified in the relevant tender document.

4.6.4 Control facilities

4.6.4.1 All protection and control equipment shall be housed in a separate control room. The protection and control facilities shall be housed in clearly designated, custom designed cubicles with tiled mimics and shall be linked to the switchgear by multicore cable.

4.6.4.2 The protection, control and metering cable shall be run in ducts or on cable trays within the confines of the substation.

Note: It is possible that in retrofitting existing substations, no separate control room will be available. This would require mounting of control equipment on the switchgear in the conventional manner.

4.6.5 SCADA interface

4.6.5.1 All SCADA requirements shall adhere to CP_TSSPEC_268 and CP_TSSTAN_087 and relevant City Power SCADA design standards and philosophies

4.6.5.2 Circuit breaker Protection IEDs shall be equipped with a communication port for the purpose of transmitting real time monitoring and control data to a SCADA RTU. The communication port shall comply with the following protocols listed in the above specification.

4.6.5.2 Protection and control requirements will be detailed in the project specification and scope. All protection and control requirements must adhere to CP_TSSPEC_214, CP_TSSTAN_106 and related City Power's protection and control design standard and philosophies.

Facilities shall be available to manually operate the circuit breaker at the switch bay, in the separate control room, where it exists, and via SCADA, with provision to disable remote control by means of an Off Supervisory selection scheme.

4.6.5.3 RTU shall be housed in the separate control room referred to in 4.6.4.1. When the room is provided.

4.6.5.4 At minimum, the following status indications per switch shall be communicated to SCADA: Double indications for open / closed status of circuit breakers (and isolators if fitted). Single indications for off supervisory and off automatic (if fitted).

4.6.5.5 At minimum, the following alarm indications per switch shall be communicated to SCADA: Over-current, earth fault and applicable unit protection operated and trip circuit faulty.

4.6.5.6 At minimum, the following measurement indications per switch shall be communicated to SCADA: Bus-bar voltage (incomers), phase currents, MW and MVar (or power factor).

4.6.5.7 The SCADA RTU shall be housed in the separate control room referred to in 4.6.4.1.

Note: Additional SCADA requirements shall be as specified in the relevant tender document

4.7 Terminals

4.7.1 Suitable terminals shall be provided.

4.7.2 Ferrules shall not be used to join circuit breaker panel wiring.

4.7.3 Spring loaded terminals shall be used for all current transformer wiring.

4.8 Rating Plates

The switchboard rating plate shall comply with section 5.10 of SANS 62271-200.

4.9 Panel Colours

The panel colour coding system provided shall be as per table 1.

Panel Type	**Colour required**
Feeder	Grey (G29)
Incomer & Inter-connector	Signal Red (A11)
Bus-section	Orange (B26)
Pairing inter-connectors	Light Stone (C37)

Table 1: Panel colour coding system

4.10 Labelling

4.10.1 Labels for the purposes of cable designation shall be provided. They shall be white on black sandwich board.

4.10.2 Dimensions of the board shall be 130mm x 40mm. Labels shall be fixed to the front of the switchgear with screws or pop rivets.

4.11 Operating accessories

4.11.1 Any operating handles or ancillary operating equipment required shall be provided with each switchboard.

4.11.2 Phasing devices shall be provided with each switchboard. The device shall work with the relevant VPIS.

5 TESTS

5.1 Type tests

5.1.1 Type tests shall be performed as per SANS 62271-200.

5.1.2 Internal arc tests shall be mandatory as detailed in this specification

5.2 Routine tests

5.2.1 Routine tests shall be performed as per SANS 62271-200.

5.2.2 All current transformers shall be primary tested, magnetization curve tested and partial discharged tested. The partial discharge levels shall not exceed 5pC and test reports shall be provided. The magnetization curve test shall exceed the knee point voltage of the current transformer and test reports shall be provided.

Factory Acceptance Test (FAT)

5.3.1 Factory Acceptance Test (FAT) shall be carried out as per SANS 62271-200, in the presence of City Power Personnel before the switchgear is released from the manufacturer.
5.3.2 And test plan shall be provided four weeks prior to FAT.

5.4 Site Acceptance Test (SAT)

5.5.1 On-site tests after installation shall be carried out as per clause 5 of SANS 62271-200.

6 DOCUMENTATION

6.1 Full technical and descriptive details, relating to all the items offered in this enquiry, shall be submitted so the offer can be fully evaluated.

6.2 The information shall include:

a) Company history;

b) Copy of type test certificate, in English, performed at an independent, certified laboratory;

b) Business address; and

c) Contact person and details.

7 TRAINING

7.1 Certified training courses shall be offered for City Power's personnel to teach the correct operating techniques, installation methods and various applications of the switchgear.

7.2 The associated costs for the certified training courses in 7.1 shall be given per person and shall be fixed for the period of the contract.

7.3 Two circuit breaker units shall be donated for use in the City Power training simulator.

7.4 Details of maintenance training courses, maintenance procedures, task lists, tools and spares shall be provided.

8 QUALITY MANAGEMENT

A quality management plan shall be set up in order to assure the proper quality management of the fixed pattern non withdrawable switchgear during design, development, production, installation and servicing phases. Guidance on the requirements for a quality management plan may be found in the ISO 9001:2015. The details shall be subject to agreement between City Power and the Supplier.

9 ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up in order to assure the proper environmental management of the fixed pattern non withdrawable switchgear 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 ISO 14001:2015 standards. The details shall be subject to agreement between City Power and the Supplier. This is to ensure that the asset created conforms to environmental standards and City Power SHERQ Policy

10 HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management and compliance of the fixed pattern non withdrawable during installation operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan may be found in ISO 45001:2018 standards. This is to ensure that the asset conforms to standard operating procedures and City Power SHERQ Policy. The details shall be subject to agreement between City Power and the Supplier.

Annex A - Bibliography

None

Annex B - Revision information

Nov 2005	0	First issue
September 2018	1	Added new work group
		Change NRS 012 to SANS 876
		Change IEC to SANS
		Created Stock item for switchgear.
March 2020	2	Listed Type test and Routine test
		Added 2500A
November 2022	3	Revised clause 4.4 to include all the cable termination ranges
February	4	Added Technical Schedule of Feeder 2500A and incomer of 1250A for SAP 4871

Annex C - Technical Schedules A and B SAP 4431

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Rated voltage	KV	12	
		Rated Current (Incomers)	A	1250	
		Rated Current(Feeders)	A	800	
		Rated peak insulation level	KV	95	
		Rated r.m.s. short time withstand current for 3 second	KA	20/31,5/40	
		Auxiliary supply voltage?	V dc	110	
		Internal arc withstand current for 0,5 second	KA	20/31,5/40	
		Type of Insulation		XXXXX	
		Internal arc classification		Type A -FLR	
		Switchgear panel information:			
		a) manufacturer		XXXXXXXXX	
		b) country of origin		XXXXXXXXX	
		c) catalogue/type designation		XXXXXXXXX	
		d) total switchgear mass	Kg	XXXXXXXXX	
		Is the switchgear to be joined to an existing switchboard?		see tender	
		Make of existing switchboard (if applicable)		see tender	

Note: Ticks, Cross [√, X], Asterisk [*], 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 and B SAP 4431

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Open/close switches for local electrical operation		Required	
		Circuit-breaker open / closing mechanism		Magnetic Actuator or Mechanical Spring	
		If magnetic actuated input voltage ranges		110V d.c.	
		Minimum number of spare contacts over and above the contacts required for circuitry design:			
		a) circuit-breaker auxiliary 'a'		2	
		b) circuit-breaker auxiliary 'b'		2	
		c) circuit-breaker earthed		2	
		Circuit-breaker details:			
		a) manufacturer		XXXXXXXXX	
		b) country of origin		XXXXXXXXX	
		c) model/type designation		XXXXXXXXX	
		d) total mass (cart included)	Kg	XXXXXXXXX	
		e) rating nameplate position		XXXXXXXXX	

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

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Annex C - Technical Schedules A and B SAP 4431

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Location of MCBs?		XXXXXXXXX	
		Are test blocks required?		Yes	
		If yes, type required		PK2	
		Type of test blocks offered		XXXXXXXXX	
		Details of arc protection equipment offered		XXXXXXXXX	
		Details of protection and control IED offered		XXXXXXXXX	
		a) manufacturer		XXXXXXXXX	
		b) type		XXXXXXXXX	
		c) rating		XXXXXXXXX	
		Details of differential protection relay offered			
		a) manufacturer		XXXXXXXXX	
		b) type		XXXXXXXXX	
		c) rating		XXXXXXXXX	
		Protection IED output contact continuous minimum rating at station DC voltage	A	6	
		Protection IED output contact short time minimum rating at station DC voltage	A/1sec	50	
		Protection IED contact break capacity minimum rating at station DC voltage		0,3mA L/R 40ms	
		IED contact make minimum rating at station DC voltage	A	30	

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Annex C - Technical Schedules A and B SAP 4431

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Circuit designation plates provided		Required	
		State method used to attach circuit designation plates		XXXXXXXXX	
		State method used to attach rating pates		XXXXXXXXX	
		Markings of current and voltage transformers terminals		XXXXXXXXX	
		***** Number of current transformers required for:		XXXXXXXXX	
		a) overcurrent and earth fault protection		XXXXXXXXX	
		b) differential protection		XXXXXXXXX	
		c) metering		XXXXXXXXX	
		***** State the following requirements for each current transformer application:		XXXXXXXXX	
		a) class		XXXXXXXXX	
		b) burden	VA	XXXXXXXXX	
		c) tap ratios		XXXXXXXXX	
		d) tap points		XXXXXXXXX	
		e) knee-point voltage	V	XXXXXXXXX	
		f) secondary resistance	Ω	XXXXXXXXX	

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

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Full name of company: _____

Annex C - Technical Schedules A and B SAP 4431

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

Item	Sub clause of CP_TSSPEC_159	Description	Schedule A	Schedule B
		g) excitation current at knee-point voltage mA	XXXXXXXXX	
		Voltage presence indicating system provided	Required	

Note: Ticks, Cross [√, X], Asterisk [*], 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: _____

Technical Schedules A and B Deviation schedule SAP 4431

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_159**	**Proposed deviation**

Tender Number: _____

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

Full name of company: _____

Annex C - Technical Schedules A and B SAP 4871

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Rated voltage	KV	12	
		Rated Current (Incomers)	A	2500	
		Rated Current(Feeders)	A	1250	
		Rated peak insulation level	KV	95	
		Rated r.m.s. short time withstand current for 3 second	KA	20/31,5/40	
		Auxiliary supply voltage?	V dc	110	
		Internal arc withstand current for 0,5 second	KA	20/31,5/40	
		Type of Insulation		XXXXX	
		Internal arc classification		Type A -FLR	
		Switchgear panel information:			
		a) manufacturer		XXXXXXXXX	
		b) country of origin		XXXXXXXXX	
		c) catalogue/type designation		XXXXXXXXX	
		d) total switchgear mass	Kg	XXXXXXXXX	
		Is the switchgear to be joined to an existing switchboard?		see tender	
		Make of existing switchboard (if applicable)		see tender	

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

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

Full name of company: _____

Annex C - Technical Schedules A and B SAP 4871

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Open/close switches for local electrical operation		Required	
		Circuit-breaker open / closing mechanism		Magnetic Actuator or Mechanical Spring	
		If magnetic actuated input voltage ranges		110V d.c.	
		Minimum number of spare contacts over and above the contacts required for circuitry design:			
		a) circuit-breaker auxiliary 'a'		2	
		b) circuit-breaker auxiliary 'b'		2	
		c) circuit-breaker earthed		2	
		Circuit-breaker details:			
		a) manufacturer		XXXXXXXXX	
		b) country of origin		XXXXXXXXX	
		c) model/type designation		XXXXXXXXX	
		d) total mass (cart included)	Kg	XXXXXXXXX	
		e) rating nameplate position		XXXXXXXXX	

Note: Ticks, Cross [√, X], Asterisk [*], 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 and B SAP 4871

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Location of MCBs?		XXXXXXXXX	
		Are test blocks required?		Yes	
		If yes, type required		PK2	
		Type of test blocks offered		XXXXXXXXX	
		Details of arc protection equipment offered		XXXXXXXXX	
		Details of protection and control IED offered		XXXXXXXXX	
		a) manufacturer		XXXXXXXXX	
		b) type		XXXXXXXXX	
		c) rating		XXXXXXXXX	
		Details of differential protection relay offered			
		a) manufacturer		XXXXXXXXX	
		b) type		XXXXXXXXX	
		c) rating		XXXXXXXXX	
		Protection IED output contact continuous minimum rating at station DC voltage	A	6	
		Protection IED output contact short time minimum rating at station DC voltage	A/1sec	50	
		Protection IED contact break capacity minimum rating at station DC voltage		0,3mA L/R 40ms	
		IED contact make minimum rating at station DC voltage	A	30	

Note: Ticks, Cross [√, X], Asterisk [*], 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 and B SAP 4971

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

Item	Sub clause of CP_TSSPEC_159	Description		Schedule A	Schedule B
		Circuit designation plates provided		Required	
		State method used to attach circuit designation plates		XXXXXXXXX	
		State method used to attach rating pates		XXXXXXXXX	
		Markings of current and voltage transformers terminals		XXXXXXXXX	
		***** Number of current transformers required for:		XXXXXXXXX	
		a) overcurrent and earth fault protection		XXXXXXXXX	
		b) differential protection		XXXXXXXXX	
		c) metering		XXXXXXXXX	
		***** State the following requirements for each current transformer application:		XXXXXXXXX	
		a) class		XXXXXXXXX	
		b) burden	VA	XXXXXXXXX	
		c) tap ratios		XXXXXXXXX	
		d) tap points		XXXXXXXXX	
		e) knee-point voltage	V	XXXXXXXXX	
		f) secondary resistance	Ω	XXXXXXXXX	

Note: Ticks, Cross [√, X], Asterisk [*], 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 and B SAP 4871

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

Item	Sub clause of CP_TSSPEC_159	Description	Schedule A	Schedule B
		g) excitation current at knee-point voltage mA	XXXXXXXXX	
		Voltage presence indicating system provided	Required	

Note: Ticks, Cross [√, X], Asterisk [*], 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: _____

Technical Schedules A and B Deviation schedule SAP 4871

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_159**	**Proposed deviation**

Tender Number: _____

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

Full name of company: _____

Annex D – Stock Items

Material Group: SWG-MV

Item	SAP No.	SAP Short Description	SAP Long Description
1	4431	11 KV 1250A FIXED PATTERN NON WDRBLE INDOOR SWG	11KV 1250A FIXED PATTERN NON WITHRAWABLE INDOOR SUBSTATION SWITCHGEAR. ITEM SPECIFICATION NUMBER CP_TSSPEC_159.
1	4871	11 KV 2500 A FIXED PATTERN NON WDRBLE INDOOR SWG	11KV 2500A FIXED PATTERN NON WITHRAWABLE INDOOR SUBSTATION SWITCHGEAR. ITEM SPECIFICATION NUMBER CP_TSSPEC_159.