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City Power

Johannesburg

TITLE SPECIFICATION FOR LINE TAP

REFERENCE
CP_TSSPEC_244

REV
1

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FOREWORD

This specification was prepared by the following Work Group members:

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INTRODUCTION

This Specification sets out the requirements for line tap connectors for use on overhead electricity distribution systems in a totally exposed environment

1 SCOPE

The line tap connector is primarily used to attach or remove a tap conductor to or from an energised conductor with the aid of a line tool or an insulated clamp type head operating stick.

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 50483-4, fittings and connectors for low-voltage overhead power lines using aerial bundled conductors - part 4 applies to connectors used for the electrical connection of ABC.

3 DEFINITIONS AND ABBREVIATIONS

The definitions and abbreviations in the above documents shall apply to this specification.

4 DESIGN AND CONSTRUCTION

4.1 Main Components

Connector suitably profiled which are able to effectively engage the conductor to provide a durable electrical connection without corrosion or overheating.

A screwed spindle which when rotated by an operating stick to the right hand thread convention either applies the connector or loosens it from the conductor.

An element with spring characteristics which ensures that the jaws apply spring loaded contact to the conductor at all times.

A screw type connector fastening for connecting the tap conductor to the connector body to provide a spring loaded durable electrical connection.

4.2 Conductor Range

The connectors shall be capable of accommodating conductor sizes as follows:

Main Connection – 5mm to 10mm diameter.

Tap Connection – 5mm to 10mm diameter.

4.3 Connector Body

The connector body shall be of materials which are resistant to corrosion and suitable for use with Copper, Aluminium, Steel, or ACSR Mains and Tap Conductors. Protrusions on the spindle housing shall not prevent or hinder the installation or removal of the connector with live line tools or an insulated clamp type head operating stick.

4.4 Connector Spindle

The spindle shall be of material which prevents corrosion between the spindle and the connector body or components and binding of the thread. The operating end of the spindle shall be a ring type dimensioned to withstand an ultimate torque of 34Nm. The spindle shaft diameter shall not be less than 8.5mm and not more than 11mm. The parallel free shank between the ring and the connector body shall be a minimum of 35mm to facilitate the use of suitable operating sticks. A backstop shall be provided to prevent backing off of the spindle beyond the point where the connector jaws are fully opened.

4.5 Spindle Threads

Thread Protection against Corrosion – Spindle threads shall be enclosed in a threaded housing and protected by a wide temperature range, corrosion inhibiting compound.

Thread Protection against Arcing and Burning – The threaded housing shall protect the threads from damage by arcing of power line charging currents as the clamp is applied or removed.

4.6 Mains/Tap Connection

For the tap connector, single eye bolt types only will be acceptable and shall be supplied with nut combined with lock washer so as to provide a positive locking and joint pressure at all times when tightened. The assembly shall be capable of withstanding an ultimate torque of 34Nm. U-bolt type connectors are not acceptable.

4.7 Finish

Castings shall be impervious and free from pores and slag. Burrs and sharp edges shall be removed.

4.8 Marking

Connectors shall be marked with Manufacturer's name or trademark and the conductor cross sectional areas or the conductor diameters of both the main and tap connections for which the connectors are designed.

5 PERFORMANCE AND TESTING

5.1 Type Tests

Type tests shall be conducted as per SANS 50483-4 requirements.

a) Electrical Rating - The connector shall be capable of carrying a minimum current of 100A continuously without damage when installed with a torque of 10Nm on a conductor rated in excess of 100A.

5.1.1 Type test required for Lugs

- a) Mechanical test
- b) Water tightness test
- c) Low temperature assembly test

- d) Environmental
- e) Electrical ageing

5.1.2 Type test required for joint

- a) Mechanical test
- b) Di-electrical voltage test and water tightness test
- c) Low temperature assembly test
- d) Environmental
- e) Electrical ageing
- f) Endurance test

5.2 Factory Acceptance Test (FAT)

5.2.1 Factory acceptance Test (FAT), shall be carried out as per SANS 50483-4, with the presence of City Power Personnel before the Line Tap can be released from the manufacturer. City Power reserves the right to request to approve prototype testing before any ordering can commence

- a) Checking the compliance of the supplied products
- b) Final Inspection and testing
- c) Inspection and test records
- d) Visual verification
- e) Dimensional and material verification
- f) Test for permanent marking
- g) Tensile test at ambient temperature and braking load test
- H) Bolt tightening test

5.3 Routine Test

5.3.1 Routine Test shall be carried out as per SANS 50483-4, with the presence of City Power personnel before the line tap can be released from the manufacturer. City Power reserves the right to request to approve prototype testing before any ordering

- a) Dimensional and material verification
- b) Visual examination
- c) Test for permanent marking
- d) Bolt tightening test

6 TRAINING

Training material in the form of drawings, instructions and/or audio visuals (in CD format) are required to be provided for the items accepted under the tender. The Tenderers shall allow the cost of production and delivery of training material in the tendered prices.

The training materials should include but not be limited to the following topics:

Handling

Storage

Application (particularly in areas of heavy coastal pollution)

Installation

Maintenance

Environmental performance

Electrical performance

Mechanical performance

Disposal

7 QUALITY ASSURANCE

It is the responsibility of the supplier to establish quality assurance of the line tap by quality control procedures which ensure that the product meets the requirements of this standard and the subsidiary sectional specifications and family specifications. It is not intended that a complete testing programme be carried out on every length of fiber. When the customer wishes to specify acceptance tests or other quality procedures, it is essential that an agreement be reached between the supplier and the customer at the time of ordering.

8 ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up in order to assure the proper environmental management of the line tap 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 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.

9 HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management of the line tap and compliance of the queuing system during installation, operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan may be found in OHSAS 18001 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

ANNEXURE A - BIBLIOGRAPHY

None

ANNEXURE B - REVISION INFORMATION

DATE	REV. NO.	NOTES
AUGUST 2017	0	First lissue
SEPTEMBER	1	Normal editing Added

ANNEXURE C - TECHNICAL SCHEDULES A AND B

ITEM 1: LINE TAP – M24, 11.1mm SAP5 5163

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXX	
2		Date of manufacture	XXXXX	
3		Place of manufacture	XXXXX	
4		Manufacturer's identification reference	XXXXX	
5		Line Tap Size	M24,11.1mm	
7		Suitable for use with	Copper, Aluminium, Steel, or ACSR Mains	
8		Resistant to corrosion	Yes/No	
9		Temperature	45°C summer day time -5°C winter night time	
10		Solar Radiation Level	1 000 W/m2 with high ultraviolet content	
13		Technical Catalogue to be provided with tender documentation	Required	
13		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 1: LINE TAP – M24, 11.1mm SAP 5163

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	Clause	Proposed deviation

NOTE: TICKS [✓×], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 2: LINE TAP – M16, 5.5mm SAP 5461

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXXX	
2		Date of manufacture	XXXXXX	
3		Place of manufacture	XXXXXX	
4		Manufacturer's identification reference	XXXXXX	
5		Line Tap Size	M16.5,5mm	
7		Suitable for use with	Copper, Aluminium, Steel, or ACSR Mains	
8		Resistant to corrosion	Yes/No	
9		Temperature	45°C summer day time -5°C winter night time	
10		Solar Radiation Level	1 000 W/m2 with high ultraviolet content	
13		Technical Catalogue to be provided with tender documentation	Required	
13		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓×], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 2: LINE TAP – M16, 5.5mm SAP 5461

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	Clause	Proposed deviation

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 3: LINE TAP – M6.5mm SAP 5462

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXX	
2		Date of manufacture	XXXXX	
3		Place of manufacture	XXXXX	
4		Manufacturer's identification reference	XXXXX	
5		Line Tap Size	M6.5mm	
7		Suitable for use with	Copper, Aluminium, Steel, or ACSR Mains	
8		Resistant to corrosion	Yes/No	
9		Temperature	45°C summer day time -5°C winter night time	
10		Solar Radiation Level	1 000 W/m2 with high ultraviolet content	
13		Technical Catalogue to be provided with tender documentation	Required	
13		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 3: LINE TAP – M6.5mm SAP 5462

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	Clause	Proposed deviation

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 4: LINE TAP – M18.8mm SAP 3463

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXXX	
2		Date of manufacture	XXXXXX	
3		Place of manufacture	XXXXXX	
4		Manufacturer's identification reference	XXXXXX	
5		Line Tap Size	M18.8mm	
7		Suitable for use with	Copper, Aluminium, Steel, or ACSR Mains	
8		Resistant to corrosion	Yes/No	
9		Temperature	45°C summer day time -5°C winter night time	
10		Solar Radiation Level	1 000 W/m2 with high ultraviolet content	
13		Technical Catalogue to be provided with tender documentation	Required	
13		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 4: LINE TAP – M18.8mm SAP 3463

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	Clause	Proposed deviation

NOTE: TICKS [✓×], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 5: LINE TAP – M20, 10.5mm SAP 3464

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXXX	
2		Date of manufacture	XXXXXX	
3		Place of manufacture	XXXXXX	
4		Manufacturer's identification reference	XXXXXX	
5		Line Tap Size	M20,10.5mm	
7		Suitable for use with	Copper, Aluminium, Steel, or ACSR Mains	
8		Resistant to corrosion	Yes/No	
9		Temperature	45°C summer day time -5°C winter night time	
10		Solar Radiation Level	1 000 W/m2 with high ultraviolet content	
13		Technical Catalogue to be provided with tender documentation	Required	
13		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 5: LINE TAP – M20, 10.5mm SAP 3464

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	Clause	Proposed deviation

NOTE: TICKS [✓×], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 6: LINE TAP – M27.14mm SAP 5781

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXXX	
2		Date of manufacture	XXXXXX	
3		Place of manufacture	XXXXXX	
4		Manufacturer's identification reference	XXXXXX	
5		Line Tap Size	M27,14mm	
7		Suitable for use with	Copper, Aluminium, Steel, or ACSR Mains	
8		Resistant to corrosion	Yes/No	
9		Temperature	45°C summer day time -5°C winter night time	
10		Solar Radiation Level	1 000 W/m2 with high ultraviolet content	
13		Technical Catalogue to be provided with tender documentation	Required	
13		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓×], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 6: LINE TAP – M27.14mm SAP 5781

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	Clause	Proposed deviation

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 7: Plate, Blank, 100x50mm, Metal, White SAP 5194

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXXX	
2		Date of manufacture	XXXXXX	
3		Place of manufacture	XXXXXX	
4		Manufacturer's identification reference	XXXXXX	
5		Plate Blank Metal	100mm x 50mm	
6		Temperature	45°C summer day time -5°C winter night time	
7		Solar Radiation Level	1 000 W/m2 with high ultraviolet content	
8		Technical Catalogue to be provided with tender documentation	Required	
9		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 7: Plate, Blank, 100x50mm, Metal, White SAP 5194

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	Clause	Proposed deviation

NOTE: TICKS [✓*], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 8: Clamp: Dead End, ST, for use with ACSR Hare SAP 6362

Schedule A: Purchaser's specific requirements

Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC-244_	Description	Schedule A	Schedule B
1		Name of manufacture	XXXXXX	
2		Date of manufacture	XXXXXX	
3		Place of manufacture	XXXXXX	
4		Manufacturer's identification reference	XXXXXX	
5		Dead End	XXXXXX	
7		Suitable for use with	Copper, Aluminium, Steel, or ACSR Mains	
8		Resistant to corrosion	Yes/No	
9		Temperature	45°C summer day time -5°C winter night time	
10		Technical Catalogue to be provided with tender documentation	Required	
11		Certified copy of type test to be provided with tender	Required	

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

TECHNICAL SCHEDULES A AND B

ITEM 8: Clamp: Dead End, ST, for use with ACSR Hare SAP 6362

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	Clause	Proposed deviation

NOTE: TICKS [✓x], ASTERISK [*], WORD [NOTED], OR TBA [TO BE ADVISED] SHALL NOT BE ACCEPTED.

Tender Number: _____

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

Full name of company: _____

ANNEXURE D – STOCK ITEMS

Material Group: NET-OH

Item	SAP No.	SAP Short Description	SAP Long Description
1	5163	Line Tap: M24,11mm	Line Tap Connectors: M24,11mm
2	5461	Line Tap: M16.5mm,5mm	Line Tap Connectors: M16.5mm,5mm
3	5462	Line Tap: M6.5mm	Line Tap Connectors: M6.5mm
4	3463	Line Tap: M18,8mm	Line Tap Connectors: M18,8mm
5	3464	Line Tap:M20,10.5mm	Line Tap Connectors:M20,10.5mm
6	5781	Line Tap:M27,14mm	Line Tap Connectors:M27,14mm
7	5194	Plate,Blank,100x50mm,Metal,White	Plate, Blank, 100x50mm, Metal, White. Item specification cp_tsspec_244
8	6362	Clamp: Dead End,ST,for use with ACSR Hare	Clamp: Dead End, ST, for use with ACSR Hare. Item specification cp_tsspec_244

