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City Power
Johannesburg

		REFERENCE		REV
TITLE	**SPECIFICATION FOR CONCENTRIC SERVICE CABLE WITH COMMUNICATION CORES TINNED COPPER AND COATED STEEL**	**CP_TSSPEC_271**		**1**
		DATE:		**OCTOBER 2021**
		PAGE:	**1** OF	**15**

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INTRODUCTION

This specification covers requirements for the tinned copper and coated steel concentric type of service cable to connect customers to the low voltage reticulation system and to enable the purchaser to acquire the cable without the need for detailed and extensive contract documents.

The "more safe" cable (6mm2) shall meet SANS 1507-6 requirements and "additional" requirements as per City Power specification.

The following document contain provisions that, through reference in the text, constitute requirements of this specification. At the time of publication, the editions indicated concentric cable with communication cores for split metering. The design shall address issues of contact between wires and fusing of individual strands .The mechanical strength of the cable is addressed by steel galvanised steel wires as gap filters. Tinning of copper is required to ensure corrosion compatibility and improve the electrical contact resistance between steel and copper.

Tinning and mixed metals might reduce theft by:

- Mimicking an Al cable
- Contaminate metallurgical meltdown of stolen cable

1 SCOPE

This specification specifies City Power's requirements for the manufacture and supply of 6mm2 (more safe) concentric service cable for nominal system a.c. voltages up to and including 0.6/1kV. It is intended for use in overhead, single-phase connections to a customer's installation, but it may also be installed underground. There are two communication cores included in the design

2 NORMATIVE REFERENCES

For the purpose of this specification, FOR City Power the references given in SANS 1507-6 will apply.

ISO 9001, Quality Management Systems.

SANS 1507-1, Electric cables with extruded solid dielectric insulation for fixed installations (300/500V to 1900/3 300V) Part 1: General

SANS 1507-6, Electric cables with extruded solid dielectric insulation for fixed installations (300/500V to 1 900/3 300V) Part 6: Service cables

SANS 1411-1, Materials of insulated electric cables and flexible cords Part 1; Conductors

SANS 1411-4, Materials of insulated electric cables and flexible cords Part 4: Cross-linked polyethylene (XLPE)

SANS 1411-6, Materials of insulated electric cables and flexible cords Part 6: Armour

SANS 1411-7, Materials of insulated electric cables and flexible cords Part 7: Polyethylene (PE)

IEC 50:1984, International Electrotechnical Vocabulary (IEV)Chapter 461: Electric cables

Current rating	can carry continuously under the specified conditions of use and behaviour
Insulation	Insulating materials incorporated in a cable with the specific function of withstanding voltage
Stranded conductor	A conductor consisting of a number of individual wires, all or some of which generally have a helical form
UV stabilized	Modified by methods to withstand ultraviolet radiation

4.1.2. General Abbreviations

Abbreviation	Description
GSW	Galvanised steel wire
AL	Aluminium
N/E	Neutral/Earth
TCU	Tin cooled copper wire
XLPE	Cross-linked polyethylene
PE	Polyethylene

5 REQUIREMENTS

5.1 General

The cable shall comply with this specification and SANS 1507-6 and "additional" City Power requirements.

a) The GSW strands shall comply with this specification and SANS 1411-6.

b) The TCU strands shall comply with this specification and SANS 1411-1

5.2 Construction Requirements

5.2.1 Conductor

a) The central conductor of the cable referred as the phase or live conductor see figure 1 for a typical construction shall consist of 6 circular tin coated hard drawn copper strands and 1 galvanised steel wire.

b) The phase and neutral conductor nominal copper equivalent cross-sectional (including the GSW) area shall be 6 mm² in each case. Compliance is determined by the maximum DC resistance as per Annexure C.

c) The central insulated core shall be surrounded by:

* An arrangement of alternating GSW and annealed TCU wires and

* One blue and one white PE insulated stranded copper communication cores placed next to each other and shall comply with SANS 1507.

d) Neutral/earth strands or GSW and TCU wires shall be in electrical contact over the length of the cable and that compliance is determined by continuity testing between two bare N/E wires on either side of the two communication cores over a specified length (typically 3m) of cable.

6.1.1 Finished cable tests

a) Bending radius test
b) Test for adherence of the covering sheath

Carefully bend the sample around a mandrel of diameter equal to eight times the diameter of the cable to make a 180° turn and check for compliance with SANS 1507-.6

6.2 Routine tests

The Routine tests shall be performed on each completed cable drum and complied with SANS 1507-6.

6.2.1 Finished cable tests

a) Marking test
b) Conductor resistance
c) Voltage withstand test

6.2.2 Insulation tests

a) Spark test
b) Core identification

6.3 Sample tests

The Sample tests below shall comply with SANS 1507-6 and SANS 1411-6

NOTE: It is intended that the sample tests be conducted at the manufacturer's works on a regular basis.

6.3.1 Conductor test

a) Construction test
b) Elongation at break test

6.3.2 Insulation tests

a) Physical properties test
b) Thickness test
c) Core identification test

6.3.3 Sheet test

a) Physical properties
b) Thickness

6.3.4 Finished cable test

a) Dielectric resistance test

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 during manufacture, installation, removal, transportation and disposal of Concentric Service Cable with Communication Cores Tinned Copper and Coated Steel. Guidance on the requirements of a health and safety plan shall be found in OHSAS 18001:2007/ ISO 45001:2018 standards. The details shall be subject to agreement between City Power and the Supplier.

ANNEXURE B-REVISION INFORMATION

DATE	REV. NO.	NOTES
OCTOBER 2018	0	First Issue
OCTOBER 2021	1	Alignment of Annexure D with the SAP Master General Editing

		- underground at 25□C A	Required	
11	3.5	Dielectric resistance at 20□C M□.km	Required	
12		Sequential marking on cable and length marking shown on drum label	Yes / No	
	4	Did the cable pass the adherence of sheath to concentric layer test	Required	
13	5	Method of indication on cable	Required	
14		Does the cable comply fully with this specification, If not, state exceptions	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: _____

ANNEXURE D – STOCK ITEMS

Material Group: COND-ABC

Item	SAP No.	SAP Short Description	SAP Long Description
1	4171	CAB LV 6MM², CSC CU	CABLE, LV, 6MM², CONCENTRIC SERVICE CABLE WITH COMMUNICATION CORES TINNED COPPER AND COATED STEEL ITEM SPECIFICATION NO. CP_TSSPEC_271