



a world class African city



TITLE:	<b>SPECIFICATION FOR CONDUCTOR WIRE – CABTYRE</b>	REFERENCE <b>CP_TSSPEC_252</b>	REV <b>0</b>
		DATE:	<b>APRIL 2022</b>
		PAGE:	<b>1 OF 38</b>


## TABLE OF CONTENTS

	Page
FOREWORD.....	2
INTRODUCTION .....	3
1. SCOPE .....	3
2. NORMATIVE REFERENCES.....	3
3. DEFINITIONS AND ABBREVIATIONS .....	3
4. REQUIREMENTS.....	4
5. INSPECTION AND METHODS OF TEST .....	8
6. QUALITY ASSURANCE .....	17
7. ENVIRONMENTAL MANAGEMENT .....	17
8. HEALTH AND SAFETY .....	17
ANNEXURE A – BIBLIOGRAPHY .....	18
ANNEXURE B - REVISION INFORMATION .....	19
ANNEXURE D – STOCK ITEMS.....	38

---

## **FOREWORD**

This standard was prepared by the following Work Group members:

T Moyaha	Primary Plant (Research and Development)
Z Ngqwala	Primary Plant (Research and Development)

The Emergency study committee was appointed by the Technology Services, which, at the time of approval, comprised of the following members:

Nolubabalo Makana	Metering (Retail Services)
Arsenio Cossa	Metering (Retail Services)
Masape Mokgadi Kahumba	Secondary Plant (Metering)
Katlego Mogale	Maintenance (Engineering Operations)
Gavin Jardine David	Planning
Makoni Hilda	Primary Plant (Network Operation)
Nonkonyana	Planning
Anza Mudau	Planning
Noel Maso	Field Services
Sipho Gamede	MAOS (Engineering Operations)
Thabiso Letsaoana	Logistics & Warehouse
Mpho Molope	Logistics & Warehouse
Mokgadi Magemba	Primary Plant (Research and Development)
Itumeleng Gamede	Renewables (Research and Development)
Paul Vermeulen	Renewables (Research and Development)
Mike Radebe	Renewables (Research and Development)
Silvester Raseboka	Secondary Plant (Research and Development)
Vijay Rampersad	Primary Plant (Research and Development)

Recommendations for corrections, additions or deletions should be addressed to the:

Research and Asset Development Department  
General Manager  
City Power Johannesburg (SOC) Ltd  
P O Kiosk 38766  
Booyens  
2016

---

## INTRODUCTION

Cabtyre Cable is high conductivity bunched plain flexible copper conductors to SANS1411 Part 1. Insulated and colour coded with general purpose flexible grade PVC to SANS1411 Part 2. Cores are twisted together and sheathed with a flexible grade PVC.

### 1. SCOPE

This specification covers City Power's requirements for Cabtyre Cable covers solid, stranded and flexible circular conductors, and solid and stranded shaped conductors of the sizes included in various specifications for insulated electric cables and flexible cords published by Standards South Africa. Reactive load not exceeding 1 800 VA at 230 V and 50 Hz in accordance with SANS1411-1.

### 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 1411-1: 2008: *Materials of insulated electric cables and flexible cords - Part 1: Conductors*

SANS 1411-2:2014: *Materials of insulated electric cables and flexible cords - Part 2: Polyvinyl chloride (PVC)*

ASTM B355: 2011: *Standard Specification for Nickel-Coated Soft or Annealed Copper Wire*

SANS 6282-1:2007: *Test methods for bare conductors and conductors of insulated electric cables Part 1: Conductor resistance*

SANS 6282-2:2007: *Test methods for bare conductors and conductors of insulated electric cables Part 2: Quality of metallic coatings*

SANS 6282-3:2007: *Test methods for bare conductors and conductors of insulated electric cables Part 3: Mechanical tests*

### 3. DEFINITIONS AND ABBREVIATIONS

The following definitions and abbreviations shall apply to this specification:

#### 3.1 Acceptable

Acceptable to the authorities administering this standard, or to the parties concluding the purchase contract, as relevant

#### 3.2 Bunched conductor

Flexible conductor in which the wires are assembled in helical formation, all in the same direction and with the same length of lay

#### 3.3 Compacted conductor

Stranded conductor, the overall diameter of which has been reduced by mechanical means

### **3.4 Flexible conductor**

Uncompacted stranded conductor, made up of fine wires to increase its flexibility for use in non-fixed wiring applications

### **3.5 Metal coated**

Description of wire that is covered with a thin layer of another metal or metal alloy to improve its solder ability or its resistance to oxidation, particularly in high temperature applications

### **3.6 Milliken conductor**

Conductor made up of three or more compacted stranded segments, lightly insulated from each other to reduce the a.c. resistance of the conductor

### **3.7 Plain conductor**

Conductor made up of wires that are not metal coated

### **3.8 Rope-stranded**

Conductor flexible conductor, that comprises a number of groups of wires, assembled in one or more helical layers, the wires in each group being either bunched or stranded

### **3.9 Sectoral conductor**

Circular conductor made up of four helically assembled solid aluminium segments

### **3.10 Shaped conductor**

Conductor of non-circular cross-section

### **3.11 Sector shaped**

Shaped conductor, the cross-section of which approximates to a sector of a circle

## **4. REQUIREMENTS**

### **4.1 Classification**

A conductor shall be of one of the following classes:

- a) Class 1 A solid conductor intended for use in cables for fixed installations.
- b) Class 2 A stranded or compacted conductor, for use in cables for fixed installations.
- c) Class 5 A conductor intended for use in flexible cables or cords.
- d) Class 6 A conductor intended for use in flexible cables or cords, having greater flexibility than that of a class 5 conductor.

## **4.2 General**

Conductors shall be made from one of the following materials:

- a) Plain or metal-coated annealed copper.
- b) Plain or metal-coated hard-drawn copper; or
- c) Plain aluminum

### **4.2.1 Copper**

Copper for conductors shall be in the form of plain annealed or plain hard-drawn wire. The wire shall be un-oxidized, smooth, uniform in quality and free from scale, spills, splits and other defects.

### **4.2.2 Aluminum**

Aluminum for stranded conductors shall be in the form of plain hard,  $\frac{3}{4}$  hard, or  $\frac{1}{2}$  hard (H,  $\frac{3}{4}$  H, or  $\frac{1}{2}$  H) wire. The wire shall be smooth, uniform in quality and free from scale, spills, splits and other defects. Aluminum for solid conductors shall, in the finished cable, be in a temper condition corresponding to a maximum tensile strength of 80 MPa.

## **4.3 Constructional requirements**

### **4.3.1 General**

Conductors shall be clean and uniform in size and shape, with the surface free from sharp protruding edges. There shall be no protruding broken wires.

### **4.3.2 Joints**

**4.3.2.1** A stranded conductor shall be free from broken wires.

**4.3.2.2** Any joint in a conductor or wire shall be made to an acceptable standard of workmanship, and shall be such that it will not materially increase the dimensions of the individual wire, individual bunch or the finished conductor, or impair the inherent flexibility of the conductor.

**4.3.2.3** A joint involving all the wires in a stranded class 2 conductor shall be made to an acceptable standard of workmanship, by separately joining each individual wire, with the individual joints acceptably staggered.

**4.3.2.4** Subject to the requirements given in 4.3.2.2 above, class 2 conductors of sizes up to and including 16 mm<sup>2</sup>, to be used in multicore cables with outer protection, may be butt-jointed by an acceptable method.

**4.3.2.5** There shall be no butt-joints in class 2 conductors for single-core cables.

**4.3.2.6** There shall be no joints in hard-drawn class 1 copper conductors.

-----

**4.3.2.7** Joints may be made to the wires within an individual bunch of a rope-stranded class 5 or class 6 conductor, by grouping together up to seven wires at any one point. Such joints shall be acceptably staggered.

**4.3.2.8** There shall be not more than one joint involving all the wires or bunches of the conductor in any 100 m length of conductor.

#### **4.3.3 Conductors for cables to be used in fixed installations**

##### **4.3.3.1 Solid conductors (class 1)**

4.3.3.1.1 A solid copper conductor shall be of circular cross-section.

4.3.3.1.2 A solid aluminum conductor of size 25 mm<sup>2</sup> to 300 mm<sup>2</sup> (inclusive) shall be of circular cross-

4.3.3.1.3 Section for a single-core cable and may be either circular or shaped for a multicore cable.

A sectoral conductor of size 280 mm<sup>2</sup> to 1 200 mm<sup>2</sup> (inclusive) for single-core cables, shall be of circular cross-section, and shall consist of four solid sectors, each of the shape appropriate for a four-core cable, helically laid up and acceptably bound.

##### **4.3.3.2 Non-compacted stranded circular conductors (class 2)**

A non-compacted stranded aluminum conductor shall be of minimum size 16 mm<sup>2</sup>.

The wires in each non-compacted stranded conductor shall all be of the same nominal size.

The number of wires in a non-compacted stranded conductor shall not be less than the appropriate minimum number given in table 2. No minimum number is quoted for conductors in the range 1 200 mm<sup>2</sup> to 2 000 mm<sup>2</sup>.

##### **4.3.3.3 Compacted circular and shaped conductors (class 2)**

Compacted circular or shaped conductors shall comprise plain or metal-coated annealed copper wires or plain aluminum wires.

A compacted circular aluminum conductor shall be of minimum size 16 mm<sup>2</sup>. A compacted shaped aluminum conductor shall be of minimum size 25 mm<sup>2</sup>.

The number of wires in a compacted stranded conductor shall not be less than the appropriate minimum number given in table 2. No minimum number is quoted for conductors in the range 1200 mm<sup>2</sup> to 2 000 mm<sup>2</sup>.

A circular conductor larger than 630 mm<sup>2</sup> may be of Milliken construction.

##### **4.3.3.4 Flexible conductors (class 5 and class 6)**

A flexible conductor shall be of plain or metal-coated annealed copper. The wires in a flexible conductor shall all be of the same nominal size.

The diameter of the wires in a flexible conductor shall not exceed the appropriate maximum diameter given in column 2 of table 3 for class 5 conductors or in column 2 of table 4 for class 6 conductors.

#### **4.4 Electrical requirements**

The D.C resistance of a conductor in a finished cable, measured in accordance with 5.3 and related to a reference temperature of 20 °C by means of the appropriate correction factor given in table 5, shall not exceed the appropriate value specified for the conductor in tables 1 to 4.

#### **4.5 Physical requirements**

##### **4.5.1 Ductility of annealed copper wires**

The elongation at break, determined in accordance with 5.4.1, of a solid annealed copper conductor shall not be less than the appropriate minimum value given in table 7.

##### **4.5.2 Ductility of aluminum wires and hard-drawn copper wires**

A solid circular aluminum or hard-drawn copper conductor, or an aluminum or hard-drawn copper wire, taken from a class 2 non-compacted stranded conductor, shall withstand, without breaking, the lapping test given in 5.4.2.

##### **4.5.3 Tensile strength of aluminum, aluminum alloy and hard-drawn copper wires**

The tensile strength of a solid circular aluminum or hard-drawn copper conductor, or of an aluminum or a hard-drawn copper wire taken from a class 2 non-compacted stranded conductor, determined in accordance with 5.4.3, shall not be less than the appropriate minimum value given in table 8.

#### **4.6 Requirements for coatings**

##### **4.6.1 Quality of tin coating (copper wires)**

When tin-coated copper wires are tested in accordance with 5.5.1, the mass of copper dissolved shall not exceed the appropriate value given in table 6.

##### **4.6.2 Quality of silver coating (copper wires)**

When silver-coated copper wires are tested in accordance with

- a) 5.5.2.1, the specimens shall show no signs of exposed copper, and
- b) 5.5.2.2, the mass of the silver coating shall be at least 2, 5 % of the total mass of the wire.

---

#### **4.6.3 Quality of nickel coating (copper wires)**

When nickel-coated copper wires are tested in accordance with:

- a) 5.5.3.1, the specimens shall show no signs of exposed copper,
- b) 5.5.3.2, the specimens shall show no signs of cracking or flaking of the coating, and
- c) 5.5.3.3, the mass of the nickel coating shall be at least 4 % of the total mass of the wire.

### **5. INSPECTION AND METHODS OF TEST**

#### **5.1 Inspection**

Inspect the conductors in the finished cable for compliance with all the relevant requirements of this part of SANS 1411 for which tests to assess compliance are not given in 5.2 to 5.5 inclusive.

**NOTE:** *Compliance with this part of SANS 1411 can be assessed only on specimens removed from a finished cable or cord.*

#### **5.2 Dimensions**

From a sample of flexible conductors, take at random 10 % of the wires, or five wires, whichever is the greater, and determine the maximum diameter of the wire, using a vernier micrometer graduated in 0,002 mm intervals.

#### **5.3 Conductor resistance**

Use SANS 6282-1, and adjust the measured value to the reference temperature of 20 °C by means of the appropriate correction factor given in table 5.

#### **5.4 Physical properties**

##### **5.4.1 Ductility (annealed copper wires)**

Use SANS 6282-3.

##### **5.4.2 Lapping test (aluminum and hard-drawn copper wires)**

Use SANS 6282-3.

##### **5.4.3 Tensile properties (aluminum, aluminum alloy and hard-drawn copper wires)**

Use SANS 6282-3.

#### **5.5 Tests on Coatings**

##### **5.5.1 Quality of tin coating on copper wires**

Use SANS 6282-2.



## 5.5.2 Quality of silver coating on copper wires

### 5.5.2.1 Continuity of coating

Use SANS 6282-2.

### 5.5.2.2 Mass of coating

Use one of the methods given in the appendix to ASTM B 298.

## 5.5.3 Quality of nickel coating on copper wires

### 5.5.3.1 Continuity of coating

Use SANS 6282-2.

### 5.5.3.2 Adherence of coating

Use SANS 6282-2

### 5.5.3.3 Mass of coating

Use one of the methods given in the appendix to ASTM B 355.

**Table 1 — Class 1 solid conductors in single-core and multicore cables**

1	2	3	4
Conductor size mm <sup>2</sup>	Maximum resistance of conductor at 20 °C Ω/ km		
	Circular annealed copper conductor		Aluminum conductor, circular or shaped
	Plain	Metal-coated	
0.5	36,0	36,7	—
0.75	24,5	24,8	—
1	18,1	18,2	—
	12,1 7,41 4,61	12,2 7,56 4,70	— — —

**Table 2 — Class 2 stranded conductors in single-core and multicore cables**

1	2	3	4	5	6	7	8	9	10
Conductor size mm²	Minimum number of wires in conductor						Maximum resistance of conductor at 20 °C Ω/km		
	Circular conductor (non- compacted)	Circular conductor (compacted)		Shaped conductor		Annealed copper conductor		Aluminum conductor	
		Cu	Al	Cu	Al	Plain wires	Metal coated wires		
0,5	7	—	6	—	—	—	36,0	36,7	—
0,75	7	—	6	—	—	—	24,5	24,8	—
1	7	—	6	—	—	—	18,1	18,2	—
1,5	7	—	6	—	—	—	12,1	12,2	—
2,5	7	—	6	—	—	—	7,41	7,56	—
4	7	—	6	—	—	—	4,61	4,70	—

**Table 3 — Class 5 flexible copper conductors in single-core and multicore cables and flexible cords**

1	2	3	4
Conductor Size  mm <sup>2</sup>	Maximum diameter of wires in conductor  mm	Maximum resistance of conductor at 20 °C Ω/km	
		Plain wires	Metal-coated wires
0,22 0,33 0,5	0,21 0,21 0,21	92,0 61,0 39,0	92,4 61,7 40,1

**Table 4 — Class 6 flexible copper conductors in single-core and multicore cables and flexible cords**

1	2	3	4
Conductor Size  mm <sup>2</sup>	Maximum diameter of wires in conductor  mm	Maximum resistance of conductor at 20 °C Ω/km	
		Plain wires	Metal-coated wires
0,22 0,33 0,5	0,16 0,16 0,16	92,0 61,0 39,0	92,4 61,7 40,1
0,75 1 1,5	0,16 0,16 0,16	26,0 19,5 13,3	26,7 20,0 13,7

**Table 5 — Temperature correction factors**

1	2
Temperature <i>t</i> of conductor at time of measurement  °C	Correction factor <i>kt</i> (all conductors)
5	1,064
6	1,059
7	1,055
8	1,050
9	1,046
10	1,042
11	1,037
12	1,033
13	1,029
14	1,025
15	1,020
16	1,016
17	1,012
18	1,008
19	1,004
20	1,000
21	0,996
22	0,992
23	0,988
24	0,984
25	0,980
26	0,977
27	0,973
28	0,969
29	0,965
30	0,962

**NOTE:** The values of the correction factor *kt* are based on a resistance-temperature coefficient of 0,004/°C at 20 °C.

*The values of the temperature correction factors are approximate, but give practical values well within the accuracies that can normally be achieved in the measurements of conductor temperature and length of cables or flexible cords.*

*For more accurate values of the temperature correction factors for copper and aluminum, reference should be made to annex A. The more accurate values that are obtainable by use of the formulae given in annex A are, however, not required for the purpose of assessing compliance with the requirements for conductor resistance given in this part of SANS 1411.*

**Table 6 - Permissible mass of copper dissolved in the persulfate test**

1	2	3
Diameter of wire		Maximum mass of copper dissolved  g/m <sup>2</sup>
Above  mm	Up to and including  mm	
0,149 0,510	0,510 3,200	5 3

**Table 7 - Elongation at break of annealed copper wires**

1	2	3
Diameter of wire		Minimum elongation  %
Above  mm	Up to and including  mm	
- 0,14 0,21 0,51 1,36	0,14 0,21 0,51 1,36 -	6 9 13 18 23

**Table 8 – Tensile strength of conductor wires**

1	2	3
Conductor material		Minimum tensile strength  MPa
Hard-drawn copper of Diameter		
Above  mm	Up to and including  mm	
- 1,25 2,00 3,15	1,25 2,00 3,15  -	
		370 360 350 340
Aluminum		100
Aluminum alloy		295

**Note: Annexure A** (Informative)

***Exact formulae for temperature correction factors***

**A.1 Annealed copper conductors, plain or metal coated**

$$k_t = 254,5 / (234,5 + t) = 1 / [1 + 0,003\ 93 (t - 20)]$$

]

**A.2 Aluminum conductors**

$$k_t = 248 / (228 + t) = 1 / [1 + 0,004\ 03 (t - 20)]$$

**A.3 Hard-drawn copper conductors, plain or metal coated**

$$k_t = 262,5 / (242,5 + t) = 1 / [1 + 0,003\ 81 (t - 20)]$$

where:

$k_t$  is the temperature correction factor for conductor resistance;

$t$  is the temperature of the conductor, in degrees Celsius, at the time of measure m

**Note: Annexure B** (Informative)

Guide to the dimensional limits of conductors

*The following tables are included as a guide to the likely maximum diameters of solid circular, compacted stranded circular, uncompacted stranded circular and flexible conductors.*

*Tables of dimensions for solid aluminum shaped 2-core, 3-core and 4-core conductors are also given.*

*Table B.1 Maximum diameters of solid circular class 1 conductors, compacted and uncompacted stranded circular class 2 conductors and flexible circular conductors of class 5 and class 6*

*Table B.2 Dimensions of solid aluminum 2-core conductors Table B.3 Dimensions of solid aluminum 3-core conductors Table B.4 Dimensions of solid aluminum 4-core conductors*

*Table B.1 is based on dimensions provided by members of the Association of Electric Cable Manufacturers of South Africa.*

*Tables B.2, B.3 and B.4 are based on dimensions given in BS 3988.*

**Table B.1 — Maximum diameters of circular conductors**

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Conductor size</b>  mm <sup>2</sup>	<b>Solid circular class 1</b>  Mm	<b>Compacted stranded circular class 2</b>  mm	<b>Uncompacted stranded circular class 2</b>  mm	<b>Flexible circular class 5 or 6</b>  mm
1,5 2,5 4	1,35 1,75 2,20	- - -	1,60 2,05 2,50	1,6 5 2,1 0 2,0

**Table B.2 — Dimensions of solid aluminum 2-core conductors**

1	2	3	4	5	6	7
Conductor size  mm <sup>2</sup>	Depth ( <i>D</i> )		Width ( <i>W</i> )		Nominal radii	
	Minim um	Maxi mum	Minimu m	Maximu m	Back ( <i>R</i> )	Corne r ( <i>r</i> )
	mm	mm	mm	mm	mm	mm
25	3,56	3,74	8,36	8,66	4,50	0,50
35	4,20	4,44	9,74	10,12	5,20	0,52
50	4,95	5,21	11,24	11,66	5,96	0,59
70	6,03	6,31	13,40	13,88	7,05	0,70
95	7,16	7,47	15,68	16,21	8,20	0,82
120	8,10	8,44	17,55	18,13	9,16	0,91
150	8,95	9,31	19,57	20,20	10,22	1,02
185	10,08	10,47	21,83	25,51	11,37	1,13
240	11,59	12,02	25,00	25,77	13,00	1,30
300	13,04	13,50	27,88	28,72	14,47	1,44

**Table B.3 – Dimensions of solid aluminum 3-core conductors**

1	2	3	4	5	6	7
Conductor Size  mm <sup>2</sup>	Depth ( <i>D</i> )		Width ( <i>W</i> )		Normal radii	
	Minimu m	Maximum	Minimum	Maximum	Back ( <i>R</i> )	Corner ( <i>r</i> )
	mm	mm	mm	mm	mm	mm
25	4,51	4,71	8,02	8,30	5,67	0,56
35	5,29	5,56	9,39	9,76	6,53	0,65
50	6,19	6,48	10,90	11,31	7,47	0,74
70	7,49	7,82	13,09	13,55	8,81	0,88
95	8,87	9,23	15,39	15,92	10,24	1,02
120	10,02	10,40	17,29	17,87	11,41	1,14
150	11,10	11,51	19,22	19,84	12,76	1,27
185	12,46	12,91	21,51	22,19	14,17	1,41
240	14,31	14,81	24,66	25,42	16,20	1,62
300	16,06	16,60	27,59	28,42	18,01	1,80



**Table B.4 – Dimensions of solid aluminum 4-core conductors**

1	2	3	4	5	6	7
Conductor Size  mm <sup>2</sup>	Depth (D)		Width (W)		Normal radii	
	Minimum	Maximum	Minimum	Maximum	Back (R)	Corner (r)
	mm	mm	mm	mm	mm	mm
25	5,12	5,33	7,26	7,52	6,71	0,67
35	6,02	6,30	8,52	8,87	7,71	0,77
50	7,04	7,35	9,93	10,31	8,79	0,87
70	8,51	8,86	11,95	12,38	10,35	1,03
95	10,06	10,45	14,08	14,57	12,00	1,20
120	11,35	11,77	15,85	16,38	13,36	1,33
150	12,58	13,03	17,59	18,17	14,96	1,49
185	14,11	14,60	19,71	20,34	16,59	1,65
240	16,21	16,76	22,60	23,31	18,96	1,89
300	18,18	18,78	25,31	26,09	21,06	2,10

## 6. QUALITY ASSURANCE

A quality management plan shall be set up in order to assure the proper quality management of the conductor wire cabtyre 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.

## 7. ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up in order to ensure proper management and compliance of the conductor wire cabtyre during installation operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan may be found in ISO 14001:2007 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.

## 8. HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management of conductor wire cabtyre 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 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.

TITLE: **SPECIFICATION FOR CONDUCTOR  
WIRE –CABTYRE**

REFERENCE	REV
<b>CP_TSSPEC_252</b>	<b>0</b>
PAGE	<b>18</b> OF <b>38</b>

**ANNEXURE A – BIBLIOGRAPHY**

None

TITLE: **SPECIFICATION FOR CONDUCTOR  
WIRE –CABTYRE**

REFERENCE                      REV  
**CP\_TSSPEC\_252                      0**  
PAGE                      **19**    OF    **38**

**ANNEXURE B - REVISION INFORMATION**

DATE	REV. NO.	NOTES
April 2022	0	First Issue

**ANNEXURE C - TECHNICAL SCHEDULES A AND B**

**ITEM 1: CAB CABTYRE PVC 1, 5 3CU SAP 1531**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytire Cablecomplies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	1,5	
8	4.2.4	Number of Cores	3	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_

**DEVIATION SCHEDULE**

**ITEM 1: CAB CABTYRE PVC 1, 5 3CU SAP 1531**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 2: CAB CABTYRE PVC 2, 5 3CU -SAP 7303**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytire Cablecomplies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	2,5	
8	4.2.4	Number of Cores	3	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_

**DEVIATION SCHEDULE**

**ITEM 2: CAB CABTYRE PVC 2, 5 3CU -SAP 7305**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 3: CAB: SGL Core, 1.5mm<sup>2</sup>, 600 to 1000V -SAP 7337**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabtyre Cable complies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	1,5	
8	4.2.4	Number of Cores	Required	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_



-----  
**DEVIATION SCHEDULE**

**ITEM 3: CAB: SGL CORE, 1.5MM<sup>2</sup>, 600 TO 1000V -SAP 7337**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 4: CAB SURFIX (NORSE) PVC 2, 5 2+E CU AFA -SAP 7448**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytire Cablecomplies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	2,5	
8	4.2.4	Number of Cores	2	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_

**DEVIATION SCHEDULE**

**ITEM 4: CAB SURFIX (NORSE) PVC 2, 5 2+E CU AFA -SAP 7448**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 5: CABLE NORSE 1.5MM X 2CORE (PER 100M)-SAP 7347**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytire Cablecomplies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	1,5	
8	4.2.4	Number of Cores	2	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_

**DEVIATION SCHEDULE**

**ITEM 5: CABLE NORSE 1.5MM X 2CORE (PER 100M)-SAP 7347**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 6: CABLE: FLAT, 2 CORE, 6MM PVC (PER 100M) -SAP 7352**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytire Cablecomplies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	6	
8	4.2.4	Number of Cores	2	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_

**DEVIATION SCHEDULE**

**ITEM 6: CABLE: FLAT, 2 CORE, 6MM PVC (PER 100M) -SAP 7352**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 7: CABLE: ROUND + BE, 4 CORE, 2.5MM, WHITE (PER 100M)-SAP 7304**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytire Cablecomplies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	2,5	
8	4.2.4	Number of Cores	4	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_



**DEVIATION SCHEDULE**

**ITEM 7: CABLE: ROUND + BE, 4 CORE, 2.5MM, WHITE (PER 100M)-SAP 7304**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 8: CABLE NORSE 2.5MM 2CORE (PER 100M)-SAP 7348**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytre Cablecomplies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	2,5	
8	4.2.4	Number of Cores	2	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_

**DEVIATION SCHEDULE**

**ITEM 8: CABLE NORSE 2.5MM 2CORE (PER 100M)-SAP 7348**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**TECHNICAL SCHEDULES A AND B**

**ITEM 9: CABLE: FLAT, 2 CORE, 2.5 SQ MM PVC (PER 100M) -SAP 7355**

**Schedule A: Purchaser's specific requirements**

**Schedule B: Guarantees and technical particulars of equipment offered**

Item	Sub-clause of CP_TSSPEC_252	Description	Schedule A	Schedule B
1		Name of manufacture	Required	
2		Date of manufacture	Required	
3		Place of manufacture	Required	
4		Manufacturer's identification reference	Required	
5	1	Specification to which Cabytire Cable complies	SANS 1411	
6	4.4	Rated operating ambient temperatures °C	-15 to +20	
7	4.1	Conductor size mm <sup>2</sup>	2,5	
8	4.2.4	Number of Cores	2	
9	4.3	Type of cable (Insulated wire, power or multi-core control)	Insulated wire	
10	4.1	Marking requirements	Required	
11	5	Technical Catalogue required	Required	
12	5	Type test report according to SANS 6282-1/6282-2/6282-3 required	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: \_\_\_\_\_

**DEVIATION SCHEDULE**

**ITEM 9: CABLE: FLAT, 2 CORE, 2.5 SQ MM PVC (PER 100M) -SAP 7355**

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_252	Proposed deviation

Tender Number: \_\_\_\_\_

Tenderer's Authorised Signatory: \_\_\_\_\_  
Name in block letters                      Signature

Full name of company: \_\_\_\_\_

**ANNEXURE D – STOCK ITEMS**

**Material Group: CABTYRE COND-WIRE**

Item	SAP number	SAP Short Description	SAP Long Description
1	1531	CAB CABTYRE PVC 1,5 3CU	CAB CABTYRE PVC 1, 5 3CU. ITEM SPECIFICATIONCP_TSSPEC_252
2	7305	CAB CABTYRE PVC 2,5 3CU	CAB CABTYRE PVC 2,5 3CU. ITEM SPECIFICATIONCP_TSSPEC_252
3	7337	CAB:SGL Core,1.5mm <sup>2</sup> ,600 to 1000V	CAB: SGL Core, 1.5mm <sup>2</sup> , 600 to 1000V. ITEM SPECIFICATIONCP_TSSPEC_252
4	7448	CAB SURFIX (NORSE) PVC 2,5 2+E CU AFA	CAB SURFIX (NORSE) PVC 2, 5 2+E CU AFA. ITEM SPECIFICATION CP_TSSPEC_252
5	7347	CABLE NORSE 1.5MM X 2CORE (PER 100M)	CABLE NORSE 1.5MM X 2CORE (PER 100M) ITEM SPECIFICATION CP_TSSPEC_252
6	7352	CABLE: FLAT, 2 CORE, 6MM PVC (PER 100M)	CABLE: FLAT, 2 CORE, 6MM PVC (PER 100M) ITEM SPECIFICATIO NCP_TSSPEC_252
7	7304	CABLE: ROUND + BE, 4 CORE, 2.5MM, WHITE (PER 100M)	CABLE: ROUND + BE, 4 CORE, 2.5MM, WHITE (PER 100M) ITEM SPECIFICATION CP_TSSPEC_252
8	7348	CABLE NORSE 2.5MM 2CORE (PER 100M)	CABLE NORSE 2.5MM 2CORE (PER 100M) ITEM SPECIFICATION CP_TSSPEC_252
9	7355	CABLE: FLAT, 2 CORE, 2.5 SQ MM PVC (PER 100M)	CABLE: FLAT, 2 CORE, 2.5 SQUARE MM PVC (PER 100M) ITEM SPECIFICATION CP_TSSPEC_252