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TITLE	<b>SPECIFICATION FOR FLEXIBLE PROTECTIVE PVC SLEEVES FOR UNDERGROUND DRILLING</b>	REFERENCE	REV
		<b>CP_TSSPEC_134</b>	<b>2</b>
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## **FOREWORD**

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

Technology Services Manager  
City Power Johannesburg (Pty) Ltd  
P O Box 38766  
Booyens  
2016

## **INTRODUCTION**

The protective sleeve will be used to provide a ready means of drawing cable under streets and pavements, to ensure the safety of persons engaged in excavating work in the vicinity of such cables and to afford protection to the cables that will be subject to loads due to heavy transport passing in the road above.

## **1 SCOPE**

This specification covers City Power's requirements for flexible protective PVC piping.

## **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 791:	Unplasticised polyvinyl chloride (uPVC) sewer and drain pipes and pipe fittings
SANS 1222:	Classification of degrees of protection provided by enclosures
SANS 1601:	Structured wall pipes and fittings of uPVC for buried drainage and sewerage systems.
EN 500861-2-4:	Particular requirements for conduit systems buried underground.

## **3 REQUIREMENTS**

### **3.1 General**

The flexible protective PVC sleeve shall comply with EN 50086-2-4.

### **3.2 Type**

The protective sleeve shall:

- Be constructed from black high density polyethylene (HDPE).
- Be supplied with pilot string or draw-wire.
- Be in a coil of 100m in length.
- Have a nominal outside diameter of 110mm.
- Have a wall thickness of between 2,3mm and 2,8mm.

- f) Be supplied with a knock on coupling and end caps at either end of the sleeve.
- g) Be suitable for normal duty use.

### **3.3 Construction**

The protective sleeve shall:

- a) Be of a double wall with an outer corrugated type construction.
- b) Have a bore that is true and smooth.
- c) Be impact and chemical resistant and shall have good thermal conductivity of at least 0.4W/mK for better dissipation of heat generated by cables.
- d) Contain no recycled or pitch fibre material.

### **3.4 Flexibility**

The protective sleeve shall be flexible to facilitate the installation of the sleeve around immovable objects.

### **3.5 Friction**

The protective sleeve shall have a low co-efficient of friction to accommodate the easy draw of cables through the sleeve.

### **3.6 Jointing**

Jointing of the protective sleeve shall be done by means of the push on coupling which shall have an IP 30 rating as per SANS 1222.

## **4 PHYSICAL PROPERTIES**

### **4.1 Impact**

The protective sleeve shall show no signs of splits and cracks when subject to an impacted force, such as rough handling or compaction.

### **4.2 Compression**

4.2.1 The resistance to impact shall be normal, as per EN 50086-2-4.

4.2.2 The flexible HDPE protective sleeves shall be Type 450, as per En 50086-2-4.

### **4.3 Temperature**

The protective sleeve shall be capable of dissipating the heat (working temperature of at least 70 °C) generated by the cable.

#### **4.4 Ultra violet**

The protective sleeve, although intended to be buried underground, shall be UV resistant for storage purposes up to one year.

### **5 END CAPS**

End caps for sealing the open ends of sleeves already laid in the ground, but not yet installed with cable, shall be provided for both ends of the sleeve. The end caps shall fit securely into the sleeve ends.

### **6 TESTS**

#### **6.1 Type test**

6.1.1 The protective sleeve shall be type tested as per EN 50086-2-4.

6.1.2 Type tests shall be performed by an accredited laboratory.

#### **6.2 Routine test**

Visually examine each sleeve for compliance with the relevant requirements of this specification.

### **7 MARKING AND PACKAGING**

#### **7.1 Marking**

7.1.1 All protective sleeves shall have the 110 mm nominal size indelibly marked on the sleeve.

7.1.2 The manufacturer's trademark or name shall be on all protective sleeves.

7.1.3 The duty of the sleeve, i.e. "normal" shall be indelibly marked on the sleeve.

7.1.4 The classification code "450" shall be marked on the sleeve.

7.1.5 The markings shall be spaced at intervals not longer than 3m apart.

#### **7.2 Packing**

All flexible protective sleeves shall be securely coiled in 100m lengths.

### **8 DOCUMENTATION**

8.1 Documentation shall be submitted in a technical catalogue format.

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- 8.2 The catalogue shall specify the protective sleeve sizes, dimensions, reference number, and whether the sleeves offered are in compliance with the EN 50086-2-4 or alternative.
- 8.3 Test reports shall be provided.

## **9 QUALITY MANAGEMENT**

- 9.1 The supplier (deemed to be an organization that undertakes any manufacturing or assembly operation) shall have a formally documented and implemented quality management system (QMS) that, is a minimum that meets with the requirements of the international code of practice for quality systems ISO 9002. City Power reserves the right to audit quality management systems for suitability and effectiveness, and to verify all goods for conformance prior to delivery.
- 9.2 Foreign and third party manufacturers, shall, in addition, hold valid certification of their quality management system. Such certification shall be from a national quality systems certification body (Registrar), duly accredited by a QMS accreditation body, which is signatory to a mutual recognition agreement with South Africa.

## **10 HEALTH AND SAFETY**

A health and safety plan shall be set up in order to ensure proper management and compliance of the flexible protective PVC sleeves for underground drilling. Guidance on the requirements of a health and safety plan may be found in OHSAS 18001:2007 standards. This is to ensure that the services provided conforms to standard operating procedures and City Power SHERQ Policy. The details shall be subject to agreement between City Power and the Supplier.

## **11 ENVIRONMENTAL MANAGEMENT**

An environmental management plan shall be set up in order to ensure the proper environmental management and compliance of the flexible protective PVC sleeves for underground drilling for the entire life cycle (i.e. during design, development). Guidance on the requirements for an environmental management TPVS 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.



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## **ANNEX A - Bibliography**

None

**ANNEX B - Revision information**

<b>DATE</b>	<b>REV. NO.</b>	<b>NOTES</b>
July 2004	0	First issue
Aug. 2005	1	Foreword: New list of members
June 2021	2	General Editing 10. HEALTH AND SAFETY 11. ENVIRONMENTAL MANAGEMENT New Study Group committee

**ANNEX C – Item 1 – FLEXIBLE PROTECTIVE SLEEVE – SAP NO. 932**

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

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

Item	Subclause of CP_TSSPEC_134	Description	Schedule A	Schedule B
1		Manufacturer Name	Required	
2	3.1	Flexible sleeves comply with BS EN 50086-2-4 Yes/ No	Yes	
3	3.2(a)	Material of flexible sleeve uPVC/ HDPE	HDPE	
4	3.2(b)	Pilot string or draw-wire supplied Yes/ No	Yes	
5	5	End caps on both ends Yes/No	Yes	
6	6	Type test report	Required	
7	7	Markings on the sleeve	Required	
8	8	Technical catalogue provided	Required	

**Note: Ticks, Cross [✓, X], Astrick [\*], 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: \_\_\_\_\_

**Item 1 – FLEXIBLE PROTECTIVE SLEEVE – SAP NO. 932**

**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.**

<b>Item</b>	<b>Subclause of CP_TSSPEC_134</b>	<b>Proposed deviation</b>

**Note: Ticks, Cross [√, X], Astrick [\*], Word [Noted] or TBA [“To Be Advice”] will not be accepted**

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**ANNEX D – Stock Items**

**Material Group:    PIPE-DST**

Item	SAP No	SAP Short Description	SAP Long Description
1	932	SLEEVE PVC 100M X 110MM FLEXIBLE	SLEEVE, PROTECTIVE, FLEXIBLE, BLACK HIGH DENSITY POLYETHYLENE, 100M IN LENGTH WITH AN OUTER DIAMETER OF 110MM, SUPPLIED WITH PILOT STRING, FITTED WITH END CAPS AND COUPLING PER END. ITEM SPECIFICATION NO. CP_TSSPEC_134