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TITLE	STANDARD FOR UNDER ROAD HORIZONTAL DRILLING	REFERENCE		REV	
		CP_TSSTAN_075		1	
		DATE:	March 2021		
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FOREWORD

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

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INTRODUCTION

City Power is required to conduct road crossings as part of the electrical distribution network. Under road horizontal drilling, trenchless method is preferred for road crossings as it eliminates the risk of road damage, low noises and the infrastructure is left undisturbed throughout a drilling process.

1 SCOPE

This standard deals with the process of using trenchless technology practice for under road horizontal drilling. Whilst this document, provides a standard with regard to "Under Road Drilling", all activities within the road crossing shall be in strict compliance with the latest edition of the "Greater Johannesburg Code of Practice for Work carried out in the Road Reserve"

2 NORMATIVE REFERENCES

The following documents contain provisions that, through reference in the text, constitute requirements of this standard. 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 standard are encouraged to investigate the possibility of applying the most recent editions of the documents listed below.

CP_TSSPEC_045, Protective PVC Sleeves

CP_TSSTAN_009, Township Electrical Reticulation Standard

CP_TSSTAN_033, Safety Operations Precautions Standard

CP_TSSTAN_042, Technical Requirements for Labour Contracts for Systems Rated Up To and including 22KV

CP_TSGUID_001, Guideline for Road Reserve Excavation and Reinstatement

Occupational Health & Safety Act (Act No 85 of 1993)

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.

SANS10198 The selection, Handling and Installation of Electric Power Cables of ratings not exceeding 33kV; Part 8: Cable Laying and Installation

3 DEFINATIONS AND ABBREVIATIONS

The definitions and abbreviations in the normative reference documents shall apply to this standard.

Johannesburg Road Authority: the organization that is responsible for providing and maintaining the road network.

Service Agency: any public utility or municipal department that has a service in the road reserve.

Wayleave: a wayleave is permission (leave) to cross the way (road), a way-leave must be obtained before any approved work may be done in the road reserve.

Wayleave Holder: any person or organization that has obtained a wayleave. The wayleave holder accepts full responsibility for all costs associated with the work carried out in terms of the wayleave.

HDD: Horizontal Directional Drilling

HDPE: High Density Polyethylene

4 GENERAL

- 4.1 It is the responsibility of the way-leave holder to ensure that any person or institution using trenchless methods has the necessary expertise and equipment to complete the work successfully.
- 4.2 Risk assessment to be done.
- 4.3 If any services are damaged whilst using trenchless excavation techniques, the wayleave holder shall be liable for repair costs.

5 SAFETY

- 5.1 Safe working procedures during the implementation of the standard shall be the responsibility of the official concerned.
- 5.2 A correct PPE shall be worn at all times when executing under road drilling.
- 5.3 No work shall be executed without the completion of a risk assessment.
Strict adherence to all requirements of CP_TSSTAN_033, Safety Operations Precautions Standard shall be maintained

6 REQUIREMENT

6.1 UNDER ROAD DRILLING PROCESS

- 6.1.1 To obtain a way-leave, a way-leave application form shall be submitted, accompanied by three copies of the approved drawing showing details of the proposed work.
- 6.1.2 Excavate an entry hole to suit your own equipment from the natural ground level before drilling. The supplier shall do a service detection exercise with the usage of a Utility Locator and or Ground Penetrating Radar (GPR). The results of the service detection shall be used to design and submit a drill plan for the approval of City Power Project Manager. The proposed drill level, angle and approach shall be clearly indicated in the drill plan.
- 6.1.3 A trenchless technology shall be with Horizontal Directional Drilling (HDD).
- 6.1.4 A Horizontal Directional Drilling (HDD) machine shall be capable of drilling through rocks and soft soil.
- 6.1.5 Ground penetrating radar to keep correct positioning shall be required in each road crossing.
- 6.1.6 A 1X 160mm diameter pipe shall be required.
- 6.1.7 A 1 X110mm diameter pipe and 3 X 300mm diameter shall be required.
- 6.1.8 110 mm diameter PVC pipes or HDPE pipe configured in a **(1) one** pipe configurations at a depth of 1000 mm from the highest pipe top in the configuration
- 6.1.9 One pipe per road crossing, 110mm diameter on a standard 9 m road crossing
- 6.1.10 Drawn pipes shall extend 0.5m past the edge of roadway or access way
- 6.1.11 The average depth shall be 1,0m from the top of the pipe to the underside of the road surface.
- 6.1.12 The equipment to be used shall comply with urban area road reserve requirements i.e. Small machines for small road reserves.
- 6.1.13 Each pipe installed shall have a draw wire inside and shall be end capped sealed at both ends
- 6.1.14 The contractor shall be required to undertake work primarily for one of the regional City Power Depots within the area of supply of City Power.
- 6.1.15 The Contractor may not enter private property without the owners' consent. Where such consent is withheld, the Project Engineer shall immediately be notified.

6.1.16 Final cable/line routes and placement of poles and stays are subject to approval by the Project Engineer. Such approval must be gained prior to construction. In failing to do so, the possible repositioning of equipment may be ordered, at the Contractor's expense.

7 MARKINGS

- 7.1 The location of laid sleeves shall be marked with an 'E' embossed into the curb at both ends. The size of the 'E' shall be 100 mm from top to bottom.
- 7.2 At road crossings the low voltage cables shall be ramped down and up as necessary.
- 7.3 Shear strength shall be measured, and the test shall be conducted by either the wayleave holder or roads authority.

8 QUALITY CONTROL

- 8.1 The Road Authority or City Power shall inspect work carried out on its behalf over a period of 12 months after completion of work.
- 8.2 Remedial work shall be required if any of the following exists:
 - a) Depressions
 - b) Humps (crowning)
 - c) Edge depression at the interface
 - d) Cracking
- 8.3 Edge depressions exceeding 10 mm over 100 mm or more of the length of the trench shall require remedial work.
- 8.4 Open cracks wider than 3 mm and longer than 100 mm shall require remedial work.
- 8.5 Any under road drilling left unattended for a period of five working days shall be made safe by the Roads Authority. The responsible contractor shall be held liable for costs.

9 TRAINING

The contractor shall provide, proof of certified training, for staff executing under road horizontal drilling on behalf of City Power.

10 QUALITY MANAGEMENT

A quality management plan shall be set up in order to assure the proper quality management of the under road horizontal drilling 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.

11 ENVIRONMENTAL MANAGEMENT

An environmental management plan shall be set up in order to assure the proper environmental management of the under road horizontal drilling 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

12 HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management and compliance of the under road horizontal drilling during installation, operation, maintenance, and decommissioning phases. Guidance on the requirements of a health and safety plan may be found in OHSAS 18001:2007 standards. This is to ensure that the asset conforms to standard operating procedures

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and City Power SHERQ Policy. The details shall be subject to agreement between City Power and the Supplier.

ANNEXURE A - BIBLIOGRAPHY

ANNEXURE B – REVISION INFORMATION

DATE	REV. NO.	NOTES
Nov 2017	0	First issue
March 2021	1	Additional items in the BOQ

ANNEXURE C- SCHEDULES OF ESTIMATED QUANTITIES AND PRICES

SCHEDULE OF ESTIMATED QUANTITIES AND PRICES ROCK DRILLING					
Item	Description (Normal working hours)	Estimated Quantity	Unit Drilling (per meter length)		
			Rate (Excl VAT)	Rate (Incl VAT)	Total (Incl VAT)
1	Rock drilling of holes to accommodate 1 x 300mm sleeves	1m length	R		R
2	Directional drilling of holes to accommodate 1 x 300mm sleeves	1m length	R		R
3	Rock drilling of holes to accommodate 1 x 110mm sleeves	1m length	R		R
4	Directional drilling of holes to accommodate 1 x 110mm sleeves	1m length	R		R
5	Rock drilling of holes to accommodate 1 x 140mm sleeves	1m length	R		R
6	Directional drilling of holes to accommodate 1 x 140mm sleeves	1m length	R		R
7	Rock drilling of holes to accommodate 1 x 140mm sleeves	1m length	R		R
8	Directional drilling of holes to accommodate 1 x 160mm sleeves	1m length	R		R
9	Rock drilling of holes to accommodate 1 x 160mm sleeves	1m length	R		R
11	Install 1x110mm diameter sleeve	1m length	R	R	R
12	Install 1x140mm diameter sleeve	1m length	R	R	R
13	Install 1x160mm diameter sleeve	1m length	R	R	R
14	Install 1x300mm diameter sleeve	1m length	R	R	R
15	Install end caps as per sleeve pipes	1m length	R	R	R
16	Insert draw wires inside the pipes	1 each	R	R	R
10	Call out fee for cancelled work	Each	R		R
TOTAL (To be carried forward to summary at the end of this part)					R

Tender Number: _____

Tenderer's Authorised Signatory _____
Name in block letters

Signature

Full name of company: _____

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Full name of company: _____

SCHEDULE OF ESTIMATED QUANTITIES AND PRICES					
Item	Description (Normal working hours)	Estimated Quantity	Unit rate per cubic meter (m ³)		
			Rate (Excl VAT)	Rate (Incl VAT)	Total (Incl VAT)
3	Reinstatement				
3.1	Tarmac (including supply of materials)	140(m ³)	R	R	R
3.2	Solid concrete (including supply of materials – 10 MPA minimum)	160 (m ³)	R	R	R
3.3	Supply and cast ready mix concrete	160 (m ³)	R	R	R
3.4	Supply and cast concrete(self mix)	160 (m ³)	R	R	R
3.5	Interlocking blocks/bricks or concrete slabs (existing materials to be reused)	60 (m ³)	R	R	R
3.6	In rock requiring wedges and/or power drilling	25 (m ³)	R	R	R
3.7	Lawn Grass	150 (m ³)	R	R	R
Note: If any specialized paving materials are encountered or where existing materials cannot be reused, instructions and agreed rates in the form of a variation order from the engineer must be received by the contractor before lifting of the materials commences.					
	Information pertaining to other services		Rate		
3.8	If City Power is unable to supply suitable way leaves or to supply them in time then the contractor must obtain the required information from the other service provided at these rates Each / service provided	50 each	R	R	R
3.9	Sign boards JRA cop for (projects only)	1	R	R	R
3.10	Install Danger barriers for trenches	1	R	R	R
3.11	Location of services with the use of appropriate locator	1	R	R	R
3.12	Location of services with the use of ground penetrating radar	1	R	R	R
3.13	Traffic deviation(where applicable)	1	R	R	R
3.14	Compaction certificate (public roads)	1	R	R	R
3.15	Contractor to attend court/hearings (witness)	1	R	R	R
TOTAL (To be carried forward to summary at the end of this part)					R

Tender Number:

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1

Full name of company: _____

SCHEDULE OF ESTIMATED QUANTITIES AND PRICES GENERAL					
Item	Description (Normal working hours)	Unit	Unit rate		
			Rate (Excl VAT)	Rate (Incl VAT)	Total (Incl VAT)
4	General – any work not covered by the above schedules (Contractor to complete if required)				
4.1		1	R		
4.2		1	R		
4.3		1	R		
4.4		1	R		
4.5		1	R		
TOTAL (To be carried forward to summary at the end of this part)					R

Tender Number: _____

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

Full name of company: _____

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Main Offer

TOTAL FOR BILL NO.1 (To be carried over to this part)	R
TOTAL FOR BILL NO.2 (To be carried over to this part)	R
TOTAL FOR BILL NO.3 (To be carried over to this part)	R
TOTAL FOR BILL NO.4 (To be carried over to this part)	R
TOTAL FOR BILL NO.1 to 4	R