a world class African city

City Power
Johannesburg

TITLE	**SPECIFICATION FOR PERIMETER FENCE, GATES AND LIGHTS**	REFERENCE	REV
		CP_TSSPEC_213	**1**
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TITLE **SPECIFICATION FOR PERIMETER FENCE, GATES AND LIGHTS**

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FOREWORD

This standard was prepared by the following work group members:

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The work group appointed by the Interim Study Committee, which, at the time of approval, comprised of the following members:

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1. INTRODUCTION

City Power distributes and sells electricity to the residents of the City of Johannesburg and surrounding areas. It is because of the nature of business that all its premises are regarded as National Key Points. The location of some of these premises make them vulnerable to intrusion, theft and vandalism. This makes it necessary to have robust perimeter fence to protect and control access into all its premises.

2. SCOPE

This specification covers material requirements and installation of security fencing and gates, in and around City Power's premises. The fence shall be made out of metal bars connected at the top and bottom with bars stretching across horizontally and vertically, creating a mesh of metal, and a barbed wire on the top to prevent climbing. The scope entails, supply, delivery and installation of perimeter fence, gates, lights and accessories in line with the said legislature. The range of perimeter equipment to be supplied shall include without being limited to the following:

a) Bowed welded mesh security fence.
b) Preparation of strip where fence shall be installed
c) Gates
d) Gate motor
e) Perimeter light
f) Training
g) Installation

3. 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.

Document	Description
OHS ACT 1993	*Occupational Health and Safety Act of 1993*
SANS 10142-1-2021	*The wiring of premises Part 1: Low-voltage installations*
SANS 10244-2- 2011	*Steel wire and wire products - Non-ferrous metallic coatings on steel wire Part 2: Zinc and zinc alloy coatings*
SANS 16368-2014	*Mobile elevating work platforms - Design calculations, safety requirements and test method*

SANS 60598-2-3:2012	*Luminaires Part 2-3: Particular requirements - Luminaires for road and street lighting*
SANS 475:2013	*Luminaires for interior lighting, street lighting and floodlighting - Performance requirements*
SANS 60529:2013	*Degrees of Protection Provided by Enclosures (IP Code)*
IEC 60068-2-6:2007	*Environmental testing*
SANS 0222-3:2016	*Electrical Security Installations, part3: Electrical Security Fences*
SANS CKS 451:1976	*Specification for anti-intruder fences*
SANS 1461:2000	*Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods*
SANS 675:2011	*Zinc-coated fencing wire (plain and barbed)*
SANS 10044-1:2004	*Welding Part 1: Glossary of terms*
SANS 10162-1:2011	*the structural use of steel*
CP_TSSPEC_278	*Specification for Energy Efficient Luminaires.*
CP_TSSDRAW_073:2014	*Detail drawing of pad lock*
CP_TSSDRAW_074:2014	*Detail drawing of mesh panels*
CP_TSSDRAW_079:2014	*Detail drawing of double leaf gate*
CP_TSSDRAW_080:2015	*Outer perimeter fence*
CP_CV_PG_NJ_001:2014	*Detail drawing of pedestrian gate*
CP_CV_SG_NJ_001:2015	*Detail drawing of sliding gate*
CP_ES_NJ_001:2014	*Detail drawing of earth spike*
LPM_DD_NJ_001:2014	*Detail drawing of padlock with lock box*

4. REQUIREMENTS

4.1. Environmental conditions

a) Ambient temperature range of -10°C to +65°C

b) Relative humidity 5-95% @ 50°C

c) IP rating: 66

4.2. General Requirements

5.5.1 Nothing in this specification shall lessen the obligation of the Service Provider. The Service Provider shall be fully responsible for the perimeter fence, gates and lights installation.

5.5.2 Perimeter fences and gates shall be categorised (depending on the facility's security risk assessment undertaken by City Power's security officials) as high, medium or low security. The

risk assessment report shall be submitted to the Engineer for review prior to commencement of any work.

5.5.3 All steel materials shall be galvanized or zinc coated steel and smooth with no joints. All manufacturing processes shall be completed prior to galvanizing or coating.

5.5.4 Fence classification range from Substation outer perimeter to High Voltage (HV) yard area, including general building requirements shall be based according to the generic drawing provided by City Power.

5.5.5 The outer perimeter fence shall be designed with an under-dig/ anti-burrow requirement of ±600mm.

5.5.6 All equipment shall be assembled in SA and meet local content requirements as dictated by the Department of Trade and Industry. (DTI).

5.5.7 The perimeter fence and lights shall be used to enclose and protect all City Power's equipment.

5.5.8 The physical perimeter shall consist of an fence and an gates of 4.5m in height.

5.5.9 All sub-systems shall be integrated with the City Power's ISS.

Note: Generic drawings for different requirements have been develop and are available on request.

4.3. Security Perimeter Fence

4.3.1 Curved 101.6mm x 4.5mm Grade W 300 Hot dipped galvanized tubular posts to radius specified with 3mm capping plate shall be used.

4.3.2 Posts have predrilled 11mm diameter holes for M8 bolts to fix cover plate to posts.

4.3.3 Posts shall be positioned in Class 6, 103mm ID P.V.C x 2.58mm wall thickness x 1500mm long sleeves set in 500mm x 500mm x 1500mm 15MPA concrete foundation.

4.3.4 Ground conditions may require additional concrete.

4.4. Covering plate

4.4.1 Covering plates required on all curved posts from ground to top of post 50mm x 5mm flat steel required, predrilled with 11mm diameter holes for fixing mesh to post.

4.5. Fixing Accessories

4.5.1 Cover plates to posts shall be: M8 x 150mm galvanized cup-square bolts with galvanized washers and shear off nuts.

4.5.2 Top rail to post & post at corners shall be: M10 x 40mm galvanized cup square bolts with galvanized washers and shear off nuts.

4.5.3 Corner post bracket shall be: M12 U-bolt galvanized with galvanized washers and shear off nuts.

4.6. Welded wire mesh panels

4.6.1 The mesh panels shall be manufactured from high tensile Galfan Class A coated wire in accordance with SANS 10244-2:2003 specification.

4.6.2 Vertical wires shall be welded on either side of the horizontal wires.

4.6.3 The vertical wires on the inside (City Power's Premises side) shall be to a height of 3000mm.

4.6.4 The vertical wires on the outside shall be for the total length (6000mm) of the welded mesh panel.

4.6.5 All vertical wires shall be spaced at 76.2mm and all horizontal wires spaced at 12.7mm centre to center.

4.6.6

a) Inside apertures :	72.2mm x 8.7mm
b) Centre to centre :	76.2mm x 12.7mm
c) Wire diameter :	4mm
d) Width of panel :	3050mm
e) Height of panel :	6000mm
f) Tensile Strength of wire :	600 – 900 N/mm square
g) Weld strength :	60 – 80%

4.7. Top rail

4.7.1 50mm x 50mm x 5mm Angle Iron top rail.

4.7.2 Pre-drilled holes according to detail drawings including 50mm x 5mm covering plate to fix Razor Wire coil to angle iron top rail.

4.8. Galvanizing

All posts, rails and cover plates shall be Hot dipped galvanized in accordance with ISO 1461 (Min.70 microns)

4.9. Additional

4.9.1 <u>Razor Wire Coil (1)</u>

a) Barbed Tape Concertina 730mm dia. Medium barb - Barbed Tape

b) Concertina Coil. Galfan Class A coated to SANS 10244-2:2003

c) (Maximum stretch – 10000mm)

4.9.2 <u>Razor Wire Coil (2)</u>

a) Barbed Tape Concertina 610mm dia. long barb - Barbed Tape

b) Concertina Coil. Galvanised (Maximum stretch 10000mm)

4.10. Erection of the fencing posts

4.10.1 After excavation of the fencing post holes shall be minimum 1300mm of the 103mm ID

4.10.2 P.V.C sleeve with positioning bolt shall be set vertically in concrete foundation.

4.10.3 Posts shall be slide into sleeve and remain for a minimum of 5 days setting time before positioning posts.

4.10.4 After setting of concrete the top 200mm PVC sleeve shall be cut off before erection of posts.

4.10.5 The PVC sleeves shall protrude through the 100mm concrete strip.

4.10.6 Care shall be exercised to ensure all posts are aligned (vertically and at tops), plump, perpendicular and in the correct position on the route of the fencing.

4.10.7 All sleeves shall be encased in a 25/19 concrete footing of adequate size.

4.10.8 Note that all galvanizing shall be done after manufacturing of the posts.

4.10.9 Prior to erection of the fence poles permission shall be obtained from both facilities managements and security managements representatives to ensure compliance and conformance with the specifications.

4.11. Concrete slab for outer security fence

4.13.1 A 25/19mm concrete slab shall be cast in situ along the inside of the external fence.

4.13.2 A reinforced concrete slab of 600mm deep by 100mm thickness shall be casted below the natural ground level.

4.13.3 The dimensions of the slab shall be as follows: 1000 x 100mm or other as specified from top of prepared ground level.

4.13.4 The wire mesh panels of the fence shall be cast into the concrete slab.

4.13.5 An expansion gap of 10 - 20mm wide shall be provided at 3000mm intervals, to provide drainage and movement.

4.13.6 The wire mesh panels of the fence shall be cast into the concrete slab.

4.13.7 The Section of mesh into concrete beam and in ground shall be bitumen dipped / covered up to 100mm above ground level.

4.13.8 Civil construction shall include route preparations, and casting of the 1000mm wide concrete slab with welded mesh steel reinforcing to a nominal thickness of 100mm and a minimum compressive strength of 25Mpa.

4.13.9 All existing electrical services as well as the cables required for this installation shall be installed in 30mm PVC sleeves in the concrete slab to ensure access for maintenance of these services after completion of the installation.

4.13.10 The area underneath the concrete plinth shall be cleared of all vegetation prior to casting and treated with a suitable sterilization herbicide to prevent any vegetation growth.

4.13.11 The contractor shall allow and install a 250 micron PVC sheet underneath the concrete slab, to prevent any vegetation growth.

4.12. Intermediate posts

The materials used for posts, extension arms and fixing rails shall be as follows:

4.12.1 All structural steel shall conform to SANS 0162. The grade of steel shall be 300WA as defined according to SANS 1431.

4.12.2 The height of posts shall range from 2400mm, to 3000mm depending on site requirements.

4.12.3 The length of extension arms shall be 700mm.

4.12.4 The extension arm shall be bolted to the top of a post.

4.12.5 Posts shall include footplates application.

4.12.6 Earthing connection points to be available on all posts.

4.13. Panel

The materials used for straining posts, extension arms; and fixing rails shall be one of the following;

4.13.12 The panel dimensions shall be of ±3000mm wide and ±2000mm in high, depending on the site requirements.

4.13.13 Panel aperture size (centres) shall be in a range of ±76mm x 12mm and wire diameter shall be Ø 3mm.

4.13.14 The panel shall be reinforced horizontal recessed bands (rigidity).

4.13.15 Panel shall have flanges along sides internal fixtures, all fixtures shall be on the inside.

4.13.16 Panel post shall have a flush panel post finish with no climbing aid.

4.13.17 The fence configuration shall not have any sharp corners.

4.13.18 The outer perimeter fence shall have an under-dig section.

Note: No tubing shall be used for substation fencing. Tubing may be used for the gate sections.

4.14. Removable sections

No removable panel on the perimeter fence shall be allowed.

4.15. Fixings

4.15.1 Strain eye bolts, hinge bolts, bolts and nuts shall comply with the requirements of SANS 135.

4.15.2 M12 bolt with nut and washer shall be used for gate hinges, as per the generic drawings.

4.15.3 Bolts used shall be stainless steel security bolts with anti-vandal shear off nuts and washers.

4.15.4 The length of bolt as well as the size of nuts and washers used shall be appropriate for its application.

4.16. Earthing

4.16.1 Fence posts shall be installed so that they align with the earth mat such that the earth grid and crusher stone extend 1m outside of the security fence.

4.16.2 All gate leaves shall be bonded to the hinged gate posts using 70mm^2 long flexible covered conductor which shall be attached to the earth lug on the gates and earth points.

4.16.3 In areas of high copper theft, the fence and gates shall be securely bonded to the earth mat.

4.16.4 All bolted earth connections shall be cleaned and filled with a joint compound to prevent oxidation at the joint.

4.16.5 The fence shall be earthed on both sides of any gate and at intervals not exceeding 20m.

4.17. Civil work and Foundations

4.17.1 Designs shall be applicable to meet specific site conditions; these include site layout, soil condition, drainage, piping, etc. The requirements shall be stipulated during the clarification meeting for the specific site.

4.17.2 Concrete work shall be in accordance to SANS 1200 and the concrete strength to be 25Mpa except for anti-tunnelling.

4.17.3 Stepping per panel shall be 150mm from the tops of panels to be horizontal.

4.17.4 Concrete anti-burrow shall be 100mm (wide) x 600mm (deep) concrete between posts.

4.17.5 The mesh shall be anchored into/onto the centre of the anti-burrow (see generic drawings)

5. GATES

5.1. Gate Requirements

5.1.1 Swing or sliding gates shall be allowed depending on site conditions and management of access control.

5.1.2 Sliding gates shall be controlled manually or by means of an electrically controlled industrial type gate motor.

5.1.3 Beams shall be provided to prevent closing of the gate while a vehicle is driving through.

5.1.4 The frame to be constructed of 60 x 40 x 2mm rectangular steel tubing and Hot dipped galvanized to ISO 1461 (Min thickness 45 micron).

5.1.5 Each gate shall consist of two leaves of same size.

5.1.6 Each section of the gate shall be secured to the gate post be means of at least 3 hinges proposed hinges shall be submitted to facilities management for approval before fitting.

5.1.7 The gate shall be installed in such a way that the leaves can open in both directions.

5.1.8 Each gate shall be clad with the same mesh as that of the fence using similar cover plate & bolting system.

5.1.9 The gap between the bottom of the gate and the road surface shall not exceed 50mm.

5.1.10 A 6m wide sliding gate with perimeter gate shall be provided.

5.1.11 Gate frames and their extension arms shall be made of tube shaped steel.

5.1.12 The height of the gate shall be the same as that of the fence.

5.1.13 The mesh razor wire sections (single strand) shall coincide with the corresponding section on the fence.

Note: Generic drawings for gates and locking requirements have been develop and are available on request.

5.2. Swing gates

5.2.1 All connections and joints shall be welded to form rigid corner frames.

5.2.2 Hinges shall not twist or turn under the action of the gate, shall be so arranged that a closed gate cannot be lifted off the hinges to obtain entry.

5.2.3 Roller wheel shall be installed at the ends, as to carry the weight of the gate.

Note: The High Voltage (HV) yard gate shall be the swinging type as per generic drawing.

5.3. Sliding gates

5.3.1 All fittings, brackets and rear wheel tracks shall be standard manufactured products for the intended application.

5.3.2 Latches, stops, and keepers shall be installed as required.

5.3.3 Sweepers to be included on sliding gates.

5.3.4 Lubrication on hardware and other moving parts shall be possible.

5.3.5 Cover plates shall be provided to form part of gates on the hinges as to prevent tampering.

5.4. Gate Dimensions

5.4.1 The vehicle access gate shall consist of two 2.5m leaf gates opening to allow a 5m entry point.

5.4.2 A single 6m sliding gate shall also be an option for vehicle access points.

5.4.3 Runner wheels shall be used on double leaf gates.

5.5. Gate motor

5.5.1 The main entrances of certain sites shall be equipped with motorized gates. Where motorized gates are required, such gates such be sliding gates.

5.5.2 The gate motor shall be in compliance with requirements listed in CP_TSSPEC_237

6. PERIMETER SECURITY LIGHTS

6.1. Light requirements

6.1.1 Perimeter light shall form part of the perimeter detection system as to CP_TSSPEC_237

6.1.2 Light components as well as the design shall be compatible and comply with CP_TSSPEC_278

6.1.3 The service provider shall issue 3D designs to portray lux density and coverage.

6.1.4 Lights shall be used to complement and interoperate with CCTV specification as to CP_TSSPEC_294

6.1.5 The lights shall be positioned in series, on or along the inner fence, illuminating the no-man's land (Horizontally, vertically)

6.1.6 Column spacing shall be such that adequate lux is achieved covering the zone, the column area and the inside of the boundary wall as per attached drawing.

6.1.7 Tilting shall be such that glare is not put into camera lights.

6.1.8 PTZ camera lighting shall be fixed on camera, enabling light movement with camera.

6.1.9 Dome camera lighting shall be positioned such that the area below the dome is well lit and clear images are captured.

7. NO MAN's LAND

7.1 The no man's land shall consist of two perimeter lines separated by an area of ground, between the outer boundary wall and the inner fence.

7.2 The width of the no man's land shall be a minimum of 2.5m and 5 meter's depending on the size of the land being demarcated.

8. DOCUMENTATION

8.1 Technical catalogue for all the products including installation approval shall be provided.

8.2 Certificate of compliance for all materials and coatings.

8.3 Design drawings of perimeter fence, gates and lights.

9. QUALITY MANAGEMENT

A quality management system shall be set up in order to assure the quality during manufacture, installation, removal, transportation and disposal. Guidance on the requirements for a quality management system may be found in the following standards: ISO 9001:2015. The details shall be subject to agreement between the purchaser and supplier.

10. HEALTH AND SAFETY

A health and safety plan shall be set up in order to ensure proper management and compliance during removal, transportation and disposal of scrap. Guidance on the requirements of a health and safety plan shall be found in ISO 45001:2018 standards. 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 is adhered to during, removal, transportation and disposal of scrap. Guidance on the requirements for an environmental management system shall 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.

ANNEXURE A - BIBLIOGRAPHY

DSP0024 – Eskom specification for security fences

ANNEXURE B - REVISION INFORMATION

DATE	REV. NO.	NOTES
June 2014	0	First issue
March 2015	1	Second issue
September 2022	2	Third issue
		Added gate motor
		Added perimeter lights
		Changed title

Annex C - Technical Schedules A and B for REQUIREMENTS

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	4.2.	General Requirements		
	4.2.2.	The risk assessment report as to 4.2.2	Required	
	4.2.3.	All steel materials shall be galvanized or zinc coated steel and smooth with no joints.	Required	
	4.2.4.	Fence classification range from Substation outer perimeter to High Voltage (HV) yard area as to 4.2.4	Required	
	4.2.5.	Under-dig/ anti-burrow requirement of ±600mm.	±600mm	
	4.2.6.	All equipment shall be assembled in SA and meet local content requirements (DTI).	Required	
	4.2.8.	The physical perimeter shall consist of an fence and an fence of 4.5m in height	4.5m	
	4.3.	Security Perimeter Fence		
	4.3.1	Hot dipped galvanized tubular posts	Required	
		Grade W 300	W 300	
		Curved 101.6mm x 4.5mm	Required	
		Capping plate. 3mm	3mm	
	4.3.2	Predrilled posts 11mm diameter holes	11mm	
		M8 bolts to fix cover plate to posts.	M8	
	4.3.3	Class 6, 103mm ID P.V.C x 2.58mm.	Required	
		wall thickness x 1500mm long sleeves	1500mm	
		Set in 500mm x 500mm x 1500mm 15MPA concrete foundation	Required	
	4.4.1	Covering plates required on all curved posts from ground to top of post flat steel required,	50 x 5mm	
		Predrilled with diameter holes for fixing mesh to post.	11mm	

Note: Ticks, Cross [√, X], Astrick [*], Word [Noted] or TBA ["To Be Advice"] shall not be accepted.

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

Full name of company: _____

Annex C - Technical Schedules A and B for REQUIREMENTS Continued

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	4.5.	Fixing Accessories		
	4.5.1	Cover plates to posts: galvanized cup-square bolts with galvanized washers and shear off nuts.	M8 x 150mm	
	4.5.2	Top rail to post & post at corners: galvanized cup square bolts with galvanized washers and nuts.	M10 x 40mm	
	4.5.3	Corner post bracket: with galvanized washers and shear off nuts.	M12 U-bolt Galvanized	
	4.6.	Welded wire mesh panels		
	4.6.1	The mesh panels shall be manufactured from high tensile Galfan coated wire as to SANS 10244-2:	Class A	
	4.6.2	Vertical wires shall be welded on either side of the horizontal wires.	Required	
	4.6.3	The vertical wires on the inside (City Power's Premises side) shall be to a.	height of 3000mm	
	4.6.4	The vertical wires on the outside shall be for the total) of the welded mesh panel.	Length 6000mm	
	4.6.5	All vertical wires shall be spaced at 4.6.5	76.2mm	
		All horizontal wires spaced at as to 4.6.5	12.7mm	
	a)	Inside apertures	72.2x 8.7mm	
	b)	Centre to center :	76.2x12.7mm	
	c)	Wire diameter :	4mm	
	d)	Width of panel :	3050mm	
	e)	Height of panel :	6000mm	
	f)	Tensile Strength of wire N/mm: square	600 – 900	
	g)	Weld strength :	60 – 80%	
	4.7.	Top rail		
	4.7.1	Angle Iron top rail.	50x50x5mm	
	4.7.2	Pre-drilled holes including to fix Razor Wire coil to angle iron top rail as to 4.7.2	50mm x 5mm plate	

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Annex C - Technical Schedules A and B for REQUIREMENTS

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	4.8.	Galvanizing		
	4.8.1	All Hot dipped galvanised posts, rails and cover plates as to ISO 1461	=>70 microns	
	4.9.1	Razor Wire Coil (1)	Required	
	a)	Barbed Tape Concertina Medium barb - Barbed Tape diameter	730mm	
	b)	Concertina Coil. Galfan coated as to SANS 10244-2	Class A	
	c)	(Maximum stretch –)	10000mm	
	4.9.2	Razor Wire Coil (2)	Required	
	a)	Barbed Tape Concertina dia. long barb - Barbed Tape	610mm	
	b)	Concertina Coil. Galvanised (Maximum stretch)	10000mm	
	4.10.	Erection of the fencing posts		
	4.10.1	After excavation of the fencing post holes shall be minimum 1300mm of the 103mm ID	Required	
	4.10.2	P.V.C sleeve with positioning bolt shall be set vertically in concrete foundation.	Required	
	4.10.3	Minimum of setting time before positioning posts.	5 days	
	4.10.4	After setting of concrete the top 200mm PVC sleeve shall be cut off before erection of posts.	Required	
	4.10.5	The PVC sleeves shall protrude through the 100mm concrete strip.	Required	
	4.10.6	Posts shall be aligned (vertically and at tops), plump, perpendicular and in the correct position as to 4.10.6	Required	
	4.10.7	All sleeves shall be encased in a concrete footing of 25/19 adequate size.	25/19	
	4.10.8	Note that all galvanizing shall be done after manufacturing of the posts.	Required	
	4.10.9	permission shall be obtained from City Power's management representatives as to 4.10.9	Required	

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Annex C - Technical Schedules A and B for REQUIREMENTS

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	4.11.	Concrete slab for outer security fence		
	4.11.1	A concrete slab shall be cast in situ along the inside of the external fence.	25/19mm	
	4.11.2	The dimensions of the slab shall be as specified from top of prepared ground level.	1000x100mm	
	4.11.3	The wire mesh panels of the fence shall be cast into the concrete slab.	Required	
	4.11.4	An expansion gap shall be provided at 3000mm intervals, to provide drainage and movement.	50mm wide	
	4.11.5	The wire mesh panels of the fence shall be cast into the concrete slab.	Required	
	4.11.6	The Section of mesh into concrete beam and in ground shall be bitumen dipped / covered up above ground level.	100mm	
	4.11.7	Civil construction shall include route preparations, and casting of concrete slab	1000mm wide	
		With welded mesh steel reinforcing to a nominal thickness of	100mm	
		Compressive strength of a minimum.	20Mpa	
	4.11.8	Installation of electrical services and cables in PVC Sleeves as to 4.11.8	50mm	
	4.11.9	The area underneath the concrete plinth shall be cleared of all vegetation as to 4.11.9	Required	
	4.11.10	The contractor shall allow and install a PVC sheet underneath the concrete slab, as to 4.11.10	250 micron	
	4.12.	Intermediate posts		
	4.12.1.	The grade of steel shall be as defined according to SANS 1431.	300WA	
	4.12.2.	The height of posts shall range depending on site requirements as to 4.12.1	2.4m, to 3m	
	4.12.3.	The length of extension arms shall be	700mm.	
	4.12.4.	The extension arm shall be bolted to the top of a post.	Required	
	4.12.5.	Posts shall include footplates application.	Required	
	4.12.6.	Earthing connection points on all posts.	Required	

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Annex C - Technical Schedules A and B for REQUIREMENTS

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	4.13.	Panel		
	4.13.1.	The panel dimensions shall be as to 4.13.1	±3m X ±2 m	
	4.13.2.	Panel aperture size (centres) shall be in a range of	±76 x 12mm	
		and wire diameter shall be	Ø 3mm.	
	4.13.3.	Panel reinforced with horizontal recessed bands (rigidity).	Required	
	4.13.4.	Panel shall have flanges along sides internal fixtures, all fixtures shall be on the inside.	Required	
	4.13.5.	Panel post shall have a flush panel post finish with no climbing aid.	Required	
	4.13.6.	The fence configuration shall not have any sharp corners.	Required	
	4.13.7.	The outer perimeter fence shall have an under-dig section.	Required	
	4.14.	No removable panel on the perimeter fence shall be allowed.	Required	
	4.15.1.	Strain eye bolts, hinge bolts, bolts and nuts shall comply with the requirements of. SANS 135	SANS 135	
	4.15.2.	M12 bolt with nut and washer shall be used for gate hinges, as per the generic drawings.	M12	
	4.15.3.	Bolts used shall be stainless steel security bolts with anti-vandal shear off nuts and washers.	Required	
	4.15.4.	The length of bolt as well as the size of nuts and washers used shall be appropriate for its application.	Required	
	4.16.	Earthing	Required	
	4.16.1.	Fence posts shall be installed so that they align with the earth mat as to 4.16.1	Required	
	4.16.2.	All gate leaves shall be bonded to the hinged gate posts using 70mm2 conductor as to 4.16.2.	70mm2	
	4.16.3.	In areas of high copper theft, the fence and gates shall be securely bonded to the earth mat.	Required	
	4.16.4.	All bolted earth connections shall be cleaned and filled with a joint compound tas to 4.16.4	Required	
	4.16.5.	The fence shall be earthed on both sides of any gate and at intervals not exceeding 20m	<=20m	

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Name in block letters Signature

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Annex C - Technical Schedules A and B for REQUIREMENTS CONTINUED

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	4.17.	Civil work and Foundations		
	4.17.1.	Designs shall be applicable to meet specific site conditions; as to 14.7.1		
	4.17.3.	Stepping per panel shall be 150mm from the tops of panels to be horizontal.	150mm	
	4.17.2.	Concrete work shall be in accordance to SANS 1200 and the concrete strength as to 4.17.2	25MPa	
	4.17.4.	Concrete anti-burrow shall be 100mm (wide) x 600mm (deep) between posts.	100 x 600mm	
	4.17.5.	The mesh shall be anchored into/onto the centre of the anti-burrow (see generic drawings)		

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PERIMETER FENCE

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 shall at least be more cost-effective than that specified by City Power.

Item	Sub clause of CP_TSSPEC_213	Proposed deviation

Tender Number: _____

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Annex C - Technical Schedules A and B for GATES

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	5.1.	Gate Requirements		
	5.1.1.	Swing or sliding gates shall be allowed depending on site conditions and management of access control.	Required	
	5.1.2.	Controlled both manually and or by means of an electrically controlled motor	Required	
	5.1.3.	Beams shall be provided to prevent closing of the gate while a vehicle is driving through.	Required	
	5.1.4.	The frame to be 60 x 40 x 2mm rectangular steel tubing	Required	
		Hot dipped galvanized to ISO 1461	ISO 1461	
		Min thickness 45 micron	45 micron	
	5.1.5.	Each gate shall consist of two leaves of same size.	Required	
	5.1.6.	Each section of the gate shall be secured to the gate post be means of at least 3 hinges. As to 5.1.6	Required	
	5.1.7.	The gate installed in such a way that the leaves can open in both directions.	Required	
	5.1.8.	Each gate shall be clad with the same mesh as that of the fence using similar cover plate & bolting system.	Required	
	5.1.9.	The gap between the bottom of the gate and the road surface shall not exceed 50mm	<=50mm	
	5.1.10.	A 6m wide sliding gate with perimeter gate	6m	
	5.1.11.	Gate frames and their extension arms shall be made of tube shaped steel.	Required	
	5.1.12.	The height of the gate shall be the same as that of the fence.	Required	
	5.1.13.	The mesh razor wire sections (single strand) shall coincide with the corresponding section on the fence.	Required	

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Annex C - Technical Schedules A and B for GATES Continued

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	5.2.	Swing gates	Required	
	5.2.1.	All connections and joints shall be welded to form rigid corner frames.	Required	
	5.2.2.	Hinges shall not twist or turn under the action of the gate, shall be so arranged that a closed gate cannot be lifted off the hinges to obtain entry.	Required	
	5.2.3.	Roller wheel shall be installed at the ends, as to carry the weight of the gate.	Required	
	5.3.	Sliding gates	Required	
	5.3.1.	All fittings, brackets and rear wheel tracks shall be standard manufactured products for the intended application.	Required	
	5.3.2.	Latches, stops, and keepers shall be installed as required.	Required	
	5.3.3.	Sweepers to be included on sliding gates.	Required	
	5.3.4.	Lubrication on hardware and other moving parts shall be possible.	Required	
	5.4.	Gate Dimensions	Required	
	5.4.1.	The vehicle access gate shall consist of two 2.5m leaf gates opening to allow a 5m entry point.	Required	
	5.4.2.	A single 6m sliding gate shall also be an option for vehicle access points.	Required	
	5.4.3.	Runner wheels shall be used on double leaf gates.	Required	
	5.5.	Gate motor	Required	
	5.5.1	The main entrances of certain sites shall be equipped with motorized gates.	Required	
	5.5.2	The gate motor shall be in compliance with requirements listed in CP_TSSPEC_237	Required	

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Item No. 2 – GATES

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 shall at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_213**	**Proposed deviation**

Tender Number: _____

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

Full name of company: _____

Annex C - Technical Schedules A and B for GATES Continued

Schedule A: Purchaser's specific requirements
Schedule B: Guarantees and technical particulars of equipment offered

Item	Sub-clause of CP_TSSPEC_213	Description	Schedule A	Schedule B
	6.1.	Light requirements	Required	
	6.1.1	Perimeter light shall form part of the perimeter detection system as to CP_TSSPEC_237	Required	
	6.1.2	Light components as well as the design shall be compatible and comply with CPTSSPEC_278	Required	
	6.1.3	The service provider shall issue 3D designs to portray lux density and coverage.	Required	
	6.1.4	Lights shall be used to complement and interoperate with CCTV specification as to CP_TSSPEC_294	Required	
	6.1.5	The lights shall be positioned in series, on or along the inner fence, illuminating the no-man's land (Horizontally, vertically)	Required	
	6.1.6	Column spacing shall be such that adequate lux is achieved covering the zone, the column area and the inside of the boundary wall as per attached drawing.	Required	
	6.1.7	Tilting shall be such that glare is not put into camera lights.	Required	
	6.1.8	PTZ camera lighting shall be fixed on camera, enabling light movement with camera.	Required	
	6.1.9	Dome camera lighting shall be positioned such that the area below the dome is well lit and clear images are captured.	Required	
	7.	No man's land,	Required	
	7.1	The no man's land shall consist of two perimeter lines separated by an area of ground, between the outer boundary wall and the inner fence.	Required	
	7.2	The width of the no man's land shall be a minimum of 2.5m and 5 meter's depending on the size of the land being demarcated.	State	
	8.	DOCUMENTATION	Required	
	8.1	Technical catalogue for all the products including installation approval shall be provided.	Required	
	8.2	Certificate of compliance for all materials and coatings.	Required	
	8.3	Design drawings of perimeter fence, gates and lights.	Required	

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Item No. 3 –Perimeter Lights

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 shall at least be more cost-effective than that specified by City Power.		
Item	**Sub clause of CP_TSSPEC_213**	**Proposed deviation**

Tender Number: _____

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ANNEXURE D – Stock Items

It is not intended that City Power shall keep stock of these items.