

MEERKAT NATIONAL PARK BOUNDARY FENCE - PROJECT SPECIFICATIONS

STANDARD SPECIFICATIONS

Standard Engineering Specifications

Although not bound in or issued with this document, the following SANS 1200 Standard Specifications for Civil Engineering Construction as approved by the Council of the South African Bureau of Standards shall form part of the Contract Documents. The Contractor shall be in possession of these Standard Specifications and their related SABS 0120 Code of Practice (latest edition) which apply equally and shall keep a copy thereof on site for reference by himself or the Engineer for the duration of the Contract.

SABS 1200 A	1986 :	General
SABS 1200 AB	1986 :	Preliminary and General Specification
SABS 1200 C	1980 :	Site Clearance
SABS 1200 DA	1988 :	Earthworks (Small Works)
SABS 1200 GA	1982 :	Concrete (Small Works)
SABS 1200 LE	1982 :	Stormwater Drainage

NOTES:

1. FOR THE PURPOSE OF THIS CONTRACT "SABS" IS TO BE REPLACED BY "SANS" FOR THE ENTIRE RANGE OF STANDARD SPECIFICATIONS.
2. COPIES OF THE STANDARDISED SPECIFICATIONS ARE AVAILABLE AT SANS, PRETORIA.

PROJECT SPECIFICATIONS

PREAMBLE

The Project Specification, consisting of three parts, forms an integral part of the contract and supplements the Standard Engineering Specifications.

C1.2.1 Contains a general description of the works, the site and the requirements to be met.

C1.2.2 Contains End-User Specifications (SANPARKS).

C1.2.3 Contains variations, amendments and additions to the Standard Engineering Specifications and, if applicable, the Particular Specifications.

In the event of any discrepancy between a part or parts of the Standard or Particular Specifications and the Project Specification, the Project Specification shall take precedence. In the event of a discrepancy between the Specifications, (including the Project Specifications) and the drawings, the discrepancy shall be resolved by the Engineer before the execution of the work under the relevant item.

1.2.1 GENERAL

PS.1 PROJECT DESCRIPTION AND SCOPE OF CONTRACT

This contract entails the construction of a new 2.4m high Predator Proof Boundary Fence to enclose the proposed new SANPARKS Meerkat National Park in the Northern Cape.

The works consists primarily of the following:

- a) Construction of a new 208 km, 2.4m high Predator Proof Boundary Fence.

PS.1.1 Description of Works

- Clearing and grubbing along proposed new fence line route (workspace width to be 2m on the inside of the property and 1m on the outside).
- Removing, maintaining and relaying topsoil along the route of the fence line.
- Setting out of the new 2.4m high predator-proof fence line.
- Excavation for bases to new fence posts.
- Construction of bases to new fence posts.
- Construct new triple straining box 150mm Ø Creosote treated pine poles consisting of 3 no. 150mm Ø 3.3m long vertical posts and 2 no. 2m long horizontal posts, bolted together with 13mm diameter threaded bolts with nuts and washers, tied together using 4mm winded wire cross bracing (1 km apart).
- Construct new double post straining box 150mm Ø Creosote treated pine poles consisting of 2 no. 150mm Ø 3.3m long vertical posts and 1 no. 2m long horizontal post, bolted together with 13mm diameter threaded bolts with nuts and washers, tied together with 4mm winded wire cross bracing (500m apart).
- Construct new single post straining post 150mm diameter Creosote treated pine vertical post 3.3m long (50m apart).
- Construct new 125mm diameter Creosote treated pine poles planted 500x500x800mm in ground compacted 3.3m long posts, fixed with 32mm staples (10m apart).
- Construction of new vehicular access gates - 40mm Ø x 4mm wall thickness tubing forming 2.4m x 4.5m wide and 2.4m x 2.4m wide gates framed with top, middle and bottom rail and with 5 no. vertical rails covered with wire netting and wire strands to match the fence, complete with fixing brackets, hinges etc. Including 70mm Master keyed padlock and chain.
- Construct new 2.4m high pedestrian access gates along the new fence line as indicated on the reference drawings.
- Reinstatement of all hardened areas to match existing (Asphalt/Concrete Roads and Walkways), where required.
- Reinstatement of grassed areas outside fence line workspace width (noted above).
- Spraying of weed killer along fence line route (within workspace width) as instructed by Engineer.
- Rehabilitation of the area to previous condition to be maintained.

Summary of Infrastructure

ITEM	TRADE	DESCRIPTION
1	POSTS	Intermediate posts -3.3m x 125-150mm diameter Creosote treated pine poles 9 Straining posts -3.3m x 125-150mm diameter Creosote pine treated poles
2	DROPPERS	-2.4m x 35-50mm Creosote treated pine poles
3	SCREENING WIRE	-13 No. high strain steel wire 2,24mm diameter strands - hexagonal wire netting 1500x75x1.8mm to wire strands, folded 300mm wide onto ground to form an apron
4	OTHER	-All posts must be at a minimum depth of 800mm -Straining boxes to be set in concrete bases -Straining posts (single posts) every 50m -Intermediate Straining box (double post) every 500m -Main Straining boxes (three posts) every 1km Droppers to be fixed at 2m apart

PS.1.2 Description of Site and Access

The Meerkat National Park is situated in the Kareeberg and Karoo Hoogland Municipalities, in the Administrative District of Carnarvon and Williston, in the Northern Cape Province.

PS.1.3 Nature of Ground and Subsoil Conditions

The Contractor is to make on site evaluations of the nature of the ground conditions and make provision in rates for work in poor to average subsoil conditions. In addition, the presence of soft to hard rock can be anticipated at various positions of construction. A Geotechnical Engineer is to be engaged to carry out a geotechnical investigation to establish the actual ground conditions along the length of the proposed new fence.

PS.1.4 Site Usage

The Contractor is to make all the necessary provisions to ensure that the site is kept safe, clean, and neat and trafficable by both pedestrians and vehicles at all times, where required. Traffic accommodation and careful planning will be essential throughout the duration of the contract. Care must be taken to ensure that there is minimal disturbance to environmentally sensitive areas that traverse the site to avoid any adverse environmental issues.

PS.1.4.4 Survey Control and Setting Out of the Works *(Read with SANS 1921 - 1: 2004 clause 4.15)*

The Contractor is to engage a Professional Topographical Surveyor to carry out a survey of the existing area along the path of the proposed new boundary fence. This information will be provided to the Client whereby verification of the setting out data will be done. The setting out information will then be made available on the

relevant drawing(s), on a separate schedule. The setting out of the works in total will be the responsibility of the Contractor. The Contractor is responsible for notifying the engineer of any discrepancies in this regard. At the end of the contract, the Contractor is to provide as built information for fence line constructed, and shall be included in the rates. No additional payment will be entertained by the client / engineer. Contractor will provide the as built data (in the formats Dwg, Word, Pdf, Visio, GIS shapefiles, kmz) drawing together with a set of hard copies, the as-built survey file will be released in a Civil 3D file.

The Contractor shall take special precautions to protect all permanent survey beacons or pegs such as bench-marks, stand boundary pegs and trigonometrical beacons, regardless whether such beacons or pegs were placed before or during the execution of the Contract. If any such beacons or pegs have been disturbed by the Contractor or his employees, notification will be given and the Contractor shall have them replaced by a registered land surveyor at his own cost.

PS.1.5 Management

PS.1.5.1 Management of the Works

PS.1.5.1.1 General

The Contractor is referred to SANS 1921: 2004 parts 1, 2, 3 and 5: Construction and Management Requirements for Works Contracts. These specifications shall be applicable to the contract under consideration and the Contractor shall comply with all requirements relevant to the project.

Certain aspects however require further attention as described hereafter.

PS.1.5.1.2 Quality Assurance (QA) (*Read with SANS 1921 – 1: 2004 clause 4.4*)

The Contractor will be solely responsible for the production of work that complies with the Specifications to the satisfaction of the Engineer. To this end it will be the full responsibility of the Contractor to institute an appropriate Quality Assurance (QA) system on site. The Engineer will audit the Contractor's quality assurance (QA) system on a regular basis to verify that adequate independent checks and tests are being carried out and to ensure that the Contractor's own control is sufficient to identify any possible quality problems which could cause a delay or failure. The Contractor shall ensure that efficient supervisory staff, the required transport, instruments, equipment and tools are available to control the quality of his own workmanship in accordance with his QA-system. His attention is drawn to the fact that it is not the duty of the Engineer or the Engineer's representative to act as foreman or surveyor.

Where necessary, the Contractor must arrange for the usual quality tests to be carried out on the works to ensure that all work is carried out according to and applying with the specifications. Final approval of the works, however, lies with the Engineer. It also remains the responsibility of the contractor to, beforehand, provide the Engineer with samples of materials, components and quality of workmanship for his approval.

PS.1.5.1.3 Security

Contractor shall provide security watchmen for the contract as he deems fit at no extra cost for the Employer. The Contractor must ensure that all his employees as well as the employees of his subcontractors are able to identify themselves as members of the construction team.

PS.1.5.1.4 Safety Measures

Suitable barricading and danger tape must be put around all open trenches and excavations near buildings or where such a trench or excavation may pose a hazard for pedestrians, animals and/or vehicles.

PS.2 PROGRAMME, METHOD OF WORK, AND ACCOMMODATION OF TRAFFIC

This Clause is to be read in conjunction with the provisions and obligations as contained in SANS 1921-1 and SANS 1921-2.

PS.2.1 Preliminary Programme

The Contractor shall include with his tender a preliminary programme on the prescribed form (List of Returnable Documents) to be completed by all Contractors. The programme shall be in the form of a simplified bar chart with sufficient details to show clearly how the works will be performed within the time for completion as stated in the Contract Data.

Contractors may submit tenders for an alternative Time for Completion in addition to a tender based on the specified Time for Completion. Each such alternative tender shall include a preliminary programme similar to the programme above for the execution of the works, and shall motivate his proposal clearly by stating all the financial implications of the alternative completion time.

The Contractor shall be deemed to have allowed fully in his rates and prices as well as in his programme for all possible delays due to normal adverse weather conditions and special non-working days as specified in the Special Conditions of Contract, in the Project Specifications and in the Contract Data.

PS.2.2 Programme in Terms of Clause 5.6 of the General Conditions of Contract

It is essential that the construction programme, which shall conform in all respects to Clause 5.6 of the General Conditions of Contract, be furnished within the time stated in the Contract Data. The preliminary programme to be submitted with the tender shall be used as the basis for this programme. The Contractor's attention is also drawn to Clause 5.7.3 of the General Conditions of Contract 2015.

The Contractor's attention is drawn to the fact that a number of factors will affect the programming of and method of carrying out the works. The more important of these are:

- 1) The Contractor is to allow for a one-month task within their programme, on the critical path, to undertake sectional completion requirements from the Client that will arise from the Contractors programming of works.
- 2) Attention must be paid to the accommodation of pedestrians and traffic during the period of the contract where the proposed fence may cross any pedestrian or vehicular crossings.
- 3) The Contractor shall allow for all signs, barricades, delineators, and temporary road markings under the applicable items, where necessitated.
- 4) Vehicular access is to be maintained at all times unless prior written permission to close the access has been obtained, by the Contractor, from the occupier, and approved of by the Engineer.
- 5) Those known, existing services in the area of the works have been depicted on the contract drawings. It is evident, however, that the status of existing service records as far as can be ascertained might not reflect the actual situation in the field.

PS.2.3 Requirements for Accommodation of Traffic

PS.2.3.1 General

The Contractor shall make provision for accommodating all pedestrian and vehicular movement in the area of the works. Allowance shall be made in the relevant rates for any barricades and signs required. Accommodation of traffic, where applicable, shall comply with SANS 1921-2: 2004: Construction and Management Requirements for Works Contracts, Part 2: Accommodation of Traffic on Public Roads occupied by the Contractor. The Contractor shall obtain this specification from Standards South Africa if accommodation of traffic will be involved on any part of the construction works.

Clause 4.10.4 of SANS 1921-2: 2004 shall be replaced with the following:

“Road signs and markings shall comply with the requirements of SANS 1200 MM and / or The South African Road Traffic Signs Manual - Volume 2: Roadworks Signing”.

PS.2.3.2 Basic Requirements

The travelling public shall have the right of way on roads, and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

The Contractor shall ensure that all road signs, barricades, delineators, flagmen and speed controls are effective and that courtesy is extended to the public at all times, where affected by the proposed construction.

The Contractor may not commence constructional activities affecting existing roads before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

PS.2.3.3 Traffic Safety Officer

Where warranted by traffic conditions on or near the site, the Contractor shall nominate a suitable member of his staff as traffic safety officer to be responsible for the arrangement and maintenance of all the measures for the accommodation of traffic for the duration of the project. Duties of the traffic safety officer shall be in compliance with the Occupational Health and Safety Act 1993 and the Construction Regulations 2003.

PS.2.3.4 Payment

The Contractor's rates for the relevant items in the Detailed Activity Schedule shall include full compensation for all possible additional costs which may arise from this, and no claims for extra payment due to inconvenience as a result of the modus operandi will be considered.

PS.2.3.5 Pedestrian movement

The Contractor shall make provision for accommodating all pedestrian movements in the area of the works. Allowance shall be made in the relevant rates for any barricades and signs where required.

PS.2.3.6 Temporary Reinstatement

Provided always that if in the course or for the purpose of the execution of the works or any part thereof any road or way shall have been broken up, then notwithstanding anything herein contained:

- b) If the permanent reinstatement of such road or way is to be carried out by the appropriate authority or by some person other than the contractor (or any subcontractor to him), the contractor shall at his own cost and independently of any requirement of or notice from the Engineer be responsible for the making good of any subsidence or shrinkage or other defect, imperfection or fault in the temporary reinstatement of such road or way, and for the execution of any necessary repair or amendment thereof from whatever cause the necessity arises, until the end of the period of maintenance in respect of works beneath such road or way until the Client authority or other person as aforesaid shall have taken possession of the site for the purpose of carrying out permanent reinstatement (whichever is the earlier), and shall indemnify and save harmless that Client against and from any damage or injury to the Client or to third parties arising out of or in consequence of any neglect or failure of the Contractor to comply with the foregoing obligations or any of them and against and from all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.
- c) Where the authority or person as aforesaid shall take possession of the site as aforesaid in sections or lengths, the responsibility of the contractor under paragraph (a) of this sub clause shall cease in regard to any such section or length at the time possession thereof is so taken, but shall during the continuance of

the said period of maintenance continue in regard to any length of which possession has not been taken and the indemnity given by the contractor under the said paragraph shall be construed and have effect accordingly.

This Clause is to be read in conjunction with the provisions and obligations as contained in SANS 1921-1 and SANS 1921-2.

PS.3 EXISTING SERVICES ON SITE

PS.3.1 Existing Services

The Contractor's attention is drawn to the existing services (electrical, fibre, telecoms, water, sewer, etc.) in the area. Although every effort has been made to depict these services accurately the positions shown must be regarded as approximate.

PS.3.2 Proving Underground Services

This clause must be read in conjunction with SANS 1200 Part DB Clause 5.1.4, the requirements of which shall be extended to cover all foundation construction operations in the vicinity of underground services.

It is stressed that all services in a particular area must be proven before commencing work in that area.

Insofar as excavations are concerned, where services are indicated on the drawings or where from site observations can reasonably be expected that such services are likely to exist where excavations are to take place, the Contractor shall without instructions from the Engineer carefully excavate by hand to expose and prove their positions.

The cost of the proving trenches should be included in the Activity Schedule.

When a service is not located in its expected position the Contractor shall immediately report such circumstances to the Engineer who will decide what further searching or other necessary action is to be carried out and shall instruct the Contractor accordingly.

Should any service be damaged by the Contractor in carrying out the works and should it be found that the procedure laid down in this clause has not been followed then all costs in connection with the repair of the service will be to the Contractor's account.

It should be noted that 33 000 Volt cables may only be exposed by the specialist personnel. The cables are usually protected and therefore if the protection is inadvertently exposed, excavation work must stop, and the specialist personnel shall be contacted immediately.

Proving of services shall be completed at least two weeks in advance of the actual programmed date for commencing work in the area. The position of these services located must be coordinated and levelled by the Contractor, and the information given in writing to the Engineer's representative.

The requirements of this clause do not relieve the Contractor of any obligations as detailed under Clause 4.17 of SANS 1921-1.

PS.3.3 Accommodation of Services

Further to Clauses PS.2 and PS.3 of this specification Contractors are to note that allowance must be made under this item and / or the appropriate rates, for all costs incurred as a result of complying with these clauses. It shall also cover liaison with the services organisations and accommodation of their work gangs / contractors on site.

PS.4 MANAGEMENT OF THE ENVIRONMENT

The Contractor shall pay special attention to the following:

PS.4.1 Natural Vegetation

The Contractor shall confine his operation to as small an area of the site as may be practical for the purpose of constructing the works.

The Engineer may direct in writing all trees and shrubs to be cut down and stumped. The natural vegetation, grassing and other plants shall not be disturbed other than in areas where it is essential for the execution of the work as directed by the Engineer.

PS.4.2 Fires

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of fire, the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires which may have been caused by him or his employees.

PS.4.3 Environmental Management Plan

In addition to the above, all requirements according to the Integrated Environmental Management Plan (SSA-0008B-019 - Integrated Environmental Management Plan (IEMP) for SKA Phase 1 mid-frequency array (SKA1_MID) in South Africa) will be adhered to. This will apply to the specific requirements pertaining to rehabilitation of the surrounding disturbed areas

C1.2. END USER SPECIFICATIONS

SOUTH AFRICAN NATIONAL PARKS (SANPARKS) SPECIFICATION: PREDATOR PROOF GAME FENCE (Rev. 3)

1. GENERAL DESCRIPTION

- 1.1 The length of required game fencing is specified in the Enquiry Document
- 1.2 The type of fence can generally be described as a non-electrified predator-proof big game fence.
- 1.3 Detail specifications for the fence are compiled for fences with timber posts for humid areas.
- 1.4 Timber poles to be ordered in the required lengths and pre-treated with Creosote to SABS 753. Should cutting of poles however occur, the newly cut ends must be treated to above SABS requirements.
- 1.5 The design and erection of gates is specified in the Enquiry Document.
- 1.6 The boundary will be staked out by the Contractor and bush-cleared by Contractor prior to the commencement of the contract, to a width of at least 3 metres. The fence must be erected on the cleared area, at a distance of 1 metres from the side of the bush-clearing facing the inside of the Park. The foliage can be gathered in piles along the fence line.
- 1.7 Weed killer to SANPARKS approval to be sprayed 500mm wide on both sides of the fence after completion of the contract only upon instruction from Engineer.

2. DETAIL SPECIFICATION

2.1 MAIN STRAINING BOXES

- 2.1.1 a) **Main Straining Boxes (Three posts)** conforming to the diagram given must be erected at:
 - i) every corner, change of direction or bend exceeding 5° change of direction in the fence line;
 - ii) at intervals of at least 1 000m along straight sections of the fence line;
 - iii) at both sides of each gate; and
 - iv) at significantly uneven terrain such as at river – and donga crossings and over ridges, as will be identified during construction by and at the discretion of SANPARKS.
- 2.1.2 The vertical and horizontal posts used in straining boxes must be Creosote treated pine poles with a minimum diameter of 125mm and at least a 3.5mm wall thickness and at least 3300mm long, bolted together with 13 mm dia. bolts, nuts and washers.
- 2.1.3 The poles must otherwise be erected in augured holes to a minimum depth of 800mm, back-filled and compacted to the satisfaction of SANPARKS.
- 2.1.4 To allow for drainage, the bases of these poles must rest on the soil at the bottom of the hole; i.e. the bases must not be sealed with concrete or a base plate
- 2.1.5 The height of these poles above ground level must be exactly 2 400mm.
- 2.1.6 Treated caps to be added to all vertical steel poles.
- 2.1.7 All welds or damage to the poles, bolts and nuts must be re-treated to the satisfaction of SANPARKS after erection of the poles.

2.2 INTERMEDIATE STRAINING BOX (Double Posts)

2.2.1 Intermediate Straining Boxes conforming to the diagram given must be erected at intervals of at least every 500m, halfway between Main Straining Boxes, wherever the Main Straining Boxes are more than 500m apart.

2.2.2 The vertical and horizontal posts used in straining boxes must be Creosote Pine treated poles with a minimum diameter of 125 mm and at least a 3.5 mm wall thickness and at least 3300 mm long bolted together with 13mm dia bolts, nuts and washers.

2.2.3 To allow for drainage, the bases of these poles must rest on the soil at the bottom of the hole; i.e. the bases should not be sealed with concrete or a base plate.

2.2.4 The height of these poles must be exactly 2 400 mm above ground level

2.2.5 Treated caps to be added to all vertical steel poles.

2.2.6 All welds or damage to the poles, bolts and nuts must be retreated similar to item 2.1.7 after erection of the poles.

2.3 **STRAINING POSTS (Single Posts)**

2.3.1 Straining posts conforming to the diagram given in Figure 4 must be erected at intervals of at least every 50m.

2.3.2 The straining posts used must be 125-150mm dia. at top ends Creosote treated pine poles, at least 3 300mm long.

2.3.3 The poles must otherwise be erected in augured holes to a minimum depth of 800mm, back-filled and compacted to the satisfaction of SANPARKS.

2.3.3 To allow for drainage, the bases of these poles must rest on the soil at the bottom of the hole; i.e. the bases must not be sealed with concrete or a base plate.

2.3.4 The height of these poles above ground level must be exactly 2 400mm.

2.3.5 Treated caps to be added to all vertical steel poles.

2.3.6 All welds or damage to the poles, bolts and nuts must be retreated similar to item 2.1.7 after erection of the poles.

2.3.7 A stay of at least 3 000 mm long x 125-150mm dia at top end Creosote treated pine stay for timber posts, must be embedded in the ground 1 800mm from the base of the post. The stay must be constructed on the side of the post on which the force of pulling the fence during construction is placed. Stays to be treated the same as straining posts.

2.4 **STANDARDS AND DROPPERS**

2.4.1 a) 3 050 mm Long Y profile metal standards must be spaced at 10m intervals between the straining posts and boxes.

Alternative:

2.4.1 b) 100-125mm Dia. at top ends Creosote Pine treated standards at least 3 000 mm long. Must be spaced at 10m intervals between the straining posts and boxes.

2.4.2 These standards must be sunk 600mm below ground level.

2.4.3 The height of standards above ground level must be exactly 2 400mm

2.4.4 Droppers: 2,4m Long Ridgeback spaced 2m/3,33m intervals.

2.5 **FENCE**

The basic specifications for the spacing of mesh and wire strands are illustrated in Figure 6.

The detailed specifications are listed as follows:

2.5.1 16mm dia. cables for elephant and river crossings, otherwise 6mm dia., to be strung to the inside of the Park prior to fencing at 600mm, 1500mm and 2 400mm above ground level respectively.

2.5.2 Secure approximately 300 mm wide apron in item 2.5.1 with Y-standard pegs, 400mm long spaced at 10m intervals if stone pitching cannot be done.

Alternative for mountainous areas:

2.5.4 b High strain steel wire with diameter not less than 2,24mm (as specified by SANPARKS), above the mesh described in 2.5.2.

2.5.6 All mesh, cable and wire strands must be tied with 2mm gauge binding wire, on the Park side of the fence, against poles, posts, standards and droppers with all loose ends of bindings pointing outwards.

2.5.7 Mark the fence at 1 km intervals with an 80 x 80 x 0.8mm heavy galvanised plate with the distance punched in 20 mm high figures and 2x6 mm dia holes drilled in top corners prior to galvanising. Attached markers to the cable 1,5m above ground level.

2.6 **DONGA, RIVER AND DRAINAGE LINE CROSSINGS**

Donga and stream crossings must be fenced according to the detail with the following specifications:

2.6.1 On each bank of the crossing, a Main Straining Box, as specified in section 2.1 of the specification document, must be erected

2.6.2 Directly against each Main Straining Box, but without any connection thereto, must be erected an Intermediate Straining Box, as specified in section 2.2 of this document.

2.6.3 Flood gate: 8mm dia welded steel mesh with 200 x 200mm pitch (Ref. 395), 1500mm high, hung onto the 16mm cable to form a hinged gate opening downstream across the river bed. Secure the mesh lightly to the cable at 600mm above ground level. Pave with stone, minimum 100mm dia x 600mm wide underneath the gate.

2.6.4 Protect the flood gate approx. 20m upstream by planting 250mm dia Creosote treated timber posts or 1,8m railway posts approx. 800mm deep and 3m apart cross the waterway. Secure 4x 16mm dia cables horizontally to the posts.

3. POLES FOR FENCING

3.1 DESIGN CRITERIA

a) Refer to tender drawings:

- I.L2000-0000-002 Rev C - MeerKAT National Park Boundary Fence Part Site Plan - Sheet 1 of 3
- II.L2000-0000-004 Rev C - MeerKAT National Park Boundary Fence Part Site Plan - Sheet 2 of 3
- III.L2000-0000-003 Rev C - MeerKAT National Park Boundary Fence Part Site Plan - Sheet 3 of 3
- IV.L2000-0000-005 Rev B - MeerKAT National Park Boundary Fence Typical Details-Sheet 1 of 2
- V.L2000-0000-006 Rev A - MeerKAT National Park Boundary Fence River and Donga Crossings Typical Details Sheet 2 of 2

3.2 MATERIAL

- a) The Main Five Straining Box shall consist of the following: 5no 110x 5mm 3300mm long posts and 3no 110mm x 5mm x 2000mm long post.
- b) The Main triple Straining Box shall consist of the following: 2no 110x 5mm 2000mm long posts and 3no 110mm x 5mm x 3300mm long post.
- c) The Intermediate Straining Box shall consist of the following: 1no 110x 5mm 2000mm long posts and 2no 110mm x 5mm x 3300mm long post.
- d) The Main Straining box single shall consist of the following: 1no 110mm x5mm x 3300mm long post.
- e) Intermediate Standard posts shall consist of the following: 1no 60mm x2.5mm x 3000mm long post.
- f) Dropper posts shall consist of the following: 1no 32mmx 2.5mm x 2400mm long dropper.
- g) The resin matrix shall be iso-polyester and must contain an UV inhibitor. The colour of the poles shall be as per the treated Creosote pole finish.
- h) The pultruded parts shall meet the following minimum mechanical properties according to **BS EN 13706-3**