

	<p align="center"><b>Scope of Works</b></p>	<p align="center"><b>Generation</b></p>
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Title: **Scope of Work for the fencing around Kriel Power Station Effluent Dams**

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## 1. Introduction

Kriel Power Station has been in commission since 1979. It is responsible for generating 3000MW of electricity to South African households daily and is classified as a National Key Point. Hence, station security is important for the continuous operation and functionality of the station.

A risk assessment on the unauthorised access to the stations effluent dams was done by environmental management at Kriel Power Station. The assessment highlighted the impact of unauthorised access to these facilities and the danger to the lives and livelihood of community members living close to the dams, as well as the loss of operating capability at Eskom Kriel Power Station. Eskom Kriel Power Station Ash Dams and servitudes remain open and easily accessible to members of the public. Therefore, the erection of the fence will serve as a barrier to protect Eskom property as well as to prevent injury to members of the public who may get injured on Eskom property.

## 2. Supporting Clauses

### 2.1 Scope

This document covers the engineering requirements in the form of a scope of work for the civil works that are to be covered by the *Contractor* to erect fencing around the effluent dams at Kriel Power Station. The overview of this document is to ensure that all construction and maintenance plans will align with the Civil Maintenance Execution Strategy. This is to ensure that maintenance for civil plant is managed in a co-ordinated and objective-driven manner, and that no plant items are neglected, due to their unintended omission from the plan. It is also intended to comply with the Eskom Generation Civil Manual and the OHS Act.

#### 2.1.1 Purpose

The purpose of the document is to outline the scope of work required by the Contractor for the erection of fencing around the effluent dams at Kriel Power Station.

#### 2.1.2 Applicability

This document is applicable for Kriel Power Station.

## 2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

### 2.2.1 Normative

[1] ISO 9001 Quality Management Systems

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- [2] Osh Act; Act 85 of 93 Occupational Health and Safety Act; Act 85 of 93
- [3] GGS 0462 Eskom Quality Requirement
- [4] NWS 1058 Safety at Construction Sites
- [5] PA/270/003 Safety Guide for Contractors
- [6] 240-99527377 Inspection Manual for Civil Works at Eskom's Power Stations
- [7] EAP0064 Maintenance Execution Strategy for Civil & Structures

### 2.3 Definitions

Definition	Description
Fence	Predictive maintenance carried out because of findings from analysis of parameters measured under a condition-monitoring regime, or from recommendations from reliability analysis.
Inspection	Activities, which by means of examination, observation or measurement, determine the conformance of material, parts, components etc., to predetermined specifications and quality requirements.
Maintenance	A combination of all technical, administrative and managerial actions during the life cycle of an item intended to retain it in, or restore it to, a condition in which it can perform its required function.
Repair	Restore (something damaged, faulty, or worn) to a good condition.
Replace	Action to provide something new in place of what is damaged or broken

### 2.4 Abbreviations

Abbreviation	Description
SOW	Scope of Work
QCP	Quality Control Procedure

### 2.5 Roles and Responsibilities

- The *Contractor* is to submit Quality Control Procedures (QCP's) to the *Service Manager* for the civil engineer on site to approve.
- The *Contractor* is to perform the work according to the method statement.
- The civil engineer is to assure that the work is being executed correctly, adhering to all applicable standards.

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- The onus is with the *Contractor* to familiarize themselves with the contents/requirements of the SOW and all referenced standards.

## **2.6 Process for Monitoring**

A risk assessment, site walk-down and mapping of the patrol roads have been done to assess the need as well as identify areas for fencing.

## **3. The Works**

### **3.1 Background**

A risk assessment on the unauthorised access to the stations effluent dams was done by environmental management at Kriel Power Station. The assessment highlighted the impact of unauthorised access to these facilities and the danger to the lives and livelihood of community members living close to the dams, as well as the loss of operating capability at Eskom Kriel Power Station. Eskom Kriel Power Station Ash Dams and servitudes remain open and easily accessible to members of the public. Therefore, the erection of the fence will serve as a barrier to protect Eskom property as well as to prevent injury to members of the public who may get injured on Eskom property.

### **3.2 Description of the Works**

1. The contractor is responsible for ensuring that all the necessary training for their personnel is complete and up to date. The contractor must also ensure that operators are trained to operate any equipment required for the earthworks, construction and installation of the fence completely (e.g. excavators, post drivers, small tools, etc.)
2. Site establishment must be executed in the areas specified in the Figures below, by the contractor as per the contractor's approved method statement.
3. All materials must be delivered to the Kriel site in the lay down area that will be identified during the site establishment phase of the project. All material will be inspected and approved by the client, Eskom, before installation as per Eskom quality control procedures
4. Stripping shall be done for the following reasons:
  - Where construction vehicles will be moving
  - Where temporary facilities will be placed such as toilets
  - Where the fence will be erected

The contractor shall strip the topsoil which includes the top 150mm of soil (or to the depth of the bedrock where the soil is shallower than 150mm) and root material of cleared vegetation, for subsequent use during rehabilitation. Topsoil shall be stripped from all areas of the working area where topsoil will be impacted by construction activities including areas for temporary facilities, as directed by the Engineer. Stockpile area shall be identified by Eskom power stations EO (environmental officer) for the contractor to comply to. Topsoil and subsoil stockpiles shall not exceed 2m in height and shall be so placed as to occupy the minimum width compatible with the natural

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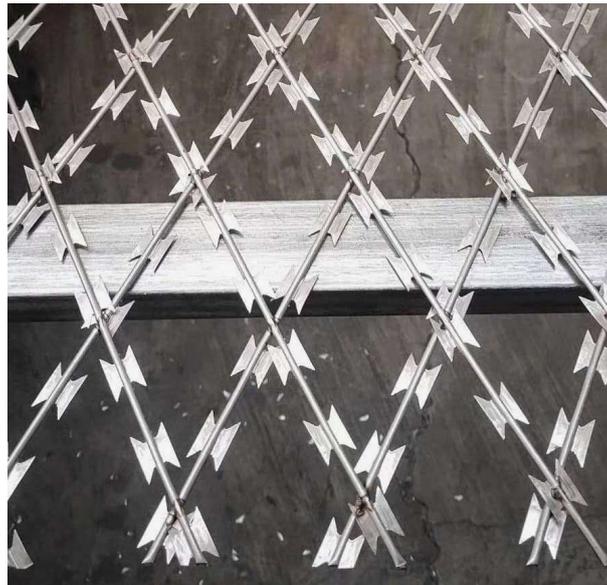
angle of repose of the material, and shall be taken to prevent the material from spreading over too wide a surface.

5. Clearing areas of all grass, weeds, shrubs, debris, including grubbing up all roots and cart away all vegetation and debris to indicated spoil areas. Once the clearing is completed the setting out will be carried out by the qualified Surveyor, according to the coordinates on the drawings prior to any excavation commences. All excavations work will be performed in accordance with method and specification under 1200D. The excavation material will be stockpiled at the designed areas approved by Eskom Kriel power station. Tipper trucks will be used to transport the top soil to the area of the stock pile. Compaction and backfill to be carried out to the specifics according to the inspection test method. Compaction of at least 90% of Mod AASHTO will be applicable on the backfill around fence mesh trench, fence post and G5 material and will be randomly tested by an independent laboratory.
6. Around the dams, the contractor is responsible for installing a 1.8 m diamond mesh – 1800 x 75 x 2.0mm with High pressure flat razor wire 2.24mm at the top and bottom of the fence. (High tensile and difficult to cut). This must include all support poles, carrier poles and corner poles.
7. Around the pump and panel area, the contractor is responsible for installing 1.8 m concrete palisade fencing with extra-long post to fit 500mm flat-wrap (flat razor wire) on top of concrete palisades as well as all post, pale and cross bars required.
8. All gates must be installed by the contractors and must have heavy duty lockable hitches
9. Safety warning signs to be installed as per SANS standards (every 50m). Safety warning sign must have hole in the middle to allow wind flow. Safety signage must consist of the following minimum description and in at least 2 languages (English & Zulu)
10. Labour will be supplied by the contractor to supervise on and off site activities, including normal & overtimes (Overtime work up to contractor discretion). All plant operators must have competent and certified operators. Supervisor (with safety training (HIRA) to conduct risk assessments) must be full time on site to supervise all work activities and required. Operators and/or General workers will be supplied by the contractor to execute the work activities.
11. Kriel Power Station Security required to patrol the fencing using the access roads surrounding the various dams. Security is required to (but not limiting to):
  - Map and schedule patrol route around fence (multiple access roads surround the cuts and dams)
  - Report any missing or damaged fencing for repair or replacement

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**Figure 1: Diamond Mesh Razor Fence**



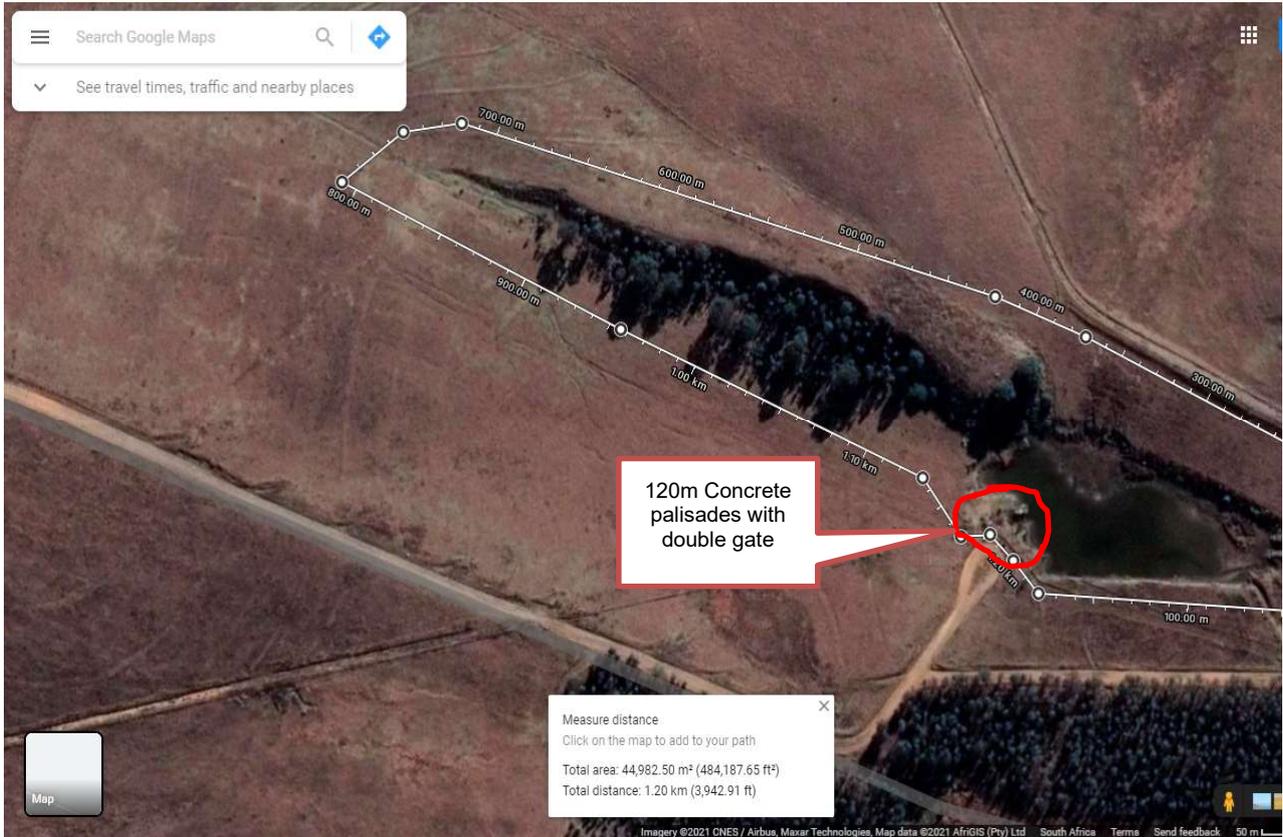
**Figure 2: Arrangement of Flat-Wrap Razor Wire**

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### CUT 1



### CUT 1B



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### CUT 2

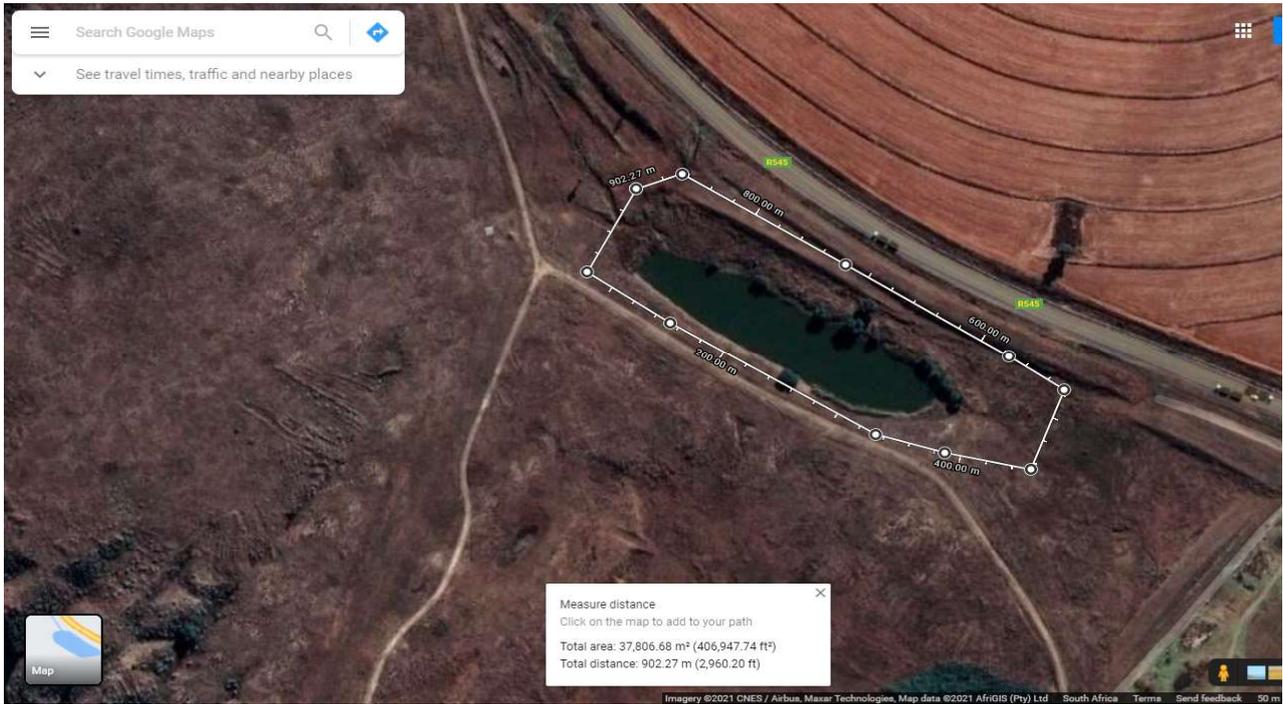


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**Cut 2B**



**Duck's pond**

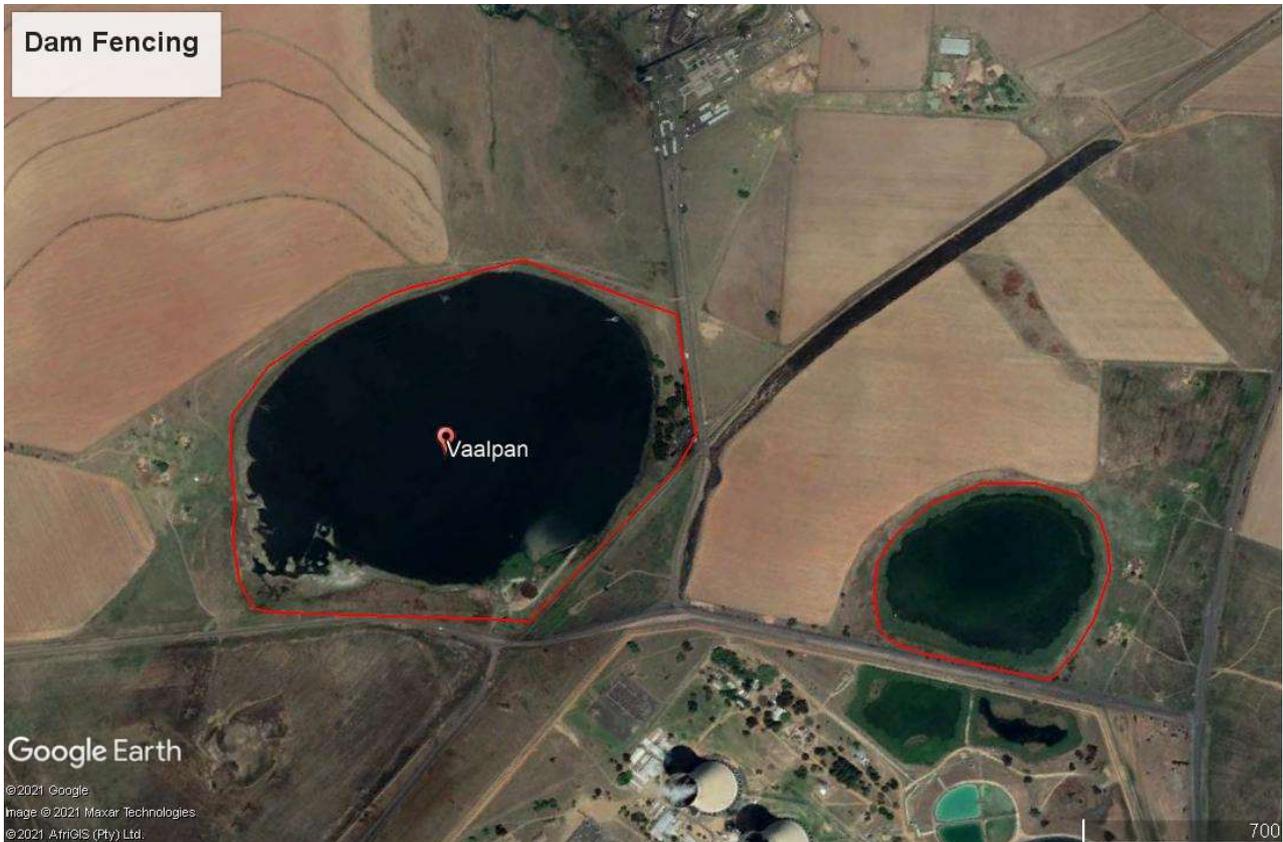


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## Vaalpan and Swartpan Dams



### 3.3 Standards

The following standards must be adhered to in the construction:

- SANS 1200
- SANS 10400 South African Building Regulations
- South African Pavement Engineering Manual (SANRAL)
- ISO 9001 Quality Management Systems
- National Environmental Management Act (NEMA) 107 of 1998
- 32-727 - Eskom Safety, Health, Environment and Quality (SHEQ) Policy
- Occupational Health and Safety Act No. 85 of 1993
- 240-105658000 (QM58) - Supplier Quality Management: Specification

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- 240-53113685: Design Review Procedure
- SANS 675

### 3.3.1 Standards, specifications and procedures

The following standards are applicable to the scope of *work* and shall be adhered to during the procurement, manufacturing, construction and erection and commissioning of the plant. Only the latest revisions of documents as at the time of tendering shall be utilised during the *works*. *Employer's* standards shall be supplied as latest revisions.

**Table 1: Standards and Codes for design, procurement, manufacturing, construction and erection and commissioning of plant**

Document Number	Title
<b>Eskom Standards</b>	
240-99527377	Inspection Manual for Civil Works at Eskom's Power Stations
EAP0064	Maintenance Execution Strategy for Civil & Structures
<b>General Standards</b>	
SANS 1200	Standardised Specification of Civil Engineering Construction
SANS 10162	The Structural Use of Steelwork
SANS 10100	The Structural Use of Concrete
OSH Act 85 of 1993	Occupational Health and Safety Act and Regulations Act 85 of 1993.
ISO 9001	Quality Management Systems.

## 4. Acceptance

This document has been seen and accepted by:

Name & Surname	Designation
H Mokabane	Kriel Engineering Manager
N Muthavhine	Kriel Auxiliary Plant Engineering Manager
J Bennett	Civil Engineer
N Nsele	Civil Engineer
MN Abdoola	Civil Engineer

## 5. Revisions

Date	Rev.	Compiler	Remarks
September 2021	1	MN Abdoola	New Document

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## **6. Development Team**

The following people were involved in the development of this document:

- Mohammed Nabeel Abdoola

## **7. Acknowledgements**

N/A.

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