



Terms of Reference

Technology

Title: **SCOPE & SPECIFICATION FOR
THE ACCESS ROAD REPAIR AT
UPINGTON SUBSTATION**

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1. Introduction

The temporary substation access road at Upington substation (located in the Northern Cape Province) began deteriorating in 2019 and has become worse with time.

A scope and specification document is required to make available the terms of reference for repairing the temporary access road such that it is comfortable and safe to drive on.

2. Supporting Clauses

2.1 Scope

This document covers the scope of work for the repair of the base course on the Upington substation access road.

2.1.1 Purpose

The purpose of the document is to make available the terms of reference regarding the scope of work for the repair of the base course on the Upington substation access road.

2.1.2 Applicability

This document shall apply to Substation Engineering Department within Group Technology in Eskom.

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.
- [2] TRH 13: Cementitious stabilizers in road construction
- [3] TRH 20: The structural design, construction and maintenance of unpaved roads
- [4] TMH1:1979. Standard methods of testing road construction materials. National Institute for Transport & Road Research C.S.I.R. Pretoria.
- [5] CSIR: The use and interpretation of the dynamic cone penetrometer (DCP) test
- [6] SANS 3001. Civil Engineering test methods
- [7] Site Investigation Code of Practice, 1st Edition, South African Institution of Civil Engineering - Geotechnical Division, January, 2010.
- [8] 240-96393507: Soil Resistivity testing for Substation application
- [9] 240-84699047: Geotechnical investigations scope and specification template

2.2.2 Informative

- [10] SANS 10160: Basis of structural design and actions for buildings; Part 5: Basis for geotechnical design and actions.

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2.3 Definitions

2.3.1 General

N/A

2.3.2 Disclosure Classification

Controlled disclosure: controlled disclosure to external parties (Both Discretionary and enforced by law).

2.4 Abbreviations

Abbreviation	Description
CBR	California Bearing Ratio
TMH	Technical Methods for Highways
SAICE	South African Institution of Civil Engineering
SAIEG	South African Institute for Engineering and Environmental Geologists
SANS	South African National Standards
SHE	Safety, Health & Environment
MTS	Major transmission substation
EA	Engineer Assistant

2.5 Roles and Responsibilities

The appointed Technician/Technologist/Engineer/Geologist shall ensure that this document is compiled with the standards noted in this document or any other approved appropriate form of literature and shall also ensure that the document is issued with all required associated documentation.

2.6 Process for Monitoring

Not applicable.

2.7 Related/supporting Documents

Site visit report: 22-10-19

3. Scope and Specification Information

3.1 Project Overview

3.1.1 Proposed Developments

The temporary substation access road at Upington substation (located in the Northern Cape Province) began deteriorating in 2019 and has become worse with time.

A scope and specification document is required to make available the terms of reference for repairing the temporary access road such that it is comfortable and safe to drive on.

3.2 Site Description

3.2.1 Location

Upington substation is situated in south east of Upington, in the Northern Cape Province. The centre coordinates of the proposed site are 28° 32'58.0985"S 21°08'20.3269"E.

3.3 Information Available

Reference is to be made 0.12/7758-1-1: Access and terrace road layout and details, for details of the base course layer.

3.4 Scope of Work

3.4.1 Repair of gravel wearing course

The access road is to be repaired due to corrugations and ravelling as follows:

- Heavy blading will be required on approximately 60% of the road in order to remove fixed corrugations observed on the road.
- The remainder of the road (40%) will require Light blading/light trimming.
- The blading should be carried out once the area that is to be repaired has been moistened using a water truck or during periods of average moisture. This is to ensure that material can be easily trimmed/cut. It is important that the material is moist before heavy blading is carried out.
- If blading is carried out during the dry season, the trimmed material should be graded towards the edges of the road.
- If blading is carried out during the wet season the trimmed material should be graded towards the centre of the road.

Reference should be made to the picture below to determine the level or amount of moisture associated with each month of the year for Upington town. Alternatively the most recent information can be found on

<https://weatherspark.com/y/86569/Average-Weather-in-Upington-South-Africa-Year-Round>

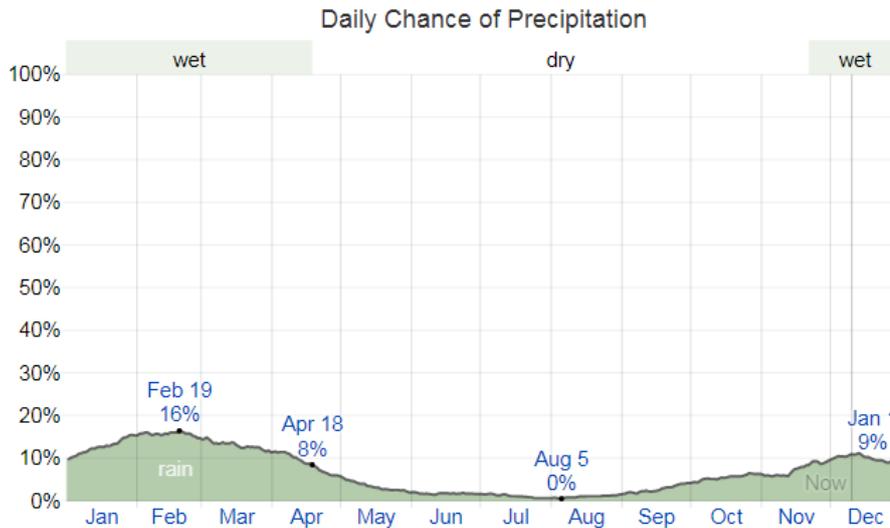


Figure 1: Upington daily chance of precipitation

3.4.2 Wearing course

An additional 100mm of wearing course as specified on drawing 0.12/7758-1-1 should be added to the existing road layers once the road has been graded and swept (should be completely free of dust)

3.4.3 Sealing of road

In order to protect the gravel wearing course layer from the abrasive and destructive forces of traffic and the environment thus eliminating any further ravelling and corrugating, the road should be sealed as follows:

Primer to be used	MC30
Type of seal to be used	S3(D<10) Graded aggregate seals - Double application (<10mm per layer)
Grading of sand	As per Table B3 – Manual 40
Dust content	Maximum 5% (2% preferred)
Aggregate grade	Grade B
Binder type	65% or 75% Cationic spray emulsion complying with SANS 4001–BT4
Spray rate	1.4 – 1.6l/m ²
Application rate of aggregate	200-100m ² /m ³ OR 120-100 m ² /m ³ if by hand
Aggregate spread rate	(0.015 m ³ /m ²) or 67 m ² /m ³

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Table 1: Grading specifications for Sand Seals and Sand Blinding (From Table B3: Manual 40)

Sieve size (mm)	Percentage passing by mass
7.1	100
0.300	0-15
0.150	0-2
Sand equivalent (%) (min)	35
Plasticity index	NP (Non plastic)

Standard specifications for road and bridge works for South African Road authorities as set out in COTO Chapter 10: surface treatments, will have to be adhered to as part of the works to seal the road.

3.5 Deliverables

3.5.1 Method statements

Method statement/s on how the scope of work will be carried out are to be provided to the substation engineering department for approval, prior to commencing with the repair of the access road.

a. As-built drawing/s

Drawing 0.12/7758-1-1 is to be updated to reflect work done to repair the gravel wearing course and seal the road.

3.6 Health, Safety and Environment

All work shall be carried out in accordance with the requirements of the Occupational Health and Safety Act (Act 85 of 1993) and the regulations accompanying this act will be adhered to where applicable and comply with Eskom's SHE specification. All employees shall be provided with adequate training for the tasks that they are required to perform including an awareness of the risks involved in the execution of their duties and the methods available for the mitigation of these risks. Safety induction and security clearance will have to be done prior to establishment of site (min 2 hours). A safety file shall be prepared for the project and medicals might have to be carried out and therefore costs thereof should be included in the quote.

3.7 Site Accessibility

The following is excluded from the contractors' responsibility:

- Arranging access (ESKOM responsibility)

4. Authorization

This document has been seen and accepted by:

Name and surname	Designation
Subhas Maharaj	Senior Manager
Andile Maneli	Middle Manager:
Sithembiso Mabena	Civil Engineer

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5. Revisions

Date	Rev.	Compiler	Remarks
21-11-21	1	Phenyo Mvuyana	Additional layer wearing course added as well as road sealing against possible carbonation

6. Development team

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

- Phenyo Mvuyana

7. Acknowledgements

Andile Maneli

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