	<p style="text-align: center;">SoW</p>	<p style="text-align: center;">Camden Power Station</p>
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Title: **Road Maintenance at Camden Power Station.** Document Identifier: **240-158550592**

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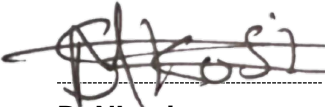

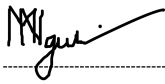

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 D. Nkosi Civil Engineer System	 O. Tilodi Auxiliary Engineering Manager Line	 M. Ngubeni Auxiliary Maintenance Line Manager	 M. Mathabatha Engineering Manager Line
Date: 2023/11/02	Date: 06/11/2023	Date: 06/11/2023	Date: 06/11/2023

Content

1. Introduction.....	3
2. Supporting Clauses	3
2.1 Scope.....	3
2.1.1 Purpose.....	3
2.1.2 Applicability	3
2.1.3 Effective date.....	3
2.2 Normative/Informative References	3
2.2.1 Normative.....	4
2.2.2 Informative.....	4
2.3 Definitions	4
2.3.1 Document:.....	4
2.4 Abbreviations	4
2.5 Roles and Responsibilities	4
2.6 Process for Monitoring.....	5
2.7 Related/Supporting Documents.....	5
3. Scope of Work.....	5
3.1 Description of work to be done	5
3.1.1 Potholes in asphalt surfacing.....	5
3.1.2 Hot-mix asphalt	6
3.1.3 Natural Gravel	6
3.1.4 Road Drainage Maintenance	7
3.1.5 Road Marking and Signage	7
3.2 Material	8
3.3 Hose Keeping.....	10
4. General	10
5. KKS Coding.....	10
5.1 Camden Power Station: 14-00.....	10
5.2 Drawings	10
N/A 10	
6. Revisions.....	10
7. Development Team	10
8. Acknowledgements	10
9. Appendix A.....	11
9.1 Gravel roads outside the station	11
9.2 Grave roads inside the station	12
9.3 Asphalt paved roads inside and outside the station	12

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1. Introduction

The access roads to Camden Power Station and inside and outside the station are being used by employees to reach the workplace and goods transportation. These roads require frequent maintenance to prolong the life span of the roadbed and to ensure safety of the road users.

2. Supporting Clauses

- National Road Traffic Act 1996(Act no 93 of 1996) and National Road Traffic Regulation 2000.
- The South African National Roads Agency Limited ("SANRAL") was established in terms of the South African National Roads Agency Limited and The National Roads Act, 1998 (Act No 7 of 1998) ("the SANRAL Act").
- SANRAL Act provides for the establishment of SAMRAL to manage and control the Republics national roads system and take charge of the development, maintenance, and rehabilitation of national roads within the framework of government policy.

2.1 Scope

2.1.1 Purpose

The purpose of this scope of work is to give information regarding the road maintenance Camden Power Station. Roads are an enormous national investment and require maintenance to keep them in a satisfactory condition and to ensure safe passage at an appropriate speed, and with low road user costs.

2.1.2 Applicability

This document shall be applicable to the following departments:

- Auxiliary Maintenance Department
- Auxiliary Engineering Department
- Environmental Department
- Safety Department.

2.1.3 Effective date

This document will be effective after it has been signed for Authorisation.

2.2 Normative/Informative References

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

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2.2.1 Normative

- [1] ISO 9001 Quality Management Systems
- [2] OHSACT
- [3] 240-142483465- Guidelines on Maintenance and Rehabilitation of Roads
- [4] COLTO section 4203

2.2.2 Informative

N/A

2.3 Definitions

N/A

2.3.1 Document:

N/A

2.4 Abbreviations

Abbreviation	Explanation
COLTO	Committee of Land Transport Officials
CPS	Camden Power Station
G1-GS	Natural road layer material
ISO	International Organization for Standardization
N/A	Not Applicable
OHSACT	Occupational Health and Safety Act
SANS	South African National Standards
SOW	Scope of work
TMH/TRH	Technical Methods for Highways/Technical Recommendation for Highways

2.5 Roles and Responsibilities

- **Auxiliary Engineering Department** — Development and issuing of scope of work
- **Common Plant Maintenance** — Scope management and supervision of daily activities during execution.
- **Safety and Environmental Department** — Supervision of activities to ensure adherence to safety and environmental compliance
- **Contractor** - Scope of Work Execution.

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2.6 Process for Monitoring

- All activities shall be done as per the approved Quality Control plan/s to be developed by the Contractor and be accepted by the Client.

2.7 Related/Supporting Documents

As per 2.2.1

3. Scope of Work

The contractor shall provide all necessary management, supervision, administrative support, personnel, labour, material, tools, plant, miscellaneous supplies, and equipment necessary to successfully perform the required contained in this SOW. The roads at Camden are mainly asphalt and gravel, the asphalt roads have sections with concrete. These sections are along the old train rail which passes the roads inside the station, and the intersection at oak road to the coal stockyard.

3.1 Description of work to be done

3.1.1 Potholes in asphalt surfacing

- Prepare surface by cutting around damaged surface with a diamond saw.
- Remove failed material to the required depth.
- All loose and unbounded material must be removed.
- For small potholes (area <0.9 m²), both cold and hot mix patching materials can be successfully used to rebuild the top of the road surface. Repairs of shallow (<15 cm) potholes can be done using patching materials only when an appropriate repair process is used.
- For small but deeper potholes, where a softening of the base and subbase layers has occurred, prior to placing the patching material in the hole, the softened material must be recomputed back in place with the addition of more base aggregate if necessary.
- For large shallow potholes (>0.9 m², <15 cm deep), resurfacing the road using a variety of approaches like hot mix, cold mix, cold-in-place recycle, or similar proprietary processes work best.
- For large and deep potholes where there is a loss of strength in the entire structure (surface, base, subbase, and subgrade), deep patching is the only repair approach which will produce satisfactory results.
- Fill with layers of crushed stone or G4 material to within between 75 and 50 mm of surface.
- Seal around edges to prevent pothole from expanding.
- Seal joints properly to avoid letting in water and establishment of vegetation.

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3.1.2 Hot-mix asphalt

- Must comply with current specifications (COLTO section 4203).
- Minimum working temperature must be adhered to (varies with mix but usually 135°).
- Coat covering entire patched area should not be thicker than 75mm or thinner than 25mm.
- Cold-mix asphalt.
- Supplier/Contractor to use product or material that will give a good strong and durable patch.
- Material to be approved by the client.

3.1.3 Natural Gravel

- Should have properties as close as possible to existing material.
- Should comply with COLTO, (1998) and TRH 4/14.
- Compact to same density as original materials.
- Require similar permeability and strength.
- Edge break repairs.
- The damaged areas to be removed should be marked out clearly along the side of the road.
- Ensure that the area marked out covers the full extent of the damaged road edge.
- The loose material to be removed to a depth of a maximum 150mm.
- The entire exposed area to be coated with the diluted emulsion to assist in creating a bond between new and existing layer material.
- The bitumen stabilised material to be placed in the repair area and to the required level.
- The finished level should allow for a thickness of 40mm.
- Either hot mix or cold mix wearing material depending on the size of repair area.
- To allow for a compaction the loose asphalt should be about 10mm proud of existing road surface.
- The finished surface level should be checked with the straight edge in both directions.

Gravel road shoulder

- The existing shoulder gravel should be loosened along the length of the repair area.
- If required, additional material should be added.
- The gravel material is placed and moistened and compacted level with the outer surfacing.
- Ensure that this operation does not disturb or damage the new repairs.

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Gravel roads Cross-section

- Reshape the cross-section of the gravel road to promote adequate drainage. This shall include the road's shoulder and the adjacent drainage trenches. The intervals for this activity shall be as stated on [3] during the Contract's period.
- Repair depressed areas according to **240-142483465** [3].
- Execute chemical dust suppression using **dustex** or **similar approved material** on an *as and when required* basis during the Contract's period.

3.1.4 Road Drainage Maintenance

- As part of the Scope of work, the contractor shall repair damaged inlet drain structures, this shall also road kerbs and manholes.
- Contractor to clean the stormwater side drains of the roads on an as-and-when-required basis. This shall be for both gravel and asphalt roads.

3.1.5 Road Marking and Signage

a) Road marking

- No road marking shall be done until the setting out and pre-marking have been inspected by the client and the contractor's representative. The area to be marked shall be dry, free of damage and be cleaned (using mobile street sweepers or other) prior to marking. All temporary traffic control measures for the works shall be the responsibility of the Contractor.
- Personnel executing the works shall be experienced and qualified to operate the equipment and handling the road marking paint and chemicals thereof.
- Application of the road marking products shall be according to the manufacturer's instructions. The marking product to have a uniform thickness and a smooth surfaced cross-section throughout its entire length on the road.
- All spoiled markings to be removed permanently using methods that will not damage the road's surface and compromise the road's drainage.
- Pre-marking to be done using paint spots (10mm in diameter) of the same colour as the final lines, symbols, and marks. The paint spots to be not more than 1.5m apart to ensure marking accuracy.
- The dimensions and positions of the road markings shall be as indicated by the Technician. Road markings shall be constructed to accuracy within the tolerances given below.

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- **Width:** The width of the lines and other markings shall not be less than the specified width, nor shall it exceed the specified width by more than 10mm.

- **Position:** The position of the lines, letter, figures, arrows, retro-reflective road studs and other markings shall not deviate from the true position by more than 100mm in the longitudinal and 20mm in the transverse direction.

When an unbroken line and a broken line are painted alongside each other, the beginning and/or the end of the adjacent lines shall coincide.

When existing lines are repainted, the new marking shall not deviate more than 100mm in the longitudinal direction and 10 mm in the transverse direction from the existing marking.

- **Alignment of marking:** The alignment of the edges of longitudinal lines shall not deviate from the true alignment by more than 10mm in 15m.

- **Broken lines:** The length of segments of broken longitudinal lines shall not be shorter than the specified length or deviate by more than 150mm from the specified length.

- **LED solar cat eyes:** Supply and install flashing LED solar cat eyes on an as and when required basis. LED solar cat eyes to be installed properly as per national road act standard.

b) Road Signage

- Contractor to ensure that all road signs are cleaned and repaired when broken and replaced where missing.

3.2 Material

c) Hot mix asphalt

- Must comply with current specifications (COLTO section 4203)
- Minimum working temperature must be adhered to (varies with mix but usually 135°)
- Coat covering entire patched area should not be thicker than 75mm or thinner than 25mm

d) Cold-mix asphalt

- Supplier/Contractor to use product or material that will give a good strong and durable patch.
- Material to be approved by the client.

e) Natural gravel

- Should have properties as close as possible to existing material.
- Should comply with COLTO, (1998) and TRH 4/14.
- Compact to same density as original materials.
- Require similar permeability and strength.

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f) Chemical Dust suppression

- Application shall be done using a water tanker with nozzles that have been set to the manufacturer's recommended application pressure.
- The selected product must allow for timeous return to service of the road to traffic.
- The road's surface preparation and that of the of the product and application thereof must be according to the manufacturer's instructions. This includes the moisture content of the road's surface, mixing ratio of the product, etc.
- The application shall ensure that the product adequately penetrates and covers all parts of the roadbed.

g) Compaction

- Compact each layer to expected original densities.
- Base 98% Mod AASHTO
- Subbase 95% Mod
- Cemented materials 97% Mod.
- Upper selected 93% Mod
- Other layers 93% Mod

h) Signage

- All repair/replaced signage shall be according to the South African road traffic signs manual.

i) Road Marking Paint and other marking material

- Road marking to be done using water base and reflective methods and thermoplastic on identified areas. The paint shall comply with the requirements of SANS 731-1 type 1, type 2, or type 4 paint. The paint shall be delivered at the site in sealed containers bearing the name of the manufacturer and the type of paint. Marking shall be in accordance with SANS 731-1. The viscosity of the paint shall be such that it can be applied without being thinned down.
- Retro-reflective road -marking paint shall comply with the requirements of CKS 192 and SANS 731.
- The colours to be used shall be bright white, yellow and/or red, and black paint. The colour of the yellow and red paint shall be as specified in SANS 731. The black paint shall be used to remove/ erase undesired lines.
- The retro-reflective beads shall be glass beads that comply with the requirements for glass beads specified in CKS 192. The beads shall be delivered at the site in sealed bags, marked with the name of the manufacturer, the batch number, and an inspection seal of the SABS.

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3.3 Hose Keeping

The supplier needs to remove the waste generated during the work process.

4. General

N/A

5. KKS Coding

5.1 Camden Power Station: 14-00

5.2 Drawings

N/A

6. Revisions

Date	Rev.	Compiler	Remarks
08/10/2020	01	L. Mapukata	Original issue
02/11/2023	02	D.S. Nkosi	Document due for revision

7. Development Team

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

N/A

8. Acknowledgements

N/A

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9. Appendix A


9.1 Gravel roads outside the station

	Road	Dimensions
A		<p>Length: approx. 1.71km Width: Varies, max. approx. 12m</p>
B		<p>Length: approx. 3.45km Width: 6m</p>
D		<p>Length: approx. 1.27km Width: approx. 6m</p>
E		<p>Length: approx. 0.93km Width: approx. 6m</p>
F		<p>Length: approx. 1.27km Width: approx. 6m</p>

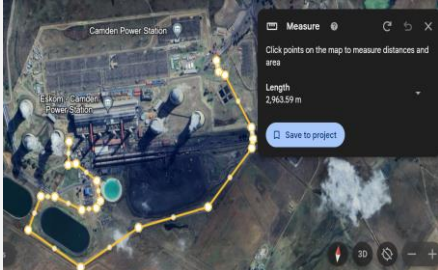

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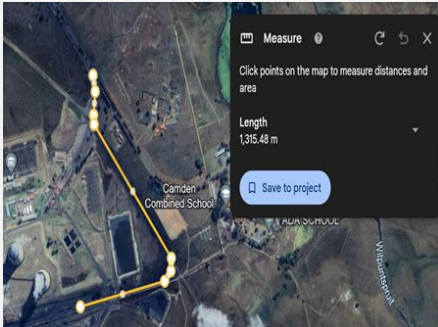
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H		<p>Length: approx. 2.08km Width: approx. 6m</p>
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9.2 Grave roads inside the station

	Road	Dimensions
A		<p>Length: approx. 2.97km Width: Varies, max. approx. 6m</p>
B		<p>Length: approx. 3.2km Width: varies, max: 6m</p>

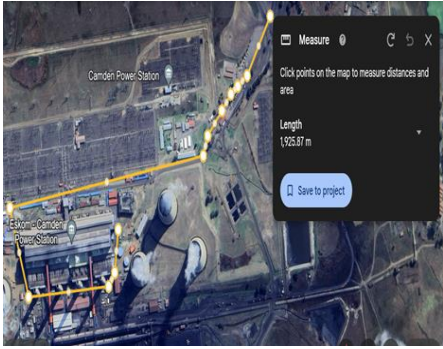
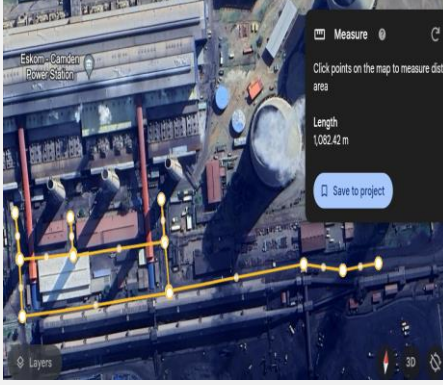
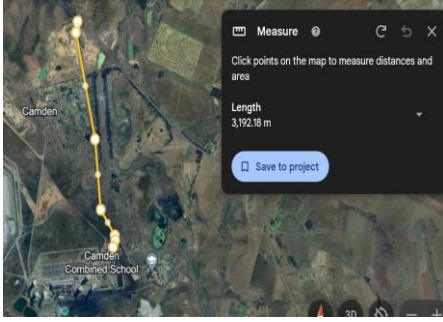

9.3 Asphalt paved roads inside and outside the station

	Road	Dimensions
A		<p>Length: approx. 1.32km Width: Varies, min. approx. 6m</p>

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<p>B</p>		<p>Length: approx. 1.93km Width: 6m</p>
<p>C</p>		<p>Length: approx. 1.09km Width: approx. 6m</p>
<p>D</p>		<p>Length: approx. 3.19km Width: approx. 6m</p>
<p>E</p>		<p>Length: approx. 0.35km Width: approx. 6m</p>

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