Eskom	Scope of Work – Substation Engineering	Technology

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1. INTRODUCTION

This document seeks discusses the scope of work for Leseding 3rd Transformer Project 500MVA 275/132 kV Transformer project at Leseding Substation. The 2017 Northern Grid Transmission Development Plan (TDP) has identified that the 2 x 500 MVA 400/132 kV transformation at Leseding Substation will exceed firm capacity in 2023 due to load growth in the area. The main trigger for this load growth can be attributed to an increase in mining activities and possible smelting operations in and around Leseding and Merensky substations. Leseding Substation is interconnected to Merensky Substation through the underlying 132 kV Distribution network and a 400 kV Transmission line. Upon further investigation, it was confirmed that Leseding Substation would exceed firm capacity, but the 2018 Groblersdal Master Plan suggested that this will only happen in 2025. The analysis went on to include civil works, hardware, structures, earth mat, oil traps, yard stone, trench covers, lighting etc. The designs makes use of standardised substation components ranging from steel supports, equipment, through to complete bay layouts, unless otherwise indicated on design layouts.

2. REFERENCES

[1] 240-55922824 Substation layout design guidelines
[2] Occupational health and safety act (OHS Act) 85 of 1993
[3] (32-1205) Eskom maintenance management policy
[4] (TST41-794) Substation and facility maintenance
[5] (32-727) Eskom safety, health, environment and quality policy
[6] (32-846) Operating regulations for high voltage systems
[7] (SANS 1200) General civil
[8] SANS 10400 – The application of the national Building Regulations
[9] National Building Regulations and Building Standards Act No. 103 Of 1977
[10] (240-109644476) - Standard for Implementation of Substation Layouts for Transmission Substations
[11] (240-1001183119) - Standard for Fences in Eskom Transmission Stations
[12] (240-139282493) – Security Lighting for Eskom applications
[13] (240-78980848) – Non-lethal Fence Specification

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3. SCOPE OF WORK

Note that this document must be used in conjunction with the asset specification, design report (Les23P04-SE-D87), design drawings (see item 3) as well as all specifications, procedures, guidelines and standards mentioned therein. Work will be performed in a live substation, and therefore all necessary safety procedures and precautions must be adhered to.

The civil engineering scope of work for this project includes the following:

- Extend 132kV busbar.
- Extend 132kV yard terrace to tie in to existing.
- Construct plinth for the third 1 x 500MVA 400/132kV transformer.
- Add a bus section (with associated bus zone protection) on the 132kV busbar.
- Equip and commission all new infrastructures at Leseding Substation with all associated primary and secondary plant.
- Upgrade safety and security fences to latest standard (Entire Substation).
- Install a Guard House, as per latest standard.
- Cater for storage area
- Refurbish Control room damages due to unstable ground conditions
- Install another 132kV Bus Coupler, to prevent islanding of a portion of the 132kV Busbar, with the installation of the New 132kV Bus Section.

3.1 ACCESS ROAD

- The contractor shall refurbish the existing road before the delivery of the new transformer according to LES23P04-SE-D39.

3.2 TERRACE

- The terrace to be extended according to LES23P04-SE-D38

3.3 TRANSFORMER

- New 500 MVA transformer will require a new plinth as shown on LES23P04-SE-D41 SHT 1
- Transformer 1 fire wall to be installed as per LES23P04-SE-D41 SHT 2

3.4 FOUNDATIONS

- New foundations required in the new and existing yards are captured on the following drawings:
    1. LES23P04-SE-D8/D9 – Foundation, trench and earth-mat drawing
    2. LES23P04-SE-D16 – Bay Layouts

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- Micropiles to be installed according to LES23P04-SE-D105

3.5 STEELWORK

- New steelwork required in the new and existing yards are captured on the following drawings:
    1. LES23P04-SE-D13 - Steelwork Marking Plan
    2. LES23P04-SE-D16 – Bay Layouts
    3. LES23P04-SE-D81 - Steelwork Proformas

3.6 FENCE

- Three tier security fences to be installed as shown on LES23P04-SE-D14
- Perimeter security lighting to be installed as shown on LES23P04-SE-E43

3.7 CONTROL BUILDING

- Existing control building to be upgraded according to LES23P04-SE-E47

3.8 ACCESS CONTROL BUILDING

- New access control building to be upgraded according to LES23P04-SE-E50

3.9 DRAINAGE

- The terrace extension requires stormwater drainage to LES23P04-SE-D40

3.10 HVAC & LIGHTING

- New access control building to be upgraded according to LES23P04-SE-E43.

3.11 FLOODLIGHT

- New floodlighting to be installed as shown on LES23P04-SE-E44.

3.12 DEMOLISHING

a) Demolish the existing concrete revertment wall, ensuring no damage to the existing HV yard during earthworks for the terrace extension.
b) Demolish the geo-cell concrete cut-off drain to enable its relocation to a new position for the installation of the three-tier fence (refer to drawing Les23P04-SE-D43).
c) Demolish a section of the safety fence within the 132kV yard and dispose of spoil material.
d) Remove piggy-backed non-lethal equipment attached to the safety fence and dispose of spoil material.

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3.13 OIL DAM

- Existing oil dam to be upgraded to the latest standard. Add in compartment wall, mesh and staircase. Refer to 0.54-3754-10 for details.

3.14 YARD STONE

- Yard stone to be installed as shown on LES23P04-SE-D14
- Yard stone to be topped up to at least 100mm across all HV yards, and with the latest specifications.

3.15 WASTE MATERIAL

a) Construction rubble must be disposed of, as per Eskom's environmental and waste disposal procedures.

b) Scrap steel and other material that will not be re-used will remain the property of Eskom, unless otherwise authorized, and is to be scrapped in accordance with Eskom's asset disposal procedures

c) Contractor to ensure that excavated contaminated material is disposed of at a registered landfill site.

4. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
Bilal Hajee	Chief Engineer – Civil
Andile Maneli	Middle Manager – Civil

5. REVISIONS

Date	Rev.	Compiler	Remarks
25 April 2025	1	Senzo Duma	First Issue

6. DEVELOPMENTAL TEAM

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

- Senzo Duma
- Anton Naude
- Jeanette Mathekga

7. ACKNOWLEDGEMENTS

None

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