



Scope of Work – Substation Engineering

Technology

Title: **Esselen 88kV Emergency
Bypass Primary Plant
Electrical Remaining Scope of
Work**

Unique Identifier:

CESS11P03-SE-E15

Alternative Reference
Number:

N/A

Area of Applicability:

Engineering

Documentation Type:

Report

Revision:

1

Total Pages:

7

Next Review Date:

N/A

Disclosure Classification:

**CONTROLLED
DISCLOSURE**

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1. INTRODUCTION

In the event of an emergency when the 275kV cannot be supplied from Esselen to Jupiter, a contingency supply of the 88kV needs to be sourced. The supply will be taken from the 88kV Feeder 11 (SAR Modder 2 Tee) which will be interrupted during this emergency, which will connect on the incoming 275kV line from Apollo. The Apollo 2 line will be isolated at the Apollo end for the duration of emergency. Section 2 of 275kV Busbar will be dedicated for the 88kV supply. Which is then fed through the 275kV Feeder 3 (Jupiter 1) to Jupiter MTS.

Work has been initiated in this regard. The purpose of this document is to outline the scope of work that is outstanding or remaining that is required to complete the project.

The Scope of work involves the following design aspects:

- Erection of Equipment
- Installation of Tubular Busbar
- Stringing
- Earthing

2. REFERENCES

- [1] 240-55922824 - Substation Layout Design Guideline
- [2] 240-109644476 - Standard for Implementation of Substation Layouts for Transmission Substations
- [3] 240-5592127 – Substation Engineering Product Realisation
- [4] South African Grid Code
- [5] Occupational Health and Safety Act (OHS Act) 85 of 1993
- [6] 32-1205 - Eskom Maintenance Management Policy
- [7] TST41-794 - Substation and Facility Maintenance
- [8] 240-43008621 - Eskom Generation and Wires Operating policy
- [9] 32-727 - Eskom Safety, Health, Environment and Quality policy
- [10] 32-846 - Operating Regulations for High Voltage Systems
- [11] IEEE 80 - Guide for Safety in AC Substation Grounding
- [12] TSP41-1009 - Standard for Labelling Outdoor High Voltage Equipment within Eskom Transmission Substations
- [13] 240-53459042 – Process Control Manual (PCM) for Perform Substation Engineering
- [14] 240-46977482 – Process Control Manual (PCM) for Perform Technical Assessment
- [15] 240-93393507 – Soil Resistivity Testing for Substation Application

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- [16] 240-101940513 - Earth Electrode Resistance Measurement standard
- [17] 240-95773230 – The Transmission Earth Fault Application Guide
- [18] 0.54/393 – Transmission Substation Earthing Standards
- [19] DST_34-1245 – Substation Earthing
- [20] 240-53113685 – Design Review Procedure
- [21] 240-606480018 - Terms of Reference for Design Review Teams presiding over Power Delivery Infrastructure Designs in Eskom
- [22] 240-109589380 – Direct Lighting Stroke Protection of Substation
- [23] 240-82736997 - Stringing, Cabling, Earthing & Erection Specification for Transmission Substations
- [24] 240-53113927 - Specification for Substation Clamps for Stranded Aluminium Conductors
- [25] Asset Spec
- [26] Technical Tender Evaluation Strategy for Stringing, Earthing & Erection at Esselen
- [27] Technical Tender Evaluation Strategy for Tubular Conductor

3. THE SCOPE OF WORK IS AS FOLLOWS:

3.1 ERECTION OF EQUIPMENT

- Install the 275kV Bypass Isolator
- Install the 12 x 275kV PI's
- Install the 9 x 132kV PI's.

3.2 INSTALLATION OF TUBULAR BUSBAR

- Install the $\varnothing 200$ x 6WT Tubes as per as per the drawing 0.18/17324 Sheet 3 Rev 2 and 0.18/17324 Sheet 4 Rev 1.

Item	Tube Length	Quantity
1	4500	1
2	5000	3
3	8000	1
4	11600	1
5	18100	1
6	19600	1
7	20600	1

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- Install 130m Damping Conductor 1 x Centipede (1 x 400mm²)

3.3 STRINGING

- Complete all the stringing from Apollo 2 275kV line dropping down to tubes and from the 275kV Bypass Isolator to tubes. Refer to drawing 0.18/17324 Sheet 3 Rev 2, Sections A-A, B-B, C-C, D-D,E-E, F-F, G-G, H-H, I-I & J-J.
- Complete the stringing from the 88kV Feeder 11 (SAR Modder2 TEE) Gantry to 275kV Apollo 2 1st inline Strain Steel H-Pole.
- Re-String the 88kV Feeder 11 (SAR Moder 2 Tee) as per 0.18/17320 Sheet 45, Rev 4 using twin Bull (2 x 800mm²).

3.4 EARTH TAILS IN HV YARDS

Where missing, not installed or installed incorrectly:

- Install Earth Connections (2 x 10mm Copper Rods) as per 0.18/17324 Sheet 4 Rev 1.

4. LIST OF DRAWINGS

Drawing Title	Drawing Number
Esselen 88kV National EPP Bypass Layout & Details.	0.18/17324 Shtt 3 Rev 1
Esselen 88kV National EPP Bypass Layout & Details. Schedules & Notes	0.18/17324 Shtt 4 Rev 1
Esselen 88kV Feeder Bay 11	0.18/17320 Sht 45 Rev 4
Esselen 8275/132kV Yard Key Plan	0.18/17324 Shtt 4 Rev 4

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Figure1: Esselen Sustation

5. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
Derrick Delly	Chief Engineer - Substation Engineering Electrical
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6. REVISIONS

Date	Rev.	Compiler/s	Remarks
July 2025	1	F. Laka	The Scope of work has been revised to Separate the Electrical Scope of work document and Civil Scope of Work document.

7. DEVELOPMENTAL TEAM

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

- Fredda Laka

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8. ACKNOWLEDGEMENTS

- Derrick Delly

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