

**Scope of Work – Substation Engineering****Technology**

Title: Poseidon Temporary Emergency  
40MVA 220/66kV Transformer -  
Primary Plant Scope of Work

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### CONTROLLED DISCLOSURE

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## 1. INTRODUCTION

This document covers the scope of work to construct a Transformer Plinth suitable for a 220/66kV 80MVA unit,

The scope requires a storage plinth to host a spare Transformer 220/66kV 80MVA, the spare transformer will not be operated on the storage plinth but when required will be moved to the position of the failed transformer as a replacement.

The high level scope of work:

- Construction of a Transformer Plinth suitable for a 220/66kV 40MVA unit,
- Inclusion of all associated civil works related to the above mentioned Plinth (Runway, bund wall & connection to emergency oil trap system).

There are two 132kV yards at Poseidon MTS's. This project involves 132kV Busbars 1 and 2, which are housed in the yard referred to as 132kV Yard A. Busbars 3, 4 and 5 are located in Yard B, located northeasterly from the 400kV busbar.

This document ultimately serves as the Primary Plant: Electrical Scope of Work that is required to be completed for the Temporary Emergency 40MVA 220/66kV Transformer Project.

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## 2. REFERENCES

- [1] South African Grid Code
- [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] (240-43008621) - Eskom Generation and Wires Operating policy
- [6] (32-727) - Eskom Safety, Health, Environment and Quality policy
- [7] (32-846) - Operating Regulations for High Voltage Systems
- [8] (IEEE 80) - Guide for Safety in AC Substation Grounding
- [9] (240-84854974) – Continuity Measurement of Substation Earth Grid Systems
- [10] (240-46977482) Process Control Manual (PCM) for Perform Technical Assessment
- [11] (240-55922824) - Substation Layout Design Guideline
- [12] (240-109644476) - Standard for Implementation of Substation Layouts for Transmission Substations
- [13] (240-55921217) - Substation Engineering Product Realisation
- [14] Occupational Health and Safety Act (OHS Act) 85 of 1993
- [15] (SANS 1200) - Standardized Specification for Civil Engineering Construction
- [16] (IEEE std 80) - IEEE Guide for Safety in AC Substation Grounding
- [17] (TSP41-1009) - Standard for Labelling Outdoor High Voltage Equipment within Eskom Transmission
- [18] (240-53459042) - Process Control Manual (PCM) for Perform Substation Engineering
- [19] (240-46977482) - Process Control Manual (PCM) for Perform Technical Assessment
- [20] (240-53113927) - Specification for Substation Clamps for Stranded Aluminium Conductors.
- [21] (240-82736997) - Stringing, Cabling, Earthing & erection Specification for Transmission Substations.
- [22] (240-108982466) - Standard for HV Yard Stone in Eskom Substations
- [23] DST\_34-1245 – Substation Earthing
- [24] (Pos18P15-SE-D78) - Proforma for Substation Earthing Requirements

## 3. SCOPE OF WORK

Designs and construction are in accordance to [1] – [24]. All construction is to be carried out in accordance with Eskom's Safety, Health and Environmental Specification. Construction will be done in close proximity to other energized electrical equipment and therefore all necessary safety procedures must be strictly adhered to.

The detailed Primary Plant Scope of Work involves the following:

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### 3.1 DISMANTLING

No items to be dismantled as this is a new installation for primary plant electrical.

### 3.2 SUPPLY OF MATERIAL

The primary plant utilised in this design are specified below including estimated quantities and the applicable technical specifications. Only standard plant (equipment) as per the Eskom National Contracts, LAP or Adhoc Evaluation Contracts performed for this Project will be used.

#### 3.2.1 SUPPLYING OF TRFR PLINTH EARTHING

- i. Supply of Transformer Plinth Earthing with unique ID: Pos18P15-SE-D16 SHT 3B, see Table below:

SIZE	TYPE	QUANTITY
10 MM	ROUND BAR	25m
50 X 3 MM	FLAT BAR	28m
EARTHTAIL CONNECTION	50x3 FLAT BOLTED 0.54/393 SHT C26	6
50 X 3 mm Cu TO 10 mm diameter Cu	CONNECTION SHT C25 & C26	4
2 BY 10 MM	CRIMPET - 0.54/393 C5	12
50 X 3 mm Cu TO 50 x 3 mm Cu	BRAZED CONNECTION 0.54/393 SHT C5	9
"L" SHAPED EARTHING STUD ADAPTOR PLATE ( 2 HOLES ) 80KA		-

### 3.3 INSTALLATION OF TRFR PLINTH EARTHING

- i. Install new supplied 10 Dia Cu and 50 x 3 Cu earthing conductors, Crimpets, Earth Clamps, Bolted Earthtails and Brazed Connectors as per drawing – Pos18P15-SE-D16 SHT 3B shown on figure 2 below an extract:
- ii. Removal and piling(at a suitable position) of yard stone
- iii. The excavation of a suitable trench in which to connect the new 2 x 10mm round copper rods to the existing earth grid,
- iv. The backfilling and compacting of opened trenches
- v. The cleaning sifting and reinstallation of yard stone
- vi. Perform earthing continuity testing to establish the integrity connection of new to existing earth grids.

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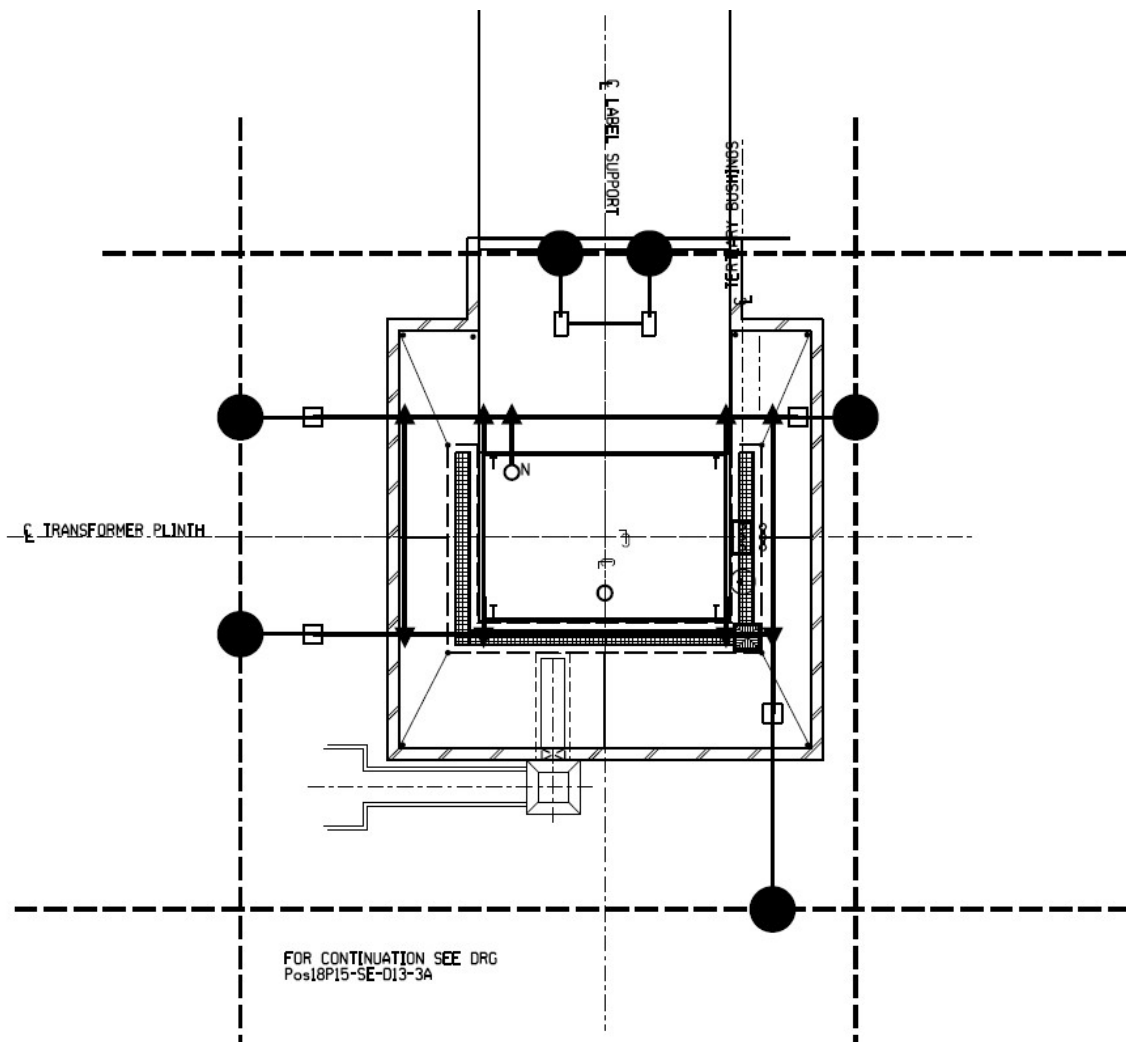


Figure 1: TRFR1 Tertiary bay earthing layout extract

#### 4. LIST OF DRAWINGS FOR POSEIDON MTS SITE

No.	Drawing Title	Drawing Number
1	Poseidon 132/66 kV Emergency Transformer Bay Plinth Earthing	Pos18P15-SE-D16 SHT 3B
2	Poseidon Foundation, Trench & Earthmat Layout	Pos18P15-SE-E3 SHT 0

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## 5. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
N Mazibuko	Engineer - Electrical
S Zulu	Chief Engineer - Electrical
S Maharaj	Senior Manager Substation Engineering

## 6. REVISIONS

Date	Rev.	Compiler/s	Remarks
January 2022	1	N Mazibuko	First Issue

## 7. DEVELOPMENTAL TEAM

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

- N Mazibuko

## 8. ACKNOWLEDGEMENTS

None

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