
 Eastern Cape Operating Unit Network Engineering & Design	TYPE B: SUBTRANSMISSION SUBSTATION FINAL DESIGN PACKAGE			
	VOLUME 2: PRIMARY PLANT			
	Project Name	Dimbaza Substation Refurbishment		
	Project Number	C.DS00073		
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August 2021

SCOPE OF WORKS

DIMBAZA 66/11kV SUBSTATION REFURBISHMENT REV. 3

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1. LOCATION OF SITE

This document outlines the work to be carried out in an existing Dimbaza 66/11kV Substation a restricted area. Dimbaza 66/11kV Substation lies approximately 25km south of King Williams Town on the Alice Road with GPS coordinates 320 49'48"S;27012'16"E.

2. INTRODUCTION

2.1 TRFR 2 & TRFR 3 66/11kV BAYS

Establish the TRFR 2 & TRFR 3 66/11kV Bays as detailed on D-EC-862 Sheet 7 and sheet 8. TRFR 3 66kV breaker and its support is to be taken down and be re-installed as TRFR 2 66kV breaker, once the existing TRFR 1 bay has been decommissioned.

Note: the previous contractor except for control and operating arms has installed new 66kV busbar 1 & 2 isolators. Install 66kV busbar 1 & 2 Isolator control and operating arms. Re- use the 66kV breakers, medium equipment supports and caps for 66kV CT's, 66kV Post Insulators and 66kV Surge Arrestors. Take down the existing TRFR bay stringer and glass insulator and replace with new conductor and new insulators. The jumpers are to be installed as D-EC-862 Sheet 8 Rev 5.

2.2 TRFR 1 66/11kV BAY

Decommission the existing TRFR 1 bay complete with the exception of the oil containment area, 11kV stringer and 11kV columns and beams. TRFR 1 and the NEC must be transported to KWT Stores. The rest of material is to be scrapped.

2.3 11kV BUSBAR 1

Establish a single Tubular busbar with VT's as detailed on D-EC-862 Sheet 07 Rev 5. 66kV Post insulators are to be used for tubular supports.

2.4 11kV FEEDER BAYS

Establish BCM 1 & BCM 2 11kV feeder bays as detailed on D-EC-862 Sheet 7 Rev 5. Install 3 x 630mm² XLPE cables with cleats and termination kits complete for each of the BCM 11kV feeders and terminate on the CSE. Terminations on the BCM switchgear will be the Municipality's responsibility.

3. HIGH LEVEL CONSTRUCTABILITY PLAN

PRE OUTAGE 1:

- Refurbish Trfr 2 & Trfr 3 bays
- Install 11kV busbar and feeder bays
- Restrung TRFR bay stringers

OUTAGE NO.1:


- Commission Trfr 3 bay and 11kV feeder bays.
- Disconnect TRFR 1 bay.

PRE OUTAGE 2:

- Decommission TRFR 1 bay. Note: TRFR 1 66kV breaker is to be installed as TRFR 2 66kV breaker and labelled as such
- Install TRFR 2 66kV breaker.

OUTAGE NO.2:

- Commission Trfr 2 bay.

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4. ORDERING OF CONTRCTOR SUPPLIED MATERIAL

There is material available and structures not fully installed on site. The contractor is to evaluate the existing structures with the Clerk of Works to identify for re-installation and re-use where possible. Also, the contractor with the Clerk of Work are to evaluate and identify if material on site can be used before any new material is ordered as indicated in the BOQ.

5. CIVIL WORKS

5.1 EARTH WORKS

Soft material excavations required are included in their respective activities (e.g. foundations, trenching, earth tails, cabling) in the BOQ, these are measured as supply and install. Only the extra-over excavation is measured separately.

The quantities provided in the BOQ are provisional quantities for intermediate excavations and shall be used as a contingency in the event soil conditions other than soft excavations are encountered.

5.2 TRENCHING

Install trench works to be done according to D-EC-862 Set 11 Sheet 11 Rev 5.

- Carefully remove cable trench covers and paving on the 2 x trenches in the area next to the control room and paving on the access road.
- Stack paving bricks and trench covers neatly within a designated area for later re-use.
- Widen the existing 750mm wide trench next to the access road into a 1500mm wide trench.
- Install a 6-pipe LV cable road duct below the existing access road in accordance with D-EC-862 Set 11 Sheet 11.
- Remove 10m long existing cable trench kerbing in the HV Yard for the installation of the two cable trench ramps.
- Install 4 x 10m long cable trench ramps.
- Install cable trench covers on all cable trenches.
- Ungrout 10mm gaps between the cable trench blocks every 5m to create water seepage through trenches.
- Re-install paving bricks on the access road and area next to the control room.

5.3 YARD STONE

Remove the existing layer of yard stone from the area where construction work is to be done. Stockpile and re-spread the yard stone to a layer thickness of 100mm after the work has been completed as indicated on D-EC-862 Sheet 11 Rev 5 (See Project Specifications).


5.4 FENCING

Decommission the existing razor mesh fence and non standard stone kerbing complete. Install earthing on palisade fence and gates and yard stone as detailed on D-EC-862 Sheet 4 and Sheet 11. Install fence labels on the palisade fence and gates.

Note: the contractor together with the Clerk of Works are to verify if the palisade fence has been earthed as per D-EC-862 Sheet 4 Rev 5 prior trenching and earthing are done on site. Provisional quantities have been provided for in the BOQ.

5.5 WEED KILLER

Spray weed killer on newly stoned and paved works area. Perform this task after all the stoning and paving has been completed (See Project Specifications).

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6. NEWLY INSTALLED SUPPORTS AND EQUIPMENT

All newly erected structures and equipment are to be checked for full installation and torqued.

7. CONDUTORS, CLAMPS & EARTHING

7.1 ELECTRICAL PHASING

Electrical phasing of the substation is to be done as per D-EC-862 Set 11 Sheet 1.

7.2 EARTHING

All steelwork is to be earthed to the foundation HD bolts. The 66kV Current Transformers and Voltage Transformer are to be earthed in accordance with the Project Specification. Install earthing balls on the equipment steelwork supports as detailed on D-EC-860 Sheet 4 Rev 6, the final position of earthing balls is to be negotiated with the Customer Network Centre.

The protection panels must be earthed using a 2 x (25 x 3mm) flat copper earth tail per panel, bolted to the panel and main trench earth. The isolator mechanical boxes and handles are to be earthed in accordance with the manufacture's isolator specification.

7.3 LIGHTING & LIGHTNING PROTECTION

Install floodlights in existing masts, the direction of floodlights are to be as indicated on D-EC-860 Set 11 Sheet 07 Rev 5.

Reposition the existing LM and re-install as detailed in D-EC-862-Sheet 5.

8. LABELLING

8.1 LABELS

Install new equipment labels, busbar labels and phasing discs as detailed on D-EC-862 Set 11 Sheet 1 Rev and D-EC-862 Set 11 Sheet 7. Labels are to be manufactured in accordance with the BOQ (See Label Schedule). Install fence labels and brackets as per (Project Specification).

9. CONTROL PLANT


9.1 LV CONTROL CABLES & PANELS

Install the secondary cables as per the cable block diagram. Note: The cable block diagram will be issued once the contract is awarded.

10. CONTROL BUILDING

10.1 BATTERY ROOM & EXISTING CONTROL BUILDING

- Repair the existing ceiling in the battery room as detailed on D-DT-5281 Sheet 1A Rev 1.
- Install battery room labels.
- Take down the existing battery door and install a new battery door as detailed on D-DT-5281 Sheet 3C Rev 1.
- Remove the existing floor paint in the control room, prepare area and install epoxy floor paint in the entire control room as specified in D-DT-5281 Sheet 1A Rev 1.
- Install modified trench covers complete as detailed in D-DT5280 Sheet 2A Rev 1.
- Repair toilet accessories, paint floors and install new doors on both toilets complete as per D-DT-5281 Sheet 3C and Sheet 5E Rev 1.

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11. CONSTRUCTION RISKS

<u>Risk</u>	<u>Mitigation</u>
Access: Substation is restricted area and public and visitors should not be allowed to enter without approval.	Induction training of both staff and visitors required.
Insects: Existing cabinets are often inhabited by bees, wasps and hornets.	Induction training of both staff and visitors required.
Gates: The substation is a restricted area and gates must be closed at all times.	Observe status of gates at all times.
Oil Spill: Some equipment is oil filled and extreme care must be taken when handling the same since the risk of an oil spill is high	Induction training of staff to include oil spill risk and action if a spill should occur.
Snake: Since the construction will take place during the summer the risk of encountering snakes is high.	Staff should be educated regarding the types of local snakes that may be encountered.
Porcelain: The equipment has in most instances porcelain insulators and extreme care must be taken when handling the equipment not to chip and/or break the insulators. Chipped insulators could render equipment unfit for use or injury.	Staff must be made aware of the risk and the correct lifting equipment must be used when lifting the equipment.
Close proximity: Should works be undertaken in an operational yard care must be taken when handling/erecting conductive components such as steelwork.	Induction training of staff to include risk associated with working in close proximity.

12. GENERAL

Two sets of project drawings have been issued with this document. The contractor to whom the tender is awarded must make his own copies of the drawings to use during construction. For ease of reading, references has been made throughout this document to relevant project specifications, it however remains the contractors responsibility to ensure the he/she complies to all specifications and standards relating to the Project.