

August 2021

**GOOD HOPE TEXTILE SUBSTATION**

**SCOPE FOR REFURBISHMENT  
PROJECT  
REV. 3**

**WEF116 (C.DS00074)**

## Scope of Works

### 1. LOCATION OF SITE

This is an existing substation situated at GPS co-ordinates 32°54'21.8" S and 27°25'46.8" E close to King Williamston.

### 2. HIGH LEVEL SCOPE OF WORK:

Complete the Refurbishment project of the 66kV yard.

- Completing the 66kV King Williams Town 1 feeder bay upgrade
- Install 66kV busbar isolators for King Williamstown 66kV feeder bay and 66kV Trfr 1 & 2 Bays
- Upgrade protection for 66/11kV TRFR 1- TRFR 2 bays and replace 66kV CT's.
- Install equipment labels
- Install jumpers and clamps

### 3. PHASING OF THE PROJECT

The following is the proposed implementation program. The phasing discussed below relates to a construction plan for outage related work.

#### 3.1 PRE-OUTAGE 1:

- Complete the refurbishment of the 66kV King Williams Town 1 Feeder Bay.
- Complete the scope for the 66kV Bus coupler.
- Complete the scope for the Trfr 1 66/11kV bay.
- Erect all remaining 66kV busbar isolators.

N.B. Note: An outage will required to connect the above mentioned bays to the 66kV busbars as the 66kV Busbar is live and all work to be done and planned in accordance with the ORHVS.

#### 3.2 OUTAGE 1

- Commission 66kV King Williams Town 1 Feeder Bay.
- Commission the 66kV Bus coupler.
- Commission the Trfr 1 66/11kV bay.
- Decommission Trfr 2 Bay from the 66kV Busbar.

#### 3.3 PRE-OUTAGE 2:

- Complete the scope for the Trfr 2 66/11kV bay.

N.B. Note: An outage will required to connect the above mentioned bay to the 66kV busbars as the 66kV Busbar is live and all work to be done and planned in accordance with the ORHVS.

#### 3.4 OUTAGE 2

- Commission the Trfr 2 Bay

## **4. SCOPE FOR 66KV YARD WORKS AND DECOMMISSIONING**

### **4.1 ORDERING OF CONTRACTOR SUPPLY MATERIAL**

There is existing material on site and the contractor is to evaluate the existing material with the COW to identify material which is available for re-use before ordering any new material indicated in the BOQ. Note: New isolator support are to be ordered.

### **4.2 FORT MURRAY 1 66KV FEEDER BAY**

Install phasing discs for the feeder bay as indicated on D-EC-1541-11-06.

### **4.3 KING WILLIAMS TOWN 1 66KV FEEDER BAY**

Complete the refurbishment of this bay by;

- Remove the existing 66kV Bkr support and secure the new support (which is erected already) in position. Install new 132kV single pole breaker inclusive of a breaker kiosk foundation indicated on D-EC-1541-11-05.
- Install busbar isolators complete with support, note that the isolator foundations are existing.
- Install isolator JB.
- The jumpers can be installed and connected as shown on D-EC-1541-11-08.

### **4.4 TRANSFORMER 2 AND 3 66/11KV BAY**

Complete the refurbishment of this bay by;

- Replace 66kV CT's for the Trfr 2 bay, note Trfr 1 CT's have already been replaced.
- Install busbar isolators complete with support, note that the isolator foundations are existing.
- Install M1 Cap on the small equipment supports for the CT's. Note additional holes will need to drilled for to fit the cap to the support and these holes are to be drilled by the steelwork supplier prior to galvanising.
- Install cable support brackets. Note the cable support bracket for the CT's are to be modified to fit the small equipment support.
- Install isolator JB.
- The jumpers can be installed and connected as shown on D-EC-1541-11-08.

### **4.5 66KV VOLTAGE TRANSFORMER**

Complete the refurbishment of this bay by;

- Install cable support brackets.

Install jumpers for the 66kV VT's.

Install jumpers, the jumpers can be installed and connected as shown on D-EC-1541-11-08.

### **4.6 66KV BUS COUPLER**

Complete the installation of this bay by;

- Install busbar isolators complete with support, note that the isolator foundations are existing.
- Install item EW6-9 and EW6-10 detailed on 0.54/327 for EW9.
- The jumpers can be installed and connected as shown on D-EC-1541-11-08.

### **4.7 66KV BUSBAR & STRINGERS**

Install busbar jumpers below beam to extend Busbar 1 & 2.

#### **4.8 EARTHING**

All steelwork is to be earthed to the foundation HD bolts inclusive of the columns. The Voltage Transformer and Current Transformers are to be earthed in accordance with the Project Specification and earthing Standard.

Install portable earthing balls on the equipment steelwork supports as illustrated on D-EC-5141-11-04 and final positions are to be confirmed by the Technical Services Officer for King Williams Town Technical Services Centre. The isolator mechanical boxes and handles are to be earthed in accordance with the manufacture's isolator specification.

The protection panels must be earthed using 2 x (25 x 3mm) flat copper earth tails per panel, bolted to the panel and brazed to the flat copper in the trench.

Install shield wire from EW3 to EW9 to EW10.

#### **4.9 STONING**

Stockpile the existing stone yard before work commences and re-spread on completion.

Spread yard stone in the substation yard, where required, after the work has been completed as indicated on D-EC-1541-11-05 (Project Specifications).

#### **4.10 TRENCHING**

Replace the existing covers when work has been completed. Note an activity has been included in the BOQ to replace missing/damaged trench covers. There are covers on site which are smaller than 750mm, when replacing these smaller trench covers the existing covers are to be measured and the new covers are to match the existing covers. The smaller trench covers are to be manufactured in accordance with D-DT-5254-1 Rev.0.

#### **4.11 DECOMMISSIONING**

Decommission all HV equipment, steelwork and foundation as specified on the BOQ.

Decommissioned material e.g. supports and equipment is to be placed in a demarcated area on site. Eskom PPM will evaluate equipment and Eskom will arrange for the removal of equipment from site, the contractor is to allocate time for this the construction program. When decommissioning temporary fence and temporary woodpole cable supports, suitable material is to be used and costed for to backfill the holes to the required compaction (See project specification for compaction). The material is to be included in the decommissioned activity in the BOQ.

#### **4.12 WEED KILLER**

Spray weed killer in the substation on stoned areas where work has been carried out (Project Specification).

#### **4.13 LABELS**

Install equipment labels, busbar labels and phasing discs as indicated on D-EC-1541-11-01 and label schedule. The existing busbar label brackets are to be re-used in their existing positions.

#### **4.14 EXISTING SUPPORTS**

All newly erected supports on the previous contract are to be checked and torqued.

#### **4.15 LV CONTROL CABLES**

Install the control plant cables where required. Note; The cable block diagram will be issued once the contract is awarded.

#### 4.16 CONTROL BUILDING

- **DC mechanical timer and DC light fittings:**

Supply and install a JSGUS or equally approved 60-minute mechanical timer mounted on a 100x100mm box 1,2m above floor level. The timer is positioned inside the relay room, near the main door.

Install one tube, per light fitting, that will be connected to the DC side of the distribution panel via the mechanical timer. Install these DC tubes and electrical accessories on the two light fittings in the centre of the relay room.

- **Air condenser unit:**

Remove the existing wall mounted air condenser unit brackets and the associated electrical equipment. The existing air condenser unit brackets are positioned outside of the control building (near the store-room door).

Install a new air condenser unit for the Control building on the position indicated on 5.17/3855 Rev 1. The air condenser unit must be positioned 2500mm above the ground level. The air condenser is to be compatible with the existing air conditioning unit.

- **Floor finish**

Remove existing floor paint on the relay room, store-room & toilet and make good.

Prepare the area and apply epoxy-based paint on the relay room, store-room and toilet floor. Prepared and apply paint to the manufacturer's specification. Paint colour to be light ship grey.

- **Checker plates and checker plates supports**

Supply new checker plates for the relay room extension. Checker plates should have red oxide primer, 1x universal undercoat and 2x finishing coats of approved Gloss enamel panel. Final coat colour to be light grey. Checker plates to have 2x 25mm diameter lifting holes on opposite ends.

Bolt the checker plate's supports (angle iron's) behind the control panel to provide support for the checker plates. Contractor to supply 2x M10 galvanised bolts, 2x nut and 2x flat washers per bracket.

- **Water tank tap**

Supply new water tank tap and secure to the existing water tank.

- **Water tank stainless steel straps**

Supply and install 19mm stainless steel strap to secure water tank to the existing water tank base. Existing hook bolts are in place to connect the stainless steels to the concrete base. See Picture 1 on Annexure A for water tank and water tank base.

- **Water pump**

Supply and install a water pump and bolt to the water tank base floor. The water pump must be a Jet Smart Composite 0.85kW pump. The water pump to have dry run protection with integrated automatic reset, spring loaded non-return valve and 32mm discharge port. The water pump should be complete with a PC15 pressure control unit. Use uPVC pipes to connect the water tank to the water pump.

- **Water supply pipe**

Supply and install a suitably sized uPVC water supply pipe and fittings from the water tank to the WC suite and toilet sink.

- **Toilet sink**

Supply and install water tap and plumbing accessories for the toilet sink as indicated on 5.17/3855 Sheet 1 Rev 1. See Picture 2 on Annexure A for existing toilet sink. Supply COC on completion of building electrical works.

- **Security gate**

Supply and install security gates for the store-room and toilet door. Single door security gates are to be manufactured and install as indicated on D-DT-5281 Sheet 4D. The padlock box is to be modified to be able to fit the Eskom padlock. Prior to manufacturing, the proposed modification should be provided to Eskom for approval.

- **Burglar bars**

Design a suitably sized burglar bar made out of 16mm round bars. The burglar bars should be fitted on the outside of the toilet, over the 900 x 600mm aluminium window and windblok. Prior manufacturing, the final design should be provided to Eskom for approval.

## 5. CONSTRUCTION RISKS

Risk	Mitigation
<p><b style="color: blue;">Access:</b> Substation is restricted area and public and visitors should not be allowed to enter without approval.</p>	Induction training of both staff and visitors required.
<p><b style="color: blue;">Insects:</b> Existing cabinets are often inhabited by bees, wasps and hornets.</p>	Induction training of both staff and visitors required.
<p><b style="color: blue;">Gates:</b> The substation is a restricted area and gates must be closed at all times.</p>	Observe status of gates at all times.
<p><b style="color: blue;">Oil Spill:</b> Some equipment is oil filled and extreme care must be taken when handling the same since the risk of an oil spill is high</p>	Induction training of staff to include oil spill risk and action if a spill should occur
<p><b style="color: blue;">Snake:</b> Since the construction will take place during the summer the risk of encountering snakes is high.</p>	Staff should be educated regarding the types of local snakes that may be encountered
<p><b style="color: blue;">Porcelain:</b> 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.</p>	Staff must be made aware of the risk and the correct lifting equipment must be used when lifting the equipment.
<p><b style="color: blue;">Close proximity:</b> Should works be undertaken in an operational yard care must be taken when handling / erecting conductive components such as steelwork.</p>	Induction training of staff to include risk associated with working in close proximity.
<p><b style="color: blue;">Asbestos:</b> When handling asbestos, care must be taken to ensure that it must not be broken, scratch or defaced in any way.</p>	Induction training for staff on how to handle asbestos.

## 6. GENERAL

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 drawings, BOQ & project specifications, it however remains the contractors responsibility to ensure the he/she complies to all specifications and standards relating to the **Project**.

## ANNEXURE A

**Photograph 1: Water tank and base**



**Photograph 2: Toilet sink**



**KING WILLIAMSTOWN SUBSTATION**

**SCOPE FOR PROTECTION UPGRADE  
PROJECT  
REV. 2**

**(C.DS00068)**

## Scope of Works

### **1. LOCATION OF SITE**

King Williamstown Substation is an existing substation situated in the King Williamstown area with coordinates: 27° 23' 8.9"E; 32° 53' 4.4"S.

### **2. SCOPE OF WORK:**

The modifications to the building have been complete, control plant panels and schemes will be installed in the control building and control plant cables will be installed according to the cable block diagram. Note; The cable block diagram will be issued once the contract is awarded.