

	Scope of Works	Technology
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Title: **Kusile Power Station  
Temporary Ash Laden Slurry  
and Belt Wash Water  
Temporary Control Facility** Unique Identifier: **366-387131**  
Alternative Reference Number: **N/A**

Area of Applicability: **Engineering**

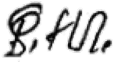

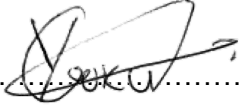
Documentation Type: **Scope of Works**

Revision: **01**

Total Pages: **14**

Next Review Date: **N/A**

Disclosure Classification: **CONTROLLED  
DISCLOSURE**

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## TABLES

### CONTROLLED DISCLOSURE

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## **1. INTRODUCTION**

Kusile Power Station Radial Stacker, Retaining Walls and Slab were awarded to P24B Contractor for design and erection. P23A Contractor executed the Radial Stacker Terrace and associated Drainage Facilities detail design and construction. The design of the radial stacker drainage facility did not take into consideration the ash slurry water properties and the radial stacker operations.

The drainage system design at Transfer House 8 is unable to drain ash laden water from the transfer house into the station drains as initially designed due to drain pipe blockages. The drainage system was designed to cater for only floor wash, and the belt wash system water did not form part of the drainage system design. The belt wash system is a continuous water spray system that requires continuous drainage within the Transfer House footprint, and as a result contaminated water spills into the environment. The additional water resulted in lack of drainage and pipe blockage, therefore causing ponding water on the foundation slab and contaminated water spillages into the environment.

Kusile Execution Team has been monitoring the operations on the radial stacker and Transfer House 8 & 9 after Unit 1 first coal fire. Based on the operations in these areas, there is a need for a temporary ash laden slurry and belt wash water temporary control facility.

This document will outline the scope of the temporary remedial works that are to be carried out on the above mentioned areas. This will also specify other requirements relating to the works.

## **2. SUPPORTING CLAUSES**

### **2.1 SCOPE**

#### **2.1.1 Purpose**

The purpose of this document is to define the scope of works required on the radial stacker slab temporary ash laden slurry and ash transfer house 8&9 belt wash water temporary control facility at Kusile Power Station.

#### **2.1.2 Applicability**

This document is applicable to Kusile Power Station.

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## 2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

### 2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] 203-770: Kusile Power Station Specification for Structural Concrete, Rev 4
- [3] SANS 1200 Series: Standardised Specification For Civil Engineering Construction
- [4] OHSACT Occupational Health and Safety Act, 85 of 1993.
- [5] Construction Regulations, 2014
- [6] 240-53114026 Project Engineering Change Management

### 2.2.2 Informative

- [7] 32-727 Safety, Health, Environment and Quality (SHEQ) Policy/Procedure

## 2.3 DEFINITIONS

Definition	Description
Contractor	Service provider contracted to provide a specific service to Eskom, Kusile Power Station.
Employer	Eskom, or Eskom Kusile Power Station or representative
Engineer	A registered Professional Engineer or a registered Professional Engineering Technologist specialising in and having experience in the design of civil works or structures

## 2.4 ABBREVIATIONS

Abbreviation	Explanation
KET	Kusile Execution Team
OHSA	Occupational health and Safety Act

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Abbreviation	Explanation
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
QMS	Quality Management System
SABS	South African Bureau of Standards
SANS	South African National Standards
SHE	Safety Health and Environmental
SOW	Scope of Work

## 2.5 ROLES AND RESPONSIBILITIES

### 2.5.1 Contractor

#### 2.5.1.1 Safety & Health Matters

The *Contractor* shall ensure:

- i) Compliance with all requirements of the Occupational Health and Safety Act no 85 of 1993 and its regulations so as to ensure the health and safety of persons carrying out the *Works*.
- ii) All employees are medically, physical and psychologically fit to perform the *Works*.
- iii) All employees undergo the relevant training as per their function requirement.
- iv) Compliance with Eskom's SHE policy, procedures, standards, guidelines, specifications and site regulations. Employees shall have a valid medical certificate of fitness specific to the work to be performed.
- v) Employees are informed of hazards identified in the risk assessment before commencement of *Works*. The Method Statement shall also be communicated to the employees on this work activity before commencement of *Works*.

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- vi) The emergency rescue plan shall also be communicated to personnel undertaking the *Works*.
- vii) All safety and health related incidents around site or working areas and threats that pose a danger to one's life or health are immediately reported.
- viii) Sufficient health and safety information as well as resources are made available.
- ix) All employees undergo safety induction on-site.
- x) All power tools will be inspected as and when required.
- xi) Prescribed PPE for the specified *Works* shall be worn at all times. The provision of PPE shall be the responsibility of the *Contractor*.
- xii) Correct site drawings are obtained and communicated to the employees undertaking the *Works*.

#### **2.5.1.2 Environmental Matters**

The *Contractor* shall ensure:

- i) Appropriate measures shall be undertaken to minimise the generation of dust from work activities
- ii) All environmental incidents are reported as guided by 32-95
- iii) The work area is kept clean, tidy and free of waster/rubbish. Waste shall be disposed in designated bins
- iv) Plant and machinery shall be equipped with drip trays. Oil refills for plant and machinery shall take place in designated areas

#### **2.5.1.3 Quality**

- i) The Contractor shall provide an inspection and test plan (ITP) or quality control plan (QCP) for the *Works*
- ii) All documents shall be approved prior to execution of *Works*
- iii) All quality procedures and verification points as per the project quality requirements or specifications shall be adhered to
- iv) All quality documents and records applicable to this Scope of *Works* shall be submitted for record keeping.

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## **2.6 PROCESS FOR MONITORING**

Not applicable.

## **2.7 RELATED/SUPPORTING DOCUMENTS**

Not applicable.

## **3. DOCUMENT CONTENT**

### **3.1 DESCRIPTION OF WORKS/ WORKS INFORMATION**

#### **3.1.1 Boundary of Scope of Works**

Kusile Power Station radial stacker slab and ash & gypsum transfer house 8 and 9 belt wash drainage facilities.

#### **3.1.2 Detail of Works**

- i) Materials selected for Works shall be pre-approved by the Engineer
- ii) Dimensions are to be confirmed on site prior to procurement and installation.
- iii) Arrangements are made timeously with the *Engineer* to witness and monitor the *Works* on site
- iv) A KET QA inspector is requested to inspect *Works* as and when required

#### **3.1.3 Construct Temporary Solution by Project Engineering**

The Employer provides temporary solutions for ash laden and belt wash water control during implementation of permanent drainage solutions for TH8 and TH9.

##### **3.1.3.1 Temporary Ash Laden Slurry**

The Contractor shall provide the following at the Radial Stacker Area;

- i) A pre-cast concrete barrier wall, for the length of the concrete barricade wall to be installed. Refer to the marked up drawing no: 366-238332.
- ii) An access road ramp made of G5 material on the northern side of the slab. The proposed ramp has a width =30m, length=10m and the highest point of the ramp is about 1m. Refer to drawing no: 366-238334 typical section A.

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The Employer shall provide the following at the Radial Stacker Area;

- i) Cleaning services on the existing eastern v-drains on a monthly basis. The v-drains to be cleaned once a month as well as the area below the eastern v-drain which is about 500 m<sup>2</sup>.
- ii) The estimated volume to be cleaned in the v-drains 284 m<sup>3</sup>. Refer to the attached drawing no: 0.90/160103 where the volume was taken, from control point – CP1 to CP3

### **3.1.3.2 Belt Wash Water Temporary Control Facility**

The Contractor shall provide the following at Ash & Gypsum Transfer House 8

- i) Replace flexible pipes connected under belt wash boxes with new steel pipes that extend from the belt wash boxes to the existing precast manhole sump.
- ii) Contractor to furnish piping including supports. A flanged 100mm pipe will be connected to an existing SANS 1123 (Table 1600K/3), field routed and supported on the existing structure to the existing precast manhole sump.
- iii) Provide pipe connection for the new steel pipes to the steel pipe.
- iv) Transfer House 8 belt wash box two extension steel pipes to the existing manhole are approximately 15m each.
- v) Make provision for emptying of manhole sump daily by mobile suction water tanker.
- vi) The return trip from transfer house 8 (precast manhole) to ADDD is approximately 4km. Suction truck to empty the manhole 6 times a day at a 4 hour interval.
- vii) Transfer house 8 existing temporary precast manhole volume is approximately 6 m<sup>3</sup>
- viii) Transfer house 8 existing temporary precast manholes to be cleaned before use.

The Contractor shall provide the following at Ash & Gypsum Transfer House 9

- i) Provide three water storage tanks of 30 000 liters volume combined. The tanks will be placed directly on the existing slab without plinths or stands.
- ii) Provide link pipes for the three tanks. The three tanks to be interconnections on the tanks top overflow outlets using approved tanks pipe connection fittings.
- iii) Remove the existing belt wash steel pipe up to the Y-piece and extend with the new steel pipe to the tank inlet.
- iv) Contractor to furnish piping including supports. A flanged 100mm pipe will be connected to an existing SANS 1123 (Table 1600K/3), field routed and supported on the existing structure to the proposed three tanks inlet.
- v) Provide pipe connection for the new steel pipes to the steel pipe.

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- vi) Transfer House 9 belt wash box extension steel pipe to the 1st tank inlet is approximately 10m.
- vii) The feeding pipe from the belt wash must feed from the top inlet of the first tank, and the over flow from the first tank to feed the two equalizer tanks via interconnection pipes for the three tanks.
- viii) Each tank must have a ball valve the bottom outlet of each tank for the cleaning of settled ash every two weeks.
- ix) Make provision for emptying of tanks daily by mobile suction water tanker. Suction by the truck from the top inlets of the tanks.
- x) The return trip from transfer house 9 (three tanks) to ADDD is approximately 3km. Suction truck to empty the each tank once a day (three tanks combined 3 times a day) at an 8 hour interval.

#### **3.1.4 Pipe Support Specifications**

The actual support and hanger dimensions and details are the responsibility of the Contractor. All supporting component design shall be checked by the Contractor for interference and obstructions with equipment and other plant components. A minimum of 2.3 m of clearance headroom shall be provided on walkways and a minimum of 3 m over maintenance aisle ways.

Where possible, supports shall be located on the building steel beams or columns of 200 mm size or larger and near changes in direction of piping. Supports shall not be attached to building structural angles, diagonal bracing, or truss members.

Hanger rods shall be constructed of solid round steel bars. Maximum allowable stress in a rod shall be 62 MPa at the thread root cross-sectional area, or 83 MPa in non-threaded rods. Eye rods shall have fully and neatly welded eyes with the cross-sectional area and strength of the eye greater than or equal to the cross-sectional area and strength of the rod.

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### 3.1.5 Coating

All exposed components of piping supports shall be painted in accordance with the Eskom Standard.

Standard	Description
240-101712128	Standard for the Internal Corrosion Protection of Water Systems, Chemical Tanks and Vessels and Associated Piping with Linings
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings

### 3.2 MATERIALS

The *Contractor* is to provide the necessary resources, equipment and materials required for the *Works* specified herein.

**Table 1: Belt Wash Drainage Pipe Material and Components**

Component	Material
<b>Plate</b>	
Carbon Steel	EN 10025-2-S355JR
<b>Pipe</b>	
Mild Steel	SANS 719 Gr B, SANS 62-1
Bolts and studs	<538° C, ASTM A193, Grade B7 >538° C, ASTM A193 Grade B16
Rods	Manufacturer standard per MSS SP-58
Nuts	<538° C, ASTM A194, Grade 2H >538° C, ASTM A194, Grade 7

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Component	Material
Post-installed expansion anchors smaller than M20	Federal Specification A-A-1923A, Type 4, Wedge Type Anchor; ASTM A307 GR A or B with ASTM A563 GR A nuts.
Post-installed expansion anchors M20	Federal Specification A-A-1923A, Type 4, Wedge Type Anchor; ASTM F1554 GR 36, ASTM A36, or ASTM A307 GR B with ASTM A563 GR A nuts.
Adhesive anchors M20 and larger	ASTM F1554 GR 36, ASTM A36, or ASTM A307 GR B with ASTM A563 GR A nuts
Miscellaneous steel including channel, angle, clip angles, etc.	EN 10025-2-S355JR, except for equal angles up to 50x50mm which shall be Commercial Quality (mild) steel

### 3.3 CODES & STANDARDS

Works shall be done in accordance with prescribed Eskom standards, applicable codes of practice, specifications and regulations. These include those stated in this document such as OHS Act and the Eskom Kusile Project Specific Safety Plan. However, they are not limited to these.

### 3.4 TOLERANCES

Tolerances shall be as specified in the relevant clauses of the applicable sections of the SANS standards and specifications. The Contractor shall ensure that tolerances are complied with.

### 3.5 GENERAL

- i) The *Contractor* shall carry out works as per applicable drawings, codes of practice, standards, specification and regulations.
- ii) All *Works* performed by the *Contractor* will be subject to an inspection.

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- iii) *Works* shall be performed at the highest standard and satisfaction of the *Engineer*. The *Engineer* shall have the authority to reject any work and materials, which is not in full accordance with best practices and approved standards, drawings and codes.

## **4. DELIVERABLES**

### **4.1 Contractor Submissions**

The *Contractor* is to provide:

- i) A Construction Schedule Plan and Cost for review and acceptance by the *Engineer*.

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## 5. DRAWINGS

The listed drawing shall form part of the Employer's Documents.

**Table 2: Employer's Documents**

Employer's Drawing No.	Rev No.	Title
366-238332	0	<b>Red Lined</b> - Radial Stacker Upgrade - Radial Stacker Slab General Site Plan
366-368003	0	Kusile Power Station – Terrace Coal and Ash Transverse Ash Conveyor (TAC 1 & TAC 2) – Belt Wash Drainage Layout and Details
0UZX-M6900-04	0	Double U-Bolt Anchor
0UZX-M6900-05	0	Single U-Bolt Anchor
0UZX-M6900-17	0	2 Bolt Clamp W/O Turnbuckle
0UZX-M6900-30	0	Cantilevered Steel Attached To Steel
0UZX-M6900-31	0	Cantilevered Steel Attached To Concrete

## 6. Documentation

There are no additional documents which will form part of the Employer's Documents:

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## 7. AUTHORISATION

This document has been seen and accepted by:

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## 8. REVISIONS

Date	Rev.	Compiler	Remarks
10 June 2020	0	Phathamandla Sithole	Initial Issue

## 9. DEVELOPMENT TEAM

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

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## 10. ACKNOWLEDGEMENTS

Not Applicable.

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