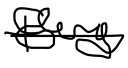
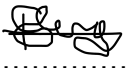
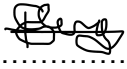


	<b>Scope of Work</b>	<b>Construction Services</b>
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<b>Title:</b> <b>Scope of Work for the Design, Construction, Refurbishment and Commissioning of Coal and Ash Conveyor Belts to be Executed by Eskom RoteK Industries at Various Eskom Power Stations for a period of 4 years on When and As Required</b>	<b>Unique Identifier:</b> <b>ERI-CS-BMH-OC003</b>	
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	<b>Disclosure Classification:</b> <b>CONFIDENTIAL</b>	

<b>Compiled by</b>	<b>Functional Responsibility</b>	<b>Authorised by</b>
<b>Koos Radebe</b>	<b>Koos Radebe</b>	<b>Koos Radebe</b>
		
.....	.....	.....
Date: 08 May 2024 .....	Date: 08 May 2024 .....	Date: 08 May 2024 .....

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## **1. INTRODUCTION**

Eskom Rotek Industries SOC Ltd is a wholly owned subsidiary of Eskom Holdings and through Construction Services will be appointing via a public tender the Contractor that can provide the design, construction and refurbishment of belt conveyors and works specified in this Scope of Work (SoW) at various Eskom Power Stations.

A Contractor must have adequate design and construction experience in coal and ash conveyor systems, low pressure services and dust handling plants and be able to offer design and construction support, supply of spares and materials and commissioning and should have established relationships with various OEMs supplying components associated with belt conveying system and other works as specified in this scope of work.

## **2. SUPPORTING CLAUSES**

### **2.1 SCOPE**

To design, procure materials, construct, refurbish and commission the belt conveyor system including other auxiliary works as specified in the scope of work for a period of 4 years on when and as required.

#### **2.1.1 Codes and Standards**

##### **2.1.1.1 Mechanical (BMH)**

- [1] 240-55864503 Belt Conveyor Mechanical Components Standard
- [2] 240-120532564 Splicing and Repairs of Steel Cord and Textile Plied Reinforced Conveyor Belting Standard
- [3] 240-55864504 Belt Conveyor Structural Steelwork and Welding Specification
- [4] ISO 5048 Continuous mechanical handling equipment – Belt conveyors with carrying idlers – Calculation of operating power and tensile forces.
- [5] SANS 1313-1 Conveyor belt idlers Part 1: Troughed belt conveyor idlers (metallic and non-metallic) for idler roller rotational speeds of up to 750 revolutions per minute
- [6] SANS 1313-2 Conveyor belt idlers Part 2: Link suspended idlers and fixed-form suspended idlers (metallic and non-metallic) for idler rotational speeds of up to 750 revolutions per minute
- [7] SANS 1313-3 Conveyor belt idlers Part 3: Performance specifications for troughed belt conveyor idlers (metallic and non-metallic) for idler roller rotational speeds of up to 750 revolutions per minute
- [8] SANS 1173 Conveyor belting - General purpose textile-reinforced construction
- [9] SANS 1669-1 Conveyor belt pulleys Part 1: Pulley types, construction and dimensions
- [10] SANS 1669-2 Conveyor belt pulleys Part 2: Lagging
- [11] 240-119637905 Belt Conveyor Design Review Standard
- [12] 240-55864457 Belt Conveyor Design Manual
- [13] 240-55864479 Belt Conveyor Chute Design Manual
- [14] 240-55864498 Operation and Selection of Fluid Couplings for Belt Conveyor Drives
- [15] 240-5586455 Magnetic Separators and Metal Detectors Standard
- [16] 240-55864550 Mass Meters for Coal Measurement in Power Stations Design Standard
- [17] OHS Act Occupational Health and Safety Act, 1993

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#### **2.1.1.1.2 Electrical**

- [18] 240-56227443 Requirements for Control and Power Cables for Power Stations Standard
- [19] 240-53114214 Cabling and racking standard
- [20] 240-56357424 MV and LV Switchgear Protection Standard
- [21] 240-56356396 Earthing and Lightning Protection Standard
- [22] 240-56227516 LV Switchgear and Control Gear Assemblies and Associated Equipment for Voltage up to and including 1000V AC and 1500V Standard
- [23] 240-55714363 Coal Fired Power Stations Lighting and Small Power Installation Standard
- [24] 240-57617975 Procurement of Power Station Low Voltage Motors Specification
- [25] 240-50237155 New MV Motor Procurement Standard
- [26] 240-56361435 Transport of Power Station Electric Motors Standard
- [27] 240-56360387 Storage of Power Station Electric Motors
- [28] 240-56536505 Hazardous Locations Standard
- [29] 240-56227573 Air Insulated Withdrawable AC Metal Enclosed Switchgear and Control Gear for rated voltages above 1kV up to and including 52kV
- [30] 240-143485806 Generation Auxiliary plant MV Protection standard
- [31] 240-8697501 Engineering drawing standard
- [16] 240-57648800 New oil filled auxiliary transformers rated 1 MVA and below 33kV

#### **2.1.1.1.3 Control and Instrumentation**

- [32] 240-563557516 Field instrument installation standard
- [33] 240-56385815 Field Instrument installation standard for Junction boxes and cable termination
- [34] 240-56227516 Requirement for Control and Power cables for Power station Standard
- [35] 240-56355731 Environmental Conditions for Process Control Equipment
- [36] 240-56356396 Earthing and Lighting Protection
- [37] 240-56227927 Electrical Load List template
- [38] 240-56355466 Alarm Management System Guideline

#### **2.1.1.1.4 Civil and Structures**

- [39] 240-56364535 Architectural Design and Green Building Compliance Manual
- [40] 240-56364545 Structural design and Engineering standard
- [41] SANS 10100-1 The Structural Use of Concrete Part 1 – Design
- [42] SANS 10100-2 The Structural Use of Concrete Part 2 – Materials and execution of work
- [43] SANS 10160 Basis of structural design and actions for buildings and industrial structures
- [44] SANS 10162-1 The structural use of steel Part 1: Limit-states design of hot- rolled steelwork
- [45] SANS 10162-2 The structural use of steel Part 2: Cold-formed steel structures

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- [46] SANS 10400 The application of the National Building Regulations
- [47] SANS 1200 Standardised specification for civil engineering construction
- [48] SANS 2001 Construction Works
- [49] SANS 12944 Corrosion Protection of Steel Structures
- [50] 240-85549846 Standard for Design of Drainage and Sewerage Infrastructure
- [51] 240-84418186 Road Specification Manual
- [14] NRS060 Code of Practice for Clearance of Electrical Systems up to 145 kV

#### **2.1.1.1.5 Fire System**

- [52] 240-54937439 Fire Protection/ Detection Assessment standard
- [53] 240-54937450 Fire Protection & life safety Design Standard
- [54] NFPA 68 Standard on Explosion Protection by Deflagration Venting The Classification of Hazardous Locations and the Selection of
- [55] NFPA 15 Standard for Spray Fixed Systems
- [56] 240-56737448 Fire Detection and Life Safety Design Standard
- [57] NFPA 13 Standard for Installation of Sprinkler System
- [58] NFPA 2001 Standard on Clean Agent Fire Extinguishing Systems
- [59] NFPA 850 Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
- [60] 240-54937454 Inspection, Testing and Maintenance of Fire Protection Systems

#### **2.1.1.1.6 Low Pressure Services**

- [61] 240-123801640 Standard for low pressure pipelines
- [62] 240-108079430 Power Plant water systems Design guideline
- [63] 240-105020315 Standard for low pressure valves
- [64] SANS 121 Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles – Specification and Test Method
- [65] SANS 62 Steel Pipes
- [66] SANS 719 Electric Welded Low Carbon Steel Pipes for Aqueous Fluids (Large Bore)
- [67] SANS 1476 Fabricated Flanged Steel Pipework
- [68] SANS 815 Shoulder-ended and Groove-ended Piping Systems
- [69] SANS 533 Black Polyethylene Pipes for the Conveyance of Liquids
- [70] SANS 14 Malleable Cast Iron Fittings Threaded to ISO 7-1
- [71] SANS 1223 Fibre-cement Pressure Pipes and Couplings
- [72] SANS 966 Components of Pressure Pipe Systems Part 2: Modified Poly(vinyl chloride)(PVC-M) Pressure Pipe Systems
- [73] SANS 1748 Glass Fibre Reinforced Thermosetting Plastics (GRP) Pipes: Part 3 Pipes, Fittings, and Ancillaries for Underground (Buried) Fire Protection Services

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- [74] SANS 1123 Pipe Flanges
- [75] SANS 1700 Fasteners
- [76] SANS 1143 Mushroom- and Countersunk-head Bolts and Nuts
- [77] SANS 191 Cast Steel Gate Valves
- [78] SANS 226 Water Taps (metallic bodies)
- [79] SANS 776 Copper Alloy Gate Valves – Heavy Duty
- [80] SANS 664 Wedge Gate and Resilient Seal Valves for Waterworks
- [81] SANS 665 Wedge Gate and Resilient Seal Valves for General Purposes
- [82] SANS 198 Functional-control Valves and Safety Valves for Domestic Hot and Cold Water Supply Systems

### **2.1.2 Informative**

- [83] 240 – 53113685: Design Review Procedure
- [84] 240-53114026, Project Engineering Change Procedure.
- [85] 240-4332798, Engineering Policy.

### **2.2 DEFINITIONS**

Contractor	Person or company undertaking to perform work for the Employer.
Employer	Client for this Scope of Works.

### **2.2.1 Classification**

#### **a. Controlled Disclosure**

### **2.3 ABBREVIATIONS**

<b>Abbreviation</b>	<b>Description</b>
A	amperes
BMH	Bulk Materials Handling
C&I	Control and Instrumentation
CS	Construction Services
COC	Electrical certificate of compliance
ERI	Eskom Rotek Industries
DB	Distribution board
FAT	Factory Acceptance Test
LPS	Low Pressure Services
NFPA	National Fire Protection Association
OEM	Original Equipment Manufacturer

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Abbreviation	Description
QCP	Quality control plan
SANS	South African National Standards
SD & L	Supplier Development and Localization

## 2.4 ROLES AND RESPONSIBILITIES

### 2.4.1 Minimum Requirements

N/A

## 2.5 PROCESS FOR MONITORING

## 2.6 RELATED DOCUMENTS

## 3. SCOPE OF WORK FOR CONSTRUCTION AND SUPPLY OF SPARES AND MATERIALS

### 3.1 MECHANICAL WORKS

#### 3.1.1 Main Works Bulk Materials Handling

Based on Eskom standards and specifications, the Contractor shall perform the design, installation, fabrication, construction, commissioning and supply the required equipment and materials required to execute and complete the mechanical bulk materials handling as per SoW or SoW to be issued. Eskom Rotek Industries SOC will reserve the right to free issue the construction, design and supply of equipment or materials.

In instances where the Contractor will be sourcing the equipment from the OEM, such OEM/s shall be approved and certified by Eskom and ERI, thus it will be the responsibility of the Contractor to familiarize himself with various OEMs currently being used by Eskom on its coal plant fleet including standards and specifications.

The list of equipment and associated materials to be supplied by the Contractor will be as per the bill of materials and in the SoW or SoW to be issued. All equipment and materials proposed should comply to applicable Eskom BMH standards and specifications or as per the issued SoW or SoW to be issued. The mechanical bulk materials handling services to be designed, constructed and supplied by the Contractor includes but not limited to:

- Drives
- Holdbacks
- Gearboxes
- Scrappers
- Brakes
- Lubricating systems
- Greases

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- Low speed couplings
- High speed hydrodynamic couplings
- Fluid couplings
- V-belts and v-belts pulleys
- Conveyor belting
- Cover guards
- Nip points and nip point guards
- Interlocks
- Flexible coupling shear pins/bolts
- Conveyor pulleys
- Conveyor belt cleaning systems
- Bearings
- Magnets
- Plummers
- Conveyor gravity take up equipment
- Moving heads and shuttle conveyors
- Tripper cars
- Chutes
- Idlers and idler frames
- Trunnion
- VRN plates and lining
- Ceramic ling
- Hydraulic systems
- Greasing system
- Steel hopper bins
- Steel plates
- Chains blocks and fittings;
- Crawl beams and fittings;
- Motorized winches
- Thimble
- Crosby clamps
- Wire rope
- Turnbuckle
- D-shackle

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- Wires rope
- Sheaves & Winches (Incl. Ropes and clamps)
- Manual hoists, electric hoists, and pneumatic hoists;
- Take-Up cylinders
- Testing and certification.

### **3.2 LOW PRESSURE SERVICES (WTP, WTPP, HVAC, SLURRY PLANT, COMPRESSORS & FIRE SYSTEM)**

Based on Eskom standards and specifications, the Contractor shall perform the design, installation, fabrication, construction, commissioning and supply the required equipment and materials required to execute and complete the low-pressure services as per SoW or SoW to be issued. Eskom Rotek Industries SOC will reserve the right to free issue the construction, design and supply of equipment or materials.

In instances where the Contractor will be sourcing the equipment from the OEM, such OEM/s shall be approved and certified by Eskom and ERI, thus it will be the responsibility of the Contractor to familiarize himself with various OEMs currently being used by Eskom on its coal plant fleet including standards and specifications.

The list of equipment and associated materials to be supplied by the Contractor will be as per the bill of materials and in the SoW or SoW to be issued. All equipment and materials proposed should comply to applicable Eskom standards and specifications or as per the issued SoW or SoW to be issued. The mechanical bulk materials handling services to be designed, constructed and supplied by the Contractor includes but not limited to:-

- Fire piping
- Pressure gauges
- Hose reels
- Sprinklers
- Fire extinguishers (9kg)
- Fire Hydrants
- HDPE piping
- uPVC piping
- Steel piping
- Valves
- Pumps
- Flanges
- Pipe fittings
- Vessels
- HVAC system

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- Compressors
- WTP & WTP systems
- Actuators

### 3.3 CIVIL & STRUCTURES

Based on Eskom standards and specifications, the *Contractor* shall perform the design, installation, fabrication, and construction and supply the required mechanical spares and materials required to execute and complete works. Eskom Rotek Industries SOC will reserve the right to free issue the material, take other construction, design and supply of materials. In instances where the *Contractor* will be sourcing the equipment from the OEM, such OEMs shall be approved and certified by Eskom and ERI.

The list of equipment and associated materials to be supplied by the *Contractor* will be as per the bill of materials and in the scope of work. It will be the responsibility of the *Contractor* to familiarize himself with various OEMs currently being used by Eskom on its coal plant fleet. All equipment and materials proposed should comply to applicable Eskom BMH and Civil standards and specifications or as per the issued SoW or SoW to be issued. The civil and structural works associated with BMH to be designed, constructed and supplied by the *Contractor* includes but not limited to:-

- Concrete (15MPa, 25Mpa and 35Mpa)
- Asphalt (A-E32 or different grades)
- Aggregates
- Bricks
- Reinforcement
- Cladding&Sheeting
- Insulation
- Cladding
- Doors, painting, plastering etc
- Idler frames
- I-sections, H-sections, c-channels, angle sections, square tubes, round tubes etc
- Gratings
- Handrails
- Staircases
- Fencing
- Fabricated and Non-Fabricated Galvanized steel
- Fabricated and Non-Fabricated Ungalvanized steel
- Corrossion protection and galvanizing

### 3.4 ELECTRICAL

Based on Eskom standards and specifications, the Contractor shall perform the design, installation, fabrication, and construction and supply the required mechanical spares and materials required to execute

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and complete works. Eskom Rotek Industries SOC will reserve the right to free issue the material, take other construction, design and supply of materials. In instances where the Contractor will be sourcing the equipment from the OEM, such OEMs shall be approved and certified by Eskom and ERI.

The list of equipment and associated materials to be supplied by the Contractor will be as per the bill of materials and in the scope of work. It will be the responsibility of the Contractor to familiarize himself with various OEMs currently being used by Eskom on its coal plant fleet. All equipment and materials proposed should comply to applicable Eskom Electrical and IT standards and specifications or as per the issued SoW or SoW to be issued. The electrical systems to be designed, constructed, and supplied by the Contractor includes but not limited to:-

- Electrical cables;
- Racking;
- Small power lighting and associated accessories;
- UPS
- Small generators
- VSDs
- Motors
- Plugs; and
- Distribution Boards (DB's).

### **3.5 CONTROL AND INSTRUMENTATION**

Based on Eskom standards and specifications, the Contractor shall perform the design, installation, fabrication, and construction and supply the required mechanical spares and materials required to execute and complete works. Eskom Rotek Industries SOC will reserve the right to free issue the material, take other construction, design and supply of materials. In instances where the Contractor will be sourcing the equipment from the OEM, such OEMs shall be approved and certified by Eskom and ERI.

The list of equipment and associated materials to be supplied by the Contractor will be as per the bill of materials and in the scope of work. It will be the responsibility of the Contractor to familiarize himself with various OEMs currently being used by Eskom on its coal plant fleet. All equipment and materials to be supplied should comply to applicable Eskom Electrical, Control & Instrumentation and IT standards and specifications or as per the issued SoW or SoW to be issued. The control and instrumentation to be designed, constructed, and supplied by the Contractor includes but not limited to:

- Emergency stop (E-stop) buttons
- Pull-key switches/ pull wires/pull ropes
- Fibre optic cable
- Belt overload
- Belt misalignment switches
- Belt tear detection switches
- Belt rip detection switches

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- Block chute detectors
- Cord guard system
- Take-up over-travel limit switches
- Fluid coupling over temperature switches / fusible plugs
- Fire detection and protection systems
- Warning alarms, sirens, warning beacons or lights
- Conveyor Start-up warning strobe light.
- Conveyor moving head proxy and limit switches
- Conveyor belt motor thermal overload equipment, earth fault and over-current devices
- Motor current sensor per phase.
- Motor bearing and winding temperature sensors
- Motor speed sensor to protect the drive against over-speed.
- Gearbox oil temperature sensor to prevent deterioration of lubricant.
- Fluid coupling failure.
- Brake failure (if required).
- Fibre optic cable
- Scales
- Analysers
- CBMS system

### **3.6 CONSTRUCTION AND COMMISSIONING SUPPORT**

The list of construction, supervision and commissioning resources are as per the BoQ.

### **3.7 OTHER WORKS**

Other works to be expected to be performed by the Contractor on when and as required are as follows:-

- Site establishment & offices
- Transport
- FMECA, HAZOP studies etc
- Provide tools, plant and equipment required to execute the works
- Site consumables
- PPE
- Required software
- Sand blasting, corrosion protection, coating and painting
- Ceramic tiling
- Pulley lagging
- Conveyor splicing

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- Site disassembly and re-assembly
- Welding materials and consumables
- Automated Multi-Deck Weighbridges
- Grizzly bars
- Mobile Feeders
- VRN plates
- Dust Handling Plant
- Flanges, bolts and nuts or any other miscellaneous items required or necessary to execute the works.

#### **4. DESIGN**

The design and detailing remains the full responsibility of the Contractor. The acceptance of the designs by Eskom does not relieve the contractor's adequacy of the design, dimensions and details. Design and drawings to be submitted to ERI Project Manager for approval.

The Contractor issued with an Eskom or ERI or third party copyright design, must satisfy themselves of the adequacy of the designs and the site conditions proposed. The following disciplines should be covered in the proposal:-

- Civil & Structures;
- Control & Instrumentation;
- Electrical; and
- Mechanical
- Surveying

All design and drawing produced should not be copyright protected will remain property of ERI SOC Ltd unless it's an Intellectual Property or Patented or it's a product of an OEM. ERI SOC Ltd or Eskom Holdings logo to be used on all drawings to be submitted. ERI has Bentley Microstation, thus drawings to be produced should be compatible to this or the approved of drawing software at that time.

Eskom Rotek Industries reserves the right to free issue design, design offices, design software packages where necessary or assign its engineers and draughtmen as part of the design team. Also, from time-to-time Eskom Rotek Industries and/or Eskom Generation will second its Engineers or Technicians in Training to gain design, construction and commissioning experience.

#### **5. BILL OF MATERIALS**

The Bill of materials was developed and is attached separately on an Excel spreadsheet. All items not specified on the BoQ were included as part of the provisional.

#### **6. AUTHORISATION**

This document has been seen and accepted by:

<b>Name &amp; Surname</b>	<b>Designation</b>
K Radebe	ERI CS BMH HOD

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Name & Surname	Designation
K Mothata	ERI CS BMH PM

## 7. REVISIONS

Date	Rev.	Compiler	Remarks
09 June 2023	0.1	K Mothata	Draft Rev 1 Document
05 December 2023	1	K Mothata	Final document
16 April 2024	1.1	K Radebe	Added additional scope of work
16 April 2024	2.0	K Radebe	Final Draft Rev 2
06 May 2024	3	K Radebe	Revised Draft 2 and final Rev

## 8. DEVELOPMENT TEAM

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

- K Mothata
- K Radebe

## 9. ACKNOWLEDGEMENTS

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