	<p style="text-align: center;">Scope of Work</p>	<p style="text-align: center;">Kriel Power Station</p>
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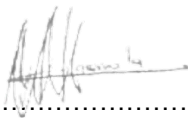


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1. Introduction

This document consolidates the scope of work for the Kriel Power Station lighting and small power installation upgrade and the perimeter fence lighting upgrade. The purpose is to enhance safety, efficiency, and compliance with Eskom standards and national regulations. The consolidation provides a comprehensive technical and functional guideline for contractors, engineers, and project stakeholders.

The upgrades aim to replace outdated and insufficient lighting systems with modern LED technology, improve illumination levels, enhance security, and ensure compliance with South African National Standards (SANS) and Eskom's internal standards and policies. The installations shall comply with Eskom Safety and site management standards, SANS codes of practice, Occupational Health, and Safety Act No. 85 of 1993, and equipment manufacturers' recommendations. This initiative is vital to maintaining operational efficiency, ensuring worker safety, and supporting long-term sustainability goals.

Overview of the objective of the scope are to:

- Enhance illumination levels, energy efficiency, and safety across all designated areas.
- Upgrade existing lighting systems with modern LED technology.
- Ensure compliance with Eskom standards and regulations.
- Improve security through effective perimeter lighting.
- Standardize lighting installations throughout the facility.

2. Supporting Clauses

2.1 Scope

This document covers the requirements for the supply, delivery, installation, and testing of lighting systems at Kriel Power Station, including both interior and perimeter security lighting. It encompasses:

- Station lighting upgrade in all designated areas.
- Perimeter security lighting system enhancement.
- Small power installations.
- Emergency lighting systems.
- Control and monitoring systems.

2.1.1 Purpose

This document details the requirements for upgrading lighting systems at Kriel Power Station. The primary objectives include:

- Enhancing illumination levels to comply with safety standards and operational needs.

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- Upgrading perimeter security lighting to meet SANS and Eskom requirements, ensuring effective surveillance and deterrence.
- Implementing energy-efficient LED technology to reduce operational costs and environmental impact.
- Providing a secure and safe working environment for personnel, especially during night operations.
- Ensuring the seamless integration of new systems with existing infrastructure.
- Establish uniform standards for lighting installations.

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited Divisions.

This scope applies to the following areas within Kriel Power Station:

- Boiler house and basement - addressing high-dust environments with durable lighting solutions.
- Turbine house and basement - ensuring sufficient floor coverage with high-bay luminaires.
- Auxiliary bay, offices, switchgear rooms and workshops - focusing on energy efficiency and automated controls.
- Control room - ensuring uninterrupted lighting with essential power supplies.
- Cable tunnels, substation basement and conveyor walkways - managing illumination in confined and critical areas.
- Outside areas and terrace lighting - enhancing visibility and security across open spaces.
- Smoke stack lighting - providing compliance with aviation regulations.
- Perimeter security fence lighting - integrating advanced lighting systems with security protocols.
- All associated distribution boards and control systems

2.1.3 Effective date

This document shall be effective from the date of authorization and will be implemented across all applicable areas of Kriel Power Station immediately thereafter. Compliance training and preparatory activities must be completed before this date.

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] 240-55714363 Eskom Generation Power Station Lighting and Small Power Installation Standard
- [2] 240-139282493 Security Lighting For Eskom Applications

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- [3] SANS 10142-1 The wiring of premises part 1: Low-voltage installations
- [4] SANS 10114-1 Interior Lighting Part 1: Artificial lighting of interiors
- [5] SANS 10114-2 Interior Lighting Part 2: Emergency lighting
- [6] SANS 60598-1 Luminaires part 1: General requirements and tests
- [7] SANS 10108 Classification of Hazardous Locations
- [8] SANS 10389-1: Exterior lighting Part 1: Artificial lighting of exterior areas for work and safety
- [9] SANS 10389-2 Exterior lighting part 2: Exterior security lighting
- [10] SANS 10389-3: Exterior lighting Part 3: Guide on the limitation of the effects of obtrusive light from outdoor lighting installations
- [11] EN 55015: Limits and methods of measurement of radio disturbance of electrical lighting or equipment.
- [12] OHS Act 85 of 1993
- [13] Generation Plant Safety Regulations
- [14] SANS 121 Hot Dip Galvanized Coatings
- [15] ISO 9001 Quality Management Systems

These documents are indispensable for the application of this document, i.e., documents to be used together with this document.

2.2.2 Informative

- [16] Equipment Manufacturer Specifications
- [17] Kriel Power Station Hazardous Location Classifications
- [18] IEC 62493 Assessment of lighting equipment related to human exposure to electromagnetic fields
- [19] Electricity Act 41 of 1987 as amended
- [20] Electricity Regulation Act 2006
- [21] PLCM-SS-1306 Generation Project Lifecycle Model

The list the documents that are further sources of information referenced in your document, e.g., laws, standards, codes and procedures.

2.3 Definitions

Assembly

A combination of one or more low voltage switching devices together with associated control, measuring, signalling, protective, regulating equipment, etc., completely assembled under the responsibility of the manufacturer.

Capability

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The ability of a resource to achieve its objectives quantified as the sum of expertise and capacity.

Colour rendering index (CRI)

A quantitative measure of the ability of a light source to reveal the colours of various objects faithfully in comparison with an ideal or natural light source.

Contractor

The party appointed by the Employer to "Provide the works".

Design Engineer/Designer

The person responsible who must be qualified as a competent lighting individual with sufficient training in lighting and lighting design. Must be ECSA accredited as a professional Engineer/Technologist.

Illuminance

The luminous flux incident on a surface per unit area (Lm/m²), measured in lux (lx).

Maintenance factor

The minimum light level to be safeguarded, independently from the installation's number of burning hours and service life

Luminaire

A complete lighting unit consisting of a lamp, housing, and associated components.

Power Factor

A measure of how effectively electrical power is used by a system.

Uniformity Ratio

A calculation indicating the evenness of lighting across a designated area.

2.4 Classification

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary).

2.5 Abbreviations

AC: Alternating Current

CCTV: Closed Circuit Television

CRI: Colour Rendering Index

DB: Distribution Board

EMC: Electromagnetic Compatibility

HVAC: Heating, Ventilation and Air Conditioning

IP: Ingress Protection

LED: Light Emitting Diode

OHSA: Occupational Health and Safety Act

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PM: Project Manager

PVC: Polyvinyl Chloride

2.6 Roles and Responsibilities

Project Manager: Overall project execution responsibility

Site Engineer: Technical oversight and approval. The site engineer specifies and technically evaluates lighting components for Eskom applications.

Contractor: Installation and testing implementation

Quality Control Officer: Quality assurance management

Safety Officer: Safety compliance oversight

Electrical Engineering Manager: Technical review and approval

Engineering Manager: Final authorization

Procurement Officials: Verify compliance of purchased materials with documented standards.

2.7 Process for Monitoring

The following monitoring processes shall be implemented:

1. Weekly progress meetings and reporting.
2. Quality control inspections.
3. Safety audits.
4. Illumination measurements.
5. Testing and commissioning verification.
6. Document control and updates.

Progress shall be monitored through:

- Regular site inspections.
- Progress reports.
- Quality control checks.
- Safety compliance audits.
- Testing documentation.
- Commissioning records.

2.8 Related/Supporting Documents

1. Drawing No. 0.45/3708 Kriel Power Station Security Lighting Layout
2. Drawing No. 0.03/12156 Rev 2 Earthing Specifications
3. Drawing No. 0.54/393 Earthing Standard
4. SANS Standard Documentation

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5. Equipment Manufacturer Specifications
6. Site Safety Regulations

In addition, Refer to the normative and informative references listed in Section 2.2 for all related documents. These include technical guidelines, safety protocols, and operational manuals relevant to the project.

3. Engineering Scope of Work

3.1 Overview of the Scope of Work

The project involves the removal of outdated lighting systems, the installation of energy-efficient LED luminaires, and the retrofitting of control systems to optimise illumination and safety. Specific tasks include:

- Developing a comprehensive inventory of existing luminaires.
- Conducting detailed lighting simulations using licensed software to identify inadequacies.
- Ensuring proper earthing and bonding of all installations to prevent electrical hazards.
- Upgrading perimeter security lighting systems to ensure compliance with SANS and Eskom standards.
- Installing new luminaires and retrofitting existing poles with advanced fittings.
- Integration of lighting systems with the power station's electrical infrastructure.

3.2 General Requirements

The work encompasses comprehensive lighting upgrades throughout Kriel Power Station, including:

1. Station Interior Lighting:
 - Removal of existing luminaires.
 - Installation of energy-efficient LED lighting.
 - Emergency lighting systems.
 - Small power installations.
 - Control systems integration.
2. Perimeter Security Lighting:
 - Replacement of existing perimeter fence lighting.
 - Installation of new LED luminaires.
 - Integration with security systems.
 - Zone control implementation.
 - Emergency backup systems.

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3. The contractor shall provide:
 - Skilled and qualified personnel.
 - All necessary tools and equipment.
 - Quality control measures.
 - Safety compliance.
 - Documentation and testing.
 - Training and handover.

3.3 Design Philosophy

The lighting design philosophy aims to achieve optimal efficiency, reliability, and compliance. Key considerations include:

- Maintenance factors tailored to each area's environmental conditions.
- High ingress protection ratings for luminaires in dusty or wet environments.
- Compliance with aviation safety for high structures such as smoke stacks.
- Zonal lighting design for perimeter security, integrated with alarm systems.

The lighting design shall follow these core principles:

1. Energy Efficiency:
 - Use of LED technology.
 - Smart control systems.
 - Occupancy sensing where appropriate.
 - Photocell for exterior lighting.
2. Safety and Security:
 - Adequate illumination levels.
 - Emergency lighting coverage.
 - Security zone integration.
 - Fail-safe operation.
3. Maintainability:
 - Standardised components.
 - Accessible installation locations.
 - Spare parts availability.
 - Documentation and training.

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4. Environmental Considerations:

- Minimal light pollution.
- Energy conservation.
- Sustainable materials.
- Waste management.

3.4 Installation Requirements

General Installation:

- Compliance with SANS 10142-1.
- Professional workmanship.
- Safety regulations adherence.
- Quality control measures.
- Documentation requirements.

Specific Requirements:

- Area-specific mounting details.
- Control system integration.
- Emergency lighting circuits.
- Testing procedures.
- Commissioning protocols.

3.5 Testing and Commissioning

Factory Tests:

- Equipment verification.
- Performance testing.
- Documentation review.

Site Tests:

- Installation inspection.
- Performance verification.
- Control system testing.
- Emergency system verification.
- Integration testing.

NOTE: All luminaires should undergo the compulsory luminaire testing done at RT&D as per the Eskom lighting standard.

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Commissioning:

- System startup.
- Performance verification.
- Documentation completion.
- Training provision.
- Handover procedures.

3.6 Specific Requirement

Boiler House: IP65-rated luminaires to withstand dust and moisture, ensuring reliable operation.

Turbine House: High-bay lighting systems to provide adequate illumination and minimise energy consumption.

Control Room: Essential lighting connected to backup power supplies to ensure continuous operation.

Perimeter Lighting: Zoned lighting systems with manual override capabilities and automated activation based on security signals.

3.7 Quality and Safety Requirements

All installations shall adhere to Eskom’s quality assurance protocols and safety regulations. Contractors shall provide documentation, including quality control plans, method statements, and compliance certificates, to validate their adherence to Eskom’s standards.

4. Acceptance

This document has been seen and accepted by:

Name	Designation
1. ██████████	Electrical Engineering Manager
2. ██████████	Engineering Manager
3. ██████████	Electrical Maintenance Manager
4. ██████████	Electrical Engineer
5. ██████████	Senior Advisor (Electrical/Lighting)

5. Revisions

Date	Rev.	Compiler	Remarks
August 2025	3	██████████	Revision of the scope of work to include a revised BoQ post the tender clarification meeting.
May 2025	2	██████████	Revision to the scope of work to include additional installation spaces.

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January 2025	1	[REDACTED]	Final consolidated scope of work
January 2025	0.1	[REDACTED]	Initial draft of the scope of work

6. Development Team

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

- [REDACTED] (System Engineer)
- [REDACTED] (Electrical Engineering Manager)
- [REDACTED] (System Engineer)

7. Acknowledgements

The development team acknowledges the contributions of all stakeholders involved in the compilation of this consolidated scope of work document, including the Electrical Maintenance Department, Engineering Department, and Security Services.

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ITEM	DESCRIPTION	UNIT	QUANTITY	LABOUR	RATE	AMOUNT	NOTES	ADDITIONAL NOTES
1	Preliminary & General							
1.1.1	HANDOVER FILE (DATA & QC)	SUM	1				Compilation and submission of project documentation including quality control records, as-built drawings, compliance certificates, test results, and commissioning reports.	
1.1.2	DETAIL DESIGN	SUM	1				Provision of a detailed design for all plants listed in the scope of work.	
1.1.3	TRANSPORT (2 VEHICLES)	MONTHLY	29				Provision of two dedicated vehicles for site logistics, personnel transport, and materials handling, for the duration of the project. Cost includes fuel, maintenance, and driver wages.	
1.1.4	MEDICAL FITNESS	YEARLY	29				Annual medical assessments for site personnel to verify physical and psychological fitness to work in hazardous and regulated environments, as per occupational health standards.	
1.1.5	SECURITY SCREENING	YEARLY	29				Comprehensive background checks and security clearance procedures for all site staff, aligned with power station access protocols and national security requirements.	
1.1.6	PPE	YEARLY	29				Procurement and issue of full personal protective equipment kits for all personnel,	No special PPE will be required for this contract (e.g., Arc Flash PPE Cat 2 or Cat 4)

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								including hard hats, safety boots, high-visibility clothing, gloves, and eye protection for all personnel.	
1.1.7	HEALTH & SAFETY FILE	SUM	1					Preparation of a complete health and safety documentation set required for construction compliance.	
1.1.8	TRAINING	YEARLY	1					Setting up of temporary site infrastructure including offices, storage containers, ablution facilities, signage, and fencing for safe and efficient site operations.	
1.1.9	SITE ESTABLISHMENT	EACH	1					Removal and cleanup of temporary infrastructure post-project, restoring area to pre-construction condition.	
1.1.10	MOBILE PLATFORMS 5M	MONTHLY	2					Provision of mobile working platforms for boiler areas	
1.1.11	MOBILE PLATFORMS 12M	MONTHLY	2					Provision of mobile working platforms for electric fence and outside plant	
1.1.12	CERTIFICATE OF COMPLIANCE (CoC)	EACH	120					Provision of CoCs for all the distribution boxes (DB) worked on	
2	Labour								
2.1	SUPERVISOR	HOURLY	2112	1					
2.2	ELECTRICIAN	HOURLY	2112	8					
2.3	SEMI-SKILLED	HOURLY	2112	16					
2.4	SAFETY OFFICER	HOURLY	2112	1					
2.5	PROJECT MANAGER	HOURLY	2112	1					
2.6	STOREMAN	HOURLY	2112	1					
2.7	ELECTRICAL ENGINEER	HOURLY	2112	1					
3	Spares And Consumables								

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3.1	400W LED FLOODLIGHT	EACH	80				High mast lights	For additional luminaire specifications refer to APPENDIX A: TYPICAL LED LUMINAIRE TECHNICAL REQUIREMENTS in the Eskom Generation Power Station Lighting and Small Power Installation Standard (240-55714363)
3.2	200W LED FLOOD LIGHTS	EACH	650				Boiler and security gate high position flood lights	
3.3	100W LED FLOOD LIGHTS	EACH	150				Outside plant high position flood lights	
3.4	50W LED FLOODLIGHT	EACH	6900				Bulkhead replacements	
3.5	100W LED HIGH TEMPERATURE 75 DEGREES	EACH	190				Hottest areas of boiler at high levels	
3.6	300W LED HIGH BAY	EACH	360				Turbine plant roof	
3.7	100W LED HIGH BAY	EACH	360				Workshops and Stores roof	
3.8	90W LED STREET LIGHT	EACH	200				Streets	
3.9	24W LED LINEAR TRIPROOF	EACH	600				Offices and Canteen	
3.10	40W LED PANEL LIGHT	EACH	600				Offices	
3.11	SWA CABLE 2.5MM ² X 3 CORE	METRE	300				Turbine plant basement	
3.12	CONSUMABLES (PER FITTING CONNECTION POINT)	EACH	9000				All material needed for new connection on new fittings (cable glands, terminal strips, junction box, bolts and nuts, insulation tape, drill bits, galvanising spray paint)	
3.13	TERMINAL BLOCK (AMP CLIP IN SCREW TYPR 16A CONNECTOR STRIP)	EACH	1000					
3.14	TRUNKING (SPECIFY BOSAL, GALV TRUNKING PVC TRUNKING)	EACH	1000					
3.15	25 A MCB 1 PHASE CIRCUIT BREAKER	EACH	750					
3.16	50 A MCB 1 PHASE CIRCUIT BREAKER	EACH	100					
3.17	100 A MCB 3 PHASE CIRCUIT BREAKER	EACH	100					
3.18	EARTH LEAKAGE 63 A 1 PHASE	EACH	300					

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