Eskom	Scope of Work	Kusile Power Station

Title: **Kusile Power Station Design and Construction of North Gate Parking Facility Scope of Work**

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1 Introduction

Kusile Power Station was designed with a parking facility outside the access control building. However, the available parking does not have enough parking spaces to accommodate employee and visitor vehicles. Kusile is currently looking to appoint a suitable contractor to design, construct ad commission parking facilities. These facilities shall accommodate light and heavy vehicles. A suitably qualified Contractor is required to undertake the design and construction of these facilities. The Contractor shall assume professional design liability and accountability for all the designs that will be provided to the Employer. The design and construction work is multidisciplinary and will include the following:

a) Civil and Structures

b) Electrical

c) Low Pressure services (Fire System)

d) Control and Instrumentation

2 Supporting Clauses

2.1 Scope

2.1.1 Purpose

The purpose of this document is to outline the requirements and specifications for the design and construction of Kusile power station north gate parking facilities and associated infrastructure.

2.1.2 Applicability

This document shall apply to Kusile Power Station

2.1.3 Effective Date

This document shall be effective from the day of its authorisation.

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] 240-53114002: Engineering Change Management Procedure

[3] 240-53113685: Design Review Procedure

[4] 240-53665024: Engineering Quality Manual

[5] National Environmental Management Act, Act 107 of 1998

[6] National Water Act, 1998 (Act No. 36 OF 1998)

[7] 203-770: Kusile Concrete Specification

[8] 240-56364545: Structural Design and Engineering

[9] 240-85549846: Design of Drainage and Sewerage Infrastructure

[10] 240-57127951: Standard for the Execution of Site Investigations

[11] 240-76368574: High Security Mesh Fencing Standard

[12] 0.90/137 – Kusile Power Station Layout

[13] TRH 4 – Structural Design of Flexible Pavements for Interurban and Rural Roads

[14] TRH16 – Traffic Loading for Pavement and Rehabilitation Design

[15] TRH 17 – Geometric Design of Rural Roads

[16] TMH 7: Code of Practice for the Design of Highway Bridges and Culverts in South Africa

[17] TMH 16: South African Traffic Impact and Site Traffic Assessment Standards and Requirements Manual

[18] SANRAL Pavement Engineering Manual, Second Edition 2014, Chapter 10

[19] AASHTO. 1986. Guide for Design of Pavement Structures, American Association of State Highway and Transportation Officials

[20] 240-54937450 - Eskom Fire Protection & Life Safety Design Standard.

[21] SANRAL Geometric Design Guidelines South African Manual for Parking Standards, Department of Transport

2.2.2 Informative

[22] 35-681 - Eskom Plant Safety Regulations

[23] 146838-FS-00014 Kusile Power Station Undergrounds and Foundations layout Rev 42

[24] KUS-20251058 Kusile Power Station Stakeholder Requirements Definition for North Gate Parking Facility Rev 1

[25] KUS-20251144 Kusile Power Station North Gate Parking Facility Concept Design Report

2.3 Definitions

Definition	Explanation
Consultant	Service provider contracted to provide a specific service to Eskom, Kusile Power Station.
Controlled Disclosure	Controlled disclosure to external parties (either enforced by law, or discretionary).
Employer	Eskom, Eskom Kusile Power Station or representative
Services	Services on a project for which the *Consultan*t is engaged
Subconsultant	Party employed by the Consultant for specialized work (i.e., Electrical, Mechanical and Civil and Structural installations)
Technical Specification	The document/s forming part of the contract which describe the method of executing the project scope works
Works	Activities on a project for which Contractors are under contract to perform including the supply of goods and equipment

2.4 Abbreviations

Abbreviation	Explanation
CCTV	Closed Circuit Television
C&I	Control & Instrumentation
ECSA	Engineering Counsel of South Africa
EEPA	Emergency Exit Public Address
HVAC	Heating, Ventilation and Air Conditioning
ISO	International Organization for Standardization
ITP	Inspection, Testing Plan
LPS	Low Pressure Services
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
SANS	South African National Standards
SAGC	South African Geomatics Council
SAQCC	South African Qualification and Certification Committee
SOW	Scope Of Work
UPS	Uninterruptible Power Supply

2.5 Roles and Responsibilities

2.5.1 Contractor

The Contractor shall ensure the following:

a) Review the contract in detail to fully understand the design and construction scope, technical requirements, and deliverables.

b) Executes and completes the defined scope according to contractual agreements.

c) Submits all relevant and necessary documentation requested by the Employer e.g. risk assessments, safety compliance reports, certifications, etc.

d) Submits both electronic and hard copy versions of all required documentation e.g. design reports, drawings, calculations, and specifications.

e) Review the contract in detail to fully understand the design and construction scope, technical requirements, and deliverables.

f) Executes and completes the defined scope according to contractual agreements.

g) Submits all relevant and necessary documentation requested by the Employer e.g. risk assessments, safety compliance reports, certifications, etc.

h) Submits both electronic and hard copy versions of all required documentation e.g. design reports, drawings, calculations, and specifications.

i) Report any design changes that could impact cost, schedule, or feasibility.

j) Observe all relevant regulations, standards of professional conduct and industry norms established in relevant South African National Standards and standards recommended by relevant professional associations.

k) Demonstrate skill and care generally used by professionals providing services similar to the required services.

l) Submit all approved design documents, drawings, and models.

2.5.2 Employer

The Employer shall ensure the following:

a) Provide support and information relevant to the scope of work.

b) Reviews the Consultant's designs.

c) Ensure that the contractor signs the contract and understands the scope, deliverables, timelines, and payment terms.

d) Provide all necessary project documentation, including technical specifications, design guidelines, and any regulatory requirements.

e) Ensure compliance with legal, safety, and environmental regulations.

2.6 Process for Monitoring

N/A

2.7 Related/Supporting Documents

N/A

3 Description of the Works

3.1 Executive Overview

The station intends to appoint a suitable external Consultant for engineering professional and construction services to undertake the design and construction of a parking facility for heavy vehicles and light vehicles to meet the end-user's needs. The Consultant shall take full liability for all their designs and Services provided to the Employer.

This section of the document provides the requirements and specification for the design and construction of the following facilities:

a) Light vehicles covered parking

b) Heavy vehicles parking

c) Fencing, guardhouse and lockable gates.

d) Walkways to access control building.

e) Pavement design and modification of access roads.

The work includes but not limited to the following:

a) Architectural design

- Schematic designs and design concepts

b) Site investigations

1. Topographical Surveys
2. Geotechnical investigations
3. Underground services detection, etc.
4. Traffic study for pavement design purposes

c) Civil & Structural

1. Structural Design and construction of Building elements
2. Structural design and construction of carport structures and associated elements
3. Pavement design and construction of parking and Access roads
4. Design and construction Fencing and locking gate systems
5. Design and construction of drainage systems (surface and sub-surface)
6. Design and construction of Sewage reticulation systems and associated water supply.
7. Landscaping

d) Electrical design and construction

1. Lighting and Small Power
2. Earthing and lightning protection

e) Low Pressure systems

1. Fire Protection
2. HVAC (where required)
3. Design and construction of potable water supply system

f) Control and Instrumentation systems

1. Design and construction of a Closed-Circuit TV (CCTV) cameras for monitoring of the parking areas
2. Design and implementation of Access Control System
3. Emergency Exit Public Address (EEPA) System

3.2 Codes and Standards

The scope of Services shall be done in accordance with SANS standards, prescribed Eskom standards and any other applicable codes of practice, specifications, and regulations. Reference to standards or manuals of any society, organization, or association, whether such reference is specific or by implication, shall mean the latest standard, manual, or code in effect at the time of the contract award. The Contractor adheres to the latest editions of the listed standards (where applicable) and normative references in section 2.1.4. If there is any contradiction within the codes and standards, the Contractor liaises with the Employer for clarification. The Contractor notes that the provided lists are not all-inclusive and do not relieve the Contractor from complying with all applicable design codes.

Table 1: Civil & Structural Standards

Definition	Explanation
Applicable standards	
240-4332798	Engineering policy
240-5311685	Design Review Procedure
203 – 1239	Conceptual Architectural Design Specifications for Structures and Buildings
240-56355815	Ergonomic Design of Power Station Control Suite Guideline
240-71432150	Plant Labelling Standard
240-93576498	Coding Standard
240-76992014	Project/Plant Specific Technical Document and Records Management Work Instruction
240-65459834	Gx Projects Documentation Deliverable Requirements Specification
240-57127953	Execution of Site Preparation and Earthworks Standard
240-57127955	Geotechnical and Foundation Engineering Standard
240-56364545	Structural Design and Engineering Standard
240-85549846	Standard for Design of Drainage and Sewerage Infrastructure
240-84418186	Road Specification Manual
240-86973501	Engineering drawing Standard
240-66920003	Documentation Management Review and Handover Procedure for Gx Coal Projects
203-103437	Technical Document Submission and Review Work Instruction
203-770	Kusile Power station specification for structural concrete
240-106365693	Standard for the External Corrosion Protection of Plant, Equipment and Associated Piping with Coatings
240-76368574	High Security Mesh Fencing
ESK AM AAA 1	Corporate Identity Manual
ESK PB AAQ 3	Interior Specifications for Eskom
SANS 10400-A	The application of the National Building Regulations – Part A: General principles and requirements
SANS 10400-C	The application of the National Building Regulations – Part C: Dimensions.
SANS 10400-D	The application of the National Building Regulations – Part D: Public safety.
SANS 10400-J	The application of the National Building Regulations – Part J: Floors.
SANS 10400-K	The application of the National Building Regulations – Part K: Walls
SANS 10400-L	The application of the National Building Regulations – Part L: Roofs

Definition	Explanation
Applicable standards	
SANS 10400-M	The application of the National Building Regulations – Part M: Stairways.
SANS 10400-N	The application of the National Building Regulations – Part N: Glazing
SANS 10400-O	The application of the National Building Regulations – Part O: Lighting and ventilation
SANS 10400-P	The application of the National Building Regulations – Part P: Drainage
SANS 10400-S	The application of the National Building Regulations – Part S: Facilities for persons with disabilities
SANS 10083 purposes	The measurement and assessment of occupational noise for hearing conservation purposes
SANS 10103	The measurement and rating of environmental noise with respect to annoyance and to speech communication
SANS 10160-1	Basis of structural design and actions for buildings and industrial structures Part 1: Basis of structural design
SANS 10160-2	Basis of structural design and actions for buildings and industrial structures Part 2: Self-weight and imposed loads
SANS 10161	The design of foundations for buildings
SANS 10162-1	The structural use of steel, Part 1: Limit-states design of hot-rolled steelwork
SANS 10162-2	The structural use of steel Part 2: Cold-formed steel structures
SANS 10164-1	The structural use of masonry Part 1: Unreinforced masonry walling
SANS 10164-2	The structural use of masonry Part 2: Structural design and requirements for reinforced and pre-stressed masonry
SANS 10218	Acoustical properties of buildings. Grading criteria for the airborne sound insulation properties of buildings
SANS 11690-2	Acoustics – Recommended practice for the design of low noise workplaces containing machinery.
SANS 204	Energy efficiency in buildings
SANS 10209-1	Concrete floors Part 1: Bases to concrete floors
SANS 10209-2	Concrete floors Part 2: Finishes to concrete floors
SANS 10021	The waterproofing of buildings (including damp-proofing and vapour barrier installation)
SANS 10155	Accuracy in buildings
SANS 10246	Accessibility of buildings to disabled persons
SANS 10305	Painting of buildings
SANS 10313	Protection of structures against lightning
SANS 1129	Steel door frames
SANS 2001 Series	Standardised Specification for Construction Works
SANS 1200 Series	Standardised Specification for Civil Engineering Construction ‘
SANS 3001 Series	Civil Engineering Test Methods

Table 2: Electrical Standards

Definition	Explanation
Applicable standards	
240-55714363	Coal Fired Power Stations Lighting and small power installation standard
240-93576498	KKS Coding Standard
240-56227443	Requirements for Control and Power Cables for Power Stations Standard
240-56356396	Earthing and Lightning Protection Standard
OHS Act 85 of 1993	Environmental Regulations for Workplace, 1987 (Section 3, Lighting)

Table 3:LPS Fire Protection & Detection Standards

Definition	Explanation
Applicable standards	
NFPA 850	Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations
NFPA 10	Standard for Portable Fire Extinguishers, 2018 edition
NFPA 11	Standard for Low-, Medium-, and High Expansion Foam
NFPA 13	Standard for the Installation of Sprinkler Systems, 2019 edition
NFPA 15	Standard for Water Spray Fix Systems for Fire Protection, 2017 edition
NFPA 72	National Fire Alarm and Signalling Code
240-56737448	Fire Detection and Life Safety Design Standard
240-54937450	Fire Protection and Life Safety Design Standard
240-54937454	Inspection, Testing and Maintenance of Fire Protection Systems
SANS 10400-T	The Application of the National Building Regulations – Fire Protection
SANS 10139	Fire Detection and Alarm Systems for Buildings – System Design, Installation and Servicing
SANS 50054	Fire Detection and Fire Alarm Systems (Adopted from BS EN 54)
SANS 10108	The Classification of Hazardous Locations and the Selection of Apparatus for Use such Locations
32-124	Eskom Fire Risk Management
BFPA	Code of Practice for Design, Installation, Commissioning and Maintenance of Asp Smoke Detector (ASD) Systems.
BS 7974	Application of Fire Safety Engineering Principles to the Design of Buildings
EN 54-18	Fire Detection and Alarm Systems Part 18: Input / Output Devices
SANS 10400-A	The Application of the National Building Regulations – General Principles and Requirements.
SANS 62	Steel pipes
SANS 121	Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles – Specification Test Method
SANS 193	Fire Dampers
SANS 246	Code of Practice for Fire Protection for Electrical Equipment Installations
SANS 428	Fire Performance Classification of Thermal Insulated Building Envelope Systems
SANS 533-1	Black Polyethylene Pipes for the Conveyance of Liquids

Definition	Explanation
Applicable standards	
SANS 719	Electric Welded Low Carbon Steel Pipes for Aqueous Fluids (Large Bore)
SASN 4427	Plastics piping systems for water supply and for drainage and sewerage under pressure – Polyethylene (PE)
SANS 10287	Automatic Sprinkler Installations for Fire-Fighting Purposes
SANS 1091	National Colour Standard
SANS 1123	Pipe Flanges
SANS 1128	Hydrant Systems
SANS 1186	Symbolic Safety Signs
SANS 1253	Fire-doors and Fire-shutters
SANS 1910	Portable Refillable Fire Extinguishers
SANS 10177	Fire Testing of Materials, Components, and Elements Used in Buildings
SANS 10400-T	The Application of the National Building Regulations Part T: Fire Protection
SANS 10400-A	The Application of the National Building Regulations – General Principles and Requirements.
SANS 62	Steel pipes
SANS 121	Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles – Specification and Test Method
SANS 193	Fire Dampers
SANS 1475-1	The production of reconditioned fire-fighting equipment – Part 1 Portable and wheeled (mobile) rechargeable fire extinguishers

Table 4: LPS HVAC Standards

Definition	Explanation
Applicable standards	
240-70164623	Eskom Heating Ventilation and Air Conditioning (HVAC) Design Guideline
32-894	Eskom Server Rooms and Data Centres Standard
240-102547991	General Technical Specification for HVAC Systems Standard
240-56355731	Environmental conditions for process control equipment used at Power Stations
CIBSE	Commissioning Code A: Air Distribution Systems
CIBSE	Commissioning Code B: Boilers
CIBSE	Commissioning Code C: Automatic Controls
CIBSE	Commissioning Code M: Commissioning Management
CIBSE	Commissioning Code R: Refrigeration
CIBSE	Commissioning Code W: Water Distribution Systems
ASHRAE 15	Safety Code for mechanical refrigeration
ASHRAE 62	Ventilation for acceptable indoor air quality
ASHRAE55	Thermal environmental condition for human occupancy
SANS10147	Refrigeration systems including plants associated with air-conditioning systems

Table 5: LPS Potable Water Standards

Definition	Explanation
Applicable standards	
SANS 10400	The application of the National Building Regulations
SANS 204	Energy efficiency in buildings
SANS 10252-1:2018 (Ed. 3.02)	Water supply and drainage for buildings Part 1: Water supply installations for buildings
SANS 10252-2 1993	Water supply and drainage for buildings Part 2: Drainage
SANS 10254:2017	The installation, maintenance, replacement, and repair of fixed electric storage water heating systems
SANS 1200 LB	Bedding (pipes)
SANS 1808	Water supply and distribution system components
240-101712128	Standard for the Internal Corrosion Protection of Water Systems, Chemical Tanks Vessels, and Associated Piping with Linings
240-106365693	Standard for External Corrosion Protection of Plant Equipment and Piping
240-5636535	Architectural Design and Green Building Compliance Manual

Table 6: C&I Standards

Definition	Explanation
Applicable standards	
SANS 10139	Fire detection and alarm systems for buildings - System design, installation, and servicing
240-56737448	Fire Detection and Life Safety Design Standard
BS EN 62676-4	Video Surveillance Systems for use in Security Applications
240-91190304 -	Specification for CCTV Surveillance with Intruder Detection
SANS 10222-5	Electrical security installations Part 5: CCTV installations
240-102220945	Specification for Integrated Access Control System (IACS) for Eskom sites
240-86738968	Specification for Integrated Security Alarm System for Protection of Eskom Install and its Subsidiaries
240-55410927	Cyber security standard for Operational Technology
240-64720986	Emergency Preparedness Public Address System – For Large Area Deployment

Table 7: Configuration Management standards

Definition	Explanation
Applicable standards	
240-131050729	Hybrid Coding Standard
240-109607732	Eskom Plant labelling Abbreviation Standard
240-109607736	Eskom KKS Key part Standard
240-86973501	Drawing Standard
240-76992014	Technical Document and Record Management
240-51093273	Engineering Change Management or Control

3.3 Site Location

The Kusile Power Station site is located approximately 37km northwest of eMalahleni in the Mpumalanga Province. The site is accessed from the R686 road between highways, N4 and N12. The Employer has identified potential sites for the new facilities, for consideration. The Consultant shall be responsible for evaluating the suitability of the sites for the intended purpose and Works. The Consultant shall identify alternative sites, where deemed necessary, and the sites shall suit project objectives and requirements.

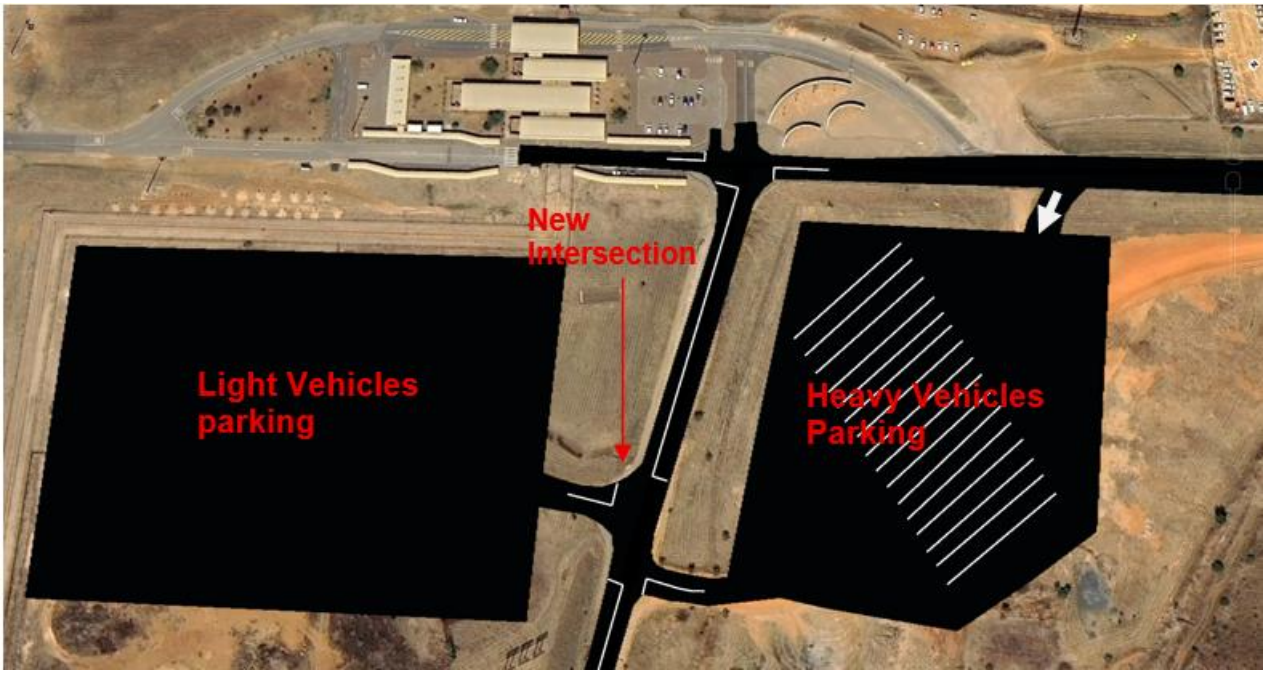

Figure 1: Proposed Locations of Facilities

3.4 Scope of Services

3.4.1 Description of the Services

The scope entails the following:

The Contractor provides engineering design services in accordance with the Engineering Profession Act, 46 of 2000, Guideline for Professional Fees: Scope of services and Tariff of Fees for Registered Persons as well as the construction, commissioning and certification of the approved designs

The scope includes the following but not limited to:

a) Design and construction of a new parking facility for light and heavy vehicles with all associated services and infrastructure.

   The infrastructure includes but not limited to:

   1. Structural design and construction
   2. Sewage system
   3. Pavement design of the parking facilities including associated traffic studies
   4. Potable water supply system

5. Fire water supply system
6. Drainage (Surface and Sub-surface)
7. Small power & lighting
8. Fire protection
9. Security Control and Monitoring system
10. Access Control System
11. Closed Circuit Television (CCTV) Surveillance
12. Emergency Exit Public address (EEPA) systems
13. IT Infrastructure, etc.
14. Landscaping

The Contractor appoints and manages his Subcontractors for the scope of Services and construction works. The Consultant co-ordinates the work of discipline specific design Subconsultants as relevant and satisfies the relevant requirements of the National Building Regulations, Act 103 of 1977, amongst others. The Consultant co-ordinates interfaces to ensure design and construction integration for all components of the Works.

3.4.1.1 Inception

a) The Contractor liaises with the project team and stakeholders to assess and establish the user needs and client requirements.

b) The Contractor establishes the need for specialist advice, studies, tests, investigations, and surveys relevant to the scope of Services, including the appointment of such specialist resources and services.

c) The Contractor performs and co-ordinates all studies, tests and surveys required for the scope of works. The Consultant collates outputs of specialist studies, surveys, and advises on implications of the findings. The findings are reported and communicated to the Employer.

d) The Contractor assesses the existing infrastructural elements to ensure integration between existing and proposed new works.

e) The Contractor obtains, investigates, and collates available data and drawings relating to the scope of Services.

3.4.1.2 Basic and Detail design development

a) Employer will supply the concept designs that have been developed and the contractor shall further improve proposed concepts and develop the basic and detailed design from the concepts and proposed locations and required services

b) The Contractor develops the basic and detail designs and related documentation per the scope requirements. The Contractor ensures that the Employer requirements are fully met in the designs. The Contractor submits his detailed designs to the Employer for review and acceptance.

c) The Contractor incorporates the Employer's detailed requirements into the design.

d) The Contractor incorporates his Subcontractor's designs and requirements into the design.

e) The Contractor performs temporary and permanent design changes necessary to complete

his designs. The Contractor submits the design changes to the Employer for review and acceptance.

f) The Contractor conducts design reviews in accordance with the Employer's Design Review Procedure, 240-5311685 in collaboration with the project team.

g) All design reports, working or construction drawings prepared by the Contractor, are signed off by an ECSA Professionally registered Engineer who takes full professional accountability and liability for the designs.

h) The Contractor prepares detailed specifications for all components of Works for inclusion in the construction/installation scope of works. The Contractor defines amongst others, the performance,quality, operating and maintenance requirements etc. of the required services.

i) The Contractor prepares detailed construction/installation cost estimates.

3.4.1.3 Construction

a) The contractor shall carry out construction once all designs are approved by the employer
b) Construction works shall be supervised by a registered professional Engineer with the Engineering Counsel of South Africa (ECSA)

c) All construction works shall be executed with complete adherence to good practice industry standards.

3.4.1.4 Additional Services of the Project.

a) The Contractor reviews design data prepared by others, that interface or may impact hisdesigns, for purposes of delivering sound engineering designs.
b) The Contractor performs all required topographical, analyses, tests and investigations necessary to carry out the Services.
c) Preparing record drawings related to alterations to works.
d) Development of as-built drawings and professional Engineering certification post construction works

3.4.2 Boundary of the Services

The extent of the works includes but not limited to the following:

a) The Contractor shall design and construct the following facilities but not limited to:

1. 1-off Heavy vehicles parking
2. 1-off Covered light vehicles parking with associated structures and other installations
3. 1-off guardhouse and associated perimeter fencing will lockable access-controlled gates
4. CCTV perimeter monitoring system
5. Fire Protection system
6. Modification of existing access roads to tie-in new facilities
7. Lighting and power supply for the facility
8. Tie-in of new services to existing services

3.4.3 Consultants Key Persons

The Contractor shall submit a detailed organogram of all the key project personnel of the principal contractor and his subcontractors. If the Contractor intends on making use of the services of a subcontractor/s for sections of the scope, the delegation of duties and responsibilities should be clearly indicated. The Contractor's key persons become a contractual obligation upon contract award. Any proposed change should be handled formally through a written request to the Employer for approval. Replacement personnel shall have the necessary competencies and experience as those initially appointed.

The project personnel required in the management and delivery of the project, include the following but not limited to:

a) Project Manager registered with SACPCMP.

b) Architectural Professional professionally registered with the SACA, with 5 years related experience in architectural design. Resource has a formal engineering degree (or equivalent qualification) in the relevant discipline i.e., BSc/B.Tech (Architecture)/MArch,

c) Structural Engineer, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in structural design.

d) Civil Engineer, professionally registered with ECSA with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in civil design.

e) Geotechnical Engineer, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in conducting geotechnical site investigations and design.

f) Electrical Engineer, professionally registered with ECSA with 5 years related experience. Resource has a formal engineering degree (or equivalent qualification) in the relevant engineering discipline i.e., BSc/BEng/BTech/Meng, with demonstrable experience in electrical system design.

g) Mechanical Engineer/ Technologist, professionally registered with ECSA with 5 years related experience in the following:

- Heating, Ventilation and Air Conditioning Systems
- Wet services i.e., potable and fire systems

h) C&I Engineer, professionally registered with ECSA with 5 years related design experience in the following:

- Access control systems
- Closed Circuit Television (CCTV)
- Fire detection systems
- Public address systems

i) Draughts persons to produce mechanical/civil/structural/architectural/C&I drawing designs, with 5 years droughting experience. Resource to have at least a Grade 12 qualification or equivalent.

j) Professional quantity surveying service provider/s, in good standing with SACQSP. Resource to have 5 years working experience in engineering projects.

k) Professional Land Surveyor professionally registered with the SAGC.

l) Safety Officer

m) Site Supervisor

The Contractor notes that all project resources shall be compliant in terms of the Construction Regulation (2014) pertaining to competency, skills, responsibility, and professional registration.

3.5 Engineering Scope

3.5.1 Civil & Structural Scope

All relevant and applicable SANS standards shall be adhered to when executing the design and construction works. This shall include all relevant organizational standards as referenced in sections 2.2 and 3.2 Designs shall be practical, functional, feasible and aesthetically pleasing. The architecture of the parking facilities and other associated structures shall align to the existing station designs: The designs to integrate to the existing station systems and infrastructure, as far as possible.

The below figure depicts the proposed location of the parking facilities. The proposed locations are outside the bounds of the NKP, access for the parking areas will be from the contractor's yard road and will be located east of the access control building. It is important to note that the light vehicles parking will interface with a proposed induction building project. Fencing shall interface seamlessly with the existing station fencing.

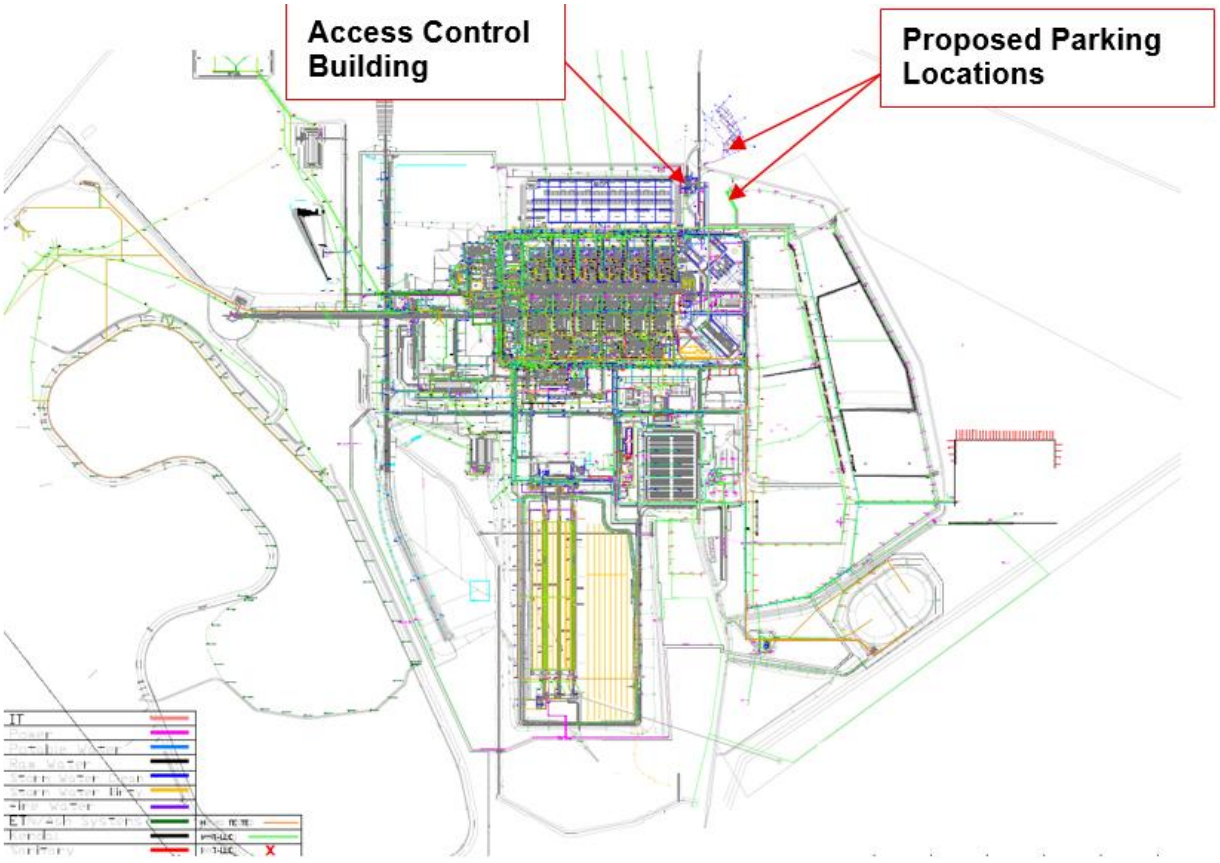

Figure 2: Proposed Location of parking facilities

3.5.1.1 Parking facilities Layout

The figure below represents the proposed layout of the parking facility which consists of a light vehicles parking area and a heavy vehicles parking area. The light vehicles parking area is a covered parking which consists of fencing, lockable gates and a guard house. The area will also accommodate a new building which is meant for induction purposes and is a future project.

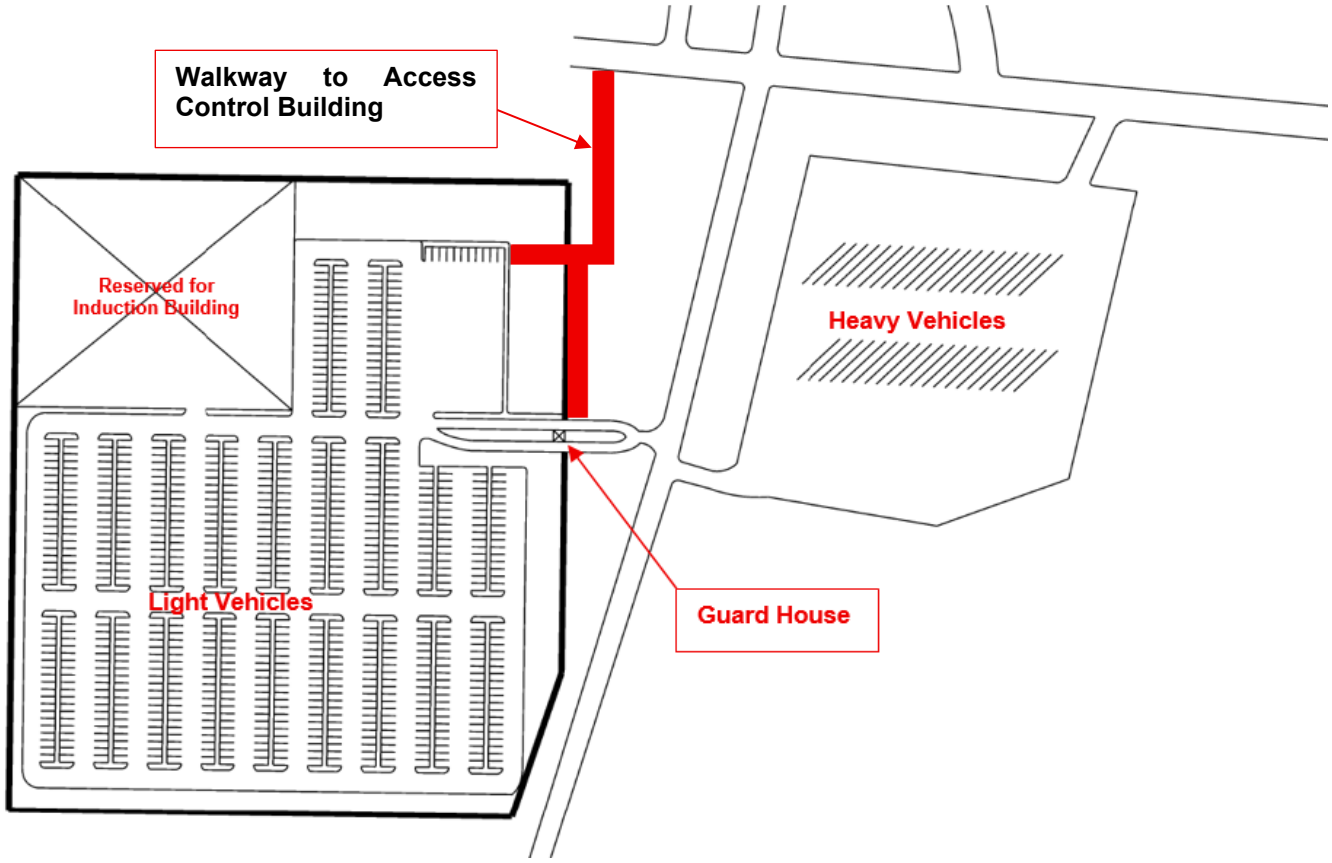

Figure 3: Parking Facilities Layout

3.5.1.2 Specifications of Parking Areas and user requirements

3.5.1.2.1 Heavy Vehicles Parking

a) The heavy vehicles parking shall accommodate at least 30 heavy vehicles.

b) The total allocated area for the heavy vehicles parking is 13 000m^2

c) Pavement shall be designed to consist of asphalt surfacing

d) All associated drainage shall be design and constructed to discharge at the lowest point towards the stream and shall be graded to at least a 2% slope

3.5.1.2.2 Light Vehicles Parking

a) The heavy vehicles parking shall accommodate at least 500 vehicles. With parking for minibus taxis and buses. The parking areas shall also be equipped with a drop off and pick-up zone that consists of covered walkways. The light vehicles parking shall consist of a covered walkway to the access control building.

b) The total allocated area for the light vehicles parking is 35 000m^2

c) Pavement shall be designed to consist of asphalt surfacing

d) All associated drainage shall be design and constructed to discharge at the lowest point towards the stream and shall be graded to at least a 2% slope. The drainage system shall interface accordingly with the existing drainage system.

e) Each parking bay shall be 2.

f) Parking Bay Dimensions 5m x 2.5m

g) Parking bays shall also be designed for persons with disabilities.

h) Isle Dimensions 3.5m per lane (total 7m)

i) All pedestrian walkways shall consist of interlocked block paving surfacing and the pavement layers designed accordingly in line with the associated guidelines and standards.

j) The **carport structures** shall be designed in accordance with relevant SANS standards to carry wind loading, self-weight, live loads as well as loading of 20kg per 1.7m^2 to accommodate future installation of domestic solar panels. The carport structures shall be sloped at an angle of 29º. The structure shall be similar to proposed structure below with associated drainage systems..

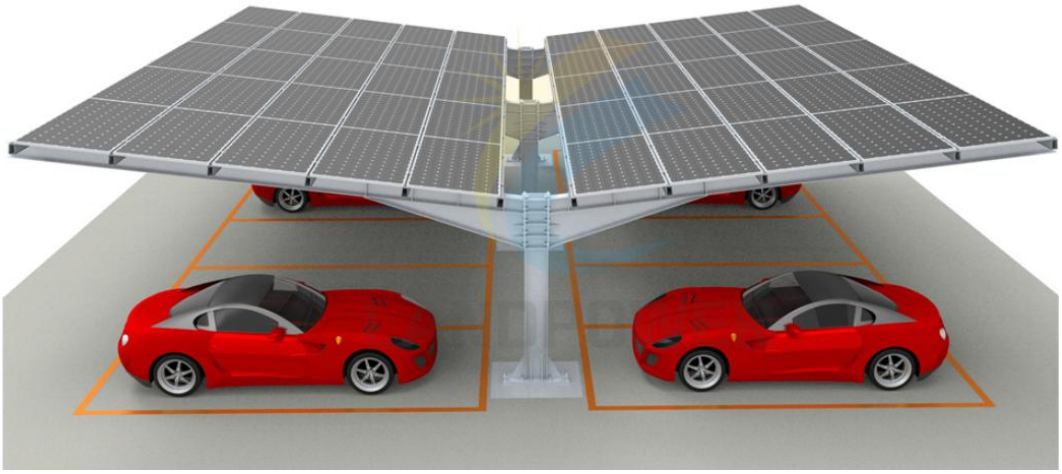

Figure 4: Proposed Carport Structure

- **Fencing:** the fencing shall interface with existing perimeter fencing and shall have a minimum height of 2.6m and an installed barbwire. Poles are to be mounted in concrete and as per figure 7 below to a depth of at least 700mm. the fencing shall be anti-cut and Anti-climb, total length of perimeter fencing is 350m. Lockable gates shall also be provided in the design and construction works.

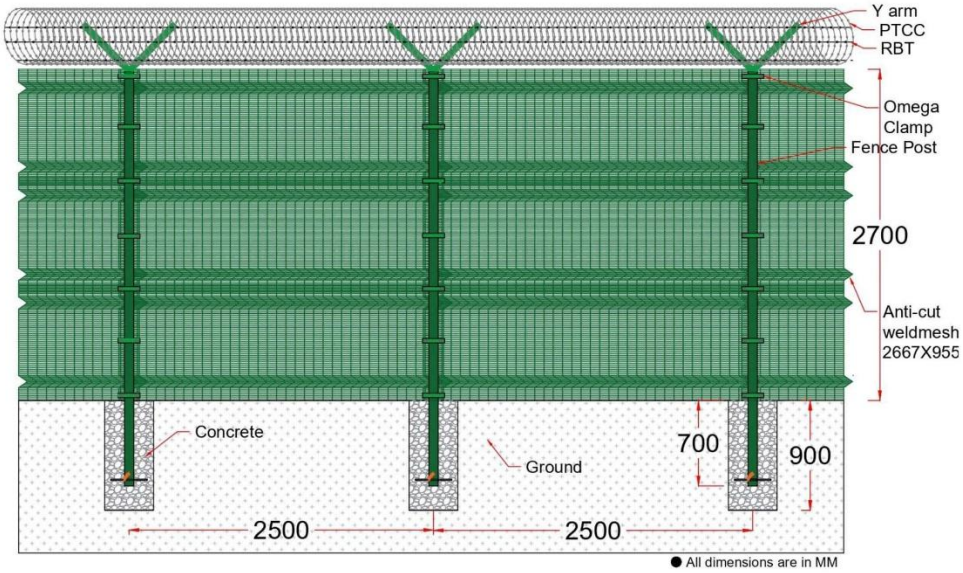

Figure 5: Fencing General Arrangement

- The driveways layer works shall be as per general illustration figure below

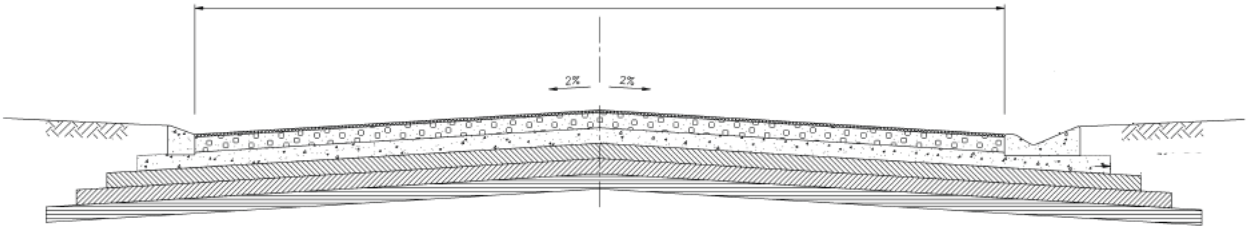

Figure 6: Proposed Layer works

The pavement layers are therefore selected as follows:

a) 30mm asphalt surfacing

b) 125mm G4 Material

c) 150mm G5 Material

d) 150mm G7 Material

e) 150mm G9 Material

1. A 4-way intersection is proposed between the parking facilities and the existing contractors yard road. For the proposed intersection, there is a possibility of a traffic congestion in the morning and during knock off time. To eliminate the risk of a traffic congestion, it is required that a detailed traffic study be conducted in the design phase and determine if there is a need for widening the road. These findings are to be incorporated in the design and once approved be implemented in the construction phase of the project.
2. All associated drainage shall be designed and constructed by the contractor in line with relevant standards.

3.5.1.3 Geotechnical Investigation

The Contractor conducts a geotechnical investigation to characterize the soil condition/properties of the proposed project site, to permit acceptable designs and construction of the Works. The Contractor submits to the Employer a report on the findings from the conducted investigation. The content of the written report must confirm what is pointed out in the investigation/s and if necessary, discussed with the Employer, highlight the extent and location of the investigation area.

3.5.1.4 Surveys

The Contractor conducts topographical surveys necessary to complete his designs for the project sites. The surveys services shall also be utilized during the construction phase to ensure that the designs are implemented accordingly. The Contractor submits to the Employer a report on the findings from the conducted surveys. The report findings, if necessary, are discussed with the Employer.

3.5.1.5 Landscaping and Access Roads

The Contractor performs the landscaping design for the new facilities to create an aesthetically pleasing environment. The landscaping should preserve and enhance the architectural and natural features of the surroundings. The access roads shall be interfaced with existing access roads.

3.5.1.6 Corporate Identity requirements

Eskom's Corporate Identity Specifications: ESK AM AAA 1, Corporate Identity Manual and Interior specifications for Eskom: ESK PB AAQ 3, shall be adhered to for all designs to ensure that all architectural components are compliant to Eskom's corporate requirements.

3.5.2 Electrical Scope

The contractor shall design and construct lighting for the parking facilities and LED lights are preferred for lighting purposes. The lights are to be mounted on 30m mast structures. The lighting structures shall be designed to be similar to the proposed arrangement in the below figure. These structures are to be mounted on a reinforced concrete foundation designed for the respective loading. Additional lighting shall be designed and mounted on carport structures to improve visibility in the covered areas.

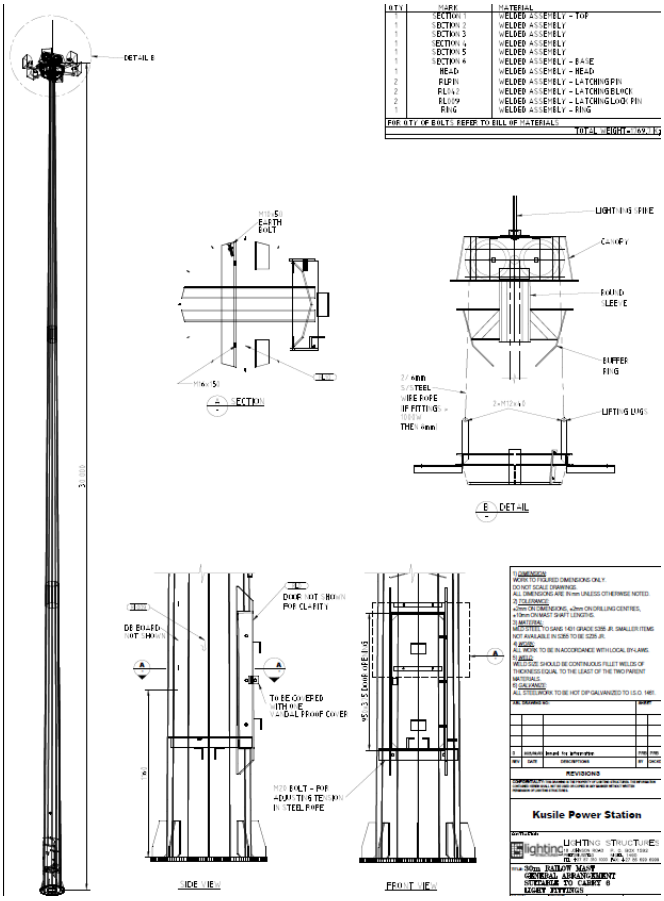

Figure 7: proposed lighting structures

The scope of Services includes the following:

a) Electrical Supply:

1. Provisions are made for sufficient power supply to meet the demands of the facilities.
2. The Contractor coordinates with electrical Contractors to establish designated supply points near the selected locations.

b) Lighting Systems:

1. All light sources to be installed must be LEDs for both covered and uncovered areas to ensure visibility and safety. The Contractor adheres to design and construction specifications and safety standards for efficient illumination.
2. Guardhouse shall be fitted with lighting and shall be standardized with lighting installed on similar structures in the station

c) Earthing Systems:

1. Implementation of effective earthing systems to protect personnel and equipment from electrical faults and lightning strikes.
2. Utilization of high-quality materials and techniques to ensure proper grounding throughout the facility.

d) Cable Routing:

1. Planning and implementation of efficient cable routing strategies to minimize interference, maximize reliability, and ensure ease of maintenance.
2. Utilization of cable racks, trunking, conduits, and appropriate labelling to organize and protect electrical cables.

e) Site Assessment:

The Contractor conducts a thorough assessment of existing electrical infrastructure and identifies areas requiring modification or expansion.

f) Planning, Design and Construction:

1. Develop detailed electrical plans in coordination with engineering teams to ensure seamless integration with existing infrastructure.
2. Implement design inline with associated design and construction standards.,

3.5.3 Control & Instrumentation Scope

3.5.3.1 Consolidated Building Management System

The control and instrumentation scope includes but not limited to the design and implementation of the following:

a) Access Control

b) CCTV system

c) Public address sytem

There is a CBMS system already existing in the station. The CBMS is based on the Honeywell EBI architecture. The CCTV portion of the CBMS is based on the DVM VMS. The modifications to be made under the project may impact on the existing CBMS systems.

The CBMS covers Access Control, CCTV, HVAC interface, Fire Detection and Public Address System.

The following are the Consultant's duties:

a) The Contractor designs in detail the below listed systems to ensure monitoring, operation, and administration capability from the existing CBMS. In cases where newer technology is available which the Consultant proposes for use, the Consultant states this clearly in the design. Both hardware and software aspects of the systems are designed, nothing more.

b) An electronic Integrated Access Control System (ACS) based on the existing Honeywell Tema Server TS02 technology.

c) CCTV system covering the perimeter of the parking and any other blind spot areas (as per user requirement). The system is interfaced to the existing DVM CCTV system.

d) A Public Address system running over the EBI infrastructure utilizing network speakers.

e) An appropriate Fire Detection System complying to SANS10139. A Honeywell hardware platform is required.

f) Independent Back-Up Power Systems which will satisfy the requirements of all systems' design standards.

g) Network for integrating all sub-systems (Switches, cabling etc.)
   1. Familiarizes themselves with the existing CBMS in the areas where modifications will be made under this project.
   2. Identifies and collects all drawings required to perform the work.
   3. Indicates where civil and/or other changes made under this project will impact the existing CBMS.
   4. Indicates where changes to the existing CBMS have been made due to the civil and/or other changes under this project.
   5. Ensures that changes to the existing installations do not lead to non-conformance of the installations to applicable design standards e.g., in the case where a smoke detector needs to be moved, it will be moved to a position where it will conform to SANS 10139.
   6. Prescribe construction/installation methodology for their design to maintain adherence
   7. to the applicable standard.
   8. Marks-up drawings of the existing CBMS installations to indicate where changes will be required. Provides marked up drawings as part of the CBMS design.
   9. Reviews the entire design(s) (new and modified installations) and confirms that they meet applicable design codes and standards.
   10. Ensures that the design of the Fire Detection System is performed by parties who have been found competent as Designers of Fire Detection Systems, compliant to SANS10139:2012. SAQCC or FDIA issued certificates of Competence are required.

3.5.4 Mechanical Scope

3.5.4.1 Fire Protection

The scope for the fire protection system includes:

Design and construction of a fire protection system that interfaces with existing infrastructure

The following requirements shall be adhered to:

a) The user of the standard, 240-56737450 shall follow the deemed to satisfy approach. SANS 10400 sets out the different possible ways of demonstrating compliance with functional regulations, including a range of prescriptive provisions that are “deemed to satisfy”. If a design is complaint to SANS10400 and any of the normative SANS, documents referenced within, thenthe design can be classified as deemed to satisfy.

b) The Contractor shall perform a Rational Fire Design where the South African National Standardsdoes not address a specific fire risk or area of plant. This will require referral to codes of practisei.e., NFPA etc.

c) The person who using this document, 240-56737450, for the purpose of designing the Fire Protection systems, must be a competent person as specified in the National Building Regulation[NBR], section A19 and AZ4.

d) The Employer requires that the person undertaking the design shall have at least the following qualifications:
   1. Bachelor’s degree in engineering or higher
   2. Registered Professional Engineer with ECSA

3. At least 4 years of experience in fire engineering

e) Fire Suppression Systems (if any) shall adhere to standard 240-56737450: Fire Protection and LifeSafety Design Standard.

f) The responsible Contractor shall be responsible for the following:

1. Design fire protection system for the parking facilities and guardhouse.
2. Coordinate with structural and architectural plans to integrate system components seamlessly into the design.

g) Fire Rated Construction:

The Contractor ensures compliance with local codes and regulations regarding fireresistance ratings for doors, walls, and floors.

h) Documentation and Compliance:

The Contractor maintains detailed documentation of all fire protection systems, including design reports, drawings, etc.

i) Emergency Evacuation Planning

The Contractor develops an emergency evacuation plan detailing evacuation route, assembly areas, and procedures for occupants in the event of a fire.

j) Construction and Commissioning

The contractor shall construct and commission the fire system in line with Employer's requirements.

3.6 Sub-Contracting Services

The Contractor submits the name of each proposed Subcontractor to the Employer for acceptance. The Contractor does not appoint a proposed Subcontractor until the Employer has accepted him.

The Contractor submits the proposed conditions of contract for each subcontract to the Employer for acceptance unless an NEC contract is proposed, or the Employer has agreed that no submissionis required. The Contractor does not appoint a Subcontractor on the proposed subcontract conditions submitted, until the Employer has accepted them.

3.7 Engineering and the Consultant's Design

3.7.1 Employer's Design

The extent of the Employer's design is as described in the Employer's drawings and proposed layouts of the facility. The Employer will make available all the available and required available native files to the Contractor to enable completion of his designs, design reviews, construction and updating of the Employer's drawings.

3.7.2 Parts of the Works Which the Contractor is to Design and Construct.

3.7.2.1 Responsibility for Design

a) The Contractor provides designs that are fit for purpose and in accordance with relevant

standards, regulations, and sound engineering principles.

b) The Contractor assumes full design accountability and liability for his designs.

c) An ECSA Professionally Registered Engineer signs off all designs, design reports andconstruction design drawings, as-built drawings prepared by the Contractor and his Subcontractor.

d) The Contractor is responsible for the design of all temporary Works required for implementation.

e) Where the Contractor requires additional information to design certain components of the Works, the contractor notifies the Employer of the requirement/s timeously.

f) The Employer may review, and will only accept, the Contractor's designs. The responsibility to ensure compliance remains with the Contractor.

g) All changes required for construction or manufacturing, that impact or change the Employer's design is redlined on drawings by the Contractor. The redline drawings include notes for clarification purposes. The Contractor submits the redlined drawings to the Employer for acceptance.

h) The Contractor is mandated in terms of Construction Regulations 2014: Duties of Designer, 6(1)g to fulfil the duties described therein or the detailed designs done by the Consultant. Any risks associated with the Contractor's design is highlighted to the Employer together with the mitigation measures.

i) The Contractor submits design reports, for all his designs, to the Employer for his acceptance. Design reports to include the following as a minimum:

1. Design philosophy
2. Assumptions made with regard to the design.
3. Design criteria/ parameters used.
4. List of applicable codes and literature that was used in the design.
5. Design results and calculations for all elements
6. Software input and output files including design models.
7. Materials used; and
8. Submit Operation and Maintenance Manuals, where applicable.

j) Submit multidisciplinary detailed design drawings for the full scope of work, capturing all necessary details.

3.8 System Interface & Design Integration

a) The Contractor is responsible for all system interfaces which form part of the project scope. The Contractor caters for all the identified interfaces, taking into consideration all packages required. The Contractor's design considers all existing services ensuring no clashes with existing infrastructure.

b) The Contractor is responsible for all interfaces that form part of the scope and shall cater for these in his design and construction scope.

c) The Contractor notes that the project areas have existing services. The *Con*tractor shall avoid any clashes with existing services as well as cater for this in his design.

3.9 Use of the Contractor's Design

The Contractor, as specified in this Works Information, supplies all design documentation for the Works to the Employer. The Contractor notes that all design documentation supplied to the Employer become the property of the Employer upon completion of the Works. *The* Contractor notes that the Employer has total rights to use the Consultant's design, as the Employer requires. The ensure that the approved designs are implemented inline with associated codes and standards.

3.10 Contractor's Programme

a) The Contractor submits to the Employer, a level 4 single integrated programme for the design and construction scope.
b) The Contractor submits an electronic copy of his programme in MS Project (MPP) format. The Contractor includes the following as a minimum in his programme:
    1. Starting date and completion date
    2. Order and timing of activities which the Contractor is to perform in order to provide theservices.
    3. For each activity, a statement of how the Contractor plans to perform the services, identifyingthe resources required to perform the activity.
c) The Contractor to make the following provisions in his programme:
    1. Time allowance for receiving information to be provided by the Employer.
    2. Time risk allowances
    3. Health and safety requirements

3.11 Submission Of Revised Programmes and Progress Reporting

3.11.1 Revised Programme

The Contractor submits his revised programme bi-weekly or as instructed by the Employer. The Contractor indicates on each revised programme:

a) Actual progress achieved on each project activity and its effect on the timing of the remainingwork.
b) Management of delays encountered etc.

3.11.2 Monthly Progress Report

The contents of the progress report may vary from month to month depending upon the phase of the project and/or the items of management focus. The basic framework of the report consists of the following:

a) Executive summary (narrative identifying major movement within the reporting period).
b) Revised Programme indicating, actual progress of work against last Accepted Programme.
c) A one-month look ahead work window.
d) Activities completed, activities in progress during current reporting period and Critical

Pathactivities report.

e) Key issues and risks of concern and mitigation actions.

f) Early warning and Compensation Event Register

g) Report selecting all the activities of the Employer and Others

h) Resource Schedule Histogram.

i) Statement and report on work ahead and behind progress.

j) Resource Plan.

3.12 Documentation Requirements

The Contractor ensures that the Technical Documents and Records Management Work Instruction, 240-76992014 is adhered to for all documentation requirements. The Contractor is responsible for the compilation and the supply of all documentation during the various project stages. The Contractor makes provision in their programme for the submission of design documentation and for construction activities. For consistency, it is important that all documents used within the project follow the same layout, style and formatting as described in the Technical Documents and Records Management Work Instruction, 240-76992014. Documents such as QCP's, Method Statements etc. that impact the project works to be approved by the Employer at least 3 working days prior to commencement of the works.

Each revision of a document or drawing shall be accompanied with a list of comments made by the Employer on previous revisions, if applicable. The responses/corrective actions taken by the Contractor to be recorded in a revision table contained in each drawing/document.

Documents and drawings to indicate the Employer's unique identification number as allocated by the Employer. The Contractor may also have his own internal document or drawing number on the document or drawing.

3.12.1 Document Identification

The Contractor shall ensure that documents have the following minimum attributes on the cover page:

a) Document title
b) Document unique identification number (Eskom number)
c) Consultant document number, if applicable
d) Document status
e) Revision number
f) Document type
g) Document revision table/history
h) Page number on the footer
i) Document author/authoriser
j) Document originator

The following additional attributes are important for technical documents:

a) Package/System name/sub-system name
b) Unit number
c) Consultant name

d) Contract number
e) Plant identification codes

3.12.2 Format and Layout of Documents

For consistency, it is important that all documents used within a specific domain follow the same layout, style, and formatting standard.

a) Layout and Typography

Every document should comply with the following font specifications:

1. Font Colour: Black
2. Main Headings Font Type: Arial, Bold, Capital Letters
3. Main Heading Font Size: 12pt
4. Subheadings Font Type: Arial, Bold, Title Case
5. Subheadings Font Size: 11pt
6. Body Font Type: Arial, Sentence Case i.e., only the first letter of the first word is a capitalletter.
7. Body Text Font size: 11pt
8. Line Spacing: 1.5 line spacing.
9. Margins: Standard
10. Alignment: Full justification to be used
11. Paragraphing: One line skip between paragraphs
12. Pagination: Centred page numbers (about 0.5 inches from bottom)
13. Indentations: Standard tab for all paragraphs (about 0.4 to 0.5 inches)

3.12.3 Document Headers

The header should include the project name, document title, document number, revision number and page number.

3.12.4 Naming of files

The Contractor complies with the Eskom standard for naming documentation files. The standard isas follows:

a) For documents that have an approval date and signature; (YYYYMMDD_DocType_DocumentTitle_UniqueIdentifier_Revision.F ileExtention)

b) For documents that do not necessarily require the ‘Approved Date’ and ‘Revision & Versioning’, usethe date of update:

c) (YYYYMMDD_DocType_DocumentTitle_UniqueIdentifier_Revision.FileExtention)

3.12.5 Documentation Submissions

The Contractor's program to allow a minimum of 21 days for mailing, processing, and review of drawings and data by the Employer. All documents and records must be submitted and managed according to the Project/Plant Specific Technical Document and Records Management Procedure, 240-76992014 as well as the Generation (Gx) Projects Documentation Deliverable Requirements Specification, 240-65459834. The Employer shall ensure that the Contractor is provided with the latest revisions of the mentioned documents.

3.12.6 Information Requirements

The Employer requires information and data from the Contractor for management and execution of the contract. The Contractor shall supply all information required in terms of the contract including, whether specified in the contract, all information necessary for:

a) Design reviews and the interface management of the works,
b) Quality assurance and control,

The scope of supply of information from the Contractor, to include the below document list, if applicable:

Table 8: Typical Document Requirement List

Typical Document Requirement List	
Document Group	**Description of document type (Includes information data sets)**
General	- Equipment arrangement drawings - Piping & Instrument Diagrams (P&ID's) Equipment list. - Isometric drawings - Drawings and data for all equipment and material
Civils & Structures	- Layout drawings - Elevation and section drawings Structural drawings Architectural drawings - Structural analysis and design report Foundation drawings - Structural support drawings - Access Platform/Walkway Drawings - Professional Engineering Certificates from Professionally Registered Engineers
Logistic Support	- Maintenance concept - Plant maintenance documentation ISI plan/program - Spare parts assessment Plant RAM analysis - Equipment access and removal paths assessment Fault finding diagrams
Safety & Protection	- Fire hazard analysis Waste management plan
Design Analyses	- Reliability model and analysis Flow dynamics analysis - Thermo-hydraulic analysis Pipe Stress Analysis Maintainability analysis FMECA / FMEA analysis HAZOP analysis

	- 3D model interference checks
Electrical	- Motor list - Electrical load list Circuit list Raceway list - Single line diagram Protection schematic diagram - Electrical load flow and fault studies report Cable block diagrams. - Cable schedule - Cabling routing and cable racking layout diagrams Cable termination diagrams - EMC and earthing standards report Earthing layout drawings. - Lighting layout drawings
C&I	- Alarm and set-point schedule. - Instrument schedule Instrument data sheets Mechanical hook-up drawings Electrical hook-up drawings Cable Schedule - Termination Schedules - Junction Box GA and Internal Layout - Junction Box and Instrument location drawings Instrument Stand GA - Maintenance Manuals and procedures Operating and Control Philosophies Functional Logic diagrams. - Field device calibration certificates Level measurement installation report
CBMS	- Alarm and set point schedule. - Instrument schedule Instrument data sheets Equipment layout drawings Routing layout drawings Cable schedules Termination schedules - Junction Box GA and Internal Layout Instrument Stand GA - Maintenance Manuals and procedures Operating and Control Philosophies Field device calibration certificates Network architecture. - Fire risk assessments

3.13 Drawings

The creation, issuing and control of all Engineering Drawings shall be in accordance with the latest revision of the Engineering Drawing Standard, 240-86973501 - to be supplied as part of the enquiry documents. Drawings issued to the Employer will be a minimum of one hardcopy and an electronic copy. The Contractor is required to submit drawings electronically in both native CAD format and PDF format. Drawings issued to the Employer may not be “Right Protected” or encrypted.

3.14 Documentation Management

3.14.1 Retention of Documentation

The Contractor must retain all documentation, specified on the VDSS. This includes data books. The Contractor must keep the documentation for a minimum of 10 years post contract close out. This is in line with the Rules of Conduct for Registered Persons, Engineering Professional Act, paragraph 4(a): “Registered Persons, may not without satisfactory reasons destroy or dispose of, or knowingly allow any other person to destroy or dispose of, any information within a period of 10 years after completion of the work concerned”.

The Contractor must retain the documentation in electronic format. The Contractor must also keep the original ink signed hard copies for the minimum of 10 years post contract close out. When the 10years end, the contractor must inform the Employer in writing prior to disposal, to confirm if the Employer is not in need of any documentation. The correspondence must include the master documentation register, which outlines all retained documentation. It is the contractor's responsibilityto ensure that the correspondence has reached the Employer, by requesting acknowledgement of receipt. The Employer has the maximum of 6 months to respond in writing to the contractor, failure to do so, the Contractor may proceed and dispose the documentation after the six months has passed.

3.15 Documentation Reviews

The Contractor shall conduct design reviews in accordance with the Employers Design Review Procedure, 240-53113685 and participate in all design reviews as specified by the Employer. The Employer shall review and consolidate review comments for submitted documentation by the Contractor. The Contractor shall also make the necessary revisions or rectify noted issues highlighted on the documentation by the Employer. The Contractor must include the documentation reviews as part of the Design schedules and allocate appropriate timelines/durations for these activities.

3.15.1 Submission of the Consultant's Design

a) The Contractor submits all design documentation to the Employer for review. The documentationsubmitted to include all design elements i.e., drawings, calculations, reports etc.

b) The Employer conducts a review of the design documentation. The Employer reserves the rightto review any design in detail, where deemed necessary. The Employer accepts no accountability and liability due to the review of any designs.

c) The Contractor is the Design Authority as defined in the Design Review Procedure, 240-53113685 for the project scope. The Contractor is responsible for following this design procedureand conducts all the design reviews as specified in this procedure.

d) The following process will be followed for submission of documents:

- The Contractor submits the documents/drawings to the Employer.
- The Employer's representative distributes the documents/drawings to all relevant parties within the Employer's project team to review.
- The Employer's project team reviews the documents/drawings and submit all comments or inputs to the Employer's representative. The Employer's representative submits the review comments to the Contractor for consideration.
- If the Employer finds major deficiencies in the submitted documents/drawings, the Contractor. revises the documents/drawings and resubmits to the Employer's representative.
- The Employer reviews the documents/drawings and if no major deficiencies are found, the Contractor organises a review session.
- The Employer and the Contractor conduct a review.
- If any fundamental errors are found in the review or further actions are required, the Contractor records all concerns raised and revises the documents/drawings accordingly.
- The Contractor organises a review session once all documents/drawings have been revised.

- If no fundamental errors are found in the documents/drawings during the review session, the Contractor compiles the review minutes/report and submits to the Employer.
- The Employer's project team reviews the Contractor's report/minutes. If the report/minutes are not acceptable, the Contractor revises the report/minutes and resubmits to the Employer.
- The Employer accepts the Contractor's documents/drawings once the report/minutes are accepted by the Employer's project team.

3.15.2 Acceptance of the Contractor's Design

The Contractor is to implement the following for design acceptance:

a) The Employer accepts the Contractor's design upon completion of reviews by the project team.

b) The Contractor stamps, dates and signs his design drawings, to signify approval of his designs.

c) The Contractor informs the Employer in writing of any deviation in the Contractor *'s* drawings, from the scope requirements.

3.16 KKS Classification System

3.16.1 Plant Codification

The KKS system shall be used by the Contractor for classifying and designating both plant and their associated documents (including labelling or tagging of the plant items). All technical documentation as per "Technical documentation classification and designation standard – 240-54179170" shall contain a KKS code as part of the documentation identification relevant to the plant equipment.

All plant (HVAC, Electrical, C&I and Civil) shall be coded up to KKS breakdown level 3 (components level). The KKS code shall contain and comply with break down levels: Level 1, break down; Level 2 and breakdown Level 3, in compliance with Eskom Hybrid Coding Standard [240-131050729]. Omission or any deviation of/from any break down level from aforementioned levels shall not be permitted without any deviation approvals from the Employer.

The system shall be applied from the concept stage until project closeout. The rules specified in the VGB guidelines will be used but all rules specified in Eskom documents will take precedence.

Detailed nameplate or label list with the service legends and including the KKS Code shall be prepared by the Contractor and submitted to the Employer for review and comment before commencing manufacture of the labels. All maintainable plant equipment and components shall be labelled including pipework.

The rules for applying the KKS and coding are contained in the Eskom Standard 240-93576498 and in the publication KKS power plant classification (B105e) 5th Edition 2003 published by Verlag VGB Power Tech Service GmbH (Essen), and the KKS Applications: Guideline and explanations A, B1-4 (B106e).

The Contractor shall use Eskom –specific interpretations of the KKS standards, which will be reviewed and agreed on after Contact Award. The following variations relating to 240-93576498 are noted.

a) Breakdown level 3 component code -> not used in P&ID's and PFUP's, only used by control hardware supplier.

b) Breakdown level 0: will be shown as a general remark on the P&ID not on the individual KKS

number.

c) F0-level is not used; FN level is free -> no general decoding system.

The Contractor shall code all plant within scope of supply according to the KKS Classification System to Breakdown Level 3 where possible. The relevant KKS codes thus allocated shall appear on all plant related documentation, drawings, lists and correspondence.

The Contractor shall code all plant within scope of supply according to the KKS Classification System to Breakdown Level 3 where possible. The relevant KKS codes thus allocated shall appear on all plant related documentation, drawings, lists and correspondence.

The Contractor shall be responsible for ensuring the accuracy, completeness, and consistency of the designations in all documents. This applies both to designations within documents (plant designations) and of Documents (documents designations). The Consultant shall submit these for the Employer's approval.

A list of the KKS designations allocated shall be drawn up by the Contractor for each scope of delivery. Methods of KKS designation, list formulation and submission format shall be proposed by the Contractor and agreed by the Employer.

3.17 Deliverables

The Contractor is required to provide professional engineering services and construction services. The Contractor submits the following deliverables to the Employer for acceptance:

a) Geotechnical investigation and survey reports
b) Detailed design reports for the entire project scope. Reports to be signed off by ECSA Professionally Registered Engineers
c) Approved working drawings for the entire project scope.
d) Design drawings to be signed off by ECSA Professionally Registered Engineers
e) Technical Specification for construction scope of *Works*
f) Bill of Quantities for entire project scope
g) Construction method statements and Quality documentation
h) Material certification and Non-Destructive testing documentation
i) All construction related documentation as detailed in this scope document.
j) Maintenance strategies.

4 Acceptance

This document has been seen and accepted by:

Full Name and Surname	Designation
Busi Nkomo	Auxiliary Plant Engineering Manager
Sithokozile Hlongwa	Engineering Group Manager
Zanele Kubheka	Project Manager

5 Revisions

Date	Rev.	Compiler	Remarks
February 2026	1	Freeman Mnisi	New Document

6 Development Team

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

a) Freeman Mnisi
b) Vely Sondezi
c) Dhiresh Ram
d) Sibonelo Mtambo

7 Acknowledgements

N/A