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Establishment of the
National Security Co-
ordination Centre**

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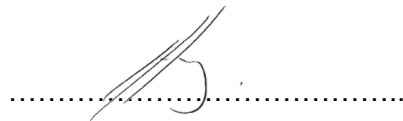
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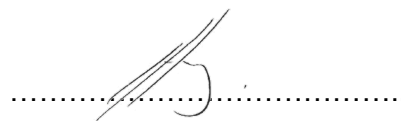
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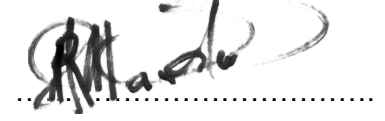
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1. INTRODUCTION

To accommodate a bigger premises within the Megawatt Park complex, the National Security Co-ordination Centre (NSCC) is relocating to the old ENERWEB offices at MWP Ground Floor Block A. To ensure that the new site is safe, and access is controlled, security has been identified as one of the aspects that needs to be upgraded. The National Security Nerve Centre is part of the National Security Co-ordination Centre (NSCC) in Group Security and is currently located in Megawatt Park lower ground (Proto Room). It consists of a security nerve centre room, offices, and boardrooms.

The scope of work for this contract includes provision of a complete Integrated Physical Security System (IPSS) for the National Security Co-ordination Centre (NSCC) and the National Security Nerve Centre.

The remaining scopes of works includes the complete refurbishment and civil alterations of the Megawatt National Security Co-ordination Centre.

2. SUPPORTING CLAUSES

2.1 SCOPE

This document covers the minimum technical specification for the scope of the *works*. This document is to be inserted into the relevant NEC Part 3 Contract.

2.1.1 Purpose

The purpose of this document is to outline the minimum technical specifications for the *works*. This document provides the Engineering input to be included in a Contract document based on the NEC conditions of contract.

2.1.2 Applicability

This document applies only to the Integrated Physical Security System (IPSS) required for the National Security Co-ordination Centre (NSCC) and the National Security Nerve Centre.

2.2 NORMATIVE/INFORMATIVE REFERENCES

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

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.
- [2] Construction Regulations, 2014
- [3] 32-727 - Eskom Safety, Health, Environment and Quality (SHEQ) Policy
- [4] Occupational Health and Safety Act No. 95 of 1993,
- [5] National Building Regulations and Building Standards Act No. 103 of 1977.
- [6] SANS 10400 The application of the National Building Regulations All Parts.
- [7] 240-118870219 Standby power systems topology and autonomy for Eskom sites.
- [8] SANS 10142-1 (The Wiring of Premises - Part 1: Low-voltage Installations)

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- [9] 240-53114214, Cabling and racking standard.
- [10] 240-56227443, Requirements for Control and Power Cables for Power stations Standard.
- [11] 240-56356396, Earthing and lightning protection standard
- [12] Compulsory specification for plugs, socket-outlets, and socket-outlet adaptors, as published by Government Notice No. R. 1075 (Government Gazette 33763) of 19 November 2010. (VC 8008)
- [13] SANS 62040-1/IEC 62040-1, Uninterruptible power systems (UPS) – Part 1: General and safety requirements for UPS
- [14] 240-53114248, Thyristor and Switch Mode Chargers, AC/DC to DC/AC Converters and Inverter/Uninterruptible Power Supplies Standard
- [15] Electrical Installation Regulations, 2009 as amended (Promulgated in terms of the Occupational Health and Safety Act by GNR 242 of 6 March 2009).
- [16] 240-56364545 Structural Design and Engineering Standard (Rev 4)
- [17] 240-157602340, Universal Access Specifications
- [18] 240-103414344, Corporate Identity Manual
- [19] 240-79537982, Security Threat and Risk Assessments
- [20] 240-170000691, Standard for Intrusion Pre-Detection Systems Used at Eskom Sites.
- [21] 240-91190304, Specification for CCTV Surveillance with Intruder Detection.
- [22] 240-102220945, Specification for Integrated Access Control System (IACS) for Eskom Sites.
- [23] 240-86738968 Specification for Integrated Security Alarm System for Protection of Eskom Installations and its Subsidiaries
- [24] 240-170000096 Physical Security Integration Standard
- [25] 240-170000086 Roles and Accountabilities for Lifecycle Management of Physical Security Systems in the Transmission Division
- [26] 240-170000257 Technical Evaluation Criteria for the Integrated Security System
- [27] 240-60725641 Specification for Standard (19-inch) Equipment Cabinets
- [28] 240-55410927, Cybersecurity standard for Operational Technology
- [29] DEM2412993 & 2425114 LAD (Logical Architecture Definition) PAC (Physical Application Component) for Physical Security Information Management System (PSIM)
- [30] Business Requirement Specification DEM_2412993 & 2425114 Tx and ET Security Monitoring System
- [31] 240-170000723 Generic Technical Requirements for Physical Security Technologies Contracts
- [32] 240-171000171 Commissioning Guideline for Secondary Plant Physical Security System
- [33] 240-180100001 Secondary Plant Security Systems Maintenance Procedure
- [34] SANS 2220-2-5 Access Control Systems Part 2-5: Biometric readers
- [35] ERE-MS-006: Megawatt Park Access Control Procedure

2.2.2 Informative

- [36] 240-53113685, Design Review Procedure

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2.2.3 Disclosure Classification

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

2.2.4 Definitions

Definition	Description
Contractor/Tenderer	Refers to the corporation appointed to perform the engineering, procurement, and construction works required for the project
Employer	Refers to Eskom Holdings State Owned Company who will be represented by Eskom Real Estate (ERE) throughout the duration of the Project
Eskom Engineering	Refers to the Eskom Engineering team who will perform the reviews and provide technical assistance for the work performed by the appointed Contractor
Specification	The document/s forming part of the contract in which the methods of executing the various items of work to be done is described, as well as the nature and quality of the materials to be supplied
Client	The end user will be Eskom who will be represented by Eskom Real Estate (ERE) throughout the duration of the Project

2.3 ABBREVIATIONS

Abbreviation	Description
DEOL	Department of Employment and Labour
ECM	Engineering Change Management
ECSA	Engineering Council of South Africa
ERE	Eskom Real Estate
IPSS	Integrated Physical Security System
LCD	Liquid Cristal Display
MDL	Master Document List
MDR	Multi-disciplinary Review
NEC	New Engineering Contract
NSCC	National Security Co-ordination Centre
OEM	Original Equipment Manufacturer
QCP	Quality Control Plan
SABS	South African Bureau of Standards
SANS	South African National Standards
SAQCC	South African Qualifications and Certification Committee
VMS	Video Management System

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2.4 ROLES AND RESPONSIBILITIES

Roles and responsibilities shall be as per *The Employer's* design review procedure 240-53113685.

Contracts Manager:

The contracts manager is responsible to incorporate this Technical Specification into a contract based on the NEC conditions of contract.

Architectural Practitioner:

The Architectural Practitioners are responsible to review the completed contract to ensure that this Technical Specification has been incorporated correctly.

Project Manager:

The project manager is responsible for facilitating and ensuring continuous coordination and management of the requirements during the design development, execution phase and closing out of the project.

Facilities Manager:

The facilities manager is responsible for ensuring continuous sustainable performance of facilities. During construction phase he/she ensures that there are smooth interactions with tenants and stakeholders where required.

Contractor:

The contractor's responsibility is to build the project according to the contract documentation within the required cost and time budgets and the specified standards.

The Contractor will play the role of the design authority ensuring the following:

- The design satisfies the design requirements.
- All relevant Eskom design standards, procedures and guidelines have been adhered to.
- The design is suitable and correct calculations, philosophy, functionality, etc. have been applied.
- The design is integrated by identifying all interfaces with other packages/plant systems/assets and ensuring that these interfaces are catered for.

Eskom Engineering

Eskom Engineering will play the role of architect engineer and ensure that:

- The design satisfies the stakeholder requirements (i.e., validation of design deliverables against stakeholder requirements).
- The design is integrated by identifying all interfaces with other packages/plant systems/assets and ensuring that these interfaces are catered for.
- Foreseen technical risks are identified and addressed/challenged with the Design Authority
- General technical oversight is provided over the design.

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2.5 PROCESS FOR MONITORING

The design aspects will be monitored by conducting end of phase design reviews as described in the Eskom design review procedure [36]

2.6 RELATED/SUPPORTING DOCUMENTS

MWP NSCC Relocation Prelim Layout Rev 06 - 16 May 2025

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When downloaded from the EDMS, this document is uncontrolled and the responsibility rests with the user to ensure it is in line with the authorised version on the system.

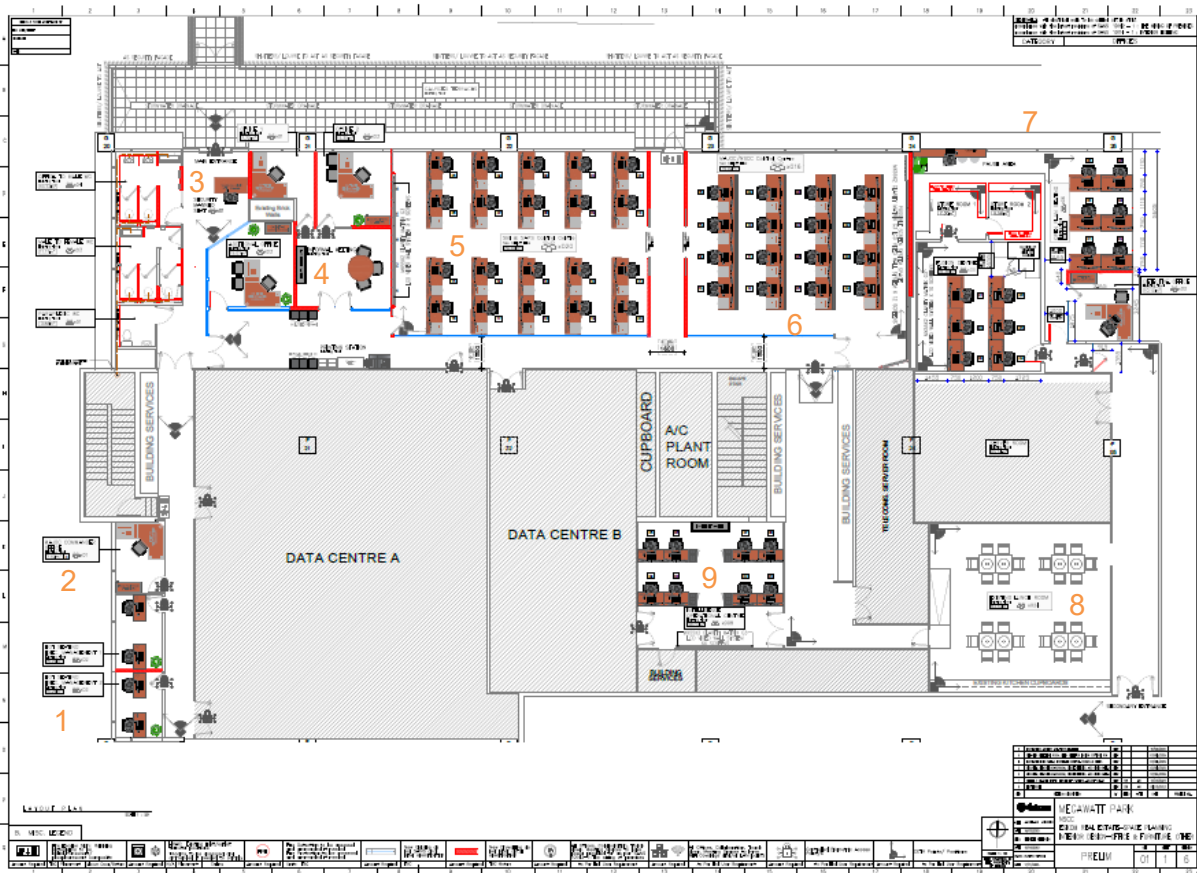
3. ENGINEERING AND THE *CONTRACTOR'S* DESIGN

3.1 DESCRIPTION OF THE *WORKS*

3.1.1 Executive overview

The scope of work for this contract includes provision of a complete Integrated Physical Security System (IPSS) for the National Security Co-ordination Centre (NSCC) and the National Security Nerve Centre.

The remaining scopes of works includes the complete refurbishment and civil alterations of the Megawatt National Security Co-ordination Centre.



Proposed floor layout.

Office space #1 accommodates two hot seat arrangement offices for executive managers with their secretaries. Two separate offices with face recognition access control at both doors.

Office space #2 accommodates the MAJOC commander. With face recognition access control fitted to the door.

Office space #3 accommodates an open plan security desk for one person at the main entrance. Face recognition access control only at main entrance.

Office space #4 accommodates two offices and an informal meeting room with no access control at double entrance/exit door. The informal meeting room has seating for 3 people, and a printing station just outside the room. The office for the executive has face recognition access control fitted on the door and, the second office accommodates one person with two visitor seats and has face recognition access control fitted to the door. Adjacent to this area

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there is a glass panel office accommodating one person with two visitor seats and no access control fitted to the door.

Area #5 houses the SBI and SAPS control room with seating for twenty (20) people and a video wall comprising of eight (8) x 43" LCD screens arranged in a 4 x 2 configuration. Entrance and exit by one sliding door and one normal door, none of the two doors fitted with access control.

Area #6 houses the MAJOC and NSCC control room with seating arrangements for sixteen (16) people and a video wall comprising of twelve (12) x 55" screens arranged in a 6 x 2 configuration. This is the main video for the NSCC which will display video footages and dashboards. Entrance and exit by one sliding door and one normal door, none of the two doors are fitted with access control.

Area #7 is the Fusion Centre. This area accommodates the fusion centre control room with seating for six people and a video wall comprising of eight (8) x 55" LCD screens arranged in a 4 x 2 configuration. It also houses two storerooms, an open plan office for six people and an office with seating for one detective and one visitor seat. All entrance and exit doors are access controlled with face recognition.

Area #8 is reserved for the lunchroom with a kitchenet and seating for twenty-four people. No access control on entrance and exit doors to the lunchroom area.

Area #9 houses the intelligence operational centre boardroom with seating for eight people and no video wall. Only the door leading to the data centre is access controlled with face recognition.

Secondary entrance/exit door is fitted with access control with face recognition.

A walk-through metal detector and X-Ray machine to be installed at the new security access control point to the NSCC.

Access control, with tailgating detection, to be installed at main and two back doors to the Centre.

Datacentre A is equipped with three (3) access control points and Datacentre B is equipped with one (1) access control point.

Work to be done by Others:

- The relocation of the NSCC and the Fusion Centre to accommodate the move is done by others.
- Cables for LAN points at each workstation to enable connectivity of all networks.
- Telephones with headsets are catered for at each workstation.
- Selection, supply and installation of printers.
- The DSTV decoder, screen and dish from the current location will be transferred.

3.1.2 Employer's objectives and purpose of the works

The works is intended to provide a complete Integrated Physical Security System (IPSS) for the National Security Co-ordination Centre (NSCC) and the National Security Nerve Centre.

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3.2 MANAGEMENT AND START UP.

3.2.1 Management meetings

Regular meetings of a general nature may be convened and chaired by the *Project Manager* as follows:

Title and purpose	Approximate time & interval	Location	Attendance by:
Risk register	Weekly	Microsoft teams/Megawatt Park	<i>Employer, Contractor</i>
Weekly progress report, reporting on actual work completed.	Every Friday of the week, reporting on the previous week's progress		
Compensation events	When required	Megawatt Park	<i>Employer, Contractor</i>
Project Progress meetings	Weekly	Megawatt Park	<i>Employer, Contractor</i>
Overall contract progress	Weekly	Megawatt Park	<i>Employer, Contractor</i>
Look ahead schedule	Bi - Weekly	Megawatt Park	<i>Employer, Contractor</i>

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the *works*. Records of these meetings shall be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

3.2.2 Documentation control

All documents supplied by the *Contractor* are subject to Eskom's acceptance. The language of all documentation is English.

The *Contractor* includes the *Employer's* drawing number in the drawing title block. This requirement only applies to design drawings developed by the *Contractor* and *Subcontractors*.

Drawing numbers are assigned by the *Employer* as drawings are developed.

All review documentation is submitted with transmittals. Any review information submitted without transmittals are considered rejected automatically.

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The *Contractor* compiles a Master Document List (MDL) which contains a list of all documents issued for review, document number, document title, transmittal number, date of submission, overall document review status. The MDL is a live document, the contractor issues an updated MDL within the progress report to the Project Manager.

Drawing number (*Employer* and *Contractor's* number)

- Revision
- Approval status
- Location of drawing at that stage
- Drawing description
- Sheet number
- Transmittal number
- Date of submission

3.2.3 Health and *safety* risk management

The supplier/contractor/tenderer is expected to comply to the following documents when working at/rendering a service to Eskom but not limited to the following:

- a. Occupational Health and Safety Act 85 of 1993 and its Regulations (OHS Act)
- b. Disaster Management Act, no 57 of 2002.
- c. Safety, Health and Environmental requirements contained in the SHE Specification for Contractors.
- d. Eskom SHEQ Policy, Standards, Procedures, Guidelines, Specifications and Regulations as listed below:
 - i. Eskom Safety, Health, Environmental and Quality Policy: 32-727
 - ii. Eskom Lifesaving Rules, Directive: 32-421
 - iii. Eskom Procedure on Smoking: 32-36
 - iv. Eskom Incident Management Procedure 32-95 (latest revision)
 - v. Implementation of Occupational Hygiene management programme, Standard 240-42262670
 - vi. Eskom Life Saving Rules, Directive: 240- 62196227
 - vii. Eskom vehicle and driver safety management 32-93
 - viii. Eskom vehicle specification 32-345
 - ix. Eskom *Contractor* Health and Safety requirements standards 32-136
 - x. Employees' right of refusal to work in an unsafe situation 240-43848327
 - xi. Eskom Waste Management Standard 32-245
 - xii. Annexure B: Acknowledgement Form for Eskom SHE Rules and other Requirements

Appendix A, The *Contractor* requests all applicable Eskom procedures & requirements. The *Contractor* ensures safety awareness at all times through continuous training. The *Contractor*, at all times is responsible for the supervision of his employees, agents, Subcontractors and takes full responsibility and accountability for ensuring they are competent, compliant and aware of the legal requirements and other requirements and execute the *works* accordingly.

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The *Contractor* ensures that all statutory appointments and appointments required by any Eskom Regulations are made in writing and that all appointees fully understand their responsibilities and are trained and competent to execute their duties.

The Divisional/Regional Safety Risk Manager or his representative having jurisdiction over the *works* must provide the relevant safety, health and environmental (SHE) criteria for incorporation into this Works Information. The SHE specification / scope must be signed off by the Divisional/Regional Safety Risk Manager or his representative confirming that the applicable safety criteria have been taken into account.

The Commodity Manager / Buyer must refer the tender to the Divisional/Regional Safety Risk Manager or his representative in order to evaluate against enquiry-specific safety criteria.

The Divisional Safety Risk Managers who will be responsible for the allocation of resources to assist P&SCM with the above processes are as follows:

- Generation: Roley McIntyre
- Transmission: Tony Patterson
- Distribution: Alex Stramrood
- Enterprises: Jace Naidoo
- Corporate: Kerseri Pather

The *Contractor* shall comply with the health and safety requirements.

3.2.4 Environmental *constraints* and management

All waste introduced and/or produced on the *Employer's* premises by the *Contractor* for this contract is handled in accordance with the minimum requirements for the Handling and Disposal of Hazardous Waste in terms of Government Legislation as proclaimed by the Department of Water Affairs and Forestry and *Employer's* environmental requirements.

All environmental incidents are reported to the *Employer* within 24 hours of such occurrence. All environmental incidents occurring on the Project Site (or on any other places, if any, as may be specified under the Contract as forming part of the Site) are recorded, detailing how each incident was dealt with in an Environmental Incident register.

The *Contractor* shall construct and/or implement all the necessary environmental protection measures in each area before any production work will be allowed to proceed. The *Employer* may suspend the Works at any time in terms the Conditions of Contract should the *Contractor*, in the *Employer's* opinion, fail to implement, operate or maintain any of the environmental protection measures adequately.

The *Contractor* ensures that all goods, services or works supplied in terms of the Contract comply with all applicable environmental legislations (National Environmental Management Act, 1998 [Act No 107 of 1998]). The *Contractor* is responsible for keeping the work area clean of any environmental waste.

The *Contractor* shall comply with all relevant applicable laws, environmental legislation and regulations, conditions of environmental approvals, environmental management plans, and *Employers* Policies and Procedures. The *Contractor* must submit an Environmental Policy demonstrating commitment to protection of the environment. The Environmental Policy shall form part of the SHE file submission. Upon the *Employer's* approval, the *Contractor* shall immediately implement the policy and any amendments and keep it in operation for the full duration of the Contract. The policy shall be communicated to all personnel and copies of the policy shall be prominently displayed at all places of work.

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The *Contractor* shall determine and develop the aspects and impacts register related to the scope of work. All aspects of the planning, manufacturing, pre-construction, construction and operational phases shall be considered. During the designing activity, the Contractor must always take into account the product's life cycle perspective in mind.

The *Contractor* shall comply with the environmental criteria and constraints.

3.2.5 Quality assurance requirements

The *Contractor* complies to the following documents when working at/rendering a service to Eskom but not limited to the following:

- i. 240-12248652 - List of Tender Returnable/Quality Requirement Document
- ii. 240-68099512 - FORM A: Tender & Contract Quality Requirements for QM 58 and Quality Requirements for ISO 9001 Standard
- iii. 240-105658000 (QM 58)- Supplier Quality Management: Specification
- iv. 240-109253698- Contract Quality Plan (CQP)
- v. 240-109253302- Quality Control Plan (QCP)/ Inspection and Test Plan (ITP)

After the acceptance of the construction drawings the *contractor* submits the associated construction Method Statements and relevant QCP/ITP for acceptance and determination of intervention points prior to construction.

Failure to comply with an accepted Method Statement/QCP or ITP may result the issuing of a NCR, rejection of the works as well as the withholding of payment until the appropriate remedial actions have occurred.

1. The *Contractor* demonstrates, provide, and maintains a Quality Management System that is ISO 9001:2008 certified or compliant thereto. Compliance with the provisions of this clause in no way relieves the *Contractor* of the final responsibility to furnish an acceptable product and/or services.

2. The *Contractor* agrees to control and professionally preserve and store appropriate documents, records, and recordings for a period of at least 3 years after termination of the agreement to guarantee the traceability of the services rendered and inspection thereof.

3. The *Contractor* agrees to regularly update and implement all the latest technology available as well as the necessary improvements for the installation, production and organisation deemed necessary to meet the requirements of the agreement and in order to enhance all system capabilities and effectiveness to deliver high quality, cost-effective services.

4. The delivered product and / or services shall be uniform in Quality and condition, sound and free from defects or external copyright or intellectual property rights, consistent with good industry practices and adhere to requested Eskom requirements, without deviation.

5. Eskom shall have the right to conduct surveys and perform surveillance of the *Contractor's* and/or Sub-Contractor facilities to evaluate their capability to comply with the requirements necessary to conform to contractual requirements.

6. Eskom reserves the right to inspect, at reasonable times, any or all of the work included in the Works Information at the *Contractor's* or Sub-Contractor's premises or elsewhere. Verification by Eskom shall not absolve the *Contractor* of the responsibility to provide acceptable product and / or services, nor shall it preclude subsequent rejection by Eskom.

7. The services must comply with the agreed specifications and the applicable directives and technical standards set out in the contract and annexures. Defects notified by Eskom shall be

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remedied by the *Contractor* upon demand by Eskom without undue delay and at no extra cost. The *Contractor* shall continuously monitor and identify non-conformances, both internal and external, as signals of opportunities for improvement making process and other relevant changes to prevent recurrence.

8. The *Contractor* shall further identify potential problems before they occur by identifying deviations in patterns or trends in product, service or process performance.

9. Nothing contained in the contract and/or scope of work and /or *Works* information shall relieve in any way the *Contractor* from the obligation of quality control thereof.

10. The *Contractor* guarantees that the quantity, quality and outward appearance of the delivered Product / services comply with the requirements of the contract and/or relevant specifications.

11. The *Contractor* shall, on request, prove its ability to relate to the proposed scope of work which establishes the manner in which the *Contractor* intends to perform the Contract.

12. The *Contractor* shall, on request, prove its organisational, logistics and support resources to ensure the requirements of the contract can and will be achieved.

13. Eskom reserves the right to assess and measure, during the existence of the agreement, the qualifications, capability and competence of the key staff (assigned personnel) in relation to the scope of work and to interview any / all *Contractors* to confirm the Quality evaluation.

14. The professional personnel who will be conducting the service will be available on a continuous basis until the conclusion of the project.

15. The *Contractor* shall demonstrate experience in comparable projects or specific aspects of the project and / or performance in similar projects, on request.

16. The Quality of the service / product and the contents thereof will always be in accordance with professional standards.

17. For the duration of the Contract, the professional staff rendering the service / product, must be and remain a member of his/her Professional Society (where available/applicable)

18. The *Contractor* must, at all relevant times, scrutinise and be aware of Eskom's requirements with specific focus on, inter alia, its philosophy, principles, strategies, practises, mission, vision, models, policies and practises.

19. It is the *Contractor's* obligation to ensure that their operations and the products and services it provides to Eskom comply with any applicable statutes and or regulations. Any non-compliance by the *Contractor* and the resultant corrective actions shall be the responsibility of the *Contractor*.

20. The *Contractor* shall ensure that he complies with the Works Information and that appropriate quality requirements (as in the main contract) are included in subcontracts placed by *Contractors* to ensure subcontractor's compliance with the Works Information.

21. The *Contractor* shall execute the Works in accordance with Eskom's Quality requirements set out in QM 58 document: Supplier Contract Quality Requirements Specification.

3.2.6 Programming constraints

A programme showing the key activities is to be submitted with the tender documents and once appointed within two weeks. The *Contractor* submits a single integrated programme that incorporates all the work to be performed including that of his Subcontractors.

The interfaces between Subcontractors as well as the interfaces between Subcontractors and the *Contractor* are clearly identified.

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Project key dates are incorporated into the programme.

All critical path items are indicated and outlined on the programme.

The order and timing of operations which the *Contractor* plans in order to provide the *Works*. Strict adherence to the programme will be monitored and updated on fortnightly basis to achieve the completion dates and submitted to Eskom Project Co-ordinator. Non-conformance to the stated programme will be liable for delay damages. Any deviations on time and cost are subject to Eskom approval.

The *Contractor* provides the Project Programme in Microsoft Projects Format to the level 3 detail. The programme is to be updated weekly and submitted to the Project Manager for review.

3.2.7 Contractor's management, supervision and key people

The *Contractor* provides the *Employer* with a detailed organogram of all staff and management on the contract, showing their lines of authority / communication, within two weeks of contract award. This is revised monthly and reflects any changes to the staff and management structure. The *Employer* reserves the right to audit and verify the structure. The *Contractor* has a full-time Safety and Health Officers onsite.

Roles and responsibilities shall be as per the *Employer's* design review procedure 240-53113685.

Contracts Manager:

The contracts manager is responsible to incorporate this Technical Specification into a contract based on the NEC conditions of contract.

Architectural Practitioner:

The Architectural Practitioners are responsible to review the completed contract to ensure that this Technical Specification has been incorporated correctly.

Project Manager:

The project manager is responsible for facilitating and ensuring continuous coordination and management of the requirements during the design development, execution phase and closing out of the project.

Facilities Manager:

The facilities manager is responsible for ensuring continuous sustainable performance of facilities. During construction phase he/she ensures that there are smooth interactions with tenants and stakeholders where required.

Contractor:

The *Contractor's* responsibility is to build the project according to the contract documentation within the required cost and time budgets and the specified standards.

The Contractor will play the role of the design authority ensuring the following:

- i. The design satisfies the design requirements.
- ii. All relevant Eskom design standards, procedures and guidelines have been adhered to.
- iii. The design is suitable and correct calculations, philosophy, functionality, etc. have been applied.
- iv. The design is integrated by identifying all interfaces with other packages/plant systems/assets and ensuring that these interfaces are catered for.

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Eskom Engineering

Eskom Engineering will play the role of architect engineer and ensure that:

- i. ▪ The design satisfies the stakeholder requirements (i.e., validation of design deliverables against stakeholder requirements).
- ii. ▪ The design is integrated by identifying all interfaces with other packages/plant systems/ assets and ensuring that these interfaces are catered for.
- iii. ▪ Foreseen technical risks are identified and addressed/challenged with the Design Authority
- iv. ▪ General technical oversight is provided over the design.

3.2.8 Invoicing and *payment*

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's payment certificate*.

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager*;
- The contract number and title;
- *Contractor's* VAT registration number;
- The *Employer's* VAT registration number 4740101508;
- Description of service provided for each item invoiced based on the Price List;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

Add procedures for invoice submission and payment (e. g. electronic payment instructions)

3.2.9 Insurance *provided by the Employer*

The *Contractor* familiarises themselves with the Eskom Insurance Format A as provided in the Contract Data and make provision for all items that they are liable for.

3.2.10 Contract *change* management

The *Employer* instructs changes to the scope at any time, each instruction sets out the change and the date on which it becomes effective; and is issued to the *Contractor* in writing to be valid.

3.2.11 Provision of *bonds* and *guarantees*

The form in which a bond or guarantee required by the *conditions of contract* (if any) is to be provided by the *Contractor* is given in Part 1 Agreements and Contract Data, document C1.3, Sureties.

The *Employer* may withhold payment of amounts due to the *Contractor* until the bond or guarantee required in terms of this contract has been received and accepted by the person notified to the *Contractor* by the *Project Manager* to receive and accept such bond or

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guarantee. Such withholding of payment due to the *Contractor* does not affect the *Employer's* right to termination stated in this contract.

3.2.12 Records of *Defined Cost*, payments & assessments of compensation events to be kept by the *Contractor*

The *Contractor* to keep accurate and detailed records of:

1. **Defined Cost** – the actual costs the Contractor incurs (e.g. People, Equipment, Materials, Subcontractors)
2. **Payments received** – for completed work or milestones
3. **Compensation events** – including supporting evidence of time and cost impacts

3.2.13 Training *workshops* and technology transfer

After Completion of the contract, the *Contractor* is required to provide training and transfer system knowledge to the building owner/manager by submitting documented Design Intent, As-built drawings, Operational and Maintenance Manual, Commissioning Records, Commissioning Report and by providing training on all the systems to the building management staff to ensure that they have all the information and understanding needed to operate and maintain the features and systems in the building.

The *Contractor* is to provide on-site training and training material to the Engineers, Operators and Maintenance personnel prior to taking-over of the *Works*. The training will preferable be offered during the commissioning and testing. The *Contractor* will, prior to handing over of the *Works*, satisfy the *Employer* or authorized representative that maintenance and operational personnel are competent and adequately trained to maintain and operate the Plant and Materials supplied.

The training is to cover the following, however not limited to:

- a. Information provided in the design intent report (including energy/environmental features)
- b. Review of controls set up, programming, alarms and troubleshooting
- c. Review of O&M manuals
- d. Building operation (start up, normal operation, unoccupied operation, seasonal changeover, shutdown)
- e. Measures that can be taken to optimise energy efficiency
- f. Occupational health and safety (OH&S) issues
- g. Maintenance requirements and sourcing replacements
- h. Obtaining and addressing occupant satisfaction feedback Steps for Conducting On site Training are to include, but not limited to:
 - a. Preparation
 - b. Introduction
 - c. Explanation
 - d. Demonstration
 - e. Practice Under Supervision
 - f. Conclusion

The operating and maintenance manual must be available during the training of site staff. Site staff must also be made familiar with the contents of that manual.

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3.3 ENGINEERING AND THE CONTRACTOR'S DESIGN

3.3.1 Employer's design

The *Contractor* provides preliminary designs by registered engineers to the Project Manager for acceptance. These would have to be reviewed with possible amendments having to be made to comply with Eskom requirements. Adequate time is allowed for this. After acceptance of preliminary designs, the *Contractor* provides detailed designs.

The scope of works includes the detail design, drawings, procurement, manufacture, fabrication, quality control, supply, delivery, installation, commissioning, testing, handing over, training and maintenance during the guarantee period of all materials and equipment necessary for a complete Integrated Physical Security System (IPSS) for the National Security Co-ordination Centre (NSCC) and the National Security Nerve Centre.

The *Contractor* is a paid-up member of Private Security Industry Regulatory Authority (PSIRA) which is a South African government entity responsible for regulating and controlling the private security industry. Its primary objective is to ensure that security service providers operate professionally, ethically, and in the public interest.

As part of the tender returnable, the *Contractor* fills the Schedule A and B found in the Technical Evaluation Criteria for the Integrated Security System (240-170000257) referenced in section 6.5 (19) of this NEC contract. Without these schedules the tender cannot be evaluated and will be marked as "nonresponsive".

3.3.2 Parts of the works which the Contractor is to design

3.3.2.1 Integrated Physical Security System (IPSS) Design

- i. Video walls, including mounting brackets, fixtures and power supplies, for NSCC and Fusion Centre with a graphical user interface (GUI) and behaviour models for the site.
- ii. Integrated security system, compliant with supplied standards, includes:
 - a. Integrated Access Control System (IACS),
 - b. Camera Surveillance CCTV System with intruder detection,
 - c. Intruder Detection System,
 - d. Integrated Security Alarm System for Protection of Eskom,
 - a. Physical Security Information Management (PSIM) System (including IT Infrastructure),
 - b. Visitor Management System,
 - c. Security Management System integrating the above-mentioned systems with each other and to the existing MWP Public Address (PA) system forming an integrated security system,
 - d. A walk-through metal detector and X-Ray machine installed at the new security access control point to the NSCC,
 - e. Access control, with tailgating detection, to be installed at main and back doors to the Centre,
 - f. Face recognition access control system at internal and external doors,
 - g. Installation of CCTV cameras at the two access points to the NSCC. (Strategically placed AI dome cameras,

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- h. A bi-directional biometric controlled access gate with face recognition and anti-pass back to be installed separating the balcony and the walkway leading to the parking area,
- i. Intrusion Detection Systems (IDC) to prevent unauthorised access.
- iii. Creation of KKS Coding and cable numbers up to component level.
- iv. Allocation of drawing numbers, based on the envisaged quantities of drawings to be produced by the Contractor, a block of drawing numbers will be supplied to the Contractor for allocation to individual drawings.
- v. Labelling of plant to suit KKS and cable numbering.
- vi. The project execution phase (detail design, installation, calibration, commissioning, Handover) will be performed by the Contractor.
- vii. The detailed handover documents include but are not limited to:
 - a. Operating manual/s
 - b. Layout and installation drawings – All systems
 - c. Assessments and reports
 - d. Maintenance Manuals and Maintenance Schedules
 - e. All statutory certificates including CoC's
 - f. All required software licences
- viii. All network designs take into consideration cyber security requirements.

3.3.2.2 Civil and Structural Design

All structural modifications are designed and supervised by a Professional Engineer/Technologist. These designs are accepted by the Project Manager prior to implementation. The existing structure (floor slab, walls and ceiling/soffit) is checked against all newly introduced loads of equipment and materials to be installed into the area.

The extension of the ablution facility and water recirculation for new installation are conducted by a professional person in accordance with SANS.

All architectural work and any quality inspections regarding to be carried out by registered Architectural Professional.

3.3.2.3 Electrical Design

The NSCC Lighting shall be replaced/upgraded to comply with SANS10114-1 & OSH Act requirements and that all material used are SABS approved. Any additional alteration on existing lighting and associated Distribution Boards shall be accompanied by a Certificate of Compliance (CoC)

Lighting control: Office facilities, small storerooms and ablution luminaires will be controlled by occupancy sensors to manage energy efficiency. Existing luminaires / lamps and light fittings shall be replaced with Light Emitting Diode (LED) lights in accordance with SANS 10114-1 (Interior Lighting-Part 1) and SANS 10142-1 (The wiring of premises-part 1) and SANS 60598-2-2. The *Contractor* shall provide a lighting simulation Report in Relux and submit to the *Employer* for review during the tender phase. The *Contractor* shall submit one (1) sample of all different luminaires proposed for interior design for testing at Eskom RT&D laboratories to verify the photometric, electrical and electromagnetic interference for approval prior installation. Emergency lighting shall be done in accordance with SANS 1464 part 22.

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All existing Distribution boards installed within NSCC shall be replaced with new Distribution Boards rated the same capacity as the existing boards and ensure compliance to section 3.2.20 of 240-55714363 (Gx Lighting and Small Power Installation Standard). The IP rating for Distribution Boards shall be IP55 and the finishing colour shall be Light Orange.

The installation shall be tested, and a certificate of compliance shall be issued per UPS distribution board.

Existing cables from the Main Low Voltage Board to the office Sub Distribution boards within NSCC shall be tested and report submitted to the Employer to assess if the cables can be reused or require replacement. All outgoing cables from the Sub Distribution Boards to the field equipment (luminaires, plug sockets, etc) are recommended to be replaced with new cables. The cable reticulation to the DBs will be by means of cable trays/ladders provided inside the ceiling void.

Replace the power outlets, standard 230 V socket outlets with a 16 A, 3-pin earthed switched outlets as per SANS 164-1 or Part 2 and replace power skirting. Provide 5A socket outlet for panel lights.

Light switches shall bear the SABS mark of approval. Specifications for each item priced shall be supplied by the tenderer to the client.

Light switches shall be rated at 16A, switches complete with white cover plates.

Light switches shall be installed in close proximity to each section DB to switch the lights in that section.

Occupancies sensors shall be installed as per the lighting layout. 10A / 240V 360° passive infra-red detectors shall be used for switching of light circuits.

Wiring and wire ways

Internal wiring shall be installed in PVC conduits mounted flush in walls and slabs, where appropriate. All exposed conduits shall be of galvanized steel or PVC. Cables shall be installed on galvanized steel cable ladders, trays, trunking and ducting.

All conductors shall be marked by suitable cable markers indicating the circuit (e.g. L1 on both line and neutral conductors) at either end.

Wiring sizes shall be indicated on the relevant single line diagrams. Where wiring sizes are not indicated the contractor shall inform the Employer. The Contractor shall submit samples and data sheets for acceptance of all types of wiring to the Engineer prior to the procurement thereof.

The office and all new electrical equipment shall be properly earthed according to SANS 10313 and SANS 62305. The existing earthing and lightning protection system for the buildings shall be inspected, repaired, tested and certified. Earthing for the electrical system shall be provided in accordance with SANS 10292.

All emergency lighting shall be done in accordance with SANS 1464 part 22.

Electrical Installation Regulations, 2009 as amended (Promulgated in terms of the Occupational Health and Safety Act by GNR 242 of 6 March 2009).

Equipment used shall originate from Suppliers which have been certified in accordance with SABS ISO 9001 (ISO 9001) or SABS ISO 9002 (ISO 9002) for quality assurance. Manufacturer's specifications and installation instructions and local by-laws.

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The *Contractor* shall ensure that all safety regulations and measures are applied and enforced during construction, repair and maintenance work on cabling, wiring, distribution boards, luminaires and power outlets.

All materials supplied or utilised under this Contract shall be new and unused. Only materials of first-class quality and finish shall be utilised. All materials and equipment shall be subject to acceptance by the Employer before procurement. Specifications for each item priced shall be supplied by the Tenderer to the Employer.

All materials shall comply with the relevant SANS specifications, STANDARD SPECIFICATIONS, REGULATIONS AND CODES.

Materials shall be of high quality and approved by the Employer. The Contractor shall provide preliminary specifications for materials, fittings and equipment at the time of tender. The tender will not be considered if this information has not been included.

All materials shall be unconditionally guaranteed for a period of 12 months from the date of practical completion, which is first hand-over. Where supplier's guarantees are of a shorter duration than 12 months, the Contractor shall unreservedly agree to the extension of all warranties and guarantees.

The Contractor shall replace any materials that are found to be defective during the 12 months defects liability period.

All work shall be executed and supervised by suitably qualified staff. Only "ACCREDITED PERSONS" shall be permitted to carry out and supervise work.

The Contractor shall at all times have an adequate number of Employees available during the construction period to ensure that the work does not delay the construction programme.

The works shall be supervised by a full time registered "Installation Electrician". All modifications are designed and supervised by a Professional Engineer/Technologist.

The Contractor shall allow for the removal, making safe, interim safe keeping and returning to the client, all existing electrical equipment, distribution boards, wiring, cabling, luminaires, socket outlets and isolators.

Distribution boards shall comply with the requirements of SANS 1973 for Type testing and Safety of distribution boards. Type testing certificates shall be made available and Routine test certificates shall be provided with each assembly.

All outlets, isolators and light switches shall be labelled with engraved labels on the cover plate. The label shall indicate the supply DB and circuit number (e.g. DB-GC-L5). Wiring inside the DB shall bear Gravoplast labels.

The *Contractor* design, procure and install a suitable standby power system, sized appropriately to handle the expected system load for the Integrated Physical Security System (IPSS) as well as emergency lighting of the NSCC area for a period of eight (8) hours. The envisaged load for this backup power UPS/Inverter is 10 kVA; however, the actual load requirements are to be calculated from the *Contractor's* design as an input for sizing the final standby power system. Server applications are housed in the MWP main datacentre which is already equipped with redundancy to Tier Level 3.

Sizing of Uninterruptable Power Supplies shall be done in accordance with the Thyristor and Switch Mode Chargers, AC/DC to DC/AC Converters and Inverter/Uninterruptible Power Supplies Standard (240-53114248) or any other related SANS standards. Sizing of UPS

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batteries shall be done in accordance with 240-51999453 (Eskom Standard for Valve Regulated Lead Acid Batteries) or any other related SANS standards.

With reference to the redlined drawing number 0.50/4211, the Contractor scope of work includes the following as the minimum:

- Area 1:
 - ❖ Decommissioning and preservation of existing HVAC Motor Control Centre (MCC) Panel. Design, manufacture, factory acceptance testing, transportation and delivery to Site, off-loading, installation, perform site acceptance testing, commissioning and plant optimisation of new MCC Panel.
 - ❖ Replacement of existing loads (motors, variable speed drives, fans, etc) with new equivalent loads (motors, variable speed drives, fans, etc)'
 - ❖ The Contractor shall reuse the Employers existing circuits associated cables and cable rack servitudes.
 - ❖ The Contractor shall test existing power cable from the Employer's existing 400V Main LV Switchgear supplying the existing HVAC Motor Control Panels as well as all the outgoing power cables from the existing HVAC Motor Control Panels. The Contractor shall produce a report for the Employers review and acceptance to indicate the condition of the cables with recommendations which cables may be re-used, and which cables are recommended for replacement.
 - ❖ The Contractor shall provide a cable assessment methodology for the Works inclusive of the proposed inspections, cable test acceptance criteria to validate the replacement or reuse of the cabling systems.
 - ❖ The Contractor shall further make provision for new power cables for the scope of this project where existing cables cannot be re-used. Provision of new low voltage power cables shall be in accordance with SANS 1507 and SANS 1574.
 - ❖ Where new cable racks are required, the Contractor shall be responsible for providing and installation of new cable racks
- Area 4: Outdoor unit is planned to be installed inside the existing AHU plant room. The Contractor shall be responsible to source the electrical point of supply from the nearest Distribution Board/s, provide new power cable, install and terminate power cables between the source and the outdoor unit to be installed.

For both area 1 and area 4, the Contractor shall ensure all new equipment installed as part of the works are bonded to existing earth math. Earthing of new equipment shall be done in accordance with and 240-56356396 (Earthing and Lightning Protection Standard) or any other SANS related standards.

The Contractor shall prepare as-built drawings as well as operating and maintenance manuals of the complete installation including schematic diagrams, cable routes and trenches, lighting and power layouts, earthing, conduits and wire ways. The drawings shall be produced on the latest version of AutoCAD and shall be copied onto a CD. A set of two CDs and two hard copies with all drawings and manuals shall be provided.

3.3.2.4 HVAC System Design

The scope to design, construct, test balancing and commission HVAC system for NSCC should cover all disciplines, including but not limited, Mechanical, Electrical, Electronics, civil and fire for the works. The design should conform to the requirements of 240-143112846 Heating Ventilation and Air Conditioning (HVAC) System Design Instruction, 240-70164623 Eskom Heating Ventilation and Air Conditioning (HVAC) Design Guideline, 240-102547991 General Technical Specification for HVAC Systems Standard.

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The design shall be reviewed and approved by the Eskom Engineering before Procurement and Construction can begin, the following procedure will be followed during review 240-53113685 Design Review Procedure.

Decommission and remove existing HVAC system (Existing unit Including but not limited ducting, diffuser, Air Handling unit), areas that have plant been decommissioned must be repaired to be safe and astatically pleasing.

HVAC should be designed to suit space planning layout, the estimated cooling load for the area is 55 kW, the contractor must do heat load calculation for sizing of the equipment.

AHU should be two Indoor (ideally should be in the lower ground floor to the same location as the existing) Dx unit for both heating and cooling, one standby and one in service.

The condenser should be of a matching Indoor Dx unit of inverter type; the condensers should be located on the lower ground floor on one of the plant rooms, ventilation should be provided for the condenser for heat rejection.

The ducting should be insulated externally.

The HVAC system should have humidifier/ dehumidifier.

The indoor condition should be according to 240-70164623 Eskom Heating Ventilation and Air Conditioning (HVAC) Design Guidelines Table 1 as outlined for control room and offices.

The HVAC design shall include:

- Fresh air and return air dampers

- Economy cycle exhaust connection

- Mixing plenum

- Washable primary air filters

- Disposable secondary (bag type) air filters (to 85% Dust Spot Efficiency – EU7)

The diffuser shall be of variable air volume, with electric heating elements

The HVAC shall have standalone equipment controls, and be integrated to Central BMS system

The *Contractor* provides extraction systems for the bathrooms

Design shall be prepared and signed off by Professionally Registered Engineer/ Technologist for each discipline

The Works is inclusive of provision of CoC's for all required installation, such as electrical installation, gas piping by Authorised Person.

Drawing 0.50/3943 Rev 2 shows original underfloor HVAC distribution system two at the top and two at the bottom, each have two air handling units, two HVAC distribution system has since been decommissioned, top left and bottom right units were decommissioned, hence as part of this works all air handling units will need to be decommissioned including piping and electrical boards even on areas that air handling units are decommissioned already.

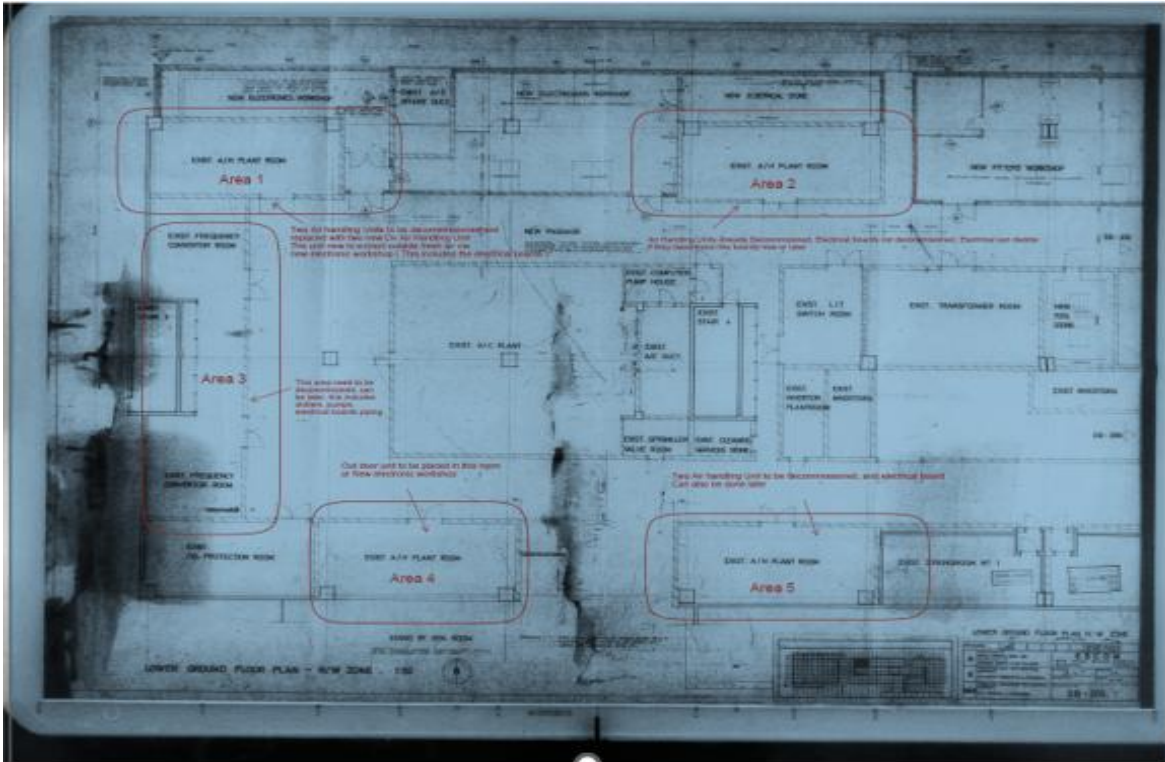
Drawing 0.50/2514 is showing existing ducting drawing for the inner web between column 24 and 25.

Drawing 0.50/2482 is showing existing drawing for the computer section shilled water system which will need to be decommissioned.

Drawing 0.50/2760 is showing drawing for existing ducting initially for fresh air supply, ducting can be checked for internal insulation and if not insulated can be re-used cleaned before use,

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and external insulate and if internally insulated ducting will need to be replaced with new design.



Area 1: To be decommissioned including Air Handling Units, associated pipe work, electrical board to make space for new equipment

Area 2: Air Handling unit already decommissioned and removed, left with electrical board to be removed.

Area 3: Chiller plant, pumps and associated pipe work, electrical board need to be decommissioned.

Area 4: Earmarked for installation of outdoor unit however new electrical workshop can also be used since is close by.

Area 5 : Air handling Unit and electrical board needs to be decommissioned.

3.3.2.5 Other Designs

Procure, construct, test and commission above systems as per approved detail designs.

Refurbish the existing bathrooms to SANS 10400 compliant bathrooms with disability access.

Install shelves in the allocated storeroom areas of area #7 "Fusion Centre".

Creation of KKS Coding and cable numbers up to component level.

Allocation of drawing numbers, based on the envisaged quantities of drawings to be produced by the *Contractor*, a block of drawing numbers will be supplied to the *Contractor* for allocation to individual drawings.

Labelling of plant to suit KKS and cable numbering.

The project execution phase (detail design, installation, calibration, commissioning, Handover) will be performed by the *Contractor*.

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The detailed handover documents include but are not limited to:

- a. Operating manual/s
- b. Layout and installation drawings – All systems
- c. Assessments and reports
- d. Maintenance Manuals and Maintenance Schedules
- e. All statutory certificates including CoC's
- f. All required software licences

All network designs take into consideration cyber security requirements.

Design, procure and install three additional optical smoke detectors in area #7 to render the area compliant with National Building Regulations and SANS 10139. The additional Fire Detection System equipment is interfaced with the existing site Ziton ZP3 Fire Detection System to have all fire alarms initiated at the MWP main control room.

By virtue of the Department of Employment and Labour (DEOL) mandate to the South African Qualifications and Certification Committee (SAQCC), any person designing, installing, commissioning or maintaining Fire Detection System needs to be certified by SAQCC at the appropriate level. The *Contractor* provides proof of certification as part of the tender returnable. In the absence of the main *Contractor's* personnel being certified he/she can submit an agreement with a certified sub-contractor to perform the duties that require certification. In this case, proof of certification of sub-contractor and formal agreement shall be supplied.

The *Contractor* revamps the NSCC and Fusion Centre areas including ceilings, re-painting, carpet deep-cleaning and removing "SARS" branding.

The *Contractor* supply and install furniture including desks, chairs and lockable office cabinets for all people. The operator chairs and consoles shall be designed in accordance with the requirements outlined in ISO 11064 ergonomic standards, as well as the Eskom requirements.

The *Contractor* supplies all kitchen furniture e.g. microwave oven, kettle etc. as part of the Works.

All windows facing the parking area to be covered with a one-way mirror film.

3.3.3 Procedure for submission and acceptance of *Contractor's* design

All Documents are submitted to the *Project Manager* for review prior to implementation. All review documentation is submitted with transmittals. Any review information submitted without transmittals are considered rejected automatically.

At the end of each contracted design phase (e.g., Concept, Basic, detailed design phase), the *Contractor* provides an integrated design report which is reviewed at a Multi-Disciplinary Design Review (MDR) which will allow the project to move into the next design phase or allow for design freeze.

Construction may not begin prior to design freeze.

The following process will be followed during submission of documents:

- a) The *Contractor* submits the documents/drawings to the *Employer*
- b) The *Employer's* Document Controller registers the documents.
- c) The *Employer's* Document Controller will supply the documents/drawings to all relevant parties within the *Employer's* project team.

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- d) The *Employer's* project team reviews the documents/drawings and will submit all comments or inputs to the *Contractor* for consideration.
- e) If the *Employer* finds major deficiencies in the submitted documents/drawings, the *Contractor* revises the documents/drawings and resubmits to the *Employer*.
- f) The *Employer* reviews the documents/drawings and if no major deficiencies are found, the *Contractor* organises a Review session.
- g) The *Employer* and the *Contractor* conduct a Review.
- h) If any fundamental errors were found in the works or further actions are required, the *Contractor* records all concerns raised and revises the designs.
- i) The *Contractor* organises a review session once all works were revised according to the concerns raised by the *Employer*.
- j) If no fundamental errors were found in the designs during the Design Review session, the *Contractor* compiles the Review minutes or report and submits it to the *Employer*
- k) The *Employer's* Document Controller registers the report.
- l) The *Employer's* project team reviews the *Contractor* report/minutes. If the report/minutes are not acceptable, the *Contractor* revises the report/minutes and resubmits to the *Employer's* Agent.
- m) The *Employer's* Agent will accept the *Contractor* works once the report/minutes are accepted by the *Employer's* project team.
- n) Work shall always be subject to full time supervision by a qualified and experienced site agent. This representative must be authorised and competent to receive instructions on behalf of the *Contractor*.

The following documents are supplied to the *Employer* by the *Contractor* as a minimum:

- i. Detail Design
- ii. Detail design report
- iii. Detail calculations
- iv. Coordination between services
- v. Design including components data sheets and specification for selected components, distribution, electrical cabling and other associated component
- vi. Dimensioned detailed drawings showing the general arrangement of all plant and component including isometrics and/or P&ID's where required. Sufficient views must be given to ensure clarity, and the drawing shall have at least a plan and two different elevations or sections giving overall dimensions.
- vii. Detail design drawings. Dimensioned detail drawings showing proposed method of fixing of all the plant and component
- viii. Detailed electrical wiring diagrams including schematic and control circuits.
- ix. Detailed sequencing manner for installation procedure of Works
- x. Detailed programme for the *Works* in sufficient detail as to represent the units of work to enable the representative to assess the progress of the Works
- xi. Technical Specifications and Technical literature for all items of component that forms part of the complete installation
- xii. List of recommended spares and technical specifications for the spares

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- xiii. Detailed structural & civil works for structural mounts
- xiv. Detailed maintenance, reliability, control and operating philosophies
- xv. Testing and commissioning procedures
- xvi. Plant and material acceptance testing
- xvii. Plant Codification Lists for each Section of the Works

3.3.4 Other requirements of the *Contractor's* design

All the design solutions are developed by the relevant Professional Engineers at all design stages, the associated Professional Engineer will form part of the *Contractor's* supervision team and inspect and sign off the various quality documents.

The *Contractor* is to comply with all legislated safety requirements as well as Eskom's health and safety standards.

3.3.5 Use of *Contractor's* design

The *Contractor* grants to the *Employer*, with effect from the starting date, an irrevocable royalty-free non-exclusive licence to use all of the documents provided to provide the Works (including, but not limited to calculations, drawings, manuals, models and other documents of a technical nature), for any purpose whatsoever, including for the purpose of operating, repairing, maintaining, dismantling, re-assembling and making adjustments to all parts of the Works.

3.3.6 Design of Equipment

- a. The components are to be designed to facilitate efficient manufacture, inspection, transportation, installation, maintenance, cleaning and repairs.
- b. The components are to be designed to ensure safe and satisfactory operation for a life expectancy of at least 30 years under the conditions prevailing at Eskom Megawatt Park.
- c. The components are to be designed to prevent undue stresses being produced by expansion and contraction due to temperature change and other local natural and manmade conditions.
- d. The components are to be designed to keep maintenance costs to a minimum.
- e. The components are to be designed to comply with all the legal requirements in respect of safety and the prevention of environmental pollution.
- f. The components are to be designed to satisfy any specific requirements contained in the relevant statutory codes and standards.
- g. The components are to be designed for operation of 365 day per annum, 24hrs per day.
- h. The components are to be designed such that all material from which the components are manufactured from is compatible with the intended duty and service conditions. All components are suitable treated and protected from corrosion.

3.3.7 Equipment required to be included in the *works*

As per the *Contractor's* approved design to satisfy the requirements stated in this document.

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3.3.8 As-built drawings, operating manuals and maintenance schedules

At Take-over, the *Contractor* provides two full sets of as-built documentation as hard copies and electronic PDF and native CAD formats (. DGN or .DWG which must be compatible with Bentley MicroStation) to the *Employer*.

The Operating and Maintenance Manual and Schedules must describe how the plant is to be operated and by whom, as well as the desired level of training and orientation required for the building occupants. The operation and maintenance manuals are to consist of the following as a minimum:

- i. List of Contents (Index)
- ii. Introduction
- iii. General description of the functions of each of the systems including detailed description of each element of each system, how it functions, how it operates and how to maintain it and what attic stock or tools to carry.
- iv. Full as-built drawings and detailed drawings, brochures and catalogues for each system and each element of each system.
- v. The format of the O & M documentations is to be A4 and be a specially bound document with hard cover and with metal ring binding. (All drawings and details are to be reduced to A3 format and folded into A4 format.)
- vi. The names, addresses and telephone/fax numbers/email addresses of all responsible persons and manufacturers/suppliers are to be listed in the O& M manual.
- vii. A full list with reference numbers is to be included to enable the O&M staff to order materials and spares.
- viii. Colour diagrams are to be provided to illustrate the operation and function of each system with reference to the relevant as-built drawings or brochures of Plant and Materials. These diagrammatic drawings must also indicate the locations of installed equipment with their generated codification.
- ix. Outlines all the required maintenance activities for the complete works as well as the frequency of such activities and by whom.
- x. Proposed maintenance schedules and activities to complete during maintenance activities.

Shop Drawings

Shop drawings are to indicate all Plant and Materials, distribution systems, testing/inspection/instrumentation positions, access requirements and builder's work requirements.

The *Contractor* is to review, stamp all shop drawings to confirm that co-ordination with building and services drawings have taken place before submitting to the *Employer* for Acceptance.

The *Contractor's* drawings are to be prepared in accordance with SANS 10111 (Engineering drawing practice) and 240-86973501 (Eskom Engineering Drawing Standard Common Requirements). General arrangement and detailed drawings are to be cross referenced using codification system.

Operating Manuals and Maintenance Schedules

The Operating and Maintenance Manual must describe how the plant is to be operated and by whom, as well as the desired level of training and orientation required for the building occupants

CONTROLLED DISCLOSURE

The operation and maintenance manuals are to consist of the following as a minimum:

- a. List of Contents (Index)
- b. Introduction
- c. General description of the functions of each of the systems including detailed description of element of each system, how it functions, how it operates and how to maintain it and what attic stock or tools to carry.
- d. Full as-built drawings and detailed drawings, brochures and catalogues for each system and each element of each system.
- e. The format of the O & M documentations is to be A4 and be a specially bound document with hard cover and with metal ring binding. (All drawings and details are to be reduced to A3 format and folded into A4 format.)
- f. The names, addresses and telephone/fax numbers/email addresses of all responsible persons and manufacturers/suppliers are to be listed in the O& M manual.
- g. A full list with reference numbers are to be included to enable the O&M staff to order materials and spares.
- h. Colour diagrams are to be provided to illustrate the operation and function of each system with reference to the relevant as-built drawings or brochures of Plant and Materials. These diagrammatic drawings must also indicate the locations of valves with their numbers

3.4 PROCUREMENT

The *Contractor* provides the following procurement services in performing the Works:

- i. Preparation of *Employer* approved supplier and Sub-Contractor's lists for equipment and contracts to be submitted to the *Employer* for review and approval.
- ii. Follows the most cost and time saving procurement strategies.
- iii. Contract management services for the selection, appointment, and management of Sub-Contractors, where required to execute the scope.
- iv. Obtains delivery dates from Sub-Contractors and suppliers in order to realize the Completion Date;
- v. Receiving of invoices, verification thereof in terms of purchase orders and contract provisions, certification of invoices as being correct and payable and supply of correct invoices to the *Employer*
- vi. Management of and negotiating of all suppliers and Sub-Contractors compensation events and recommendations to the *Employer* as to the validity, amount and payment of such events.
- vii. Determination of penalties payable by suppliers and Sub-Contractors and recommendation to the *Employer* as to the enforcement of such penalties prior to any communication to suppliers and *Contractors*.
- viii. Ensuring that all suppliers and Sub-Contractors, from whom the *Contractor* procures equipment and materials do not retain, encumber or reserve title to such items.

3.4.1 People

3.4.1.1 Minimum requirements of people employed on the Site

All the *Contractors* personnel are subjected to access control conditions as per Eskom requirements.

- i. All workers employed on site comply with Eskom's health and safety standards. Workers are not allowed to be transported on the back of vans or bakkies.
- ii. Workers are restricted to the area of activity in close proximity to the construction.

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- iii. The *Contractor* recruits within the immediate District Municipality for general labour/ skills to execute the project.

3.4.1.2 BBBEE and *preferencing* scheme

The *Contractor* is required to achieve or maintain BBBEE Level 4 rating in accordance with SD&L requirements.

3.4.1.3 Accelerated *Shared Growth Initiative – South Africa (ASGI-SA)*

The *Contractor* complies with and fulfils the *Contractor's* obligations in respect of the Accelerated and Shared Growth Initiative - South Africa in accordance with and as provided for in the *Contractor's* ASGI-SA Compliance Schedule stated below.

The *Contractor* shall keep accurate records and provide the *Project Manager* with reports on the *Contractor's* actual delivery against the above stated ASGI-SA criteria. [Elaborate on access to and format of records and frequency of submission etc.]

The *Contractor's* failure to comply with his ASGI-SA obligations constitutes substantial failure on the part of the *Contractor* to comply with his obligations under this contract.

3.4.2 Subcontracting

3.4.2.1 Preferred *subcontractors*

The *Contractor* notifies the Project Manager in the event of using any Sub-contractor and provides the Project Manager with a list of all sub-contractors on the project. Subcontractors cannot subcontract work to another subcontractor. The choice of the proposed sub-contractor is subject to the Project Manager's approval before using the services of such subcontractor. The Subcontractor must be familiar with the required work and should submit CV's of past experience and have the necessary statutory accreditations.

The *Contractor* provides the Project Manager with the Health and Safety plans of all the sub-contractors on the project, before commencing the project.

3.4.2.2 Subcontract documentation, and *assessment* of subcontract tenders

The *Contractor* uses the NEC subcontractor agreements. All subcontractor quotations for which provisional sums or budgets have been allowed, is first approved by the *Employer* or his representative with documentary proof. This is done well in advance of the planned scheduling of the work.

3.4.2.3 Limitations on *subcontracting*

As per Eskom requirements, subcontracting will be limited to 40% as far as possible. The *Employer* is notified where subcontracting exceeds the 40% threshold prior to commencement of the specific subcontracting works.

3.4.2.4 Attendance on *subcontractors*

The *Contractor* attends to the activities of all subcontractors including direct subcontractors.

3.4.3 Plant and Materials

3.4.3.1 *Quality*

The *Contractor* will not use Plant or Materials which are generally recognised as being unsuitable or otherwise to be avoided for the purpose for which they are intended.

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Only components of high reliability will be utilised, with a proven operating history, to enable the Plant to achieve required reliability and availability. Plant and Material design, engineering and manufacture will accord with the best modern practice applicable to high-grade products of the type to be furnished, so as to ensure the efficiency and reliability of the Works and the strength and suitability of the various parts for the Works.

Plant and Materials withstands ambient conditions and the variations of temperature arising under working conditions without distortion, deterioration or undue strains in any part.

All parts are made accurately, and where practicable, to standard gauges so as to facilitate replacement and repairs. Like parts are interchangeable.

No repair of defective Plant and/or Materials will be permitted without the Project Manager's Acceptance and any such repair, if accepted, will be carried out to the satisfaction of the *Employer*.

The Project Manager is free to specify hold and witness points during the installation and on-site testing stages of the project. The *Contractor* issues preliminary notification of such hold and witness points by fifteen working days advance notice to the Project Manager and confirms such hold and witness points at least seven working days prior to the activity.

Typical hold points are listed below:

- i. Design Review
- ii. Factory Acceptance Test
- iii. Delivery to Site
- iv. Erection and configuration
- v. Site Acceptance Test
- vi. All manuals and drawings (in the specified format)
- vii. Commissioning

In addition to maintaining appropriate inspection and test records to substantiate conformance to requirements, the following records are safely stored for a minimum period of seven years following the final Completion of the Works:

- i. Construction, layout and component Acceptances
- ii. Type and routine test certificates
- iii. Construction drawings and Acceptances

After this period, the *Contractor* offers these records to the *Employer* (in writing) and obtains a disposal instruction.

Documentation regarding quality procedures is submitted within thirty days of Contract Award. The *Employer* will review and comment on the acceptability of these documents in a time frame as per the requirements of the contract for contractual correspondence. If controlled copies of these documents have been submitted to the *Employer*, then the controlled copy numbers may be quoted in the submission.

The *Contractor* adheres to:

Vendor Document Submittal Schedule (the schedule to be issued to the *Contractor* by the *Employer*)

3.4.3.2 Plant & Materials provided "free issue" by the *Employer*

None, all Plant and Materials are to be provided by the *Contractor*.

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3.4.3.3 Contractor's procurement of Plant and Materials

The *Contractor* is responsible for ensuring that all products are preserved in their appropriate manner as described in their specifications or in Eskom preservation, shipping and transportation procedures as applicable. The *Contractor* shall submit the preservation, shipping and transportation procedures to the *Employer* for review and acceptance. The *Employer* may choose to witness the packaging, loading and offloading of the products depending on their criticality, this will be indicated in the intervention points on the QCP / ITP document. The *Contractor* shall ensure that all storage requirements for products are properly implemented to preserve the products against adverse conditions, deterioration, damages, etc. Storage and preservation procedures for the different products must be submitted to the *Employer* for review and acceptance. The *Employer* may request to inspect the stored products at any given point during the storage period of the product. Requirements for preservation, shipping and transportation are addressed in 240-105658000.

3.4.3.4 Spares and consumables

The *Contractor* provides as part of the tender proposal, a recommended parts list as well as a proposal for the execution thereof:

- i. The *Employer* is responsible for purchasing of recommended spares.
- ii. The *Contractor* is responsible for ensuring that consignment spares are available in time of need.

Each recommended spare part is to be uniquely identified with a part number, which can be cross referenced to a part list and associated drawing. The *Employer* prefers that support from the OEM is available locally in South Africa.

3.4.4 Tests and inspections before delivery

The *Employer* carries out quality inspections at his own discretion. The *Employer* will inspect and approve stages of manufacture of all Plant and Materials necessary to ensure the correct quality of Plant and Materials as prescribed in the accepted project quality plan.

All inspections and testing are to be performed in accordance with the Quality Control Procedure (QCP) developed by the *Contractor* after Acceptance by the *Employer*.

The *Contractor* must provide facilities for inspection of all items of Plant and Materials at the place of the manufacture, and this requirement must extend to all sub-contractors and suppliers if applicable. All material labour or assistance, tools, gauges, articles or apparatus that the *Employer* may require for the purpose of testing, gauging and inspection, must be provided by the *Contractor*. The *Contractor* must provide all such facilities for testing, and the contract price must include for this.

The *Employer* reserves the right to reject items that do not conform to the *Employer's* requirements. When the plant has passed the prerequisite tests, the *Employer* will furnish to the *Contractor* a certificate or endorse the *Contractor's* test certificate to that effect. Examination by the *Employer* does not relieve the *Contractor* from the responsibility of carrying out all tests which may be necessary to ensure the required standard of manufacture or from any obligations in terms of the contract.

The achievement of adequate standards during the tests at the place of manufacture, if performed, is only the first requirement. The final criterion will be performance onsite, and any of the requirement which proves defective due to bad workmanship or material must be replaced forthwith by the *Contractor* at his own cost on the instruction of the *Employer*.

The following tests are conducted by the *Contractor* and are to be witnessed by the *Employer* at the manufacturer's works or *Contractor's* premises as a minimum requirement:

- i. Visual inspection of the Plant and Materials
- ii. Review of the certification requirements
- iii. Inspection of paint work and corrosion protection.

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- iv. Verification that all components are delivered to the *Contractor's* premises.
- v. Verification that all power plugs is correct.
- vi. Verification that components installed is correct.
- vii. Verification that all labels are correct.

3.4.5 Marking Plant and Materials outside the Working Areas

All Material paid for by the *Employer* is clearly labelled as being the *Employer's* property.

3.4.6 Contractor's Equipment (including temporary works).

The *Contractor* provides the following in order to complete the Works:

- i. All scaffolding required
- ii. Any Equipment necessary to complete the Works
- iii. Lifting facilities

The *Contractor* supplies, installs, maintains and removes all temporary construction facilities and utilities necessary to Provide the Works.

3.4.7 Cataloguing requirements by the Contractor

Unique Identifier 240-1289988974 to be provided on request.

3.5 CONSTRUCTION

The *Contractor* is required to:

- i. Submit a comprehensive method statement of the entire Works to the Project Manager for acceptance prior to the start of the Works
- ii. Submit a project specific safety file to the *Employer* for comments / acceptance.
- iii. Prepare earthworks for craneage access and working rigging areas if required.
- iv. Manage his activities on site to ensure that no interference takes place between his work and that of others.
- v. Complete "Contract Activities Daily Reports".
- vi. Liaise with the Project Manager regarding utilities and telephone facilities required for his Site establishment.
- vii. Liaise with the Project Manager regarding the location of waste disposal sites and rubbish dumps,
- viii. Maintain and promotes labour harmony on the Site and in the working environment.
- ix. Immediately report any potential labour disharmony to the Project Manager.
- x. Not recruit or employ any personnel from the *Employer* and Others, without prior acceptance of the Project Manager.
- xi. The *Contractor* submits a fully detailed Quality Control Plan (QCP) for acceptance within one week of the Contract Date.
- xii. The *Contractor* submits a schedule of unpriced orders to be placed and this is updated regularly.

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3.5.1 Temporary works, Site services & construction constraints

3.5.1.1 Employer's Site entry and security control, permits, and Site regulations

The site is located in a part of an existing campus, with existing buildings all around, most buildings are currently occupied.

- i. The *Contractor* attends the site clarification meeting prearranged by the *Employer* prior to submitting tender.
- ii. The *Contractor* ensures that he familiarizes himself with site conditions.
- iii. *Contractor's* access is limited to the areas as indicated in the scope and *Contractor's* staff is prohibited from roaming in the rest of the facility.
- iv. Eskom Holdings indemnifies themselves from any negligent events by the *Contractor* relating to the scope of the works within the contract period
- v. The *Contractor*, his staff and the Sub-contractors maintain identification at all times e.g. Uniforms etc.
- vi. The *Contractor* is deemed to execute Safety Procedures to ensure the safety of his staff, Sub-contractors, Eskom staff during the Contract Period.
- vii. Use of power and loud tools to be controlled and/or managed with Eskom office management team.
- viii. The safety of the *Contractors* Employees, Subcontractors and building's tenants takes preference over the scope of the Works of this project.
- ix. All site instructions to be approved and authorised in writing by the *Project Manager*. If this directive is not adhered to it could result in non-payment.

3.5.1.2 Restrictions to access on Site, roads, walkways and barricades

The *Employer* provides the *Contractor* with an Access Certificate to formally provide access to the site.

The *Contractor* ensures that he is familiar with conditions of access to the buildings, which includes constraints to limited parking and no goods lift is available in some of the blocks.

The *Contractor* adheres to all the requirements which include, but not restricted to:

- i. Identity cards with photographs
- ii. Cooperation in order to help Eskom provide the customer with a project schedule reflecting the period during which the construction and commissioning activities will take place.

The Contractor will be responsible for external disputes which may occur regarding the Works.

The *Contractor* is when necessary or needed, required to make all the necessary arrangements with the Local Authorities via the Building Manager and or Eskom Representative.

3.5.1.3 People restrictions on Site; hours of work, conduct and records

Working after normal working hours and on weekends requires special permission. The *Contractor* shall give the *Employer* adequate notice if this is planned.

3.5.1.4 Health and safety facilities on Site

Refer to SHE Specification issued.

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3.5.1.5 Environmental controls, fauna & flora, dealing with objects of historical interest

The *Contractor* shall ensure that all fauna and flora is preserved and protected during his activity on site. All such fauna and flora will be reinstated after completion of the work.

3.5.1.6 Title to *materials* from demolition and excavation

The **Client (*Employer*)** retains ownership and may require the materials to be returned, reused, or disposed of in a specified way.

3.5.1.7 Cooperating with *and* obtaining acceptance of Others

Two weeks look-ahead schedule to be developed and submitted to Project Manager on a fortnight basis in order to make timeous arrangements for access into occupied buildings with the occupants concerned.

3.5.1.8 Publicity and *progress* photographs

The *Contractor* requests approval from Project Manager for any photography and progress photographs prior to undertaking.

3.5.1.9 *Contractor's Equipment*

The *Contractor* keeps an inventory of equipment brought to site. This is verified and acknowledged by Eskom security to allow removal of such equipment when required by the *Contractor*

The *Contractor* provides own security on site and is held liable for excess of insurance in case of theft or loss.

Storage and security of material is the responsibility of the *Contractor* until the Final Completion Certificate is issued.

3.5.1.10 Equipment *provided* by the *Employer*

The *Contractor* provides all equipment and tools required to complete the *Works*.

3.5.1.11 Site services and facilities

The *Employer* will provide power and water. The *Contractor* shall make provision of waste disposal and submit proof in a form of Waste Disposal Certificates to the *Employer* for approval. The *Contractor* shall provide everything else necessary for providing the *Works*

3.5.1.12 Facilities provided by the *Contractor*

A clearly demarcated site establishment area will be provided by the *Contractor* for the following:

- i. Suitable facilities for *Contractor* to store all material and equipment
- ii. Suitable facilities for his employees for changing
- iii. Facilities for the consumption of food
- iv. Site offices
- v. Toilet/Ablution facilities
- vi. Other temporary facilities required by the *Contractor*

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3.5.1.13 Existing premises, *inspection* of adjoining properties and checking work of Others

The *Contractor* is to investigate existence of any services before commencement of work. Care is to be taken when *Contractor* is doing demolitions so as not to damage the work of Others.

3.5.1.14 Survey control *and* setting out of the works

It is the *Contractor's* responsibility to ensure accuracy when performing setting out of the Works. The *Contractor* shall provide adequate fastening to existing connection points.

3.5.1.15 Excavations and *associated* water control

Where excavation is required, the *Contractor* takes the necessary precautions not to damage any existing services.

3.5.1.16 Underground services, *other* existing services, cable and pipe trenches and covers

There is no information regarding existing underground services.

Should the need arise for the *Contractor* to work on underground services, the *Contractor* is required to conduct scanning to determine the existing/underground services and provides this information as As-Build drawings to the *Employer*.

3.5.1.17 Control of noise, dust, water and waste

The *Contractor* takes all precautions necessary to prevent any noise and dust whilst carrying out the work.

3.5.1.18 Sequences of *construction* or installation

The *Contractor* sequences execution in order of priority as per the sectional completion schedule and ensures all interfaces are coordinated and carried out without causing any disruptions.

3.5.1.19 Giving notice of work to be covered up

Contractor to advise at least 4 weeks prior to starting work at that particular section so that proper notification is provided, including relevant authorisation to proceed.

3.5.1.20 Hook ups to *existing* works

The *Contractor* stipulates methodology for hooking-up when working in heights and provides notification to the SHE Officer in advance and obtain permission to proceed. The *Contractor* cannot not hook up for lifting, supporting or for any other reason to any position or existing works in the plant without a written approval by the Project Manager.

3.5.2 Completion, testing, commissioning and correction of Defects

3.5.2.1 Work to be done by the Completion Date

The contract is deemed complete when the following have been completed in accordance with the scope of work:

- i. The Plant is erected, and commissioned
- ii. Signed erection and safety clearance certificates have been submitted.

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- iii. The final drawings have been submitted.
- iv. All documentation has been submitted including testing reports and the associated certificates received. All Quality Control Plan (QCP) documentation received. Final Draft of the Technical, Operating, Maintenance manuals have been delivered
- v. The Plant and all documentation / drawings are coded and labelled.
- vi. All special tools / spares have been supplied.

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the Works and Others from doing their work.

	Item of work	To be completed by
	As built drawings of last commissioned systems	Within 10 days after Completion

3.5.2.2 Use of the *works* before Completion has been certified

On completion, commissioning and testing of plant, the *Contractor* may hand over completed section of the Works for certification and operation.

3.5.2.3 Materials facilities and samples for tests and inspections

The *Contractor* provides all Materials, facilities and/or samples required for tests and inspections.

The *Employer* reserves the right to call for samples of the Equipment offered to inspect the workmanship as the work proceeds and to either accept or reject the Equipment or workmanship.

The *Employer's* Acceptance of the workmanship or Equipment must in no way reduce the *Contractor's* liability to provide complete solutions.

The purpose of these inspections is to reduce the risk of non-compliant Equipment and Materials being transported to site. The presence of the *Employer* at the inspections does not reduce the *Contractor's* responsibility to comply with the contract.

The *Contractor* is to make arrangements that these inspections are carried out within the boundaries of South Africa. Should any tests or inspections be required outside of the Gauteng Area, the *Contractor* is to allow in his Tender price for all costs (travel, accommodation, subsistence, etc) for two persons to attend such tests or inspections. Accommodation and subsistence arrangements are to be submitted to the *Employer* for Acceptance in writing.

3.5.2.4 Commissioning

When the system is ready for service; commissioning shall take place to check whether the correct quantities of equipment have been delivered and the installation is in accordance with

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the specifications. Commissioning shall be performed in co-operation with the *Contractor* and representatives of the *Employer* and Supervisor.

Practical Completion certificates will only be issued once the whole of the system installation satisfies the operational performance requirements of the contract and the Supervisor is satisfied that all systems are capable of operating effectively.

Performance and acceptance testing to determine whether the system achieves the required level of performance will only be undertaken after all routine testing, adjusting, commissioning, approvals and building work associated with the contract are complete and the work have been fully tested and commissioned by the *Contractor*.

Details of the testing required for each system and equipment shall be included in the *Contractor's* quality plan.

The *Contractor* shall supply all labour, materials and equipment required to fully commission and test the installation.

All costs associated in demonstrating that the system performs as required by the contract, shall be borne by the Contractor. Equipment which fails to operate correctly or is found to be installed incorrectly shall be repaired or replaced by the *Contractor*. Where any test is unsuccessful the defective equipment shall be repaired appropriately and subjected to retesting.

3.5.2.5 Take over procedures

The *Contractor* shall do his own complete commissioning tests before the actual first take-over tests are done. This is to satisfy himself that everything is working and is in accordance with the specification.

3.5.2.6 Access given by the *Employer* for correction of Defects

The Project Manager arranges the date and access to site for the *Contractor* to correct defects. The *Contractor* updates the site safety file and the records contained inside as per construction regulations. The *Contractor* will be responsible for ensuring that the area is barricaded before correcting any defects.

3.5.2.7 Performance tests after Completion

In accordance with clause X17, performance test will be conducted on completion

3.5.2.8 Training and technology transfer

After Completion of the contract, the *Contractor* is required to provide training and transfer system knowledge to the building owner/manager by submitting documented Design Intent, As-built drawings, Operational and Maintenance Manual, Commissioning Records, Commissioning Report and by providing training on all the systems to the building management staff to ensure that they have all the information and understanding needed to operate and maintain the features and systems in the building.

The *Contractor* is to provide on-site training and training material to the Engineers, Operators and Maintenance personnel prior to taking-over of the Works. The training will preferable be offered during the commissioning and testing. The *Contractor* will, prior to handing over of the Works, satisfy the *Employer* or authorized representative that maintenance and operational personnel are competent and adequately trained to maintain and operate the Plant and Materials supplied.

Steps for Conducting On-site Training are to include, but not limited to:

- i. Preparation

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- ii. Introduction
- iii. Explanation
- iv. Demonstration
- v. Practice Under Supervision
- vi. Conclusion

The *Contractor* shall accordingly take into the Works an agreed number of members of the *Employer's* staff for an agreed period. The *Contractor* shall give the staff workshop hands-on training as fitter-erectors on the plant and shall give instruction in the assembly, adjustment and works testing of main items of plant.

Subsequently the *Contractor* will have the assistance of *Employer's* staff in commissioning of the plant and shall give appropriate instruction during these periods. Whilst the personnel allocated by the *Employer* can be expected to contribute in some measure to the erection work, the *Contractor* shall, in the Tender and when determining the programme, take into account that these personnel are involved only for training purposes.

The *Contractor* shall include attendance of the *Employer's* staff during testing and witnessing and for key works inspections.

The *Contractor* shall provide detailed proposals setting out the key aspects of training which will be provided for the *Employer's* personnel, both in the manufacturers' works and on the Site, including the proposed training programmes.

3.5.2.9 Operational maintenance after Completion

The *Contractor* will be fully responsible for the maintenance and support of the installed systems throughout the 36-month contract period. This includes preventive maintenance, which entails scheduled inspections, system testing, and servicing to ensure optimal performance and reduce the likelihood of failures.

The *Contractor* is also expected to provide corrective maintenance by addressing system faults and restoring functionality within agreed timeframes. In addition, the *Contractor* must implement system upgrades as needed, incorporating relevant technology updates and improvements to maintain the system's effectiveness.

As part of the support scope, the *Contractor* will also be required to provide ongoing training services, ensuring that relevant stakeholders are adequately equipped and certified to operate and manage the system by the end of the contract period, facilitating a seamless handover.

3.6 PLANT AND MATERIALS STANDARDS AND WORKMANSHIP

The drawings include final general arrangements. Drawings include sections and details to fully identify design concepts, design loadings and any other special features.

Drawings are fully dimensioned and the dimension figures on the drawing are deemed to be correct, even if the drawings are not to scale. No dimensions are obtained from a drawing by scaling.

All drawings show full endorsement by a Professional Engineer.

3.6.1 Investigation, survey and Site clearance

The *Employer* shall instruct the *Contractor* to conduct additional investigations of existing facilities within the building if required for interfacing purposes.

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3.6.2 Building works

All building works to be compliant with SANS building standards.

3.6.3 Civil engineering and structural works

- 1 240-56364545 Structural Design and Engineering Standard (Rev 4)
- 2 National Building Regulations and Building Standards Act No. 103 of 1977.
- 3 SANS 10400 The application of the National Building Regulations All Parts.

3.6.4 Electrical & mechanical engineering works

- 1 240-118870219 Standby power systems topology and autonomy for Eskom sites.
- 2 SANS 10142-1 (The Wiring of Premises - Part 1: Low-voltage Installations)
- 3 240-53114214, Cabling and racking standard.
- 4 240-56227443, Requirements for Control and Power Cables for Power stations Standard.
- 5 240-56356396, Earthing and lightning protection standard
- 6 Compulsory specification for plugs, socket-outlets, and socket-outlet adaptors, as published by Government Notice No. R. 1075 (Government Gazette 33763) of 19 November 2010. (VC 8008)
- 7 SANS 62040-1/IEC 62040-1, Uninterruptible power systems (UPS) – Part 1: General and safety requirements for UPS
- 8 240-53114248, Thyristor and Switch Mode Chargers, AC/DC to DC/AC Converters and Inverter/Uninterruptible Power Supplies Standard
- 9 Electrical Installation Regulations, 2009 as amended (Promulgated in terms of the Occupational Health and Safety Act by GNR 242 of 6 March 2009).
- 10 All statutory certificates including CoC's.

SECURITY SYSTEM, PROCESS CONTROL AND IT WORKS

- 1 240-102220945, Specification for Integrated Access Control System (IACS) for Eskom Sites.
- 2 240-91190304, Specification for CCTV Surveillance with Intruder Detection.
- 3 240-86738968 Specification for Integrated Security Alarm System for Protection of Eskom Installations and its Subsidiaries
- 4 240-170000096 Physical Security Integration Standard
- 5 240-170000086 Roles and Accountabilities for Lifecycle Management of Physical Security Systems in the Transmission Division
- 6 240-170000257 Technical Evaluation Criteria for the Integrated Security System
- 7 240-60725641 Specification for Standard (19-inch) Equipment Cabinets
- 8 240-55410927, Cybersecurity standard for Operational Technology
- 9 DEM2412993 & 2425114 LAD (Logical Architecture Definition) PAC (Physical Application Component) for Physical Security Information Management System (PSIM)
- 10 Business Requirement Specification DEM_2412993 & 2425114 Tx and ET Security Monitoring System
- 11 240-170000691, Standard for Intrusion Pre-Detection Systems Used at Eskom Sites
- 12 240-170000723 Generic Technical Requirements for Physical Security Technologies Contracts
- 13 240-78980848 Specification for Non-Lethal Energised Perimeter Detection System (NLEPDS) for Protection of Eskom Installations and its Subsidiaries
- 14 240-171000171 Commissioning Guideline for Secondary Plant Physical Security System
- 15 240-180100001 Secondary Plant Security Systems Maintenance Procedure
- 16 SANS 2220-2-5 Access Control Systems Part 2-5: Biometric readers
- 17 ERE-MS-006: Megawatt Park Access Control Procedure
- 18 240-157602340, Universal Access Specifications

CONTROLLED DISCLOSURE

Number	Title
See Section 2.2.1	Normative

4.2 ADDITIONAL REQUIREMENTS AND PREREQUISITES

4.2.1 General

a) None

5. AUTHORISATION

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6. REVISIONS

Date	Rev.	Compiler	Remarks
May 2025	1.0	Andre van den Berg	Creation of document.
April 2026	2.0	Andre van den Berg	Added Electrical standards and requirements for back-up power system.

CONTROLLED DISCLOSURE