Eskom	Scope Of Work	Generation

Title: **The Provision of HVAC System Spares and Full Maintenance & Operation at Camden Power Station for a period of five (5) years**

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1. Introduction

The contract is for the Provision of Spares and maintenance (Preventative & corrective, removal, installation, and repairs), continuous operating and monitoring of all Heating, Ventilation, and Air conditioning (HVAC) systems (including filter maintenance and pressurizing fans) at Camden Power Station for a period of five (5) years.

The contractor provides qualified and competent personnel to perform preventative maintenance (PM), corrective maintenance (CM), and continuous operating and monitoring of all employers Heating, Ventilation, and Air conditioning (HVAC) systems at Camden Power Station and immediate surroundings and Camden outside plants.

The contractor shall be based on-site and report for duty during employers normal working hours.

In addition, the contractor provides a standby service after hours with weekends and holidays included.

The contractor ensures that the number of personnel provided is sufficient and able to manage all works on-site to the employer's satisfaction.

This will include adequate management and supervision, along with suitable qualified technicians, artisans and lower task level employees for work such as filter cleaning.

Camden Power Station has a large, established site with HVAC equipment comprising of production related plant and non-production plant and equipment's.

2. Scope Of Work

2.1.1 Work To Be Performed by the Contractor for The Works

The Provision of spares and full maintenance (Preventative & corrective, removal, installation, and repairs), continuous operating and monitoring of all heating, ventilation and air conditioning (HVAC) systems (including filter maintenance and pressurizing fans) at Camden Power Station for a period of five (5) years.

The installation, repair, and replacement of split units and cassette units in all administrative offices & boardrooms and all other employer's buildings & park homes are the contractor's responsibility.

Production related HVAC systems the contract shall cover under this scope of work includes all:

a) BMS (Building Management System) and HVAC related Controls
b) Fire Detection System interface
c) Dx units (Direct Expansion)
d) (AHU) Air Handling units
e) Cooling Towers & Water Treatment Stations
f) Chiller plants (Water and air cooled) with all pumps & motors including all other related auxiliaries which form part of the system.
g) Split units
h) Package units.
i) And all other HVAC related plants systems.

NOTE: The electrical switchgear maintenance for HVAC system is the responsibility of the contract responsible for HVAC at Camden Power Station.

2.1.2 Scope Breakdown

Camden Power Station has a large, established site with HVAC equipment comprising of production related plant and non-production plant and equipment.

All plant and equipment have been maintained as part of a maintenance contract previously. In general, the plant comprises of items as indicated in 2.1.1 and the contractor shall perform the below scope at minimum and above:

a) Installs, adjusts, inspects, services and repairs a variety of mechanical equipment and mechanical parts of electrical machinery utilized in the HVAC System
b) Makes repairs and maintenance on chiller plant, condensers, compressors, centrifugal pumps and pump bearings.
c) Develops implements and maintains an effective program of equipment and outage maintenance work; performs equipment inspections to ensure that the equipment is safely maintained and operable; performs related testing and repair as needed.
d) Tests and maintains heating, ventilating and air conditioning such as compressors, condensers, pumps, control systems, fans humidifiers, chillers and heat exchangers.
e) Installs, repairs and maintain domestic air-cons.
f) Supervises a program of preventive maintenance of the electrical and/or mechanical equipment, structures and building of power station operation; makes regular inspections and tests of facilities to determine the overall condition of the plant.
g) Ensures availability of parts and supplies, by assessing jobs and determining parts that are needed for the job.
h) Performing all maintenance, repairs activities related to these systems.
i) Provide support during operation of these systems.
j) Fixing of leaks during running conditions

The plant includes Camden power station and its extended buildings (outside plant and dams).

The information above is a comprehensive data of the employer’s plant and equipment for the contractor’s information so that the extent of the scope of work is well understood.

2.1.2.1 Detailed list of HVAC system/Equipment currently installed and in-service at Camden Power Station.

HVAC system/unit - Plant Location	Total Quantity	HVAC system Description
Administrative Offices	314	9000, 12000, 18000 and 24000 BTU split air conditioners
Administrative Boardrooms	6	48000BTU Cassette air conditioner units
IT Server room	3	2 X 24000 and 1 x 56000BTU Split air conditioners
Training Centre	14	8 X 24000 and 8 X 18000BTU Split air conditioners
Admin Building – Chiller Plant system. (Main Control room, Computer room & UPS room, Telecommunication room)	2 7	Water cooled chilled water system. Split unit air conditioners (18000, 24000 and 56000BTU)
Unitised Equipment - Battery Rooms	16	Direct expansion (Dx) industrial units 2 installed per room with pressurization unts
Switchgear rooms (Inside and outside plant)	24	56000 BTU Split units – 2 installed per switchgear room
Ash Water Return Switchgear rooms	14	2 Package units installed per switchgear unit.
Canteen	2	Cold room Refrigeration system

NOTE:

When new or unidentified installations occur, the contractor provides full service to all HVAC plants or systems which the employer requires to be maintained.

Engineering Modification in Progress:

Only unitised Equipment – Battery rooms and admin building chiller plant HVAC system which are still using the R22 refrigerant gas. Project underway to transform them to R410a gas HVAC system. The contract shall also conduct full maintenance of these R22 HVAC system.

2.1.2 Resource Requirements

Item No.:	Description	Experience Required
2.1	Site Manager	Electrical/Mechanical N. Diploma **(Not site bound)**
2.2	1 X Site Supervisor	5 years' experience; qualified & registered aircon tech as authorised as refrigerant gas practitioner
2.3	Safety Officer	3 years related experience; Matric, Samtrac **(Not site bound)**
2.4	4 X Artisans (Aircon Trade Test)	3 years related experience; qualified aircon technician/artisan (trade test) as authorised as refrigerant gas practitioner
2.5	4 X Semiskilled Electrician	3 years related experience; Matric (Grade 12)
2.6	1 X General Worker	Grade 10/STD 8.
2.7	Unknown/Other	1 Year related experience

2.1.3 Employers Objectives and Purpose of The Service

The *Contractor* must be authorized in terms of Plant Safety Regulations (PSR) (Low Voltage) to be able to perform the following activities covered in the scope of work, failing which a 10% penalty will be deducted on a monthly gross labour charge effective after 6 months when the contract is in place/signed.

This service shall include all outage work, routine maintenance, repairs, inspections & cleaning, support services, emergency breakdown services, statutory inspections/maintenance and defect correction during normal and abnormal condition or operation, to ensure the integrity of the installed ventilation and air conditioning systems at Camden Power Station.

The *Contractor* shall through execution of the services ensure that all systems are safe and operational. These will include but not limited to all systems and its sub system components.

Camden Power Station operates on a 24-hour basis, 7 days a week and 365 days a year.

2.1.4 Employer's Requirements for The Service

a. The contractor ensures that relevant personnel are authorized as authorized refrigeration practitioners, in terms of the OHS act pressure equipment regulations. Proof of all authorisation/qualifications shall be submitted to the employer at the begin of the contract.

b. The contractor is solely responsible for the operation of the HVAC systems and that ensures that it works optimally and as per employers' requirements.

c. The contractor maintains repairs and replaces all plant components which form part of the HVAC system (plant spares are free issue from Eskom Stores), as and when necessary, including associated motors, compressors, fans and control circuitry (i.e., All electrical, mechanical and control and instrumentation maintenance).

d. The contractor provides the service in accordance with the original equipment manufacturers (OEM) specifications and any additional standards which the employer stipulates. This also include the statutory requirements for the future and current installed HVAC system.

e. The contractor provides the service as per Eskom Works Management principles and the employers approved maintenance strategies. This includes to and use of the employer's computer systems. The contractor provides additional inputs where necessary to improve the strategies, processes and procedures.

f. The R22, also called HCFC-22, is a banned substance in most of the developed world due to its ozone depleting potential (ODP) + classified as a greenhouse gas (GHG) which contributes to climate change – to be totally banned in South Africa by 2030, therefore replacement of units shall not be of R22 gas according to law.

g. The contractor performs the service to the employers' requirements and the contractor's performance is measured, monthly using work week management key performance indicators (KPI's. The contractor's performance is measured according to the KPI's and the level of performance required is given. Poor performance will be measured according to the service level table and applicable damages are paid by the contractor.

h. The contractor is present and available on-site during the employers' working hours and suitable personnel perform standby as per an approved roster and report to site within 45 minutes of a call out as and when required.

i. The contractor attends to plant breakdowns immediately and until these are fully rectified and completed, unless the employer instructs otherwise, and both the contractor and employer are in agreement that the work may be re-planned for a later completion.

j. The contractor attends to complaints from clients regarding air-conditioning problems and keeps the clients informed of progress and completion.

k. The contractor cleans and removes any spares, used parts, materials and debris, dust and rubble arising from work done in order to ensure that the employers' premises are left in a clean condition afterward. Waste disposal is done in accordance with the employer's site regulations.

No dust shall be generated or water spillages when maintenance of the air con plant is being performed.

l. The contractor conducts a monthly inspection of the plant before the end of each month, and provides a detailed, written report within 3 (three) working days thereafter.

m. The contractor provides cell phones and radio communication for all employees to enable prompt communication with the employer and workers without any delay.

n. The Contractor ensures that there is a vehicle in good condition and road wealthy available for the employees to use during working hours for transportation of tools and equipment as well as for use during standby periods.

o. Any other act or procedure deemed necessary or applicable if the work includes some toxic and/or hazardous substances during normal and routine maintenance activities stipulated in this document. In this case the Contractor handles such hazardous substances in accordance with the applicable regulations and procedures and is disposed of by the Contractor in accordance with the applicable law.

p. The contractor shall be based on-site and report for duty during employers normal working hours.

q. In addition, the contractor provides a standby service after hours with weekends and holidays included.

r. The contractor attends all production, Outage and SHEQ Meetings related in connection with HVAC system at Camden Power Station.

2.2 People

a) The contractor ensures that the number of personnel provided is sufficient and able to manage all works on-site to the employer's satisfaction as per section 2.1.1 and 2.1.2 above.
b) The contractor provides qualified and competent personnel to perform preventative maintenance (PM), corrective maintenance (CM), and continuous operating and monitoring of all employers Heating, Ventilation and Air Conditioning (HVAC) systems at Camden Power Station and immediate surroundings, Camden outside plants including but not limited to outside plant buildings and offices.
c) This will include adequate management and supervision, along with suitable qualified technicians, artisans and lower task level employees for work such as filter cleaning.

2.3 Applicability

This document is applicable to Camden Power Station – HVAC Maintenance, Outage and Engineering teams.

2.4 Legislation And Site Regulations

The contractor conforms to all prevailing legal requirements of the Republic of South-Africa, Eskom SOC Limited and Camden Power Station Site legal requirements.

With special reference but not limited to the following: (Note that latest revisions apply before and during contract period.)

a) Occupational Health and Safety Act 85 of 1993 as amended and its regulations.
b) Compensation for Occupational Injuries and Diseases Act 130 of 1993 as amended.
c) CIDB grade level relevant for this type of construction work.
d) National Environmental Management Act 107 of 1998 as amended.
e) National Environmental Waste Act 59 of 2008 as amended.
f) National Water Act 36 of 1998 as amended.
g) Eskom procedures and safety requirements set out in Safety, Health and Environmental specifications, Document 004 4830.

h) Eskom procedure 32-95 in regards with the management of safety, health and environmental incidents.

i) Eskom vehicle safety specification: Doc No: 32-345

j) Occupational healthy safety risk assessment procedure. Doc No: 32-520

k) Annexure B: Acknowledgement form for Eskom SHE rules and requirement. Template No:240-43921804.

l) SHEQ Policy. Doc No: 32-727

m) Lifesaving rule, Doc No: 240-62196227

n) Employer's policy for waste management on Site, policy. 229/12295.

o) QM 58 Quality management manual 240-105658000

p) Business Excellence Quality Management Manual for Refurbishment, Engineering, Manufacturing, and Maintenance Works for Camden Power Station", Document 004/11187

q) Safety health and Environmental Specification 004-4682

r) 004 10852 QMS strategic approach

s) Responsibilities of welding personal: 004/4747

t) Hot work approval: 004/4746

u) Welding consumable – Equipment control: 004/4757

v) Security access control Camden Power Station: 004/5613

Any other act or procedure deemed necessary or applicable if the work includes some toxic and/or hazardous substances during normal and routine maintenance activities stipulated in this document.

In this case the Contractor handles such hazardous substances in accordance with the applicable regulations and procedures and is disposed of by the contractor in accordance with the applicable law.

2.5 Disclosure Classification

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

2.6 Abbreviations

Abbreviations	Description
RP	Responsible Person
EMD	Electrical Maintenance Department
EOD	Electrical Operating Desk

PPE	Personal Protective Equipment
PTW	Permit To Work
QA	Quality Assurance
QC	Quality Control
QCP	Quality control program/plan/procedure
HVAC	Heat Ventilation and Air Conditioning.
SHEQ	Occupational Safety, Health, Environmental, and Quality
SOW	Scope of Work
PSR	Plant Safety Regulation
UCLF	Unplanned loss capability factor
NCR	Non-Conformance Report
LPS	Low Pressure System

2.7 Roles And Responsibilities

Roles and responsibilities are as follows:

2.8.1 Artisan

Must perform work to the highest standard and regarding to the safety regulations, hold points and notify supervisor when work is completed.

Ensure to have all required tools in his/her possession.

Must do proper inspection of plant equipment to identify when the replacement of the parts is necessary.

2.8.2 Supervisor (R.P)

Ensure that:

1. All workers have appropriate P.P.E
2. All workers are familiar with the risk assessment, safety precautions and hazards
3. The work is carried out by authorised or competent person
4. Ensure that all documents are accurately completed and signed before returning the documents like service instruction and information documentation to Work Management Department for capturing and filing.

2.8.3 Quality Controller

Must inspect the system after the maintainer has maintained, following the approved quality control plan.

2.8.4 Utility Person

Assist the artisan and must perform their work to the highest standards with regards to the safety regulations and notify the supervisor when the work is completed.

2.8.5 Contractor

All contractors shall work within the parameter of the job description and scope of work. To keep all instructions/ procedures on hand and supply Eskom power station with reference to be included in this document and supply record and history requirements.

Contractors must also ensure that the work is performed to the highest standard and safety standards and regulations.

2.8 Process For Monitoring

After the production related HVAC system has been maintained, the operating temperature, humidity and pressurization, if all in operation shall be monitored via VA View which the employer will make it available for the contractor and through DCS.

Regular plant walk inspection shall be conducted to monitor the HVAC system performance and identify any potential defects to be corrected based on their criticality.

2.8.1 Plant Modification

No plant modification shall be executed in the plant without an approved engineering instruction accepted by the employer/service manager. This include changing plant operating settings which shall be approved by engineering before get implemented.

If any plant or item is suspected or has been found modified, it must be reported to the employer immediately.

Alarm respond procedure for HVAC system shall be adhered at all times by the contractor.

2.10 Accommodation and Catering

The Contractor will be responsible for the provision of accommodation to his personnel – the Employer does not provide accommodation.

The contractor or any of his employees or subcontractors will be allowed to use the Employer’s dining facilities.

The Contractor or any of his employees or subcontractors may also buy take away meals from the fast food’s outlet on Site. Lunch time is from 12:00 to 12:30.

2.11 Provided by The Contractor

The contractor shall provide accommodation, reliable and sufficient transport to transport all employees to and from work on daily basis and on standby, equipment, standard PPE and all required measures to render required services. The contractor has to ensure own cleaning of Protective Clothing.

The Contractor shall provide own cleaning of the workshop premises, offices, kitchen and stores in the Workshop.

2.11.1 Specialized Tools and Test Equipment.

a) The contractor provides all the necessary tools and equipment to provide the service. This includes all hand tools such as spanners, screw drivers, pliers and electrical / electronic and measuring tools / instruments including drilling machines drilling machines flukes and meggers and any additional tools we will need them to have their own welding power pack, plus bottles. Step ladders, fall arrestors etc.
b) All tools that need certificates must have valid certificate to comply with safety requirements.

2.11.2 Training

a) It's the responsibility of the contractor to provide training for his employees on safety, health, environmental and quality management. It's the responsibility of the contractor to train its employees/have always trained qualified employees at Camden Power Station.
b) The contractor provides all relevant technical training to his personnel in order to render Eskom with the required services.
c) The contractor must also make provision for basic training to Eskom personnel: Maintenance, engineering, and operating staff as and when required.
d) All relevant courses must be attended as required on contractor's account, except PSR.

2.12 Personal Protective Equipment

Where the contractor is required to make use of Category 2, 2A, and Category 4 ARC Flash protective wear, such as entering and working in Electrical Substations, or where there is a danger of an Electrical Flashover or Arc to occur, or to check electrical Isolations, the contractor shall provide such category Arc flash overalls to their employees. It is the responsibility of the contractor to maintain such equipment in a good condition in line with Eskom requirements.

2.13 Provided by the Employer

2.13.1 Potable Water

Potable water for construction purposes is also available free of charge. Any installation is for the Contractors account.

2.13.2 Meals

Meals on site for the Contractors personnel are not available.

2.13.3 Sanitary Facilities

Centralised permanent facilities to serve the Power Station terrace are provided by the employer.

2.13.4 General

The Contractor is to comply with all Site requirements and instructions. The onus is on the Contractor to ensure his familiar with the Employers Site regulations and Inspections.

2.13.5 Fire Protection

The Contractor is to comply with requirements of Eskom Standard NWS 1494 Revision 4 “Fire prevention and protection of Contractors premises on Engineering Sites” and of Site Regulations pertaining fire protection. (NWS 1494 Revision 4).

2.13.5.1 Fire Precautions

Any tampering with the Employers fire equipment is strictly forbidden. All exit doors, fire escape routes, walkways, stairways, and stair landings must be kept free of obstruction, and not to be used for work or storage at any time. Fire fighting equipment must always remain accessible.

2.13.6 Induction Training to Employees

No person will be issued with an access permit without proof that the person did attend the local Camden Power Station induction course.

A one-day access permit will be issued for persons attending the induction course. It is the Contractors responsibility to arrange with the contract manager one week in advance for the course booking.

2.14 Documentation Submission and Recording

The contractor is to provide the following documentation before commencing with any work in the plant:

a) Medical and induction certificates
b) Safety file
c) Fingerer prints with criminal checks reports for all contractor’s employees covered by the contract.
d) Quality Control Process files (for quality assurance)
e) And all other documents requested as per this scope of work.

2.15 Reporting of Accidents

The Employer follows an accident prevention policy that includes the investigation of all accidents involving personnel and property. This is done with the intention of introducing control measures to prevent a re-occurrence of the same incidents.
The Contractor is expected to fully co-operate to achieve this objective. The Contract Manager must be informed immediately of any incidents and any damage to property or equipment must be reported within the same shift.

NOTE! This report does not relieve the Contractor of his legal obligation to report certain incidents to the Department of Labour, or to keep records in terms of the Occupational Health and Safety Act, and Compensation for Occupational Injuries and Diseases Act.

2.15.1 Meeting

Refer to Document 229/12149, Code of Conduct for Meetings. The contractor shall adhere to the requirements as stipulated and ensure that:

a) All relevant meetings must be attended.
b) Attends other meetings as required and directed by the Service Manager.
c) Attends Monthly scheduled contract meeting.

2.16 Plant Codification

2.16.1 System Labelling

The contractor adheres to the requirements stipulated in document 004/4682. The contract shall inspect and reports on all labelling of equipment and plant under his control to ensure the following:

a) All electrical plant shall be correctly labelled as per document 004/4682.

b) All non-labelled or defective labelling shall be reported to the Employer.

c) The employer will provide new labelling which shall then be affixed to the equipment identified.

d) The contractor ensures that the labelling is affixed to replacement part of any piece of equipment or part that is removed or replaced.

2.17 Work Permits

The contractor utilizes the employers computerized system for this purpose unless such system is off-line. The permit requirements is as per the employer's plant safety regulations procedure 36-687 and authorization of the contractor personnel is required within 6 (six) months of the contract start date.

The contractor ensures that supervisors, technicians, and artisans each become authorised as a responsible person (RP), to fulfil the employer's safety requirements for permit to work applications on HVAC plant and also safely isolating the plant.

2.17.1 Quality Requirements

The contractor prepares the ITP/QCP documentation and submit them to the employer (Engineering and Quality Departments) for approval.

All HVAC critical task as per the employer list, shall have the QCP/ITP approved prior commencing the actual work.

Eskom QC technicians are available around the clock. They can be called via EOD after hours.

The QCPs on incoming product and services rendered by the contractor shall be done and all materials are to be signed off by the system engineer and hold/witness points should be marked to ensure the quality of the supplied goods is according to standard.

2.18 Integration with the Employer's organization

The contractor provides the services in an integrated manner at Camden Power Station with the inclusion of the following minimum expectations:

a) Attends to breakdowns, until completed, unless otherwise agreed with the Contract Manager; Call outs will be according to SAP priority. Priority 1- safety related, and load loss or unit trip. Response time

for emergencies is immediate or within 45 Min on call outs basis. For scheduled breakdowns is per SAP compliance schedule.

b) The employer requires on-site maintenance during normal working hours. Standby & call out service, is required after working hours.

c) Provides personnel on standby on a 24 hour basis, in accordance with his conditions of service. The contractor ensures that there is an emergency Standby team at all times.

2.18.1 Providing access to and interface with others

If other contractors are working or located in the same area with your team, the Contractor co-ordinates his work and planning with other Contract Managers to maintain harmonious working conditions on Site.

During the progress of the works the Contractor provides access to others who also perform work in the same area, on an as and when required basis.

The Contractor makes his own assessment of the problems and difficulties which may be encountered for providing access to and interfacing with others (this includes access difficulties experienced during outages or commissioning phases).

2.19 Key Performance Indicators (KPI's)

2.19.1 The contractor shall be measured on performance on the following criteria:

a) PSR authorisation – target 75%

b) PSR compliance and audits – target 100%

c) Call out response time – 45 Min reporting to EOD

d) Quality and Safety audits – 100%

e) Electrical Trips – target 0 trips (unit unavailability due to HVAC system electrical failure or trip).

NB: Failing to meet any of the above KPIs, a 20% penalty will be deducted on a monthly gross labour charge effective after 6 months when the contract is in place/signed.

2.19.2 HVAC Works management section the following criteria will be met:

f) Schedule Compliance – 100% (Execution of PM's on time versus submitted plan to execute.)

g) PM Compliance – 100% (Close out of PM's scheduled)

h) Statutory Violations – 0% violations (Statutory PMs executed on time if any)

i) QC Compliance – 100% ITPs in place for all critical tasks

j) Rework Report – 0% Rework in 90-day cycle

NB: Failing to meet any of the above KPIs, a 10% penalty will be deducted on a monthly gross labour charge effective after 6 months when the contract is in place/signed.

2.19.3 NCR – Non-Conformance Report

An NCR report will be raised leading to an investigation and close out for non-adherence to the KPI criteria.

3. Spares

3.1 Spares and Consumables

a) The employer provides all replacement plant components and spares for servicing and repairs as per the table below, however if the spares is not available from Eskom stores, the contract shall provide the spares required within 48Hrs.

b) The contractor is responsible to inform the employer of spares requirements (provides specifications and quantities for the employer's stock holding requirements).

c) All usable spares shall be kept at Eskom main stores.

d) No plant item or spares shall leave Camden Power Station premises without a permission from the employer/Eskom accompanied by an approved gate pass permit.

e) Consumables which are stock items shall be provided by the Employer.

3.1.1 Eskom Spares with Eskom Stock Numbers:

ITEMS DESCRIPTION	MATERIAL NO:
ELECTRICAL CLEANER	016208
FILTERS-500 SQUARE BY 50MM FILTER, AIR: TYPE: PANEL; DIMENSIONS: WD 260 X HT 500 X DP 50 MM; MATERIAL: PAPER PLEATED; MICRON: 5 UM; 25 PCT DUST SPOT EFFICIENCY; FOR USE ON BRUSH GEAR; NOTE; THE ITEM MUST BE PROTECTIVE PACKED; REFERENCE NO: WASHPAK 500/260	222550
FILTER – 500 SQ X50MM FILTER, AIR: TYPE: PANEL; DIMENSIONS: SQ 500 X THK 50 MM; MATERIAL: PAPER PLEATED; MICRON: 5 UM; 25 PCT DUST SPOT EFFICIENCY; FOR USE ON BRUSH GEAR; NOTE; THE ITEM MUST BE PROTECTIVE PACKED AND CLEARLY MARKED; REFERENCE NO: WASHPAK 500/50;	222552
RAGS (5KG-PER BAG)	159679
DISPOSABLE OVERALLS	160774
EQUIPMENT ROOM CONDENSER FAN ASSY U6 ONLY	0255083
18000 BTU COMPRESSOR	0252684
24000 BTU COMPRESSOR	0252683
9000 BTU COMPRESSOR	0250270
V-BELTS: EQUIPMENT ROOM U6 V BELT SET: NUMBER OF BELTS: 3; TOP WIDTH: 13 MM; OUTSIDE CIRCUMFERENCE: 1.9 M; TO BE BUNDLED AND MARKED, THICKNESS: 10MM, MATCHED; PART NO: SPA13NX1900,	0028677
EQUIP ROOM COMPRESSORS	0252690
BOILER & SUBSTATION BOARD COMPRESSORS (COPELAND)	528077
CHILLER PLANT COMPRESSOR(YCWN170)	528074
CARRIER COMPRESSOR (M: 38QCE028708)	252691

CARRIER COMPRESSOR (18000BTU-38000A009703)	252685
CARRIER COMPRESSOR (22000 BTU- 4904Y00023)	252683
DRYER D48	528559
SOLENOID 5/8 SW RBE11215 SOLENOID, ELECTRICAL: DUTY TYPE: REGULATING TEMPERATURE; COIL VOLTAGE: 220/230V; 50/60HZ; VALVE 50L; 5/8 SW; RBE11215; PART NO: 1078/5A6;	528560
SPA 1060 V-BELT	223716
CHILLER PLANT V-BELT	528133
R22 GAS FOR AIR CON	528076
CHILLER COMPRESSOR (YCWM 170)	528074
CHILLER COMPRESSOR 2 (H7NG184DPEF OC-39) COMPRESSOR, REFRIGERATION: TYPE: RECIPROCATING; RATING: 380 V; MODEL NO: H7NG184DPEFOC-39; SERIAL NO: 29603077868;	528073
EQUIPMENT ROOM 6 COMPRESSORS	528072
AIR CON COMPRESSOR (42QDE-18H1)	528071
CHILLER PLANT FUSES (01HM5090-35AMP)	528070
DRYER DANFOSS 42 BAR (MWP610FSIG/42BAR)	528156
SOLENOID (018F6176)	528161
LIQUID LINE DRYER 5/8”	0528156
HUMIDITY TEMP SENSOR	0528160
PC BOARD PAT NO:H2NG184DPE	528561
R407C AIR CON GAS	
R410A AIR CON GAS	556284
COPPER PIPES:1/2	0556670
COPPER PIPES:1/4	0556668
COPPER PIPES:3/4	0556669
COPPER PIPES:5/8	0556667
CHILLER PLANT SHAFT ASSEMBLY	0560684
AIR CON COMPRESSOR :410 GAS: 32000 BTU	560431
AIR CON COMPRESSOR :410 GAS: 15000 BTU	560439
AIR CON COMPRESSOR :410 GAS: 24000 BTU	560433
AIR CON COMPRESSOR :410 GAS: 12000 BTU	560440
ADMIN CHILLER PLANT MAIN FAN ASSEMBLY	TBC
EQUIPMENT ROOMS AHU DRIVE MOTORS UNIT 6 ONLY	249156
EQUIPMENT ROOMS AHU DRIVE MOTORS UNIT 1-8	566964
A/C TRUNKING SQ75MM PLASTIC.	0577223
A/C TRUNKING SQ75MM GS	0577224
EQUIPMENT ROOM FILTERS 600X600X300MM COMPACT CASSETTE. FILTER, AIR: TYPE: COMPACT CASSETTE; DIMENSIONS: SQ 600 X THK 300 MM; MATERIAL: SYNTHETIC FIBER WASHABLE; MICRON: 5 U; APPLICATION: EQUIPMENT ROOM; EFFICIENCY: 90-100 PCT; SHAPE: SQ; STANDARD: ISO9000; INITIAL PRESSURE DROP: 150 PA; FINAL PRESSURE DROP: 750 PA; AVERAGE ARRESTANCE: 99.8 %; ASHRAE EFFICIENCY: 90-95 %; DUST HOLDING	586014

CAPACITY: 440 G; RATED FACE VELOCITY: 2.5 M/S; RATED AIRFLOW: 0.944 M3/S; TECHNICAL DATA AND GRAPH BASED ON A 600 X 600 X 300; 95 % EFFICIENT CASSETTE FILTER;	
EQUIPMENT ROOM PANEL FILTERS 600X600X50MM FILTER, AIR: TYPE: PLEATED PANEL; DIMENSIONS: SQ 600 X THK 50 MM; MATERIAL: POLYURETHANE; MICRON: 5 U; APPLICATION: EQUIPMENT ROOM; EFFICIENCY: 20 PCT; SHAPE: SQ; SPECIFICATION: WV350; STANDARD: ISO9000;	586015
GREASE FOR CHILLER PLANT FANS. REASE, INDUSTRIAL: TYPE: SYNTHETIC DIESTER; TEMPERATURE RATING: -73 TO 149 DEG C; THICKENER: MICRO GEL; VISCOSITY RATING: 3.1MM2/S AT 100DEG C; COLOR: AMBER/LIGHT BROWN; CONTAINER: CAN 15 KG; PHYSICAL FORM: COMPOUND; GRADE: 1-2; TRADE NAME: AEROSHELL GREASE 7; CLASS: SHELL; SPECIFICATION: MIL-G-23827B; APPLICATION: CHILLER PLANT; WORKED PENETRATION: 295DMM; DROP POINT: 260DEG C; MATERIAL SAFETY DATA SHEETS WITH ENVIRONMENTAL INFORMATION IN THE 16 POINT FORMAT TO BE PROVIDED WITH EVERY DELIVERY AS REQUIRED BY THE OCCUPATIONAL HEALTH AND SAFETY ACT;	585218
OIL BEARING FOR CHILLER PLANT FANS OIL, AUTOMOTIVE: TYPE: SYNTHETIC GEAR; GRADE: S4 GX220; CLASS: SHELL; CONTAINER: DRUM 209 L; TRADE NAME: SHELL OMALA; DENSITY: 1.025KG/L AT 15DEG C; FLASH POINT: 272 DEG C; APPLICATION: CHILLER PLANT SYSTEM; MATERIAL SAFETY DATA SHEETS WITH ENVIRONMENTA L INFORMATION IN THE 16 POINT FORMAT TO BE PROVIDED WITH EVERY DELIVERY AS REQUIRED BY THE OCCUPATIONAL HEALTH AND SAFETY ACT;	585217
56000 BTU AIR CON R410A	0598633
18000 BTU AIR CON R410A	0598634
24000 BTU AIR CON R410A	0598635
EQUIPMENT ROOM AHU FAN UNIT	0595364
PC BOARD 38VN060	0608970
PC BOARD ELECT BOX ASSY 42FTV048/060	0608974
PC BOARD ELECTRONIC BOX ASSY 42QTF018	0608975
PC BOARD ELECT BOX ASSY 42QTF022/026	0608971
COMPRESSOR 38VN0601191A	0608969
COMPRESSOR R410A 38QTF018	0608973
COMPRESSOR R410A 38QTF022713	0608974
50 000BTU CASSETTE AIR CON	0608968
EXCITER CONVERTER PANEL –AIR/C CONDENSER FAN UNIT	0614943
EXCITER CONVERTER PANEL –AIR/C CONDENSER COMPRESSOR ZR81KCE-TFD-552	632363
EXCITER CONVERTER PANEL –AIR/CON DISPLAY CONTROLLER UNIT DISPLAY: TYPE: LCD; DIMENSIONS: WD 70 X LG 125 MM; MATERIAL: PLASTIC; DISPLAY: PGDOADOFOO; PART NO: V19A-AT	662202
PCO5 CAREL CONTROLLER	0689544
EXCITER CONVERTER PANEL –AIR/CON CONTACTORS WITH CONTROL FUSE	662199 & 662201
AIR CON WATER PUMP - 52 000 BTU	0615578
CHILLER PLANT HEAT/COOL RELAY MODULE – 3RM/24VAC	0665954
GEN CONV PNL - HVAC PRESSURE SWITCH SWITCH, PRESSURE: TYPE: ACB-2UC51W; RANGE: 45 BAR; POTENTIAL: 250 VAC; CURRENT: 4 A; ACTION: 1SPDT; CONNECTION: BOTTOM IN; CONTACT ARRANGEMENT: 27.6NC; TEMPERATURE RATING: -30 TO 80 DEG C; PART NO: 029 PL	0671122
GEN CONV PNL - HVAC PRESSURE SWITCH SWITCH, PRESSURE: TYPE: ACB-2UC52W; RANGE: 45 BAR; POTENTIAL: 250 VAC; CURRENT: 4 A; ACTION: 1SPDT; CONNECTION: BOTTOM; CONTACT	0671121

ARRANGEMENT: NO; TEMPERATURE RATING: -30 TO 85 DEG C; SWI, 1.75; PART NO: 9049 PL	
DIFFUSER, GAS: TYPE: SILHOUETTE; MATERIAL: ALUMINIUM; DIMENSIONS: 595 X 595; CONNECTION: PUSH IN; PART NO: CD3-L; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	663562
DIFFUSER, GAS: TYPE: SILHOUETTE; MATERIAL: ALUMINIUM; DIMENSIONS: 595 X 595; CONNECTION: PUSH IN; PART NO: CD3; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	663561
DIFFUSER, GAS: TYPE: SILHOUETTE; MATERIAL: ALUMINIUM; DIMENSIONS: 595 X 595; CONNECTION: PUSH IN; PART NO: CD2-C; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	663560
DIFFUSER, GAS: TYPE: SILHOUETTE; MATERIAL: ALUMINIUM; DIMENSIONS: 595 X 595 MM; CONNECTION: PUSH IN; PART NO: CD2-CL; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	663559
DIFFUSER, GAS: TYPE: SILHOUETTE; MATERIAL: ALUMINIUM; DIMENSIONS: 595 X 595 MM; CONNECTION: PUSH IN; PART NO: CD2-CR; VENDORS ARE RESPONSIBLE FOR ENSURING THAT THEY ARE PERFORMING AGAINST THE CORRECT DRAWING REVISION NUMBER (IF APPLICABLE).	663558

NOTE: Consignment stock or critical spares required to be maintained available by the contractor and also be made available within 48 hrs to keep up with production.

3.1.2 Eskom Spares with no Eskom Stock Numbers:

New Ash Dam Water Return HVAC System Spares. Responsible supplier: HCM.

ITEM	DESCRIPTION	MAKE / MODEL/SIZE	QTY / Unit
1	Condenser coil LH	RAC-3B-28x720x4Rx12Fx5C - CU/PU.AL/GI	1
2	Condenser coil RH	RAC-3B-28x720x4Rx12Fx5C - CU/PU.AL/GI	1
3	Condenser Fan	Ziehl ZN-050-ZIL.DC.V7P2	2
4	Compressor + CCH	Copeland ZR61KCE-TFD	2
5	Evaporator coil	RDX-4A-20x1250x4Rx12Fx16C (FACE SPLIT)	1
6	Evaporator fan	EBM K3G400PA2703	1
7	Primary Filters	625Wx500Hx50 - G4 PLEATED	3
8	Secondary Filters	600x500x300 - F7 Bag	3
9	Motor Taper Lock Bush	n/a	-
10	Motor Pulley	n/a	-
11	Fan Taper Lock Bush	n/a	-
12	Fan Pulley	n/a	-
13	Fan Belts	n/a	-
14	Heater Elements stage 1	n/a	-
	Refrigeration Components (R407c)		
1	*Expansion Valve*	Carel E2v30	2
2	Reversing Valve	Elliwell RV-10A	2
3	Liquid Line Shut-off Valves	1/2"	2
4	Filter Drier	1/2"	2
5	Sight Glass - Liquid Line	1/2"	2
6	Liquid Line	1/2"	-
7	Discharge line	7/8"	-
8	Suction line	1-1/8"	-
	Control Components		
1	Programmable Controller	Carel PCO5 Medium	1
2	High Side Pressure Switch	Johnson P77BEA-9350	1
3	Low Side Pressure Switch	Johnson P77BCA-9300	1
4	Return Air Temperature Sensor	NTC015WP	1
5	Ambient Air Temperature Sensor	NTC015WP	1
6	High Side Pressure Transducer	Carel SPKT030 (4-20mA)	2
7	Low Side Pressure Transducer	Carel SPKT010 (4-20mA)	2
8	Air Flow Switch	106711-084	1
9	Dirty Filter Switch	Huba 300	1
10	Transformer	220/24/50VA	1
11	Air Flow Transducer	Carel 984M.543314b	1

4. Guarantees and Warranties

4.1 Guarantee

The guarantee is related only to workmanship performed and material used, which form part of the service information and the guarantee is valid for 12 months, on condition that only the contractor has worked on the plant within the contract duration.

4.2 Warranties

Warranties for the spares purchased and received from the HVAC contractor are as follow:

- 18 Months warranty if Eskom receive the spares and stores them.
- 12 Months if Eskom receive the spares directly to the plant for installation.

5. Drawing

The HVAC plant system drawings will be obtained from Eskom Documentation centre and through engineering departments. The following are the main plant drawings which the HVAC contractor must familiarise themselves with to understand the basic system and station operational setup:

4.1 Camden Site Plan

Drawing No.	Sheet No.	Revision	Title
0.36/15137	1	8	Camden Power Station Building Layout

4.2 Currently existing HVAC Drawings

Drawing No.	Sheet No.	Revision	Title
0.36/15298	1	D	Camden Power Station Unit 6 Equipment & Battery Rooms HVAC Layout
0.36/15300	1	C	Camden Power Station Administration Building A/C Plant
0.36/15465	1	1	Camden Power Station Operating Floor set 5,7 & 8 Equipment and battery rooms air conditioning

4.3 Currently existing Electrical Equipment drawings

Drawing No.	Sheet No.	Revision	Title
0.36/17781	1	0	Unit 1 Equipment Room HVAC Panel Electrical Drawings
0.36/15302	1	0	Unit 6 Equipment Room HVAC Panel Electrical Drawings
0.36/15301	1	0	Administration Building HVAC Panel Electrical Drawings

6. Authorisation

This document has been seen and accepted by:

Name	Designation
Thamie Mthiyane	System Engineer
Nkosi Ndika	HVAC Chief Engineer – LPS

7. Revisions

Date	Rev.	Compiler	Remarks
11 November 2023	01	J. Radebe	New Document

8. Development Team

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

- Jabulani Radebe

9. Acknowledgement

- None