The distribution boards must be placed in such a way that it can be built into the walls where applicable. Special provision must be made that the distribution board tray is not damaged or distorted while being built in.

Where boards have to be installed in walls of single brick width an expanded mesh shall be affixed to the rear of the board tray to provide support to plaster. All distribution boards must be installed level.

Where a sleeve to provide cable entry into a flush board is required, the distribution board tray shall be set back into the wall to permit the sleeve to terminate below the tray for its full diameter. Face brick facets shall in such instances be used to conceal the sleeve. Slots in the wall with a cover plate will not be permitted unless specifically approved by the Employer's Agent.

Earth conductors must be fastened with screws and/or lugs to earth bars.

Cables must be mounted with compression glands to the distribution board tray. Earth rings and glands must be used to earth cable armouring inside distribution boards

Labelling

Circuit breakers that do not feed any load must be marked "SPARE" on the distribution boards.

Labels indicating the source of supply and size of the supply cable must be provided on each distribution board.

Where switchboards are positioned behind doors of the building structure i.e. built-in cupboards, a suitable approved electrical danger sign as well as the applicable distribution board designation label must be supplied and fitted in a suitable position on the outside top section of one of the entrance doors at each such location.

1.13 WORKMANSHIP AND STAFF

All employees employed on the service must be under the constant supervision of a registered accredited person.

The workmanship shall be of the highest grade and to the satisfaction of the Employer's Agent.

All inferior work shall, on indication by the Employer's Agent, be removed immediately and rectified by and at the expense of the electrical contractor.

1.14 EARTHING OF INSTALLATION

The type of main earth provided must be as required by the Supply Authority, in addition to any requirements indicated by the Employer's Agent, who may require additional earthing to achieve desired results.

Earth rods or trench earths will be required as specified or directed by the Employer's Agent.

Installations shall be effectively earthed in accordance with the Wiring Code.

All hot and cold water and waste pipes are to be effectively bonded by means of 12.5 mm x 1.6 mm solid or perforated copper tape (not wire), clamped by means of brass bolts and nuts. The tape is to be fixed to walls by means of rounded brass screws at intervals not exceeding 150 mm.

Provision must be made for conduit to be installed in the wall for all earthing requirements. Main earth copper tapes / wires must be installed in these conduits.

Where provision was not made as stipulated above, 20 mm diameter galvanised steel conduit must be installed from below ground level to 3 m above ground level. This conduit must be securely fixed to the walls. Corrugated iron roofs and guttering must be effectively earthed with copper tape and brass bolts with nuts at intervals not exceeding 2m. Self-tapping screws are not acceptable as a means of securing earth conductors.

Connection from the main earth bar on the main board must be made at the cold water main, the incoming service earth conductor, if any, and the local earth electrode by means of 12.5 mm x 1.60 mm solid or perforated copper tape or 16 mm² stranded (not solid) bare copper wire or such conductor as the Employer's Agent may direct.

1.15 LIGHTNING PROTECTION

The buildings shall be protected against lighting by way of 40mm x 4mm aluminium strip secured to the roof tiles along the ridges. Fixing shall be done in such manner that no tile is penetrated or cracked, using M7 concrete anchors at every second tile edge.

The aluminium strip shall be installed perfectly straight without weaving or twisting.

At the roof edges the strip shall be bonded to a down conductor consisting of 10mm² bare copper earth wire contained in a 20dia PVC conduit, running from a point close to the roof edge to the earth pegs below.

A 100 x 100mm draw box with cover shall be provided 300mm above floor level and another above ceiling level to facilitate installation.

Bonding shall be by means of M8 stainless steel bolts washers and nuts.

1.16 MOUNTING AND POSITIONING OF LIGHT FITTINGS

The electrical contractor must note that in the case of board and acoustic tile ceilings, i.e. as opposed to concrete slabs, close co-operation with the building contractor is necessary to ensure that as far as possible, the light fittings are symmetrically positioned with regard to the ceiling pattern.

The layout of the fittings as indicated on the drawings must be adhered to as far as possible, but the exact positions must be confirmed with the Employer's Agent.

Fluorescent fittings installed against concrete ceilings shall be screwed to the outlet boxes and in addition 2 x 6mm expansion or other approved type fixing bolts are to be provided. The bolts are to be ¾ of the length of the fittings apart.

Fluorescent fittings to be mounted on board ceilings shall be secured by means of two 40 mm x No. 10 round head screws and washers and in turn secured to the ceiling brandering. The fittings shall also be bonded to the circuit conduit by means of locknuts and brass bushes. The fixing screws are to be placed ¾ of the length of the fitting apart. The use of Butterfly clips to secure the light fittings will not be acceptable.

Incandescent fittings are to be screwed directly to outlet boxes in concrete slabs. Against board ceilings, the fittings shall be secured to the brandering or joints by means of two 40 mm x No. 8 round head screws and also to the outlet boxes.

1.17 VARIATIONS IN EXTENT OF CONTRACT

The Employer reserves the right to instruct the contractor to carry out variations to the contract either in terms the Conditions of Contract or in accordance with prices quoted by the contractor in the Price Schedule for Variations or Bill of Quantities, whichever is applicable.

For variations not provided for in the Price Schedule or Bill of Quantities the Employer may call on the contractor to submit a separate written quotation.

Labour and material shall be based on the Conditions of Contract, and no payment will be made for the transport of labour and material to and from the service.

The Employer, however, reserves the right to execute any alterations or additions that may be necessary by others.

Before the Contractor orders any light fittings, the Employer's Agent must approve the manufacture and types of these fittings.

The Employer reserves the right to omit the supply of light fittings, cooking appliances, air conditioners and hot-water cylinders from the contract in whole or in part, and to deliver such material to the contractor by others.

1.18 DEPARTMENTAL MATERIAL

When the Employer supplies certain materials to the contractor for installation, the contractor must arrange for taking delivery and providing safe storage of these materials.

The contractor will be held responsible for all damage to or loss of such material while it is in his custody.

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY: DPWI KIMBERLEY REGIONAL OFFICES REPLACEMENT OF AIRCONDITIONING SYSTEM

ELECTRICAL COMPREHENSIVE CONTRACT

PART B

SECTION 1.2

TECHNICAL SPECIFICATIONS

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY: DPWI KIMBERLEY REGIONAL OFFICES REPLACEMENT OF AIRCONDITIONING SYSTEM

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Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY: DPWI KIMBERLEY REGIONAL OFFICES REPLACEMENT OF AIRCONDITIONING SYSTEM

ELECTRICAL PROJECT SPECIFICATION

1. INTRODUCTION

This project scope covers the supply and installation of the new distribution boards, new circuit breakers reticulation cabling, electrical connections for the indoor and outdoor air con units and electrical installation to suit the Department of Public Work's and infrastructure standards of the electrical system.

2. SCOPE OF WORKS

The specification covers the supply, installation, testing, commissioning, and handing over in a working condition and maintenance during the guarantee period of the general electrical installation. Scope of which includes new electrical installations necessary for the proper functioning for the building.

The contractor is to provide for all the items required to provide a COMPLETE installation as indicated below under the Summary of the work.

2.1. Essence of the contract

2.1.1. Installation Electrician

Employ an installation electrician to plan control and supervise the day-to-day construction work activities on site with the associated responsibility. The installation electrician must also do full time quality control for the contractor on the site and sign the final compliance documentation for the project.

Enclose a copy if the 'Installation Electrician' certificates, address and his telephone number with the tender. Failure to provide this document disqualifies the tender.

2.2. Summary of the work

2.2.1. New Installations

- Supply and install LV supply cables to the new LV distribution board to the different buildings within the old Magistrate Court building.
- New Distribution Boards for the air conditioning and ventilation system.
- Supply and install 120Amp triple pole circuit breakers for the condensing/outdoor units.
- Supply and install 20Amp double pole circuit breakers and isolators for the cassette indoor units.
- Supply and install 30, 80,100Amp triple & double pole circuit breakers and isolators for the fresh air supply units.
- Supply and install 20mm PVC conduit and electrical wiring for the indoor unit.
- Finishing and cleaning of the electrical installation.

- Provision of as-installed drawings and manuals, both operating and maintenance etc.
- Provision of electronic database of as installed equipment.

Note: The electrical sub-contractor must test cables and do a fault finding on the existing electrical feeder cables of the current air conditioning system. To detriment the current electrical wires be able to carry the new load or have the capacity to cater for the new air conditioning system. The contractor will submit a complete a comprehensive within 14 days of appointment electrical faulting report for the Consulting Engineers.

3. COMPLIANCE WITH STANDARDS

All work to be performed in accordance with the following: -

(a) The code of practice for the wiring of premises, SANS 10142-1, 2017 where applicable.
(b) South African National of Standards, standardised specification for Civil Engineering Construction SANS 1200.
(c) The Occupational Health and Safety Act, ACT No 85 of 1993, as amended
(d) The protection of buildings and structures against lightning, SANS 10313, as amended.
(e) The municipal by-laws and special requirements of the supply authorities of the area or district concerned.
(f) The regulations of the local Fire Department
(g) The regulations of the Post Office and Telkom
(h) The National Building Regulations and Building Standards Act, ACT 103 of 1977 and SANS 0400 of 1990
(i) Apply a checklist based quality management system based on the principles of the ISO quality standards.
(j) GNR.1010 of 2003 Construction regulations.
(k) GNR.1593 of 1988 Electrical machinery regulations.
(l) SANS 10142-1The Code of Practice for Wiring of Premises, where applicable.
(m) SANS 10114-1 Interior Lighting Part 1: Artificial Lighting for Interiors.
(n) SANS 204: 2011 Energy Efficiency in Buildings.
(o) SANS 475 Energy Ratings
(p) SANS 10400 Application of the National Building Regulations – Part O – Lighting & Ventilation
(q) SANS 10313:1999- All specified buildings shall be provided with lightning conductors and shall be capable of withstanding the tests laid down herein.
(r) The quality management system must comply with ISO 9000 part 1 and ISO 9001, 9002, 9003 and ISO 9004 parts 1 and 3 as amended.

Standards referred to in this specification are the latest edition, including all amendments, published three calendar months or longer before the closing date of tenders.

The Department's standard specification for general electrical installations takes preference in case of dispute, however the Chief Electrical Engineer from the department reserves the right to intervene and his decision is final.

The department will **NOT** entertain any claims for extra costs in respect of failure by the tenderer to comply with any of the above standards.

4. REFERENCE DOCUMENTS

The reference documents shall be as indicated above (Item 3, (a) to (r).

5. REGISTRATION AS ELECTRICAL CONTRACTOR

Electrical contractors must register with the Department, prior to the commencement of any service. This registration must be done at the relevant Regional Office. Submission of the registration details at the relevant office must be provided to the engineer prior to the commencement of any works.

The Electrical contractor must provide the following documents, when registering with the department:

(a) CIDB Grading of .....
(b) Installation Electrician certificate.
(c) Electrical contractor's license.
(d) Registration certificates and latest receipts of payment to the Workman's Compensation as required by the Workman's Compensation Act of 1941, as amended.

The contractor must enclose certified copies of the above documents (a) (b) and (c), with the tender application. Failure to provide these documents **disqualifies** the tender.

6. MAIN ELECTRICITY SUPPLY

The school will be supplied with electricity from the municipal network. The municipal power supply will feed power to the main LV distribution board which will in turn feed individual distribution boards located within the school premises.

7. METERING

The main distribution board and the sub distribution boards in each block and building will be provided with a digital maximum demand and kilowatt-hour meter with battery backed up data storage and retention.

8. MATERIAL

All material used in the execution of the works must be new, from fresh stock and of the highest quality available except where existing material is to be re-used as per the specification and instructed by the engineer.

Products that are specified as mark bearing must bear the mark of the relevant standards body.

When so requested by the Department, provide evidence in form of delivery slips, certificates, test reports or other written proof that material or components comply with the standards laid down in this specification. The Department reserves the right to have any suspect equipment or material tested and certified by an approved testing authority for compliance with the required standards. If the tests are successful the Department will bear the cost of the tests, however if the material or equipment fails the tests, the Contractor will bear the costs.

Any material or equipment that needs to be replaced must be replaced with the same quality material or equipment.

Take special care to ensure neatness in all parts of the installation. The equipment and material must be suitable for the purpose for which they are employed and the arrangement of the equipment must be of the best current practice.

Install only material and equipment manufactured in South Africa wherever possible.

9. DOCUMENTATION

The project specification must be read in conjunction with the specifications referred to herein.

Any ambiguous or dubious wording must be cleared with the Department before work is started.

The wrong interpretation of the specification and/or drawings, resulting in alterations and/or additional costs, is solely the responsibility of the contractor.

10. PROGRAMME

The Contractor must submit a detailed electrical Gantt chart programme within **two weeks** of being appointed. The Engineer and the employer reserve the right to alter the programme to meet the priorities of the client. These amendments will be such that the Contractor will still be able to complete the electrical works within the tendered construction time. The completion date of the contract shall be as indicated at the site handover meeting or in the appointment letter.

The Contractor must submit a progress report on each monthly scheduled site meeting based on this original programme. The programme should indicate the procurement of materials for easy identification of long lead materials. A summary schedule indicating the main activities of the project shall also be submitted to the Engineer.

11. POWER SKIRTING

The power skirting shall be mounted as a continuous surface skirting.
The skirting shall be fixed to the floor and walls with 4mm diameter cadmium plated screws and fisher plugs not exceeding an interval of 1,5m.

The type of power skirting shall be a one and two compartment, one and two lid extruded steel product. The material of the skirting shall be all steel. The colour of the skirting shall be suit the colour of the wall unless otherwise stated by the Architect.

Conduit connections shall be done using glands.

A minimum of two 32mm conduits will be provided to the power section of the power skirting and a minimum of two 25mm conduits to the data and a minimum of two 25mm conduits to the telephone sections.

Power skirting will be linked with conduits to each section as described above where doors or passages break the skirting run.

Provide an earth wire across each section of the power skirting to ensure earth continuity of the power skirting body.

12. LV CABLES

Supply and install 600/1000V LV cables to distribute power from the mini-substation to the various distribution boards, as indicated in the drawings.

The cables will be installed in the ground, either directly laid in the soil, in cable sleeves, or suspended on cable trays installed in walkway roofs as indicated on the drawings.

Where cables are to be installed on cable trays, new cables must be of the ECC type.

13. CABLE INSTALLATION

Provide excavations and trenches for the installation of cables and sleeves as shown on the drawing. Where the cables cross road surfaces or walkways, cable sleeves must be installed as shown on the drawings. Cable trenches are to be backfilled with material suitable for compaction to ensure re-instatement of the original surface is done as close to the original finish. In case of clay soil conditions, the Contractor will be required to import soil and to mix it in the ratio of 6:1 with cement to ensure proper compaction.

The contractor will be required to excavate cross trenches along the proposed route of the new cables, in order to identify existing cables and other services and to ensure that the existing services are unaffected during the construction of the works associated with this project.

All existing services and crossing services found on the route must be identified and noted on the as-built drawings. Should the contractor not adhere to the prescribed method statement then damages to existing cables shall be repaired on the Contractor's own cost and the cables must be repaired immediately and no claims will be entertained.

14. CABLE TRENCHING

The Electrical Contractor is responsible for all trenching excavations unless specified to the contrary. Cable trench excavations shall comply with the following dimensions: -

14.1. LV cable trench detail

- Trench depth : 800mm
- Trench width : 500mm
- Bedding : 75mm
- Cable cover : 75mm
- Sifted Backfill : 300mm
- Compact soil : 150mm layers
- Cable tape marker depth: 300mm beneath final ground level
- Cable markers : maximum spacing 30m on straight runs, and at every turn, cable joint or slack position.

15. CABLE SUPPORT SYSTEMS

The contractor is to provide the following cable support systems, as indicated on the drawings and in the standard specifications:

15.1. Heavy Duty Cable Ladder

Supply and install 150mm galvanised steel heavy-duty cable ladder as shown in the drawings. Install cable ladders on 40 mm x 40 mm channel bolted to the walls with M10 x 60mm anchor bolts.

Earth the cable supports with 16mm^2 bare stranded copper earth wire.

15.2. Heavy Duty Welded Wire Mesh

A heavy duty wire mesh cable tray shall be used for support services in the routes as indicated on the drawing.

300mm wide will be used in the roof space area to accumulate all the services and route the services to the services cupboards and equipment locations.

150 mm wide will be used to route individual services to equipment.

15.3. P8000 Wiring Duct

P8000 wiring duct will be used in the roof space area to route LV wiring from local distribution boards to circuits. Conduits will connect to the P8000 wiring duct to route the wiring to individual switches and socket outlets. All conduit connections done to the P8000 wiring duct shall be 90 degrees to ensure a neat and ordered installation.

15.4. P8300 Wiring Duct (Lighting)

P8300 wiring duct will be used in the roof space area to route LV wiring from local distribution boards to light circuits. Conduits will connect to the P8300 wiring duct to route the wiring to individual light units and switches. 5A unstitched power outlets must be provided on the P8300 wiring duct to connect light fittings to. The final cabling between the P8300 wiring duct 5A power outlet and the light fittings will be enclosed in flexible PVC conduit. All conduit connections done to the P8300 wiring duct shall be 90 degrees to ensure a neat and ordered installation.

All associated fittings, accessories and fixtures are to be factory manufactured and **NOT** to be manufactured on site by the contractor. All makeshift fittings will be **rejected.**

Wire all contacts and monitoring facilities to a terminal block at the back of the panel.

Should the isolator panel not be able to accommodate the equipment required for the current energy measurement, the contractor should consider the use of a summation transformer to provide an indication of these measurements on the main incomer. The engineer must approve the designs of all equipment to be provided before commencement of the actual work.

Wire all contacts and monitoring facilities to a terminal block at the back of the panel.

16. WIRING SCHEDULES

Item	Description	Cable Size	Earth Wire
1	Extractor Fans	2.5mm² PVC conductor	2.5mm² PVC insulated earth conductor
2	Cassette units Isolators	2.5,mm² PVC conductor	2.5mm² PVC insulated earth conductor
3	Condensing units Isolators	16.0mm2 PVC conductor	6.0mm² PVC insulated earth conductor

17. FINAL CONNECTION WIRING SCHEDULES

Item	Description	Cable Size	Earth Wire
1	Extractor Fans	2.5 & 4mm² 3-core flexible PVC cable	Provided in cable
2	Air Conditioner Units (Indoor Units)	2.5 mm² 3-core flexible PVC cable	Provided in cable
3	Isolators (outdoor units)	16.0mm² 4-core flexible PVC cable	Provided in cable

18. DISTRIBUTION BOARDS

18.1. Main LV Distribution Board Properties

- Type: Floor standing mounted surface mounted (Outside the building).
- Doors: Cupboard fitted with doors, lockable
- Front panel: Hinged front panel (face plate) with pad lockable swing handles
- Colour: Normal –Electric Orange;

18.2. Sub Distribution Boards Properties

- Type: Lockable flush wall mounted
- Doors: Fitted with lockable doors
- Front panel: Hinged front panel (face plate) with pad lockable swing handles
- Colour: Essential – Electric White (Inside the building).

The following distribution boards are to be installed in this contract as shown on the drawings:

- MLVB Main Low Voltage Distribution Board with normal and power compartments.
- DB-01 - 10 Distribution Board for Classrooms.

All doors within building that house a distribution board must have electrical signage affixed to the door to indicate the areas in which the distribution boards can be found and also, if the storeroom inside the building offices that door must have electrical signage affixed.

Distribution board doors must have a neat and professionally manufactured cut-out, with reinforced and properly finished edges, so that the main isolator of the distribution board can be switched without opening the door in case of emergency. Distribution boards must be lockable and padlocks must be supplied with the distribution board. A drawing showing the design of the locking mechanisms and cut-out forms part of the single line drawings of the project.

Two spare / additional 25mm dia. and three spare / additional 20mm diameter conduits must be installed to all distribution boards and are to be terminated onto a suitably sized galvanized draw box with a cover plate installed within the open ceiling roof space.

The main circuit breaker in the generator room distribution board and in the administration building main distribution board must be adjustable to trip at lower currents than the maximum rating.

All main distribution boards and sub distribution boards are to be fitted with a digital display kilowatt-hour meter with data storage and retention (with battery back-up). Both kilowatt-hours and maximum demand must be measured for the main incoming supply and the generator supply. Phase and neutral currents must also be measured. Provide battery backed up data storage and retention.

Install surge arrestors for the main incoming supply and in all distribution boards that complies with SANS 10142-1:2017.

19. PADLOCKS

Arrange with the Regional Inspector to provide LV padlocks to lock the miniature substations and distribution boards supplied under this contract.

20. EARTHING SYSTEM

The earthing shall comply with SANS 10142-1, 2017 and NRS034.

The following are acceptable types of Earth Electrodes.

- Crows Foot Earth

The contractor will be responsible for the complete design of the earthing system and will issue a certificate of compliance by a reputable specialist in the field. The contractor will be required to conduct initial site resistivity measurements and to base the design of the earthing system on these tests. The engineer must witness all tests conducted. All designs for the earthing system must be approved by the engineer prior to commencement of construction.

The earth system shall be separate for the MV and LV networks by the use of the crow's foot earthing arrangement. Provide a copper earth bar in the **DB-01-10** void as well as the

distribution board cubicles. Provide a link arrangement between the MV and LV earth networks for interconnecting the two.

Electrode holes are to be drilled to either 1.2 metre or 3 metre depth to suit the electrode size and filled with a conductive slurry mixture. Electrodes are to be either 900mm or 2400mm in length.

Earth the building in accordance with National Department of Public Works, Government Standard Specifications for General Electrical installations.

Earth the distribution boards to the following:

- Main cold water pipe
- Roof
- Water heating system
- Cable trays and wire mesh support systems

Install earth bars connected to a local earth system with a value of less than 5 ohm in the following locations and connected to the earth systems with a 70mm^2 insulated earth cable:

- Security control room
- Server room
- Equipment rooms
- Plant rooms

21. LIGHTNING PROTECTION

Install the lightning protection in terms of the Standard Specifications and SANS norms.
The down conductors must be spaced at regular intervals around the buildings and connected to the common earth system.
Arrange with the Engineer to witness all tests and measurements after completion of installation.
Submit a certificate of compliance issued by an accredited person from an approved company. TELEPHONE AND DATA INSTALLATIONS

Install telephone conduits and outlets from the telephone distribution board via the ceiling void and floor slab flush inside the walls:

▪ Draw wires:	1.6mm and 32mm diameter in conduits
▪ Conduit:	25mm diameter steel pipe
• Wire ways:	300 and 100mm wire basket trays supplied from services cupboards to centralised location
▪ Wall boxes:	100mm x 100mm x 50mm galvanized steel box provided for telephone and data outlets
▪ Power skirting:	Telephone and data outlets provided on power skirting
▪ Distribution:	Data Cabinets provided in services cupboard for structured cabling to be installed by specialists
▪ Colour:	White (Indoor).

Specialists will do the telephone cabling and system installation. Only wire ways will be provided.

22. TRAINING AND MAINTENANCE MANUALS

Prepare an extensive maintenance manual with equipment details, supplier details, maintenance procedures, maintenance requirements, maintenance program, drawings and switching procedures etc.

Prepare and document a short introductive training course as part of the maintenance manual including the following:

- Describe the requirements incorporated in acts and regulations governing personnel who may work on MV switchgear
- Describe the requirements incorporated in acts and regulations governing personnel who may handle or operate LV switchgear
- Describe and compare the various types of circuit breakers with reference to number of switching operations and costs. The switching performance that can be expected from vacuum circuit breakers.
- Describe and explain the technical details and operation of the switchgear
- Describe and explain the protection scheme
- Describe and explain the earthing facilities
- Describe and explain the maintenance required on the LV switchgear
- Explain the maintenance program for the switchgear
- Describe and explain the correct maintenance procedures for the circuit breakers.
- Describe and explain the correct maintenance procedures for the fire detection units

Train the department's maintenance personnel from the Regional Office at the site for one session with the prepared training course. Demonstrate the switching procedures with the switchgear on site. Point-out all the items on the switchgear and equipment that must be maintenance according to the maintenance program.

Prepare an electronic database in a format to be approved by the engineer, with all information as contained above, including but not limited to the following:

- Material – Supplier details, Manufacturer details, drawings, catalogues, where installed, required maintenance, quantities installed and recommended supplier, etc
- Quantities installed.

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY: DPWI KIMBERLEY REGIONAL OFFICES REPLACEMENT OF AIRCONDITIONING SYSTEM

ELECTRICAL COMPREHENSIVE CONTRACT

PART B

SECTION 1.3

SCHEDULE OF PRICE VARIATIONS ELECTRICAL INSTALLATION

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY: DPWI REGIONAL OFFICE
REPLACEMENT OF AIR CONDITIONING SYSTEM

SCHEDULE OF PRICES FOR VARIATIONS

Tenderers are to complete the following Schedule of Prices and these net prices shall be used in the case of additions or omissions arising from variations of the contract for material and labour not covered by the Bills of Quantities. The prices submitted must include overhead costs.

MATERIAL NOT COVERED BY THE SCHEDULE

a) Materials : Net cost plus: 10%

b) Travelling : LDV up to engine capacity of 2500cm³ _____ per km

Sedan: engine capacity of up to 2000cm³ _____ per km

Sedan: engine capacity over 2000-cm³ up to 2500cm³ _____ per km

c) Office address from where contractor operates: .....

.....

.....

.....

.....

d) Electronic communications: Telephone No (.....) .....

Telefax No (.....) .....

Cellular Number .....

E-mail .....

Address .....

LABOUR RATES

Where no quotation has been supplied or definite arrangements made, the following rates shall apply. (Rates to include overheads).

All Rates to EXCLUDE VAT

WORKMAN	NORMAL TIME (per hour)	OVERTIME (per hour)
Artisan		
Apprentice		
Labourer		

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY: DPWI KIMBERLEY REGIONAL OFFICES REPLACEMENT OF AIRCONDITIONING SYSTEM

SPECIFICATION FOR THE MECHANICAL INSTALLATION

COMPREHENSIVE CONTRACT

SECTION - A

OCCUPATIONAL HEALTH AND SAFETY

SAFETY, HEALTH AND ENVIRONMENTAL SPECIFICATION

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

MANAGED BY

THE DEPARTMENT OF PUBLIC WORKS

Project Manager: Lebogang Motlhala

OHS Manager: Wendy Mbolekwa

1. INTRODUCTION

This Health and Safety Specification has been prepared in terms of Client's responsibility[Construction Regulation 5(1)] to provide the principal Contractor and Contractors with a documented Specification of all Health and Safety requirements pertaining to the associated works on the proposed construction site/so as to ensure the health and Safety of all persons affected by the works. This health and Safety specification highlights, but in no way replaces legal requirements that the principal Contractor and Contractors are bound to comply with in terms of the Department of Public Works program.

- The client has made provisions in the tender for the Principal Contractor to price for the cost of health and safety measures before and during the construction process [Construction Regulation 5(1)(g)].The Principal Contractor in turn needs to make the same provision when Contractors(Sub-Contractors)tender or quote on work[7(c)(1).

- The principal Contractor and Contractors are required to prepare a Health and Safety plan based on the Client's health and Safety Specification, which shall be applicable from the date of commencement of and for the duration of work [Construction Regulation 7(1)(a)].This documented plan must be based on a Hazard Identification and Risk assessment (HIRA) which will serve to identify the hazards, and their associated risks, anticipated for the scope of works [Construction regulation 9].

Principal Contractor tendering must provide the client with an appropriate Preliminary Hand Safety Plan (including a Preliminary Hazard Identification and Risk Assessment) as in Construction Regulation 5(1).This plan must be submitted with the tender.

2. APPLICATION

The Health and Safety specification contains clauses that are applicable to occupational health and safety in construction and the document is intended to impose pro-active controls associated with the activities, plant 7 machinery and other aspects of the proposed construction work that impact on health and safety of persons, by means of a documented H&S Plan prepared by Principal Contractors.

Compliance to the requirements of the OHS act and relevant legislation is in addition to the requirements of the H&S Specification and forms parts of the Principal Contractor's responsibility. The Client and Client's agents will monitor the Principal Contractor to

ensure that the Principal Contractor and Contractors comply with the requirement of OHS Act and will not prescribe to the Principal Contractor how such compliance is to be achieved.

3. PURPOSE

The purpose of the Health and Safety Specification is to provide the Principal Contractor and Contractor's tendering for the proposed construction work and /or appointed for the above mentioned construction work with the necessary detail of all health and safety requirements, and hazards pertaining to the associated scope or works, so as to enable the principal Contractor and Contractors to develop a Health and Safety Plan-to be implemented on site in order to ensure the health and safety of all persons while undertaking the said woks.

4. REFERENCE DOCUMENTS AND HEALTH AND SAFETY STATUTORY REQUIREMENTS

The following Acts and Regulations are referred to in this document followed by their abbreviations in brackets. Note that this is not an exhaustive list and other documents may be referred to if necessary in order to compile **your Site Specific Health and Safety plan**:

4.1 Occupational Health and Safety Act,(Act No.85 of 1993)-[OHSA] and Regulations as follows:

- Construction Regulations[CR]
- General Administrative Regulations[GAR]
- General Safety Regulations[GSR]
- Environmental Regulations for Workplaces[ERW]
- General machinery Regulations [GMR]
- Hazardous Chemical Substances Regulations[HCSR]
- Electrical Installations Regulations[EIR]
- Electrical Machinery Regulations[EMR]
- Pressure Equipment Regulation [PER]

4.2 Compensation for occupational Injury and Diseases Act-[COIDA]

4.3 SANS 101 47:2014 –Refrigerating systems, including plants associated with air-conditioning systems

4.4 Act, Regulations and site safety rules applicable to Department of Public works Construction Sites.

With regards to workplace health and safety, the following Acts, Regulations and safety rules shall apply to all Department of Public works Construction Site and must be fully complied with at all times by all contractors on site:

- Occupational Health and Safety Act(85 of 1993) and Regulations
- Compensation for Occupational Injuries and Diseases Act and Regulations
- This Health and Safety Specification
- Any other relevant statutory laws, including Municipal By-laws where applicable
- As well as any amendments that may arise from time to time;

- **As well as any draft amendments to legislation-it is good practice to comply**

4.5 Contractor's General Requirements for Health and Safety

5The contractor shall be solely responsible for carrying out the work under the contract.

4.5.1 The contractor shall have the highest regards for health and safety of its employees, the Company and any persons at or in the vicinity of the site. This shall extend to include the works, temporary work materials, the property regard of third parties and any purpose relating to the contractor carrying out its obligations under the Contract.

4.5.2 The contractor shall initiate and maintain safety programmes to conform to all applicable safety and health laws or other requirements, including ground rules, and the project health and safety specification.

4.5.3 The contractor shall, at its own cost, erect and maintain safeguards for the protection of workers and public.

4.5.4 The contractor shall manage all reasonably foreseeable hazards created by performance of the work under the contract.

4.5.5 Provide all things and take all measures necessary for maintaining proper personal hygiene, ensuring safety of persons and property and protecting the environment at or near the site.

4.5.6 Avoid unnecessary interference with the passage of people and property at or near the site.

4.5.7 Prevent nuisance and excessive noises and unreasonable disturbances in performing the work under Contract.

4.5.8 Be responsible for the adequacy, stability and safety of all of its site operations, of all its methods of design, construction and work and be responsible for all of the work, irrespective of any acceptance, recommendation or consent by the Client, its Contractors, employees, agents and invitees, or any Government body.

4.5.9 The contractor shall comply, and shall be responsible for ensuring that all of its subcontractors comply, with the relevant statutory regulations for safety and the Client's requirements included in the contract.

4.6 Site Rules for Contractor

The site rule for contractors' document is the minimum standard with regard to specifications for construction work on this site. Contractors may have existing standards for each specific trade, but where conflict may arise between the contractor's and these Site rule for contractors, the more stringent shall apply.

4.6.1 Rules of Conduct

Contractors and all employees under their control, including any visitors brought onto site must adhere to the following Rules of Conduct on Site:

- Partake of .possess or sell drugs or alcoholic beverages on site. Any employee or visitor whose actions and demeanour show symptoms of possible narcosis or drunkenness shall be removed from site.

- Indulge in practical jokes, horseplay, fighting or gambling.
- Make use of water from fire hydrants.
- Destroy or tamper with safety devices, symbolic signs or wilfully and unnecessarily discharge fire extinguisher.
- Bring onto site or have in your possession a firearm, lethal weapon ,camera, or any other recording device, unless authorised to do so
- Assault, intimidate or abuse any other person
- Operate construction equipment (vehicle or plant) without the necessary training and authorisation.
- Display insubordination toward any supervisor, foreman or manager in respect to carrying out of properly issued instructions or orders for health and safety reasons.
- Negligently, carelessly or wilfully cause damage to property of others.
- Refuse to give evidence or deliberately make false statements during investigations.
- Enter into any areas where you have no business unless authorised to do so by the person in charge.
- Brig animals onto site.

Insubordination towards any foreman, supervisor or manager could lead to removal from site and or dismissal and or prosecution. Except insofar as the principles of common law, or conditions as determined by any relevant statutes are concerned, the decision of the Client or his agent shall be final and binding in respect of any disputes that may arise from the interpretation of these rules.

5 Definitions

The following definitions apply.

For the purpose of the General Health and Safety Specification, the abbreviations or definitions given hereunder shall apply:

"CR" refers to the Construction Regulations, 2014

"GHSS" refers to this document (the General Health and Safety Specification (including any project specific annexures that the engineers and designers could attach.

"OHSA" refers to the Occupational Health and Safety.

"S" refers to a section in Occupational Health and Safety Act of 1993.

"H&S" refers to Health and Safety.

"HSF" refers to Health and Safety File

"Client" Department of Public Works

Incident; means any unplanned event that causes, or has the potential to cause, an injury or illness and/or damage to equipment, buildings, plant or the natural environment. Incident range from near miss incidents to serious incidents and emergencies.

"Near Miss" means an incident which has the potential to cause an injury or illness or damage to company.

"Regulations" means, specifically, the Construction Regulations, 2003 as issued on 18 July 2003, under the Occupational Health and Safety Act of 1993, but not excluding the other applicable regulations existing under the Act.

"Site" means the lands and other places, made available by the Municipality or the Client for the purposes of the Contract, on under over in or through which the construction work is to be executed or carried out.

"Principal Contractor" and contractor shall be as defined in the Regulations.

Construction Work [CR1]:
Means any work in connection with-

a) The erection, maintenance, alteration, renovation, repair, demolition or dismantling of or an addition to a building or any similar structure.
b) The installation, erection, dismantling or maintenance of a fixed plant where such work includes the risk of a person falling.
c) The construction, maintenance, demolition or dismantling of any bridge, dam canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
d) The moving of earth, clearing of land or making of an excavation or work on any similar type of work.

Hazard, Identification, Risk assessment and risk control (HIRA)

Means a documented plan, which identifies hazards assesses the risk and detailing the control measures and safe working procedures, which are to be used to mitigate and control the occurrence of hazards and risks during construction or operation phases.

Site

Means the area in possession of the Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Contractor, and approved for such use by the client.

Hazards
Means a source of or exposure to danger (source which may cause injury or damage to persons, or property)

Risk
Means the probability or likelihood that a hazard can result in injury or damage.

Construction Supervisor [CR 8(1)]

Means a full time, competent employee appointed in writing by the Contractor to supervise construction work. The appointment, as required by OHSA, shall stipulate health and safety responsibilities, area of responsibility and the proposed duration of the project.

Hazardous Chemical Substance (HCS)

Means any toxic, harmful, corrosive, and irritant or asphyxiate substance, or mixture or substance for which an occupational exposure limit is prescribed, or an occupational exposure limit is not prescribed but which creates a hazard to health.

Construction Plant

Encompasses all type of plant including but not limiting to, cranes, piling frames, boring machines, excavators, dewatering equipment and road vehicles with or without lifting equipment

Contractor [CR 1]

Means an employer who performs construction work and includes principal contractors and sub-contractor.

Health & Safety Plan (HSP) [CR 1]

Means a documented plan, which addresses hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified

The plan shall be applied from the date of commencement of and for the duration of construction work [CR 5(1)]

Health and Safety File (HSF) [CR1]
The file holding all documentation and records on health and safety for the project, which shall be available at all times for evaluation, and copy of which will be forwarded to the client upon completion of the project.

Disabling Injury Frequency Rate (DIFR)
The number of disabling injuries multiplied by a constant(man hours relative to period worked divided by total man hours worked over a rolling period(usually 12 months, but can be less).

Disabling Injury Severity Rate (DISR)
The number of days lost due to (DI's) multiplied by a constant (man hours relative to period worked) divided by total man hours worked over a rolling period (usually 12 months, but can be less).

Confined Space
An enclosed, restricted or limited space in which, because of its construction, location or contents, or any work carried on therein, a hazardous substance may accumulate or an oxygen deficient atmosphere may occur, and includes any chamber, tunnel, pipe, pit, sewer, container, valve, machinery or object in which a dangerous liquids or dangerous concentration of gas, vapour, dust or fumes may be present.

5. Responsibility of Contractors for Construction Work [CR 4, 7, 8]

6.1 Notification of Intention to Commence Construction Work [CR 4]

The principal contractor shall notify the Provincial Director of the Department of labour before any work commences, in accordance with the following requirements:

- The demolition of a structure exceeding a height of 3 meter; or
- The use of explosives to perform construction work; or
- The dismantling of fixed plant at height greater than 3 meters; or
- The work exceeds 30 days or will involve more than 300 person days of construction work; and
- Includes excavation work deeper than 1 meter; or
- Includes working at height greater than 3 meters above ground or landing.

The notification and submission to the local Department of labour must be done on a form similar to that shown in **Annexure A** of this document and a copy of the completed form kept in the HSF for inspection by inspector, the client or an employees

6.2 Principal Contractor's Responsibilities [CR 7]

6.2.1. Compile a HSP [CR 7]

6.2.2. Ensure co-operation between all contractors [CR 7(c), to comply with the Act

6.2.3. Ensure compliance to the Act in terms of [CR 5(v)]

a) Provide relevant sections of these specifications to contractors as required

b) Appoint each contractor in (a) above in writing. Only contractors who have the necessary competencies and resources may be appointed [CR 7(c) (iii)]

c) Ensure each contractor's HSP is implemented and maintained on site

d) Stop any contractor from work which is not in accordance with HSP's or which pose a threat to health and safety of persons

e) Sufficient information is provided to contractors where there are changes to design and construction

f) Ensure every contractor is registered an in good standing with the Compensation Commissioner

g) Ensure potential contractors have made provision for the cost of health and safety measures.

6.2.4 Negotiate and approve the HSP of each contractor [CR 7()]

6.2.5 All HSP's including the principal contractor's to be available on site [CR 7(b)]

6.2.6 All HSF's including the principal contractor's to be available on site [CR 7(d)]

6.2.7 A consolidated HSF to be handed over to the client on completion of construction including records of drawings, designs etc. [CR 7(e)]

6.2.8 HSF to include updated list of all contractors, the agreements and their type of work [CR 7(f)]

6.3 Contractor's Responsibilities [CR 7] (including sub-contractors)

6.3.1 Provide their HSP to the principal contractor[CR 7(2)]

6.3.2 Where a contractor appoints another contractor(sub-contractor) it is the responsibility of that contractor to apply 4.2 above as if he were the principal contractor [CR 7(3)]

6.3.3 No contractor to appoint another contractor(sub-contractor) unless the latter has the necessary competency and resources to perform the required work [CR 7(3)]

6.3.4 To provide any information which affects the health and safety of any persons at work to the principal contractor

6.4. Supervision of Construction Work [CR 8]

The appointments embodied in this regulation are as follows:

6.4.1 Construction supervisor [CR 8(1)]

6.4.2 Assistant Construction Supervisor [CR 8(2)]

6.4.3 Safety Officer [CR 8(5)] or Safety Representative OHS Act S17 (1)

The detailed requirements of these appointments can be found under the relevant regulation.

The contractor shall appoint a dedicated competent Safety Officer who wills perform his duties at the work Site for the duration of the work under the Contract.

6.5. Legal Appointments

The principal contractor shall ensure copies of the appointment letters of all responsible persons appointed on site will be kept in the HSF. All legal appointments shall be conducted in accordance with the requirements set out in the OHSA and as per this specification. The tables below set out the appointment protocols for CR and OHSA.

NB: It should be noted that these represent complete lists and not all these appointments may be required.

6.5.1

The responsibilities of each appointment are detailed in the relevant form, which are signed by both the authorised person and the appointee and kept in the Health and Safety File.an example of an appointment form for a Construction Supervisor can be found under Annexure B.

7. **Documentation and Procedures**

All required HSE documentation for the construction work, shall be kept in the HSF, which shall be available on site. The Construction Supervisor shall be responsible for the file and the Project manager shall ensure that documentation is valid and up to date. The procedures to be used for the project are to be in accordance with contractor policy and as per the outcome of the HIRA exercise. It is required that the documentation is filled in an orderly fashion for easy access. The following sections are suggested:

- Policy permits etc.
- Health & safety plans, specifications
- Appointments
- Incidents management
- Inspection check lists
- Risk assessments
- Training
- Safe work Procedure
- Hazardous Chemical Substances

8. Application of COIDA and OHSA to Construction Work

8.1 Compensation of Occupational Injuries and Diseases Act, Act No.130 of 1993(COIDA)

Every contractor shall provide proof of registration and letter of good standing with the Compensation Commissioner.

8.2 Occupational Health and Safety Policy [OHSA 7]

Every contractor's OH&S Policy statement should be available for security and as evidence of their commitment to their employees' occupational health and safety

8.3 Health and Safety Training and Competency

Training of personnel is a necessity and a legal requirement when required. A record of all training shall be kept and provided on request.

8.3.1 Induction Training

The principal contractor shall be responsible for the induction of all personnel entering the site including visitors, inspectors etc. Contractors doing specific construction work shall be responsible for the induction of their employees with respect to that specific work. Records to be kept of all personnel that undergo induction training.

8.3.2 Awareness Training

In addition, the client would favour awareness training to be carried out such as weekly Toolbox Talks on relevant topics e.g. wearing PPE, manual lifting, safe use of portable electric tools etc.

8.3.3 Competency and CV's

Where applicable, valid copies of certificates of competency of appointed personnel to be provided and kept in the HSF. Other training requirements such as those identified through the HIRA process, to be completed and proof of that training also kept in the HSF. Where competency is achieved through experience, a brief CV will be required.

8.3.4 Specific OH&S Training

Valid certificates of training from registered service providers preferably accredited by the appropriate SETA are required for First Aiders, H&S Reps, Fire Marshals and Fire Equipment Inspector etc.

8.3.5 Medical Fitness

All work in elevated positions [tower crane operators (CR 20(g)), workers on elevated structures requiring fall protection (CR 8 (2b)), suspended platform workers (CR 15(12a)] and operators of construction vehicles and mobile plant (CR 21(d)) require certificates of physical and psychological fitness.

Valid certificates of training from registered service providers preferably accredited by the appropriate SETA are required for First aiders, H&S reps, Fire Marshals (CR 221 Fire Equipment Inspectors) etc.

8.4 Hazards and Potential Hazardous Situations [OHSA 13]

The principal contractor is responsible to ensure that all contractors and any visitors are warned of any hazardous or potentially hazardous situations, which may affect them on site and shall put any additional measures in place to assist in mitigating the risk of the these hazards.

8.5 Health and Safety Reps [OHSA 17 and 18]
The principal contractor shall be responsible to ensure compliance to this section of the OHSA as required and to ensure similar compliance of all contractors. If a rep is not required, the appointed Safety officer will be responsible for these functions.

8.6 Health and safety Committee [OHSA 19 &20]
The principal contractor shall be responsible to ensure compliance to this section of the OHSA as required. If a committee is not convened, health and safety matters will need to be tabled and discussed at site meetings.

8.7 General Record Keeping

The principal contractor shall ensure that all Health and safety records, required by OHSA and Regulation are kept for reference purpose and auditing.

8.7.1 Inspections

The principal Contractor shall keep all records of inspections undertaken during the contract. An assessment will need to be made of what inspections are required and their frequency. The principal contractor is also responsible to ensure compliance to this requirement by all contractors

8.7.2 Audits [CR 5(o) and 5 (p)]

The client's agent shall carry out regular audits on the principal contractor at least once per month. Similarly, principal contractor shall be responsible for carrying out regular audits on their contractors at least once per month. The results shall be tabled for action and discussed at health and Safety Committee meetings or site meetings as appropriate.

8.8 Incident Management and Emergency Plans

The principal contractor shall create and Emergency Plan for the construction site. The plan shall be clearly laid out for all types of emergencies including responsibilities, evacuation routes, siren, emergency no's etc. The plan shall fully explain to all personnel during the induction training. All contractors will become completely familiar with the requirements of the plan and will participate in any evacuation drills that may take place.

8.8.1 First Aid [GSR 3]

The principal contractor shall be responsible to ensure compliance to this regulation as required. In particular, a first aid box with the minimum stock as specified in the regulation will be located at the site office and there will be signage to indicate the location of the box. Attention is drawn to GSR 3(4) for the requirement of trained first aiders. It is also suggested that a trained first aider be made responsible for the box in terms of the following:

- Security-the box should not be left open but it must be accessible in case of emergency(spare key availability)
- Injuries – a record of first aid box injuries treated and the stock issued.
- Stock- regular inspection to maintain stock levels and check expiry dates

In addition, the first aid requirement should be noted for high risk substances or hazardous chemical substances and if these are to be used, then it should be addressed in the HIRA and the need for eye wash facilities assessed.

NOTE: It is strongly recommended and good practice to comply with the Draft Health and Safety Regulation 7

8.8.2 Incidents and Injuries-Investigation and Reporting

The principal Contractor will ensure there is a management system to report and investigate all incidents. All incident including all near miss, first aid box treatment, and all other serious incidents involving any form of disabling injury or fatality are to be reported to the Client and the Clients H&S Agents telephonically immediately. This shall be confirmed in writing as soon as possible after the incident. Failure to comply with these provisions will be considered as serious offence. Recording and Investigation of Near Miss.

Incidents

The principal Contractor shall provide evidence by means of a procedure or chart that he is fully aware of the hierarchy of incidents that can occur e.g. unsafe situations, near miss first aid box injuries, medical cases, disabling injuries etc. He shall keep an incident register of all such incidents, investigate and apply corrective action where required. The client also reserves the right to request incident statistics from the principal contractor such as Di's DIFR and DISR and it is advised that these are maintained.

Injuries

First aid box injuries have been addressed under 8.7.1 above. More serious injuries requiring transport of the injured person to the nearest hospital or doctor or the calling of an ambulance and paramedic personnel will be the responsibility of the principal contractor's appointed personnel such as the Construction Supervisor, First Aider, and Safety Officer. It is advised that all required emergency numbers be on hand and prominently displayed.as all contractors are registered an in Good Standing with the Compensation Commissioner, it will be the responsibility of the contractor whose employee has been injured; too make the necessary report and claims to the Commissioner.

8.8.3 Accident and Incident Reporting and Investigation [OHSA 24, GAR 8, 9(1) & (2)]

Should an incident or accident investigation need to be conducted, a competent person shall be appointed to conduct the said investigation. The procedure to be followed will be in accordance with Annexure 1 of GAR 9-"Recording and Investigation of incidents". Particular attention is also drawn to OHSA 24, reporting of certain incidents to an inspector of the department of labour. The principal contractor shall ensure that the investigations are kept for record purposes and he shall ensure that the outcome of the investigation is communicated to all affected parties as required i.e. the Client, Clients H& S Agent and contractors. The Client reserves the right to participate in all investigations into accidents or incidents and to conduct their own investigation if required.

8.9 Contractors and Suppliers

The client shall enter into an Agreement with Mandatory in terms of Section 37(2) of the OHS Act 85 of 1993, with all appointed principal contractors. Likewise all principal contractors shall enter in to a similar agreement with all contractors, sub-contracted to them for any period of the

contract. Please note that if contractors hire any construction vehicle or mobile plant, the companies from which the equipment is hired must provide any maintenance and test certification as required. In addition, if operators are hired with the equipment, proof of competency and medical certification must be provided.

The principal Contractor shall ensure that all contractors are issued with this safety specification where *reasonable. The* principal contractor shall assist and ensure that contractors engaged comply with all of these requirements and adhere to the requirements set out OHSA .Contractors will be stopped from working in the event of unsafe conditions and activities being observed. All contractors shall be subject to the requirements specified in the HSP and will be issued with a copy of the plan. If the contractor is not able to comply with the requirements set out in the plan, he shall not be appointed as contractor.

8.10 Personal Protective equipment, Intoxication, Signage and Access Control [GSR 2]

8.10.1 Personal Protective Equipment **(PPE)[GSR 2]**

The principal contractor shall through the Risk Assessment process identify the specific PPE needs per activity. Contractors, as employers, will be responsible for the issue of the required PPE. Should PPE be lost or stolen, then the employee will be issued with new PPE. Should PPE be worn out or damaged, the user shall return the worn or damaged PPE and will be issued with a replacement. Training in the use of this shall be provided. Visitors shall be informed of PPE requirements prior to their visit so that they may enter the site.

8.10.2 Intoxication [GSR 2A]

The principal contractor shall be responsible to ensure that no persons may enter or remain at the construction site if under or apparently under the influence of intoxicating liquor or drugs.

8.10.3 Display of signs [GSR 2B]

The principal contractor should make use of signage to assist in enforcing compliance to any requirement specified in this document or as required by law. Standard symbolic signs are acceptable for conveying these requirements where applicable.

8.10.4 Access control [GSR 2C]

The principal contractor shall be responsible to ensure control of access to all persons entering the construction site. The reason for this is as follows;

- The principal contractor is the employer on the site and all intents and purposes is responsible for section 8 of OHSA of employees and contractors and section 9 for any other person on site such as visitors and inspectors
- All persons entering the site must undergo induction training to inform them fo the hazards present on site. This includes contractors, visitors, inspectors etc.
- The construction supervisor will be aware of who is on site and their function
- The construction supervisor will be able to control tasks that may impact on other work being carried out on the site by a permit to work system.
- The number of people and their purpose on the site must be known in case of emergency and evacuation
- Security reasons

8.11 Ladders [GSR 13A]

The following requirements shall be complied with regarding Ladders and Ladder Works:

- A competent person shall be identified and appointed as ladder inspector
- Where aluminium ladders cannot be used, then wooden ladders shall be straight grained, unpainted to allow for proper inspection of the gran for cracking
- Ladders shall be secured at the top and choked at the base to prevent slipping.
- Where choking of the base is not possible, then the user shall ensure that the ladder is held in position by another employee when ascending the ladder.
- Ladders shall be inspected a minimum once per month by the person appointed as the ladder inspector.
- Proper storage shall be provided for all ladders when not in use.

8.12 Pressure Equipment Regulations, 2009(Gas Bottles) [PER 2009]

If gas bottle sets (Oxy-Acetylene for heating, cutting, welding) are used, these regulations, as required, shall be adhered to. Regular inspection of the sets shall be carried out. In particular;

- Only trained personnel shall operate such equipment.
- The construction Supervisor shall ensure operation of the equipment is in accordance with the HIRA requirements and Safe working Procedure (SWP) and /or method statement.
- All users shall undergo regular awareness training (toolbox) to ensure compliance.
- The Construction supervisor shall ensure the required PPE is used.

8.13 Portable Electric Tools [EMR 9]

This regulation shall be complied with as a minimum requirement. Regular inspections of all Portable Electric Tools such as drill, angle grinder's etc. shall are carried out. In particular:

- Only trained personnel shall operate such equipment.
- The Construction Supervisor shall ensure operation of the equipment is in accordance with the HIRA requirements and Safe working Procedure (SWP).
- All users shall undergo regular awareness training (toolbox talks) to ensure compliance.
- The Construction Supervisor shall ensure the required PPE is used.

8.14 Permit to work [including hot work]

The principal contractor shall be responsible to ensure that:

- All work being carried out on site has been approved through the necessary project control system.
- Permit require from third parties such as vetting for security clearance
- A permit system is operational so that work consisting of many tasks related to the construction on site, can be carried out without endangering he health and safety of personnel on site, neighbours and the public surrounding the site and or causing damage to property.
- In particular, attention is drawn to GSR 9, which details the requirements for welding, flame cutting, soldering and similar operations.

8.15 Environmental Rules

The contractor shall give effect to maintain all safeguards and standards and take such measures as may be necessary for the protection of the environment.

8.15.1 Clearing

The contractor shall comply with the following conditions and requirements for clearing:

- Follow the Occupational health and Safety Act, the Environmental Regulations for workplaces and Project EMP.
- Areas to be cleared will have boundaries clearly marked by tape, pegs or other means and will conform to limits on design drawings.
- No clearing is to occur without a written permit from the Engineer.
- Clearing will not commence until drainage control works are in place.
- Cleared vegetation should be windrowed along the contour to assist with erosion control.
- Any area which is not to be disturbed under requirements of the Cultural Heritage management Plan will be clearly identified.
- Vegetation clearance will be restricted to that necessary for the works.
- The Engineer is to be notified immediately if contaminated soil is discovered.
- Traffic shall be confined to maintained tracks and roads.
- Particular care shall be taken to minimise disturbance to the bed and banks of watercourses.

8.15.2 Noise and Vibration

The contractor shall ensure that each of its mobile and fixed plant and that of its subcontractor' are fitted with appropriate noise suppression equipment to ensure that noise levels from such plant are contained within the relevant limits prescribed by relevant industrial safety and environmental legislation, regulations and site standards. If there is a noise problem with electrical power generating equipment, compressors, or other facilities under the control of the contractor, additional noise suppression shall be erected by the Contractor at the Contractor's cost around the offending unit(s).Any deviation from the above listed practices is to be rectified at the Contractor's cost.

8.15.3 Transport, Storage and Handling of Hazardous Substances and Dangerous Goods

The contractor shall comply with the following conditions and requirements for storing and handling hazardous and dangerous goods:

- Comply with HCS Regulations 14. The storage and handling of flammable and combustible liquids.
- Provide a list of hazardous substances and corresponding MSDS prior to bringing substances on Site.
- Substances register to be held at each storage facility.
- Corrosive materials to be stored and handled in accordance with HCS Regulation 14.
- Fuels, oils and substances in containers of 200 litres or more shall be stored in a bunded area with capacity of at least 110% of largest container/tank.
- Fuel, oils and substances in less than 200 litre drums shall be stored as above or in a fenced and roofed compound.
- All fuels, oils and substances must be clearly labelled.

- Transfer of bulk fuel and handling of hazardous substances shall be conducted only by appropriately trained personnel
- Spill clean-up kits including absorbent materials shall be kept at each storage facility.

8.15.4 Erosion and Oil Traps

The Contractor shall comply with the following conditions and requirement for erosion, sedimentation, silt and oil traps:

- Land disturbance will be restricted to that necessary for the works.
- Topsoil will be salvaged for use in rehabilitation
- Storm water from upstream catchments will be diverted away from construction areas.
- Drains will be protected to prevent scouring if necessary.
- Sediment traps, silts fences or hay bales will be installed to control sediment where necessary and where directed by Engineer.
- Sediment traps will be cleaned periodically.

8.15.5 Dust Prevention

The contractor shall comply with the following conditions and requirements for air quality and dust:

- Dust generated by construction activities will be suppressed by water spraying, to levels that are safe for Site personnel.
- Speed limits on unsealed roads will be limited to a maximum speed consistent with the minimisation of dust generation.
- Earthworks Supervisors must pay particular attention to the management of topsoil stripping such that dust does not become a safety hazard or severe nuisance.
- All dust complaints will be investigated promptly and appropriate action initiated to reduce nuisance.

8.15.6 Waste Management

- The contractor shall provide suitable rubbish receptacles at the Site and shall ensure that all litter is collected in them and properly disposed of off Site in accordance with the requirements of the relevant statutory requirements
- The contractor shall ensure proper collection and off-site disposal of all industrial wastes in accordance with relevant statutory requirements.
- The contractor shall apply the principles of Waste Minimisation by reducing the amount of waste generated on Site by their operations and activities as much as possible. The contractor shall provide for cycling of glass, metals, plastics and papers.

8.15.7 Weed management

The contractor shall comply with the following conditions and requirements for weed management:

- Contractors shall ensure that all machinery, equipment and vehicles are washed down at a wash facility before the Site and again when leaving the site.
- Plants and soil shall not be removed from Site without authorisation.

- Soil or other material shall not be brought onto Site if it has originated from an area known to contain environmental weeds or declared weeds under the Rural land Protection act 1995.
- Areas disturbed or rehabilitated as part of a Contract will be inspected upon completion of the works. The Contractor shall eradicate any declared weeds found.
- Seeds used in rehabilitation shall be free of declared weeds
- Control measures (including use of herbicides) must be consistent with manufacture's recommendations, safe practice and recommendations in the Department of natural Resources Pest Fact series.
- Include information on the importance of weed control inductions.

Any deviation from the above listed practices is to be rectified at Contractor's cost

8.15.8 Found Object

All fossils, coins, articles, minerals of commercial value and objects of antiquity and structures and other remains and things of archaeological interest discovered at the Project site shall be deemed to be the absolute property of the Company. The Contractor shall take reasonable precautions to prevent the Contractor's employees, subcontractors and the employees of subcontractors and any other persons from removing and damaging any such article and thing and shall immediately upon discovery thereof acquaint the Engineer of such discovery and carry out, at the expense of the company and at the engineer's direction, the protection and or disposal of same,.

8.16 Monitoring, Audit and Review

- The Client's Agent/DPW Safety Manager shall have the right to conduct audits/inspections of the Contractor's operations, equipment and procedures at any time, and the Contractor shall fully co-operate with the client's agent during such audits/inspections.
- The client's agent rights under this clause shall not relieve the contractor of its obligations to conduct audits and reviews of its own safety and health performance.
- Where such Client's Agent/DPW Safety Manager audits reveal deficiency in the Contractor's procedure equipment, training, drills, etc. the contractor shall rectify such deficiencies as soon as practicable, and provide to the Client's agent a status report on all outstanding corrective actions. Where such deficiencies include an unsafe practice or breach of the Statutory or the Contract's requirements, the Client's Agents/DPW Safety Manager may in accordance with the general Conditions of Contract suspend the work associated with the unsafe practice or breach until the deficiency is rectified.

8.17 Penalties and Fines

Any contractor employees who is found not adhering to the ESH specification, Site Ground Rules ,ESH Plan or any other statutory requirement, or who is observed committing unsafe acts or contributing to unsafe conditions will be issued with a Non-Conformance Report and the relevant Contract will be issued a fine according to the scale of fines nominated below.

Contractor employees will also be reprimanded as per the relevant company HR procedures:

- First transgression constitutes a **verbal warning**.

- Second transgression constitutes **a written warning**.
- Third transgression constitutes **a full disciplinary hearing** according to the company' HR procedures
- Any life-threatening unsafe act or unsafe condition must be treated as a Gross Neglect of Company Environmental, safety and Health Rules and Procedures and Disciplinary hearing shall be conducted to determine the root cause of the incident and the appropriate action which must be taken to prevent the similar unsafe situation from occurring in the future.

  Copies of Non-Conformance Reports (NCR) and disciplinary hearings must be kept on record on the OHS File.

8.17.1 Offences and Penalties
All offences and penalties will be dealt according to CR (33)

9 Applications of the Construction Regulations [CR]
[Please note; this is the complete list. Item 9.1 is compulsory and the rest are applicable if relevant to the work being carried out]

9.1 Hazard Identification, Risk assessment and Risk Control (HIRA) [CR 9]

The contractor shall prior to the commencement of any construction work perform a HIRA exercise which will form part of the HSP and file for the project. A copy of HIRA shall be made available for viewing to the client's OHS agent and shall be kept in the Health and Safety File.

NB: The contractor shall ensure that the outcome of all HIRA exercises will be conveyed to all relevant employees with respect to the hazards and the related control measures before any work commences.

Below is the list of activities, which may be considered for HIRA if the activity is to be carried out on site. The list is not exhaustive but gives examples of activities for a construction site:

- Site security and access.
- Traffic management-restrictions etc.
- Activities that affect adjacent sites.
- Lifting operations such as offloading and moving equipment.
- Lifting equipment such as offloading and moving equipment
- Stacking, storage of equipment and materials, and good housekeeping.
- Use of hand tools
- Use of portable electric equipment(power tools)
- Use and storage of flammable and hazardous chemicals such as paint, adhesives, solvents, thinners, cement etc.
- Scaffolding.
- Painting.
- Welding.
- Electric installations.
- Mechanical installation.
- Waste management including removal of hazardous waste.
- Environmental restraints such as boundary noise and dust.

- Temporary site accommodation.
- General hazards to site personnel such as cleaning noise and dust.

The control of several of these risks may be specified in the OHSA or the CR but this does not mean that the HIRA exercise does not have to be carried out.

9.6 Construction vehicle and mobile plant [CR 23]

It will be the responsibility of each contractor on site to ensure compliance of their construction vehicles and mobile plant to these regulations.
This includes vehicles to be used for transporting personnel to and from site, which will be subject to relevant requirements such as licensing and roadworthiness checks. In addition the following will apply:

- Safe transport for personnel working on the project to and from the workplace, which shall include proper seating, side restraints and cover.
- Road safety principles shall be adhered to on and off site.

If a mobile crane or other mobile plant is hired, only approved hire companies shall be contracted to provide such equipment. The Construction Supervisor shall ensure compliance of the provider to these regulations. In particular attention is drawn to the competence and fitness of the operator [section 1(d)] and the inspection of the equipment [section 1(j)].

9.7 Electrical Works [CR 24], including [EIR] and [EMR]

The requirement of these regulations shall be met as required by the appointed electrical contractor. Competent person will be appointed for inspection and control of all temporary electrical installations as per CR 24(d) and (e) respectively.

The person /Contractor who does electrical installation work as an electrical contractor shall be registered as an electrical contractor in terms of electrical Installations Regulations.

9.8 Use and storage of flammable liquids [CR 25], and hazardous chemical substances [HCSR]

All the requirements of CR 16 shall be met.
In terms of HCSR, contractors shall ensure that all hazardous chemicals brought to site have Material Safety Data Sheet (MSDS) and the users are made aware of the important sections of the MSDS such as:

- Hazards
- First aid measures
- Firefighting measures
- Accidental release measure
- Handling storage
- Exposure control especially PPE
- Disposal

First aider shall be made aware of the MSDS and how to treat HCS incidents appropriately. Copies of MSDS's will be available on site and in the HSF.

9.9 Housekeeping [CR 27] including [ERW (6)]

All contractors shall ensure that housekeeping standards as per these regulations shall be maintained at all times.

9.10 Stacking and Storage of Materials [CR 28] including [GSR (8)]

All contractors shall ensure that materials are only stored in defined and allocated storage areas and that materials being stored are stacked in accordance with sound stacking principle as per these regulations.

9.11 Fire precautions [CR 29]

All contractors on site will comply fully with the requirements of this regulation. In particular, the principal contractor will be responsible for the evacuation plan (section (l) the details of which will be impaired to contractors, visitors etc. through the site induction.

9.12 Construction employee welfare facilities [CR 30]

The principal contractor shall be responsible for implementing this regulation and shall ensure that adequate facilities are provided for the personnel on site in terms of the following:

- Change room facilities
- Adequate toilets
- Hand wash facilities
- Drinkable water

No food preparation shall be conducted on site. Eating and drinking will only be permitted in the designated eating areas, which must be provided with adequate seating. Waste bins shall be strategically placed and cleared regularly.

10. Site Specific and Design Risks

[Please note; this is not a complete or exhaustive list. The principal contractor is expected to assess all risks to which his employees may be exposed during the construction process, as well as the hazards identified and listed below].

10.1 Hazard Identification and Risk Assessment Methodology

Once on site, every contractor shall perform task risk assessment, using the baseline risk assessment as a guide.

The Risk assessment should be reviewed once on site and thereafter after any incident, change in design or every one-year period, whichever occurs first. Additional hazards highlighted or change in the risk factor should have a separate risk assessment carried out and filed.

The risk assessment is based on the combination of the CONSEQUENCE and PROBABILITY associated with each hazards.

10.1.1 Definitions

Term	Meaning
HAZARDS	Anything that can cause harm
RISK	The chance, great or small, that someone will be harmed by hazard
CONSEQUENCE	The possible outcome of an incident/ accident, e.g. broken leg, explosion.
PROBABILITY	The possibility of the accident/incident occurring

10.1.2 Risk Assessment

The following evaluation must be used to determine risk:

Probability X Consequence= RISK

Risk Matrix

Calculating the risk

1.Take the consequences rating(1-5) and select the correct column
2. Take the likelihood rating(A-E) and select the correct row
3. Select the risk rating where the two ratings cross on the matrix below.
VH=Very, High=High, M= Medium, L=Low

		CONSEQUENCES				
Likelihood	1	1	2	3	4	5
	A	M			VH	VH
	B	M	M			VH
	C	L	M			VH
	D	L	L	M	M	
	E	L	L	M	M	

10.2 Site Specific risks

The following site-specific risks have been identified for this project. These must be catered for in the contractor's health and safety plan (that which is applicable to their scope of work), and included in the site-specific risk assessment.

10.2.1 Traffic-restrictions, existing system, site traffic

Traffic accommodation must be arranged with the principal agent.

10.2.3Site security and access-this is controlled by principal contractor.

10.3 Design risks

The following design risks have been identified by the designer for this project. These must be catered for in the contractor's health and safety plan (that which is applicable to their scope of work), and included in the site-specific risk assessment.

10.3.1 Electrical Installation
10.3.2 Mechanical and Ceilling Installations

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REPUBLIC OF SOUTH AFRICA

COVID-19 GUIDELINES FOR MANAGEMENT OF RISK ON CONSTRUCTION SITES TENDER NO: KIM 12/2020

SITE DEGREE OF RISK

BUILDING AND PROJECT TYPE	SITE SET-UP AND STAFF WELFARE	CONSTRUCTION STAGE
Lower Risk Industrial, Logistical, Roads and Bridge Construction	For most, but not all project construction stage risk may be as follows: Lower Risk	For most but not all sites, set-up risk may be as follows: Lower Risk
Medium Risk Residential Accommodation	• Excavation and groundworks • Foundations and Piling Medium Risk • Basement and Substructure • Structural Frame • Roofing • Interior First Fix • Interior Second Fix	• Large Sites Medium Risk • Site and management offices
High Risk Healthcare facilities, Correctional Centers, Military Bases, Police Stations, Magistrates Offices	High Risk • Cladding and Glazing • M+E and Lifts • Interior First Fix • Interior Second Fix	High Risk • Scaffolding • Travel to and from site and access to site • Horizontal walkways and vertical access • Staff changing and locker rooms • Showers and toilets • Confined Spaces • Confined Sites
	GUIDLINE For each construction contract there will be different levels of risk and it will be critical to evaluate the specific risks of each individual project.	GUIDLINE For each construction site there will be different levels of risk and it will be critical to evaluate the specific risk of each individual project.

RISK MITIGATION PLAN

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Demographics of Labour: • Inadequate procedures in place to identify potential infected employees and workers • Manage the exposure to COVID-19 on the project, including visitors and suppliers **Origin of labour and transportation** Need to minimize the risk of exposure to virus whilst in transport	Contractor is to maintain a register of all employees and workers on the project, including Sub-Contractors (inclusive of employees and workers) and Professional Team, keeping records of the following information as a minimum (Note: the NIOH document that is currently available): • Name • Age of employee/visitor • Contact Details • Health status • Socio-economic status/unskilled labour (work force) • Accommodation arrangements (work force) • **On site transportation**: Where on site transportation is done, a policy needs to be available for how such transportation will be made safe and limit any opportunity for cross infection. If possible the Principal Contractor should provide their own transportation of work force. (Where not possible, use of public transport can be considered to comply to transport limitations) • **Parking areas**: Private and public vehicles are required to park outside of the construction site • Support staff for professional service providers are to work from office location or from home • **Education and information**: Information boards are required at entrance of sites and within Site Offices with information on the virus and precautions to be taken during working hours and traveling. • **Social Distancing**: o **On site**: As far as possible, work activities must be so arranged that social distance is kept to a minimum of 2 metre. o **Site office**: seating arrangements must be of such that social distancing for roll players is kept to a minimum of 1 metre, ie; '**ONE CHAIR, SKIP CHAIR, ONE CHAIR, SKIP CHAIR**'. o Roll players must be limited to Professional Team and principal contractor. o Facial Masks must be worn at all times by all roll players. o Contractor work force when on site and transportation to and from site, where hand gloves can be used, they should be worn at all times to minimize touching of possible contaminated surfaces and injury.	CONTRACTOR CONTRACTOR AND PROFESSIONAL TEAM

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Public transportation across boarders/towns/cities Where a return to work will necessitate travel between Provinces and cities for employees and workers to return to the project, The Principal Contractor and Sub-Contractors are to have in place procedures for or provision of transport for the return of workers to minimize the risk of exposure to the virus whilst in transit.	**The contractor to source/recommend a transport service provider that complies with all travel restrictions and requirements as gazetted by the government, inter alia:** • Maximum occupancy of vehicles to allow for social distancing • Vehicles sanitized before passengers board • Passengers provided with Face Masks and hand sanitizers provided within vehicles for passengers sanitization before boarding and after returning from vehicles for comfort breaks • Regular testing of body temperature • Adequate number of vehicles to be provided to comply with the maximum occupancy • Principal Contractor to put in place procedures for sanitization of personal belongings and luggage of work force on arrival at final destination • Permits to be provided per vehicle and per passenger from Authorising Authority	CONTRACTOR
Social Distancing: Construction site and facilities not set up in such a way that it will be possible as far as is practicable to maintain the required social distancing of 2 metres between persons when at work **Risk:** Manual labour for physical tasks and tasks that will not allow for social distancing;	**Tasks that require more than 1 person to complete:** • Providing adequate supplies of suitable PPE such as face masks, task specific gloves, safety glasses, disposable/additional coveralls; • PPE used during multi-person activities to be exchanged immediately after the task is completed; • Sealed bins to be provided for disposable PPE such as masks, disposable coveralls, disposable gloves, etc; • Sealable bags provided to each person for keeping PPE requiring laundering, such as gloves and coveralls, and • Sanitizing/washing facilities provided for immediate sanitizing of hard hats, safety glasses, shoes, safety harnesses etc, on completion of multi-person tasks	CONTRACTOR

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Site access by non-employees/security access Inadequate access control measures in places	• Stop all non-essential visitors • All employees and non-employees to be screened with non-contact thermometers (Thermal Thermometers); • Body temperature checks with thermometer upon employee's arrival and departure; • Introduce staggered start and finish times to reduce congestion and contact at all times; • Take body temperatures of anybody stepping on or off site; • Monitor site access points to enable social distancing; • Number of access points to be reduced to enable controlled monitoring; • Ensure disinfectants are in place for disinfecting of shoes on entering/leaving the site; • Provide hand sanitizer for all entering the site to sanitize hands; • Allow social distancing of 2 metres in ques for all entering the site; • Regular cleaning of common contact surfaces areas, eg; desks, telephones handsets, site office door handles, chairs, etc; • Drivers of suppliers of materials and goods and services must remain with their vehicles if load will allow it, if not, drivers are to wash hands before unloading goods and materials	CONTRACTOR
Alcohol and Drug Testing Lack of safe testing procedures in place for alcohol and drug testing	• Alcohol testing may only be done using single use test units, and must be disposed of in the appropriate contaminated waste bins provided on site; • Drug testing will only be done by an occupational health facility either using urine or blood sampling; • A protocol will be drawn up by the Principal Contractor to manage this with the occupational health service being used.	CONTRACTOR

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Medical Surveillance No methodology in place as part of the normal requirements for pre-placement, periodic and exit medicals that includes factors related to COVID-19	• The normal requirements of pre-placement, periodic and exit medicals will remain, with the Occupational health service providing a methodology of how they will be including factors relating to Covid-19. No lung functions or peak flows will be done until deemed safe to do so by the South African Thoracic Society. • It is preferable that occupational health service providers use a cloud-based record keeping service to ensure easy tracking and tracing. Free apps such as Square 1 is such an example. • Any person who contracts the virus may need to be reported to the Compensation Commissioner as an occupational disease where their work is to monitor and in contact with others. Such details are provided in the Compensation for Injuries and Diseases Act (COIDA). • Isolation of workers who have a temperature or any symptoms, and removal to the closest facility for testing and treatment, through the numbers provided. The PC is to ensure their policy on this includes such information. • Workers will be required to complete COVID-19 questionnaires prior to returning to site. Any worker with any symptoms is not to return to work, or notify the PC of same.	CONTRACTOR
Ablution Facilities on Site Unhygienic ablution facilities leading to poor hygiene	• Restrict the number of people using toilet facilities at any one time. e.g. use a welfare attendant; • Hand washing facilities (soap and water, paper towel) to be available where possible, and if not, to provide hand sanitizer. Wash hands before and after using the facilities • Induction training to educate to ensure all users are hand washing correctly; • Enhance the cleaning regimes for toilet facilities particularly door handles, locks and the toilet flush handle. Flush toilets preferably 1:15 ratio unless increased cleaning regime present; • Portable toilets should be avoided wherever possible, but where in use these should be cleaned and emptied more frequently. Portable toilets to be provided at a 1:10 ratio; • Provide suitable and enough rubbish bins for hand towels with regular removal and disposal be cleaned and emptied more frequently; • Introduce staggered start and finish times to reduce congestion and contact at all times; • Consider increasing the number or size of facilities available on site if possible.	CONTRACTOR AND EMPLOYEES

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Waste Management for Covid-19 Waste Outdated waste management arrangements in place that leads to an increased risk of the spread of Covid-19	Waste management arrangements to be updated to include provision for the disposal of additional waste generated due to preventative measures implemented. All waste to be managed as hazardous waste. a. Disposal of any gloves, masks The contractor shall dispose of all used gloves and masks as hazardous waste and provide sealable bags and containers for the safe disposal of this waste. b. Paper towels The contractor shall provide adequate supplies of paper towels on site. At points where these towels are provided lined waste bins to be placed in order to collect all used towels and then to be disposed of in hazardous waste. c. Disinfectant solution The contractor to provide adequate supplies of disinfectant on site where the use of water and soap for cleaning is not practical. If disinfectant dispensers are not refilled it should be disposed with other hazardous waste. d. Wastewater Wastewater at washing points, toilets, and bathrooms to be contained in a drainage system that prevent surface spills. If wastewater is contained in waste buckets it must be sealed when removed and disinfected after it is cleaned.	CONTRACTOR
Site Meetings Not limiting the number of employees at all activities to the minimum required to do the work in a safe manner.	Only necessary meeting participants should attend. • Attendees should be two metres apart from each other. • Rooms should be well ventilated / windows opened to allow fresh air circulation. • Consider holding meetings in open areas where possible. • Technological alternatives to be exploited for meeting • Attendance if possible (Zoom, Skype, MS Teams). • Training and awareness to address procedures and the importance of social distancing. • Toolbox talks to be conducted outdoors when possible in order for persons to maintain social distancing. Where inclement weather does not allow for this, toolbox talks to be conducted with smaller groupings of workers in a sheltered area large enough to maintain social distancing.	CONTRACTOR

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Signage Conflicting messages/notices displayed on the site in contravention with current requirements to respond to Covid-19	The Principal Contractor is to review all current signs and notices displayed on site. The PC is to avoid conflicting messages/notices that have been in place prior to lockdown and review accordingly. **a. Access rules** The contractor shall install additional signage with site rules specific to the prevention of spreading the COVID-19 virus at the access control points of the site. **b. Notices/Posters with protocols** Notices and posters shall be placed and installed to raise awareness and regarding protocols to be followed on site. These notices and posters shall be placed conspicuously at various points on the site including the following places: • Entrance • Site notice board • Site Office • Eating areas • Next to toilets and bathrooms • Hand washing stations • Storerooms	CONTRACTOR
Emergency Planning Emergency plan not completed and undated in line with current Regulations of the National Disaster Management Act	An updated emergency plan is to be completed that is in line with the current Regulations of the National Disaster Management Act. **a. First aid** Extra gloves, and disinfectants are to be available, first aiders are to be issued with at least FFPT2 masks should they be required to respond **b. Evacuation plans** Evacuation plans should consider social distancing. **c. Isolation of potentially infected workers** The emergency plan is to consider how anyone who arrives on site and displays any of the symptoms, or has a raised temperature.	CONTRACTOR

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Welfare facilities Lack of procedures and arrangements for the provision of welfare facilities to prevent the spread of Covid-19 between employees on site	The Principal Contractor shall adapt arrangements regarding the provision of welfare facilities to be in line with Government guidelines and requirements. **a. Clean, storage for food and personal belongings** The Principal Contractor to provide lockable storage for all employees on site, which shall be disinfected daily. Training and awareness to address procedures and the importance of good hygiene practice. **b. No personal belongings to be kept on site** Apart from extra clean personal clothing no other personal belongings allowed on site accept if kept in locker provided by the Principal Contractor. **c. No communal drinking facilities (shared cups etc.)** The Principal Contractor to provide adequate supplies of bottled water to all employees on site. Empty bottles to be disposed of as normal waste. Training and awareness to address procedures and the importance of good hygiene practice. **d. Eating areas** The Principal Contractor is to limit the number of employees at all activities to the minimum. Stagger lunchbreaks and resting periods for work teams. Training and awareness to address procedures and the importance of good hygiene practice and social distancing. • Workers are required to stay on site once they have entered it and not use local shops. • Dedicated eating areas should be identified on site to reduce food waste and contamination. Where catering is provided on site, it should provide pre-prepared and wrapped food only; • Payments should be taken by contactless card wherever possible; • Crockery, eating utensils, cups etc. should be disposable if supplied; • Drinking water should be provided with enhanced cleaning measures of the tap mechanism introduced; • Tables should be cleaned and disinfected between each use; • All rubbish should be put straight in the bin and not left for someone else to clear up; • All areas used for eating must be thoroughly cleaned at the end of each break and shift, including chairs, door handles, vending machines and payment devices.	**CONTRACTOR AND EMPLOYEES**

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Consequence Management Inadequate processes and procedures in place for consequence management	• When non-compliance activities are noted, that activity will be stopped. Should the remedial actions not take place the site will be shut down till the corrective actions have been implemented. • Employees that do not work according to the SSHSS and SSHSP must be disciplined according to the company's disciplinary codes and practices. • Supervisory employees on site must ensure compliance, and when non conformances are noted disciplinary actions should also be followed. • Principal Contractor's should note that they could be fined and even according to the Disaster Management Act, arrested.	CONTRACTOR

ANNEXURE 'A' (stage 4 lockdown) templets required for covid-19 implementation risk compliance and for continuation of work on construction sites

KIMBERLEY: DPWI KIMBERLEY REGIONAL OFFICE REPLACEMENT OF AIR CONDITIONING SYSTEM SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

Contents of Templates Required from Contractor

GENERAL NOTE TO CONTRACTORS

WITHIN THE "WORKPLACE PREPARATION PROCEDURE" THE CONTRACTORS ARE REQUIRED TO REPLACE THE HIGHLIGHTED TEXT IN 'RED'; "COMPANY" WITH THEIR 'COMPANY NAME'.

RISK ROTATION PER ACTIVITY: CONTRACTORS ARE TO PROVIDE WITHIN THE DOCUMENTS ON PAGES 12 AND 13, THE TOTAL REQUIRED NUMBER OF WORK FORCE REQUIRED PER ACTIVITY (DOUBLE CLICK WITHIN THE DOCUMENT TO OPE THE EXCEL SPREAD SHEET TO EDIT THE AREA LABLED "TOTAL REQUIRED WORK FORCE" AND ENTER THE NUMBER REQUIRED PER ACCTIVITY)

DETERMINATION OF RISK PER ACTIVITY (DOUBLE CLICK IN WORK SHEET TO EDIT)

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REPUBLIC OF SOUTH AFRICA

RISK ROTATION PER ACTIVITY

	Activity	Total required work force	Rotational work force pe Activity
1	**Sub Structure**		
	Excavations		
	Foundations		
	Floor Scread		
	Foundation Walls		
2	**Super Structure**		
	Brick Layers		
	Plasters		
	Electrical First Fix		
	Mechanical First Fix		
	Plumbing First Fix		
	Carpentry First Fix		
	Painters First Fix		
	Roof Structure		
3	**Internal finishes**		
	Carpentry Second Fix		
	Electrical Second Fix		
	Plumbing Second Fix		
	Mechanical Second Fix		
	Painters Second Fix		
	Tilers		
	Floor Finishes		
4	**Site Works**		
	Back fill excavations		
	Removal of rubble		
	Paving		
	Fencing		
	Road Works		
	Land Scaping		

RISK ROTATION PER ACTIVITY

	Additional Activities identified	Total required work force	Rotational work force per Activity
5			
6			
7		0	
			C
			C
			C
			C
			C
			C
			C
8		0	
			C
			C
			C
			C
			C
			C

KIMBERLEY: DPWI KIMBERLEY REGIONAL OFFICE REPLACEMENT OF AIR CONDITIONING SYSTEM SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

Contents of Workplace Preparation Procedures

KIMBERLEY: DPWI REGIONAL OFFICE REPLACEMENT OF AIR CONDITIONING SYSTEM SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

1. Purpose

To reduce the risk of COVID-19 outbreak in the workplace and the impact on workers, customer and the public.

2. Scope

Applies to all employees, clients, suppliers and sub-contractors who are associated with [Company]

3. Responsibility

- Contracts Managers and Supervisors
  Ensure all workers under their supervision adhere to specifics of this procedure
- COVID Manager
  Coordinate the COVID Management Plan/COVID Procedure on behalf of [Company]
- HSE Officers
  Develop a COVID-19 specific risk assessment, raise awareness in the workplace, conduct routine monitoring to ensure compliance and put in place corrective measures were required.
- Employees
  Cooperate with supervisors by adhering to set guidelines and lawful instructions.

4. Implementing Workplace Controls

The legislation governing workplaces in relation to COVID-19 is the Occupational Health and Safety Act (Act 85 of 1993) as amended in conjunction with the Hazardous Biological Agents Regulation.
A COVID-19 specific risk assessment together with a written policy concerning the health and safety of employees shall be drawn up and communicated to all employees and mitigation

Measures which needs to be monitored and adjusted should the need arise.

Workplace Controls:

- All offices (including site offices) will be sanitised before opening for business each day
- Place posters that encourage staying home when sick, cough and sneeze etiquette, and hand hygiene at the entrance of offices and sites.
- On-site induction with special emphasis on COVID-19 will be done with all employees upon return to work.
- Provide tissues and waste bins lined with a plastic bag so that they can be emptied without contacting the contents
- Instruct employees to clean their hands frequently, using soap and water for at least 20 seconds or with an alcohol-based hand sanitizer that contains at least 70% - 95% alcohol.
- Continue routine environmental cleaning, which includes tools and equipment.
- Increase ventilation in offices by natural or mechanical means
- Provide soap and water and/or alcohol-based hand rubs (at least 70%) in the workplace in multiple locations and in common areas to encourage hand hygiene.
- Practice social distancing (2m) as far as possible (no handshakes, hugs, kissing, horseplay or touching each other). Keep distance from each other while working on site. Supervisors will monitor this throughout the day.
- While queuing at the gate to enter the site, employees must stand in a line, with at least 2m between them.
- Desks for employees working in the office (site office) will be spaced at least 1.5m apart, or placement of one person per office will be implemented.
- It is compulsory to wear face masks at all times. Each employee will be issued with two cloth face masks to wear at work and while commuting, with appropriate training on the use of these masks. Arrangements will be made for the washing, drying and ironing of cloth masks.
- Temperature testing will be done on all employees every morning upon arrival to site, and also randomly during the day. All readings will be recorded, monitored and sent to the SHE department. The testing will be conducted

by the site safety officer. On sites where a full-time safety officer is not available, the responsibility will fall onto the supervisor.

- During the temperature screening, employees will be screened for any additional symptoms such as body aches, loss of smell or taste, nausea, vomiting, diarrhea, fatigue, weakness or tiredness. The results will be recorded in the Social Distancing Control Sheet and send to the SHEQ department. If an employee displays any of the symptoms, he will not be permitted to enter the site/offices.
- In addition to posters, brief employees and sub-contractors that anyone with a mild cough or low-grade fever (37.3 or more) needs to stay at home and take sick leave.
- Any employee who develops flu-like symptoms (i.e. cough, shortness of breath, fever) or any of the additional symptoms should inform his supervisor immediately.
- Where practical, the minimum number of employees will be allowed on site, and rotation staggered working hours and shift work may be implemented. Promote working from home for employees who are able to do so.
- All visitors to site will undergo induction and temperature screening and must be in possession of the appropriate PPE (i.e. face mask) prior to being allowed access to site. No access will be granted to visitors not complying. All visitors will be required to sanitize their hands before entering the site as well as when they leave.
- Sub-contractors shall ensure that all of their employees are issued with face masks and any other necessary PPE, and that hand sanitizer and soap is available for their employees. Temperature testing will be done by [Company] and records kept. Failure to do so will result in the sub-contractor employee/s being put off-site until compliant.
- A copy of the Essential Service Permit must be available on site at all times. All sub-contractors to provide a copy of their Permit prior to being granted permission to work.
- All employees are obliged to comply with measures introduced in the workplace.

5. What to do When an Employee on site becomes ill with COVID-19

1. If someone becomes ill in the workplace and there is reason to suspect they may have contract or come into contact with someone who has contracted the COVID-19 virus, the person must be isolated immediately, provided with a FFP1 surgical mask, and transport arranged for the employee to go home to be self-isolated or for medical examination. Ensure testing is done at an identified testing site.

2. The Department of Health and Department of Labour will be informed of any employees testing positive for COVID-19, where after an investigation will be conducted to establish the cause, including any control failures. The risk assessment will be reviewed to ensure necessary controls and PPE is in place.

3. The risk of transmission will be assessed, the employees working area disinfected.

4. If an employee is confirmed to have COVID-19, his/her fellow employees will be informed of their possible exposure to COVID-19 in the workplace and referred for screening, but confidentiality must be maintained at all times, and no discrimination shown toward an employee who tested positive for COVID-19.

5. If evidence exist that the employee contracted COVID-19 as a result of Occupation Exposure, a Claim for Compensation will be lodged in terms of the Compensation of Occupational Injuries and Diseases Act 1993 (Act No. 130 of 1993) in accordance with Notice 193 published on 3 March 2020.

6. Once an employee was positively diagnosed with COVID-19 and isolated in accordance with the Department of Health Guidelines, the employee may only return to work after he has undergone a medical evaluation confirming the employee has tested negative for COVID-19. The employee will be required to wear a face mask, maintain social distancing and adhere to cough and sneeze etiquette. The employee will also be monitored for symptoms upon his/her return to work.

6. Transport

- Where transport is provided, occupancy of the vehicle should be reduced in line with social distancing practice.
- All passengers must wear face masks or respirators.
- All passengers to sanitize their hands before getting into the transport, as well as when disembarking.
- Transport vehicles should be sanitized before and after each trip.
- Employees making use of public transport to ensure they wear face masks and sanitize their hands regularly (before getting into the transport and when disembarking). Attempt to not touch any surfaces unless absolutely necessary.

7. **Meetings**

Wherever possible, meetings to be held via tele or video conference in order to maintain social distancing and prevent the possible spread of COVID-19.

Toolbox talk meetings, inductions and briefing sessions should be done in open areas with social distancing in place.

8. **Tracking Record log**

(Employees/Visitors)

DATE	NAME	ID NUMBER	AGE	TEMPRETURE IN	SIGNATURE	TEMPRETURE OUT	SIGNATURE	SECURITY CONTROL SIGNATURE

9. Training Schedule (Employees)

Training Attendance Register

Training Description:		Session No

Date of training	

Time training started		Time training ended	

Duration of training	

Instructor name and signature	

Training provided (Tick applicable box)			
Read only	Class Room	Practical Demonstration	Communicated Changes

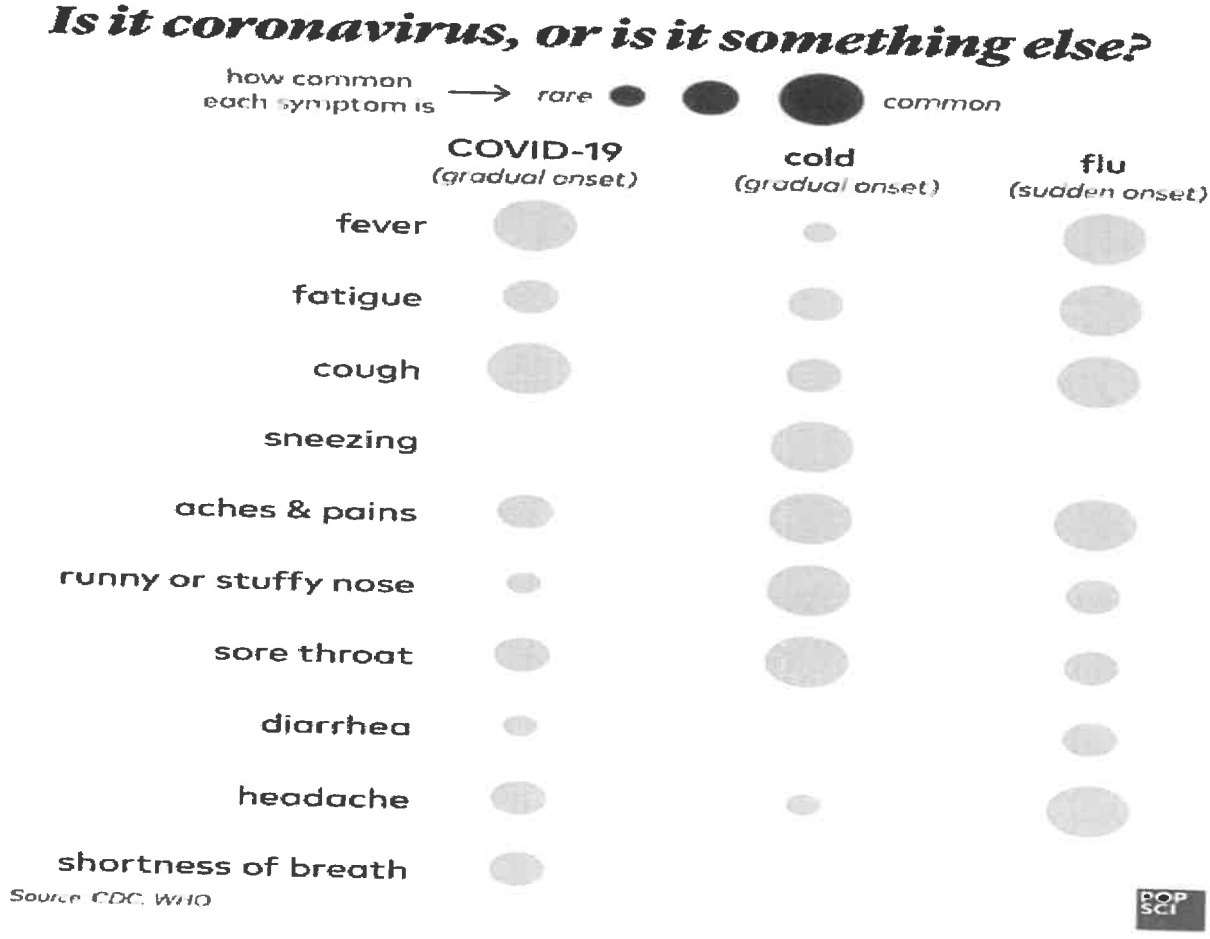
Employee number	Employee name	Employee signature *(Signature indicates acknowledgement that training was understood)*	Type of training received

Coronavirus Policy

The Occupational Health and Safety Act clearly dictates to employers that they need to ensure a working environment that is healthy and safe for all employees. In this regard, [Company] is therefore obligated to ensure that it always looks after its employees' well-being whilst the employees are at the workplace. [Company] will identify medical facilities in the area of operations that are best suited to evaluate and treat any employee that is suspected of having the virus.

Symptoms:

- Coughing
- Fever
- Shortness of Breath
- Pneumonia
- Vomiting
- Diarrhoea
- Sever pneumonia
- Kidney Failure



Transmittal of the Virus:

- Direct contact
- Droplets from patient's coughing and sneezing
- Contact with patients' belongings followed by touching your mouth or nose.

Protecting Yourself:

- Avoid contact with others, and wash your hands frequently
- Maintain good hygiene habits
- Wear a face mask when infected and when dealing with infected patient
- Use tissues when coughing or blowing nose
- Wash and prepare food carefully
- Exercise and proper sleep will bolster the immune system

Should you display any of the Symptoms:

- Stay home and inform your supervisor telephonically of your absence.
- Obtain medical attention.
- Employees should follow the guidance as provided by the Department of Health and inform public authorities promptly.
- The Basic Conditions of Employment Act (BCEA). Section 22 thereof stipulates the period to which an employee is entitled to sick leave. Generally, an employee is entitled to 30 days sick leave during a 36 month or three-year cycle, following commencement of employment. Section 23 of the BCEA stipulates that should the employee be absent for a period longer than two consecutive days or be absent on more than two occasions during an eight-week period, the employer is not obliged to pay that employee their sick leave benefit unless that employee provides a valid medical certificate citing the reason for the incapacity during that period. Such a medical certificate must be issued and signed by a registered medical practitioner.
- If an employee is placed in compulsory quarantine and produces a valid medical certificate to that effect, the employer must deduct such period of absence from the employee's current sick leave cycle and also pay the employee the equivalent of the remuneration they would have received during this period. Should the employee have exhausted their sick leave allotment at the time of being placed in quarantine then, the employer may deduct this period either from the employee's annual leave or may choose to classify the absence as unpaid leave. In this regard, the employee may claim remuneration in terms of S20 of the Unemployment Insurance Fund (UIF) Act.
- If an employee chooses to voluntarily quarantine themselves on approval by his/her Manager, by staying at home to avoid contracting the virus, then this period of absence will not qualify as sick leave. Such period of absence will be taken out of the employees' normal leave cycle and if that employee no longer has any leave entitlement, then this period may be taken as unpaid leave.
- Should the employer reduce working hours as a consequence of the COVID-19 virus, then employees are entitled, as per Section 12 of the UIF Act to claim remuneration from the Fund if the reduction of hours or "unemployment" lasts longer than fourteen (14) days.
- An instance may arise whereby an employer seeks an employee to be placed in quarantine due to the employee having been in contact with an individual who has been diagnosed with the virus or perhaps the employee has recently travelled overseas to an affected area or perhaps the employee presents with symptoms similar to those associated with the COVID-19. During such absence imposed by the employer, should the employee be diagnosed with the virus and the employee presents a valid medical certificate to that effect, the employer may treat such absence as sick leave. Due to the operational requirements, the employer may assign tasks to the employee which they can then carry out at home or at their chosen site of quarantine should the employer deem it necessary for their employees to be quarantined. If the employees render services from home during this period, they will be entitled to their normal remuneration, and no leave may be deducted.
- Should an unlikely scenario arise whereby The State declares that schools and businesses are to be closed because of the virus, then such an instruction would be through no fault of the employer. After receiving such instruction, employers should consult with their employees and discuss an appropriate way to deal with the shut-down. If the operational requirements of the employer permits, then perhaps the time during which the business is closed can be seen as annual leave. Or, if the employer implements a system of working from home, then this work will be with pay.
- In the case of a positive outcome for the Coronavirus, the site where the affected employee is from will be closed and the rest of the employees will be tested and quarantined.

The most important thing to do is stay calm, carry on as usual and exercise good personal hygiene habits.

10. COVID-19 Case Reporting Template

Reporter Name

First Name | Last Name

Reporter Phone Number

Area Code | Phone Number

Reported Name

First Name | Last Name

Reported Phone Number

Area Code | Phone Number

Report Date & Time

Date | Hour | Minutes

When did you first Suspect?

Date | Hour | Minutes

Why are you reporting this person?

Coughing

Fever

Having shortness of breath

Feeling persistent pain or pressure in the chest

Having confusion or inability to arouse

Just came from abroad, carrying highly risk of COVID-19

Comments

public works & infrastructure
Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY DPWI REGIONAL OFFICE: REPLACEMENT OF AIR CONDITIONING SYSTEM

SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

COMPREHENSIVE CONTRACT

PRICING DATA

AIR CONDITIONING AND ELECTRICAL INSTALLATIONS

PG-02.1 (EC) PRICING INSTRUCTIONS – (GCC (2010) 2nd EDITION: 2010)

Project title:	***Kimberley: DPW N/C Regional Office Replacement of air conditioning system***		
Tender no:	*KIM16/2021*	**Reference no:**	*19/2/4/2/2/2327/485*

C2.1 Pricing Instructions

1. GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents, which include the Conditions of Tender, Conditions of Contract, the Specifications (including the Standard, Project and Particular Specifications) and the Drawings.

2. DESCRIPTION OF ITEMS IN THE SCHEDULE

The Bill of Quantities has been drawn up generally in accordance with Civil Engineering Quantities 1990 issued by the SA Institution of Civil Engineers.

The short descriptions of the items in the Bill of Quantities are for identification purposes only and the measurement and payment clause of the Standardized Specifications and the Particular Specifications, read together with the relevant clauses of the Project Specification and directives on the drawings, set out what ancillary or associated work and activities are included in the rates for the operations specified.

3. QUANTITIES REFLECTED IN THE SCHEDULE

The quantities given in the Bill of Quantities are estimates only, and subject to remeasuring during the execution of the work. The Contractor shall obtain the Engineer's detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Standard, Project and Particular Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

4. PROVISIONAL SUMS

Where Provisional sums or Prime Cost sums are provided for items in the Bill of Quantities, payment for the work done under such items will be made in accordance with Clause 6.6 of the General Conditions of Contract 2010. The Employer reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract.

The Tenderer shall not under any circumstances whatsoever delete or amend any of the sums inserted in the "Amount" column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorized in writing by the Employer before closure of tenders. Unauthorized changes made by the Tenderer to provisional items in the Bill of Quantities, or to the provisional percentages and sums in the Summary of the Bill of Quantities will lead to the disqualification of the Tenderer.

5. PRICING OF THE BILL OF QUANTITIES

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include full compensation for all costs and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

Tender no: ***KIM 16/2021***

Each item shall be priced and extended to the "Total' column by the Tenderer, with the exception of the items for which only rates are required, or items which already have Prime Cost or Provisional Sums affixed thereto. If the Tenderer omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

The Tenderer shall fill in rates for all items where the words "rate only' appear in the "Total" column. "Rate Only" items have been included where:

(a) an alternative item or material is contemplated;

(b) variations of specified components in the make-up of a pay item may be expected; and

(c) no work under the item is foreseen at tender stage but the possibility that such work may be required is not excluded.

For 'Rate Only" items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

All rates and amounts quoted in the Bill of Quantities shall be in rands and cents and shall include all levies and taxes (other than VAT). VAT will be added in the summary of the Bill of Quantities.

The Tenderer shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself before submitting his tender (as far as is practicable) as to:

(a) the form and nature of the Site and its surroundings, including subsurface conditions,

(b) the hydrological and climatic conditions,

(c) the extent and nature of work and materials necessary for the execution and completion of the Works,

(d) the means of access to the Site and the accommodation he may require

and, in general, shall be deemed to have obtained all information (as far as is practicable) as to risks, contingencies and all other circumstances which may influence or affect his Tender.

6. CORRECTION OF ENTRIES

Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialled by the Tenderer.

7. ARITHMETICAL ERRORS

Arithmetical errors found in the Bill of Quantities as a result of faulty multiplication or addition, will be corrected by the Engineer at the tender evaluation stage, as set out in the Tender Data.

Tender no: ***KIM 16/2021***

8. UNITS OF MEASUREMENT

The units of measurement described in the Bill of Quantities are metric units for which the standard international abbreviations are used. Non-standard abbreviations which may appear in the Bill of Quantities are as follows:

No.	=	Number
%	=	Percent
Sum	=	Lump sum
PCsum	=	Prime cost sum
Prov sum	=	Provisional sum
$m^3.km$	=	Cubic metre - kilometre
Km-pas	=	kilometre - pass
$m^2.pass$	=	square metre – pass

Tender no: ***KIM 16/2021***

C2.1 Bill of Quantities

public works
& infrastructure
Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY DPWI REGIONAL OFFICE: REPLACEMENT OF AIR CONDITIONING SYSTEM

SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

COMPREHENSIVE CONTRACT

MECHANICAL BILL OF QUANTITIES

AIR CONDITIONING AND ELECTRICAL INSTALLATIONS

INSTALLATION OF NEW AIR VRV CONDITIONING AND VENTILATION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
1	Site Establishment (Complete Site Office)	sum	1		
2	Mobile Construction Ablution Block	sum	1		
3	Methodology statement and Construction Works Program to issued within 14 days after acceptation of the appointment letter.	sum	1		
4	Technical Submissions and Workshop Drawings.	sum	1		
5	Transportation of Materials	sum	1		
6	Health and Safety Compliance including Covid-19 method statement	sum	1		
7	Rigging, Scaffolding and Hoisting	sum	1		
8	50 Hydraulic Mobile Crane (all inclusive)	sum	1		
9	**GUARANTEE**				
	Allowance for 12 maintenance guarantee as described	sum	1		
10	Operational Training for Touch Central Controller	sum	1		
11	**MANUALS**				
	Allowance for the provision of operating and maintenance manuals (4 sets). Drawings in an electronic AutoCAD format in addition to hard copies in O & M manuals.	SET	4		
12	**MAINTENANCE AND SERVICE**				
	Allowance for the maintenance and service to the installation as described after the 12 months of the manufactures warranties, services should be done on a quarterly based per year	Item	12		
13	Quality Management Plan	sum	1		
14	**COMMISSIONING AND TESTING**				
	Allowance for the inspection, commissioning and applicable testing of the entire installation as described.	Sum	1		
15	**DRAWINGS**				
	Allowance for AS BUILT drawings (AutoCAD)	Sum	1		
16	Certificate of Compliance per building block	Sum	3		
TOTAL AMOUNT CARRIED FORWARD TO THE NEXT PAGE:					

INSTALLATION OF NEW AIR VRV CONDITIONING AND VENTILLATION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	OLD MAGISTRATE BUILDING: OLD WING SECTION (Part - A)				
	BOQ to be priced in conjunction with the mechanical specification for supply, deliver and install ceilling mounted wind free cassette units. In accordance with the Conditions of Contract, provide for all expenses, obligations and general items pertaining to such conditions and all items not specifically specified or mentioned to enable the work to be completed in a satisfactory manner. Rates to be priced to each specific item as items may be added or omitted to the client discretion. All capacities specified on the BOQ are dated capacities and must priced as such. All the units				
16	Model No: AM028NNNDEH/EU or equal approved 2.8kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14)complete with heat recovery, hard wired controller (RFC-U5) .	each	14		
17	Model No: AM036NNNDEH/EU or equal approved 3.6kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U6) .	each	12		
18	Model No: AM045NNNDEH/EU or equal approved 4.5kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U4) .	each	2		
19	Model No: AM056NNNDEH/EU or equal approved 5.6kW cooling VRV Heat pump 4way Cassette unit wind free (600 x 600) including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U1) .	each	37		
20	Model No: AM056FNCDEH/EU or equal approved 5.6kW cooling VRV Heat pump Underceiling unit including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (UC-U1).	each	6		
21	Model No: AM071NN4DEH/EU or equal approved 7,1kW cooling VRV Heat pump 4way Cassette unit wind free including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U2)	each	10		
22	Model No: AM112KN4DEH/EU or equal approved 7,1kW cooling VRV Heat pump 360 Cassette unit including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U1). First Floor	each	4		
23	Model No: AM090NN4DEH/EU or equal approved 9.0kW cooling VRV Heat pump 4way Cassette unit wind free including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U3) Ground Floor.	each	1		
24	Supply, Install and deliver (AM100FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 28,0kW	each	1		
25	Supply, Install and deliver (AM120FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 33,3kW	each	1		
26	Supply, Install and deliver (AM160FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 33,6kW	each	2		
27	Supply, Install and deliver (AM200FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 56,0kW	each	1		
28	Supply, Install and deliver (AM220FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 61,6kW	each	1		
29	Supply, Install and deliver (AM300MXVANR/ET) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 84,0kW	each	1		
30	Supply, Install and deliver Model No: MXJ-TA3419M or equal approved Y joint.	each	3		
31	Supply, Install and deliver Model No: MXJ-TA3100M or equal approved Y joint	each	3		
32	Supply, Install and deliver Model No: MXJ-TA4119M or equal approved Y joint .	each	3		
33	Supply, Install and deliver Model No: MXJ-TA3800M or equal approved Y joint.	each	1		
34	Supply, Install and deliver Model No: MXJ-YA2815M or equal approved Y joint .	each	4		
35	Supply, Install and deliver Model No: MXJ-YA2500M or equal approved Y joint.	each	5		
36	Supply, Install and deliver Model No: MXJ-YA1509M or equal approved Y joint .	each	1		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW AIR VRV CONDITIONING AND VENTILLATION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	BROUGHT FORWARD FROM PREVIOUS PAGE:				
36	Supply, Install and deliver Model No: MXJ-YA2512M or equal approved Y joint .	each	4		
37	Supply, Install and deliver Model No: MXJ-YA3100M or equal approved Y joint .	each	4		
38	Supply, Install and deliver Model No: MXJ-YA4119M or equal approved Y joint .	each	1		
39	Supply, Install and deliver Model No: MXJ-YA422M or equal approved Y joint .	each	1		
40	Supply, Install and deliver Model No: MXJ-YA3800M or equal approved Y joint .	each	1		
41	Supply, Install and deliver Model No: MCU-S6NEK2N or equal approved Heat Recovery Box .	each	9		
42	Supply, Install and deliver Model No: MCU-S6NEK3N or equal approved Heat Recovery Box.	each	5		
43	Supply, Install and deliver Model No: MEV-E32SA or equal approved Distributor Kit .	each	9		
44	Supply ,Install and deliver 360 cassette panels Model No.PC4NUDMAN or equal approved .	each	4		
45	Supply ,Install and deliver wind free 4way cassette (600 X 600) panels, model No.PC4SUFMAN or equal approved	each	63		
46	Supply ,Install and deliver wind free 4way cassette panels, model No.PC4NUFMAN or equal approved	each	8		
47	Supply, Install and deliver hard wire controls Model No: MWR-SHOON or equal approved individual controllers	each	77		
	REFRIGERANT RETICULATION PIPING (indoor unit)				
	Supply and Install refrigerant piping including the TEE's, 90 degree bends, 45 degree bends, couplings, fasten bolts and nuts and all other accessories to keep the piping in position.				
48	ø6.35mm (1/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	72		
49	ø9.52mm (3/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	16		
50	ø12.70mm (1/2") Refrigerant copper piping complete with 25mm Armaflex insulation	m	80		
51	ø15.88mm (5/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	19		
52	ø19.05mm (3/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	20		
53	ø22.22mm (7/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	6		
54	ø28.58mm (1 1/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	24		
55	ø34.93mm (1 3/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	7		
56	ø41.28mm (1 5/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	3		
57	Additional R410A for field charging of the refrigerant for the operational of the systems	Kg	39,45		
58	**GALVANISED FINISH LIGHT DUTY CABLE TRAYS INCLUDING THE HANGER SUPPORT**				
	Supply and Install wire mesh cable trays including the TEE's, Intervals, Horizontals, External,Raduis bends and straight lengths for the outdoor rising refrigerant piping from the condensing units.				
59	609 x 50mm straight light duty cable trays with splice clamps.	m	100		
60	609 x 50mm cover plates for the cable trays with splice clamps	m	100		RATE
	PVC DRAIN PIPING IN CEILLING VOID				
	Supply and Install the PVC condensate piping including the Stop ends, Radius bends, Square Bends, 45° bends, 15° bends, 90° bends and cement glue. As per the drawings				
61	ø812,8mm (32") main drain line for the condensate PVC pipe	m	60		
62	ø635mm (25") condensate drain PVC pipe from the indoor unit to connect at the main line	m	30		
	VENTILATION SYSTEM				
	Outdoor Weather louvre				
63	Outdoor Weather louvre (500 x 300) C/W vermin proof screen and storm resistant	each	12		
63,1	Outdoor Weather louvre (600 x 300) C/W vermin proof screen and storm resistant	each	1		
64	Double sided door grills natural anodised aluminium 550 x 200mm C/W vermin proof screen with low deferential pressure and low regenerated noise.	each	57		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW AIR VRV CONDITIONING AND VENTILLATION SYSTEM

		BROUGHT FORWARD FROM PREVIOUS PAGE:			
ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	Plenum Ducting Box				
65	500 x 300mm duct plenum box c/w with washable filters cartridge of 495 x 295 x 50mm and lockable door				
	c/w including all fitting, rods, hangers and brackets.	each	12		
65.1	600 x 300mm duct plenum box c/w with washable filters cartridge of 495 x 295 x 50mm and lockable door				
	c/w including all fitting, rods, hangers and brackets.	each	1		
	Fresh Air Supply Fans				
66	First Floor: SAF-01 600 x 300mm centrifugal inline tube Fan 1,200 m3/s @ 411,6 Pa C/W 2 x 800 Sound Attenuators				
	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	2		
67	Ground Floor: SAF-02 Dia 600 x 300mm centrifugal inline tube Fan 1,364 m3/s @ 489,9 Pa C/W 2 x 800mm Sound Attenuators				
	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	9		
68	Ground Floor: SAF-04 600 x 300mm centrifugal inline tube Fan 0,352 m3/s @ 365, Pa C/W 2 x 800mm Sound Attenuators				
	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
69	Ground Floor: SAF-05 600 x 300mm centrifugal inline tube Fan 0,1952 m3/s @ 224,0 Pa C/W 2 x 800mm Sound Attenuators				
	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
70	Ground Floor: SAF-06 600 x 300mm centrifugal inline tube Fan 1.431 m3/s @ 481.9 Pa C/W 2 x 800mm Sound Attenuators				
	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
71	Ground Floor: SAF-07 600 x 300mm centrifugal inline tube Fan 1,364 m3/s @ 489,9 Pa C/W 2 x 800mm Sound Attenuators				
	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
	DUCTWORK (Conferences Rooms)				
	Supply, Frabricate,Install and pressure test the Rectangular and Spiral un-insulated galvanized low pressure ducting below steel				
	trusses or concrete soffits including support mechanisms				
72	Category 1 ducting				
	Extra over for low pressure ducting				
	Category 1 - Stop ends, Radius bends, Square bends, 45° bends, 15° bends,				
73	90° bends, transformations, trouser & shoes pieces	m^3	70		
74	50mm Ø	m	0		RATE
75	100mm Ø	m	0		RATE
76	150 mm Ø	m	80		
77	200 mm Ø	m	81		
78	300 mm Ø	m	20		
79	400 x 300mm to Ø 300mm	m	12		
80	400 x 500 mm ducting	m	125		
81	400 x 600 mm ducting	m	20		
81	600 x 300mm x 90degree Tee Ducting	each	1		
	Flexible insulated ducting				
	Supply and install the Insulated flexible ductwork , externally insulated with 25mm foil @ 1000mm length				
	faced fibreglass, including jubilee duct clamps, vapour barrier tape				
82	25mm FRK Insulation	m^3	57		
	DIFFUSION, LOUVRES AND GRILLES				
83	Disc Valves diffusion type c/w 150mm diameter neck c/w adjustable blade Power coated - Hospital White	each	57		
84	400 x 300mm Diameter opposed bladed damper c/w lockable quadrant.	each	2		
85	100mm Diameter adjustable butterfly balancing damper c/w lockable quadrant	each	57		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW AIR VRV CONDITIONING AND VENTILLATION SYSTEM

BROUGHT FORWARD FROM PREVIOUS PAGE:

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	OLD MAGISTRATE BUILDING: NEW WING (Part - B)				
	BOQ to be priced in conjunction with the mechanical specification for supply, deliver and install ceilling mounted wind free Cassette units. In accordance with the Conditions of Contract, provide for all expenses, obligations and general items pertaining to such conditions and all items not specifically specified or mentioned to enable the works to be completed in a satisfactory manner. Rates to be priced to each specific item as items may be added or omitted to the client discretion. All capacities specified on the BOQ are dated capacities and must be priced as such. All the units below to be BACnet gateway compatible				
86	Model No: AM028NNNDEH/EU or equal approved 2.8kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14)complete with heat recovery, hard wired controller (RFC-U4). Ground Floor.	each	20		
87	Model No: AM045NNNDEH/EU or equal approved 4.5kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFU-U6).	each	2		
88	Model No: AM056NNNDEH/EU or equal approved 5.6kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U1) .	each	4		
89	Model No: AM071NN4DEH/EU or equal approved 7,1kW cooling VRV Heat pump 4way Cassette unit wind free including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U2).	each	5		
90	Supply, Install and deliver (AM200FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 56,0kW	each	1		
91	Supply, Install and deliver (AM220FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 61,6kW.	each	1		
92	Supply, Install and deliver Model No: MCU-S6NEK2N or equal approved Heat Recovery Box.	each	4		
93	Supply, Install and deliver Model No: MCU-S6NEK3N or equal approved Heat Recovery Box.	each	3		
94	Supply, Install and deliver Model No: MXJ-TA3419M or equal approved Y joint .	each	3		
95	Supply, Install and deliver Model No: MXJ-YA2500M or equal approved Y joint.	each	5		
96	Supply, Install and deliver Model No: MXJ-YA4119M or equal approved Y joint .	each	3		
97	Supply, Install and deliver Model No: MXJ-YA3100M or equal approved Y joint .	each	3		
98	Supply, Install and deliver Model No: MXJ-TA3419M or equal approved Y joint.	each	1		
99	Supply, Install and deliver Model No: MXJ-YA2512M or equal approved Y joint .	each	2		
100	Supply, Install and deliver Model No: MXJ-YA2500M or equal approved Y joint.	each	3		
101	Supply, Install and deliver Model No: MXJ-YA2815M or equal approved Y joint .	each	1		
102	Supply ,Install and deliver wind free 4way cassette panels, model No.PCANUFMAN or equal approved	each	5		
103	Supply ,Install and deliver wind free 4way cassette (600 X 600) panels, model No.PC4SUFMAN or equal approved	each	26		
104	Supply, Install and deliver hard wire controls Model No: MWR-SHOON or equal approved individual controllers	each	31		
105	**GALVANISED FINISH LIGHT DUTY CABLE TRAYS INCLUDING THE HANGER SUPPORT**				
	Supply and Install wire mesh cable trays including the TEE's, Intervals, Horizontals, External,Raduis bends and straight lengths for the outdoor rising refrigerant piping from the condensing units.				
106	609 x 50mm straight light duty cable trays with splice clamps.	m	214		
	REFRIGERANT RETICULATION PIPING (Indoor unit)				
	Supply and Install refrigerant piping including the TEE's, 90 degree bends, 45 degree bends, couplings, fasten bolts and nuts and all other accessories to keep the piping in position.				
107	ø6.35mm (1/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	26		
108	ø9.52mm (3/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	12		
109	ø12.70mm (1/2") Refrigerant copper piping complete with 25mm Armaflex insulation	m	27		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW AIR CONDITIONING AND VENTILLATION SYSTEM

	BROUGHT FORWARD FROM PREVIOUS PAGE:				
ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
110	ø15.88mm (5/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	17		
111	ø19.05mm (3/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	5		
112	ø22.22mm (7/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	5		
113	ø28.58mm (1 1/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	9		
114	ø34.92mm (1 3/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	2		
115	ø41.28mm (1 5/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	1		
116	Additional R410A for field charging of the refrigerant for the operational of the systems	Kg	16,75		
	PVC DRAIN PIPING IN CEILLING VOID				
	Supply and Install the PVC condensate piping including the Stop ends, Radius bends,				
	Square Bends, 45° bends, 15° bends, 90° bends and cement glue. As per the drawings				
117	ø812,8mm (32") main drain line for the condensate PVC pipe	m	55		
118	ø635mm (25") condensate drain PVC pipe from the indoor unit to connect at the main line	m	40		
	VENTILATION SYSTEM				
	Outdoor Weather louvre				
119	Outdoor Weather louvre (500 x 300) C/W vermin proof screen and storm resistant	each	4		
120	Double sided Indoor grills natural anodised aluminium 550 x 200mm C/W vermin proof screen with low deferential				
	pressure and low regenerated noise.	each	31		
	Plenum Ducting Box				
	500 x 300mm duct plenum box c/w with washable filters cartridge of 495 x 295 x 50mm and lockable door				
121	c/w including all fitting, rods, hangers and brackets.	each	1		
	Fresh Air Supply Fans				
	Ground Floor: SAF-01 600 x 300mm centrifugal inline tube Fan 1,200 m3/s @ 411.6 Pa C/W 2 x 800 Sound Attenuators				
122	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
	First Floor: SAF-03 600 x 300mm centrifugal inline tube Fan 0,8000 m3/s @ 646,9Pa C/W 2 x 800 Sound Attenuators				
123	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
	First Floor: SAF-04 600 x 300mm centrifugal inline tube Fan 0,3052 m3/s @ 365,3 Pa C/W 2 x 800 Sound Attenuators				
124	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
	First Floor: SAF-05 600 x 300mm centrifugal inline tube Fan 0,1952 m3/s @ 224,0 Pa C/W 2 x 800 Sound Attenuators				
125	with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
	DUCTWORK				
	Supply, Frabricate,Install and pressure test the Rectangular and Spiral un-insulated galvanized low pressure ducting below steel				
	trusses or concrete soffits including support mechanisms				
126	Category 1 ducting				
	Extra over for low pressure ducting				
	Category 1 - Stop ends, Radius bends, Square bends, 45° bends, 15° bends,				
127	90° bends, transformations, trouser & shoes pieces	m^3	50		
128	50mm Ø	m	0		RATE
129	100mm Ø	m	0		RATE
130	150 mm Ø	m	52		
131	200 mm Ø	m	10		
132	300 mm Ø	m	24		
133	400 x 300 to 300mm Ø	m	4		
134	500 x 300mm ducting	m	4		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW AIR CONDITIONING AND VENTILLATION SYSTEM					
				BROUGHT FORWARD FROM PREVIOUS PAGE:	
ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	Flexible insulated ducting				
	Supply and install the Insulated flexible ductwork ,externally insulated with 25mm foil @ 1000mm length				
	faced fibreglass, including jubilee duct clamps, vapour barrier tape				
135	25mm FRK Insulation	m^3	184,5		
	DIFFUSION, LOUVRES AND GRILLES				
136	Disc Valves diffusion type c/w 150mm diameter neck c/w adjustable blade Power coated - Hospital White	each	13		
137	150mm Diameter opposed bladed damper c/w lockable quadrant.	each	2		
138	150mm Diameter adjustable butterfly balancing damper c/w lockable quadrant	each	13		
	CONTROL SYSTEMS				
139	Supply, Install and deliver Model No: MCM-300N or equal approved Touch Centralized Controller.	each	1		
	OLD MAGISTRATE BUILDING: NEW HR BUILDING (Part - C)				
	BOQ to be priced in conjunction with the mechanical specification for supply, deliver and install ceilling mounted wind free				
	Cassette units. In accordance with the Conditions of Contract, provide for all expenses, obligations and general				
	items pertaining to such conditions and all items not specifically specified or mentioned to enable				
	the works to be completed in a satisfactory manner. Rates to be priced to each specific item as				
	items may be added or omitted to the client discretion. All capacities specified on the BOQ are				
	dated capacities and must be priced as such. All the units below to be BACnet gateway compatible				
	Model No: AM028NNNDEH/EU or equal approved 2.8kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including	each	4		
140	condenser water pump, interface module (MIM-B14)complete with heat recovery, hard wired controller (RFC-U4).				
	Model No: AM056NNNDEH/EU or equal approved 5.6kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including	each	4		
141	condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U1) .				
142	Supply, Install and deliver (AM100FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 28,0kW	each	1		
143	Supply, Install and deliver Model No: MCU-S6NEK2N or equal approved Heat Recovery Box.	each	1		
144	Supply ,Install and deliver wind free 4way cassette (600 X 600) panels, model No.PC4SUFMAN or equal approved	each	6		
145	Supply, Install and deliver hard wire controls Model No: MWR-SHOON or equal approved individual controllers	each	6		
	GALVANISED FINISH LIGHT DUTY CABLE TRAYS INCLUDING THE HANGER SUPPORT				
	Supply and Install wire mesh cable trays including the TEE's, Intervals, Horizontals, External,Raduis bends and				
	straight lengths for the outdoor rising refrigerant piping from the condensing units.				
146	609 x 50mm straight light duty cable trays with splice clamps.	m	30		
	REFRIGERANT RETICULATION PIPING (indoor unit)				
	Supply and Install refrigerant piping including the TEE's, 90 degree bends, 45 degree bends, couplings, fasten bolts				
	and nuts and all other accessories to keep the piping in position.				
147	ø6.35mm (1/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	6		
148	ø9.52mm (3/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	1		
149	ø12.70mm (1/2") Refrigerant copper piping complete with 25mm Armaflex insulation	m	1		
150	ø15.88mm (5/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	6		
151	ø19.05mm (3/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	1		
152	ø22.22mm (7/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	1		
153	Additional R410A for field charging of the refrigerant for the operational of the systems	Kg	2,5		
	PVC DRAIN PIPING IN CEILLING VOID				
	Supply and Install the PVC condensate piping including the Stop ends, Radius bends,				
	Square Bends, 45° bends, 15° bends, 90° bends and cement glue. As per the drawings				
154	ø812,8mm (32") main drain line for the condensate PVC pipe	m	30		
155	ø635mm (25") condensate drain PVC pipe from the indoor unit to connect at the main line	m	20		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW VRV AIR CONDITIONING AND VENTILLATION SYSTEM

AMOUNT BROUGHT FORWARD FROM PREVIOUS PAGE:

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	VENTILATION SYSTEM				
	Outdoor Weather louvre				
156	Outdoor Weather louvre (500 x 300) C/W vermin proof screen and storm resistant	each	1		
157	Double sided Indoor grills natural anodised aluminium 550 x 200mm C/W vermin proof screen with low deferential pressure and low regenerated noise.	each	8		
	Plenum Ducting Box				
158	500 x 30mm duct plenum box c/w with washable filters cartridge of 495 x 295 x 50mm and lockable door c/w including all fitting, rods, hangers and brackets.	each	1		
	Fresh Air Supply Fans				
159	Ground Floor: SAF-05 600 X 300mm centrifugal inline tube Fan 0,1952 m3/s @ 224,0 Pa C/W 2 x 800 Sound Attenuators with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
	DUCTWORK				
	Supply, Frabricate,Install and pressure test the Spiral un-insulated galvanized low pressure ducting below steel trusses or concrete soffits including support mechanisms				
	Category 1 ducting				
	Extra over for low pressure ducting				
	Category 1 - Stop ends, Radius bends, Square bends, 45° bends, 15° bends,				
160	90° bends, transformations, trouser & shoes pieces	m^3	50		
161	150 mm Ø	m	40		
162	200 mm Ø	m	12		
163	500 X 300mm	m	9		
	Flexible insulated ducting				
	Supply and install the Insulated flexible ductwork ,externally insulated with 25mm foil @ 1000mm length faced fibreglass, including jubilee duct clamps, vapour barrier tape				
164	25mm FRK Insulation	m^3	111		
	DIFFUSION, LOUVRES AND GRILLES				
165	Disc Valves diffusion type c/w 150mm diameter neck c/w adjustable blade Power coated - Hospital White	each	10		
166	150mm Diameter opposed bladed damper c/w lockable quadrant.	each	10		
167	100mm Diameter adjustable butterfly balancing damper c/w lockable quadrant	each	10		
	OLD MAGISTRATE BUILDING: OLD WING SECTION (Part - C)				
	BOQ to be priced in conjunction with the mechanical specification for supply, deliver and install ceilling mounted wind free Cassette units. In accordance with the Conditions of Contract, provide for all expenses, obligations and general items pertaining to such conditions and all items not specifically specified or mentioned to enable the works to be completed in a satisfactory manner. Rates to be priced to each specific item as items may be added or omitted to the client discretion. All capacities specified on the BOQ are dated capacities and must be priced as such. All the units below to be BACnet gateway compatible				
168	Model No: AM036NNNDEH/EU or equal approved 3.6kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U6) .	each	4		
169	Model No: AM056NNNDEH/EU or equal approved 5.6kW cooling VRV Heat pump 4way Cassette unit (600 x 600) including condenser water pump, interface module (MIM-B14) complete with heat recovery, hard wired controller (RFC-U1) .	each	7		
170	Supply, Install and deliver (AM200FXVAGR/EU) or equal approved outdoor (3Ø) VRV condensing heat recovery unit with inverter scroll compressors, inverter fan motors, expansion kit, piping between condenser and controls with BMS BACnet compatible function Cooling capacity 56,0kW	each	1		
171	Supply, Install and deliver Model No: MCU-S6NEK2N or equal approved Heat Recovery Box.	each	2		
172	Supply ,Install and deliver wind free 4way cassette (600 X 600) panels, model No.PC4SUFMAN or equal approved	each	11		
173	Supply, Install and deliver hard wire controls Model No: MWR-SHOON or equal approved individual controllers	each	9		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW VRV AIR CONDITIONING AND VENTILLATION SYSTEM

AMOUNT BROUGHT FORWARD FROM PREVIOUS PAGE:

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
174	Supply, Install and deliver Model No: MCU-S6NEK2N or equal approved Heat Recovery Box.	each	1		
175	Supply, Install and deliver Model No: MCU-S6NEK3N or equal approved Heat Recovery Box.	each	1		
176	Supply, Install and deliver Model No: MXJ-YA2815M or equal approved Y joint .	each	1		
177	Supply, Install and deliver Model No: MXJ-YA2500M or equal approved Y joint.	each	1		
178	Supply ,Install and deliver wind free 4way cassette panels, model No.PCANUFMAN or equal approved	each	7		
179	Supply ,Install and deliver wind free 4way cassette (600 X 600) panels, model No.PC4SUFMAN or equal approved	each	4		
180	Supply, Install and deliver hard wire controls Model No: MWR-SHOON or equal approved individual controllers	each	9		
	GALVANISED FINISH LIGHT DUTY CABLE TRAYS INCLUDING THE HANGER SUPPORT				
	Supply and Install wire mesh cable trays including the TEE's, Intervals, Horizontals, External,Raduis bends and straight lengths for the outdoor rising refrigerant piping from the condensing units.				
181	609 x 50mm straight light duty cable trays with splice clamps.	m	30		
	REFRIGERANT RETICULATION PIPING (indoor unit)				
	Supply and Install refrigerant piping including the TEE's, 90 degree bends, 45 degree bends, couplings, fasten bolts and nuts and all other accessories to keep the piping in position.				
182	ø6.35mm (1/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	8		
183	ø9.52mm (3/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	3		
184	ø12.70mm (1/2") Refrigerant copper piping complete with 25mm Armaflex insulation	m	9		
185	ø15.88mm (5/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	4		
186	ø19.05mm (3/4") Refrigerant copper piping complete with 25mm Armaflex insulation	m	1		
187	ø22.22mm (7/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	1		
188	ø28.58mm (1 1/8") Refrigerant copper piping complete with 25mm Armaflex insulation	m	3		
189	Additional R410A for field charging of the refrigerant for the operational of the systems	Kg	5,5		
	PVC DRAIN PIPING IN CEILLING VOID				
	Supply and Install the PVC condensate piping including the Stop ends, Radius bends, Square Bends, 45° bends, 15° bends, 90° bends and cement glue. As per the drawings				
190	ø812,8mm (32") main drain line for the condensate PVC pipe	m	15		
191	ø635mm (25") condensate drain PVC pipe from the indoor unit to connect at the main line	m	10		
	VENTILATION SYSTEM				
	Outdoor Weather louvre				
192	Outdoor Weather louvre (500 x 300) C/W vermin proof screen and storm resistant	each	1		
193	Double sided Indoor grills natural anodised aluminium 550 x 200mm C/W vermin proof screen with low deferential pressure and low regenerated noise.	each	8		
	Fresh Air Supply Fans				
194	Ground Floor: SAF-01 600 X 300mm centrifugal inline tube Fan 0,1952 m3/s @ 224,0 Pa C/W 2 x 800 Sound Attenuators with pods and electrical box, electrically linked to the outdoor unit for operational.	each	1		
	DUCTWORK				
	Supply, Frabricate,Install and pressure test the Spiral un-insulated galvanized low pressure ducting below steel trusses or concrete soffits including support mechanisms				
	Category 1 ducting				
	Extra over for low pressure ducting				
195	Category 1 - Stop ends, Radius bends, Square bends, 45° bends, 15° bends, 90° bends, transformations, trouser & shoes pieces	m^3	50		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF NEW VRV AIR CONDITIONING AND VENTILLATION SYSTEM

AMOUNT BROUGHT FORWARD FROM PREVIOUS PAGE:

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
196	150 mm Ø	m	40		
197	200 mm Ø	m	12		
198	500 X 300mm	m	8,5		
	Flexible insulated ducting				
	Supply and install the Insulated flexible ductwork ,externally insulated with 25mm foil @ 1000mm length				
	faced fibreglass, including jubilee duct clamps, vapour barrier tape				
199	25mm FRK Insulation	m^3	60,5		
	DIFFUSION, LOUVRES AND GRILLES				
200	Disc Valves diffusion type c/w 150mm diameter neck c/w adjustable blade Power coated - Hospital White	each	9		
201	150mm Diameter opposed bladed damper c/w lockable quadrant.	each	9		
202	100mm Diameter adjustable butterfly balancing damper c/w lockable quadrant	each	9		
203	Door Grill 150 x 400mm aluminium doubled sided door grilles similar or equal to model AGST-T	each	110		
	CONTROL SYSTEMS				
204	Supply, Install and deliver Model No: MCM-300N or equal approved Touch Centralized Controller.	each	2		
	DISPOSABLE OF REDUNDANT AIR CONDITIONING EQUIPMENT				
	The contractor must remove and strip all the existing Heat Pump air conditioning system consisted of the following units, High Wall, Cassette, Refrigerant piping, electrical wiring and the Condensing unit. The contractor will sell this equipment on behave of Department of Public works and Infrastructure (DPWI). The contractor can offered the Department of Public Works an sum amount and all the equipment will be sold before the practical completion date. Its the responsibility of the contractor to remove all the equipment from site not later than ten (10) days. DPWI reserves the right to resell or dispose of the equipment without incurring any liability to the contractor, or without prejudice claims of the contractor against the contractor/buyer for breach of contractor. DPWI also reserves the right to charge the contractor/buyer rental and cost incurred due to non-removal of the equipment at an amount of R200.00 daily. All equipment will be sold 'Voetstoots".The contractor will be responsible for all damages caused to the building and the redundant heat recovery air conditioning system, ne it caused by the contractor/buyer or any appointed contractor.				
205	Remove , stripping safe keeping ,disposal of Heat Pump Cassette unit	each	68		
206	Remove ,stripping , safe keeping ,disposal of Heat Pump Mid wall mounted unit	each	7		
207	Remove ,stripping , safe keeping ,disposal of Heat Spilt-type of Mid wall mounted unit	each	7		
208	Remove ,stripping ,safe keeping ,disposal of Heat Pump Underceiling wall mounted unit	each	6		
209	Remove ,stripping ,safe keeping, disposal of Heat Pump Condensing unit	each	12		
210	Remove ,stripping ,safe keeping, disposal of the electrical wiring and distribution panels.	Sum	Sum		
	TOTAL AMOUNT CARRIED THE AMOUNT TO THE NEXT PAGE :				

INSTALLATION OF NEW VRV AIR CONDITIONING AND VENTILLATION SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	MODEL PREAMBLES FOR TRADES				
	For Preambles refer to "MODEL PREAMBLES FOR TRADES 2008". These "MODE 2019 PREAMBLES", published by the Association of South African Quantity Surveyors, are deemed to be included in these Bills of Quantities and tenderers are to ensure that they are in possession thereof.				
	SUPPLEMENTARY PREAMBLES				
	Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete				
	Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres, and where described as "bolted" the bolts have been given elsewhere				
	SUSPENDED CEILINGS				
	Pre-painted 1200 x 600 x 9mm "Macsteel Reef" or similar approved acoustic lay-in vinly clad suspended ceilings on "Donn" pre-painted exposed tee suspension system including main and cross tees, necessary hangers, grids, etc				
	Material: Gypsum Core + Vinyl Face				
	Fire Classification: Class B/B1/2				
211	Ceilings suspended not exceeding 450mm below concrete soffits	Each	1500		
	Cornices, perimeter trims, etc to suspended ceilings				
212	Standard 25mm aluminium "Shadow Line" or similar approved cornice	m2	950		
	TOTAL AMOUNT CARRIED FORWARD TO THE NEXT PAGE :				

MECHANICAL SUMMARY

Mechanical Services: Schedule of Quantities

DPWI KIMBERLEY REGIONAL OFFICE REPLACEMENT OF AIRCONDITIONING SYSTEM

New VRV Air Conditioning and Ventilation Installation

ITEM	DESCRIPTION	TOTAL AMOUNT
1	Preliminary and General	R -
2	Total Air Conditioning amount carried forward from bill of Quantities	R -
3	Total Suspended Ceilling Installation amount carried forward from bill of Quantities	R -
4	**Sub-Total:**	R -
5	**TOTAL CARRIED FORWARD TO FINAL SUMMARY PAGE (Excl VAT)**	**R -**

NAME OF TENDERER: .....

NAME OF COMPANY: .....

ADDRESS: .....

.....

.....

TELEPHONE NO.: .....

SIGNATURE: ..... **DATE:** .....

NB: Tenderer's are requested to return this document and the summary with the tender form.

public works
& infrastructure
Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY DPWI REGIONAL OFFICE: REPLACEMENT OF AIR CONDITIONING SYSTEM

SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

COMPREHENSIVE CONTRACT

ELECTRICAL BILL OF QUANTITIES

AIR CONDITIONING AND ELECTRICAL INSTALLATIONS

KIMBERLEY REGIONAL OFFICE REPLACEMENT OF AIR CONDITIONING SYSTEM: ELECTRICAL SERVICES

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
1	Site Establishment	sum	1		
2	Technical submissions and Works Program	sum	1		
3	Methodology Statement	sum	1		
4	Workshop Drawings	sum	1		
5	Covid-19 method statement for construction	sum	1		
6	Transportation of Materials	sum	1		
7	Health and Safety Compliance	sum	1		
8	Scaffoldings	sum	1		
9	Attendance	sum	1		
10	3 x set of O & M Manuals & of As Built Drawings	sum	1		
11	12 months maintenance services	sum	12		
12	Certificate of Compliance	sum	4		
13	Quality Management Plan	sum	1		
14	Commissioning, Testing and Operational Training.	sum	1		
	TOTAL AMOUNT CARRIED FORWARD TO THE NEXT PAGE:				

	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	The complete installation must comply to the relevant SANS 10142 specifications and the Quality specifications in this document. Therefore Tenderers are advised to study the specifications and drawings Note: The electrical sub-contractor must test fault finding do on the existing electrical cables feeder cables for capacity to cater for the new installation. The contractor will complete comprehensive report for the Consulting Engineers. *(Please note that the distribution board's shop drawing should be submitted to the Engineer for approval prior to manufacture). Therefore Tenders are advised to study the specification and drawings before the Bill is to be priced.*				
	ELECTRICAL CONNECTION				
	Supply, install and connect all the mechanical equipment the as specified:				
	FEEDER CABLES				
	Supply & Install, 600/1000 V 4-core PVC/PVC/SWA/PVC, Cables manufactured to SANS 1507-3. Complete with Termination kits				
	AC DB-A (Old Wing)				
	25mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
15	Material	m	100		
16	Labour	m	100		
	16mm² bare earth wire complete with Termination kit				
17	Material	m	100		
18	Labour	m	100		
	AC DB-A1 (Old Wing)				
	25mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
19	Material	m	100		
20	Labour	m	100		
	16mm² bare earth wire complete with Termination kit				
21	Material	m	100		
22	Labour	m	100		
	AC DB-A3 (Old Wing)				
	25mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
23	Material	m	100		
24	Labour	m	100		
	16mm² bare earth wire complete with Termination kit				
25	Material	m	100		
26	Labour	m	100		
	AC DB-A4 (Old Wing)				
	16mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
27	Material	m	80		
28	Labour	m	80		
	10mm² bare earth wire complete with Termination kit				
29	Material	m	100		
30	Labour	m	100		
	AC DB-ODU/01 (Old Wing Plantroom)				
31	50mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
32	Material	m	100		
	Labour	m	100		
33	35mm² bare earth wire complete with Termination kit				
34	Material	m	100		
	Labour	m	100		
	AC DB-C (New Wing First Floor)				
35	25mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
36	Material	m	100		
	Labour	m	100		
	16mm² bare earth wire complete with Termination kit				
37	Material	m	100		
38	Labour	m	100		
	AC DB-D (New Wing Ground Floor)				
	25mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
39	Material	m	100		
40	Labour	m	100		
	16mm² bare earth wire complete with Termination kit				
41	Material	m	100		
42	Labour	m	100		
	AC DB - OD02 (New Wing Plantroom)				
	50mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
43	Material	m	100		
44	Labour	m	100		
	35mm² bare earth wire complete with Termination kit				
45	Material	m	100		
46	Labour	m	100		
	TOTAL AMOUNT CARRIED FORWARD:				

	INSTALLATION OF AIR CONDITIONING AND VENTILLATION SYSTEM: - ELECTRICAL BILL				
				BROUGHT FORWARD FROM PREVIOUS PAGE:	
	AC DB-ODU/01 PLANTROOM-01(New HR Wing)				
	50mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
47	Material	m	75		
48	Labour	m	75		
	35mm² bare earth wire complete with Termination kit				
49	Material	m	75		
50	Labour	m	75		
	AC DB-New HR Wing building				
	25mm² x 4 core PVC/PVC/SWA/PVC cable complete with Termination kit				
51	Material	m	75		
52	Labour	m	75		
	16mm² bare earth wire complete with Termination kit				
53	Material	m	75		
54	Labour	m	75		
	DISTRIBUTION BOARDS				
	Supply, deliver, offloading and installation of the following distribution boards including all equipment, pre-fitted in the factory complete with all busbars, accessories earthing and conduit terminations in accordance with the electrical Specifications. The DB's shall be sized to include Lighting protection and surge suppression equipment.				
55	Material	No	10		
56	Labour	No	10		
	Supply and install the following equipment in DB including all wiring and terminations.				
	AC DB-A (Old Wing)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: White, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. (As per drawing EE2019/OMB/D08)				
53	Surge arrestors - Class 2	No.	3		
54	Three phase circuit Breaker - 60A - 10kA	No.	1		
55	Three phase Circuit breaker - 40A - 10kA	No.	1		
56	Circuit breaker 1P - 20A - 5kA (Indoor Units)	No.	7		
57	Circuit breaker 1P - 20A - 5kA (HR Branch Boxes)	No.	4		
58	Circuit breaker 1SP - 20A - 5kA (Fresh Air Fans)	No.	5		
59	Digital Time Switchers with 24/7 weekly programmer	No	5		
	AC DB-A1 (Old Wing)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: White, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. (As per drawing EE2019/OMB/D08)				
60	Surge arrestors - Class 2	No.	3		
61	Three phase circuit Breaker - 60A - 10kA	No.	1		
62	Three phase Circuit breaker - 40A - 10kA	No.	1		
63	Circuit breaker 1P - 20A - 5kA (Indoor Units)	No.	7		
64	Circuit breaker 1P - 20A - 5kA (HR Branch Boxes)	No.	4		
65	Circuit breaker 1DP - 20A - 5kA (Fresh Air Fans)	No.	5		
66	Digital Time Switchers with 24/7 weekly programmer	No	5		
	AC DB-A3 (Old Wing)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: White, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. (As per drawing EE2019/OMB/D08)				
67	Surge arrestors - Class 2	No.	3		
68	Three phase circuit Breaker - 60A - 10kA	No.	1		
69	Three phase Circuit breaker - 40A - 10kA	No.	1		
70	Circuit breaker 1P - 20A - 5kA (Indoor Units)	No.	7		
71	Circuit breaker 1P - 20A - 5kA (HR Branch Boxes)	No.	4		
72	Circuit breaker 1SP - 20A - 5kA (Fresh Air Fans)	No.	5		
73	Digital Time Switchers with 24/7 weekly programmer	No	5		
	TOTAL AMOUNT CARRIED FORWARD:				

INSTALLATION OF AIR CONDITIONING AND VENTILLATION SYSTEM: - ELECTRICAL BILL					
				BROUGHT FORWARD FROM PREVIOUS PAGE:	
ITEM NO	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	AC DB-A4 (Old Wing)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: White, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. (As per drawing EE2019/OMB/D08)				
74	Surge arrestors - Class 2	No.	3		
75	Three phase circuit Breaker - 60A - 10kA	No.	1		
76	Three phase Circuit breaker - 40A - 10kA	No.	1		
77	Circuit breaker 1TP - 20A - 5kA (Outdoor Units)	No.	1		
78	Circuit breaker 1SP - 20A - 5kA (Fresh Air Fans)	No.	2		
79	Digital Time Switchers with 24/7 weekly programmer	No	2		
	AC DB-ODU/01 (Old Wing Plantroom)				
	Outdoor Unit DB's (Busbar rating: 180A, Fault level: 5kA, N+PE, 3P, Service Access: Front & Rear, Colour: Orange, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. IP65 (As per drawing layout EE2019/OMB/D08)				
80	Surge arrestors - Class 2	No.	3		
81	Three phase circuit breaker - 200A - 10kA	No.	1		
82	Three phase Circuit breaker - 150A - 10kA	No.	1		
83	Circuit breaker 3TP - 60A - 5kA (Outdoor Units)	No.	6		
	AC DB-C (New Wing First Floor)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: Orange, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. IP65 (As per drawing layout EE2019/OMB/D05/NW)				
84	Surge arrestors - Class 2	No.	3		
85	Three phase Circuit breaker - 60A - 10kA	No.	1		
86	Three phase Circuit breaker - 40A - 10kA	No.	1		
87	Circuit breaker 1P - 20A - 5kA (Indoor Units)	No.	4		
88	Circuit breaker 1P - 20A - 5kA (HR Branch Boxes)	No.	3		
89	Circuit breaker 1SP - 20A - 5kA (Fresh Air Fans)	No.	3		
90	Digital Time Switchers with 24/7 weekly programmer	No	3		
	AC DB-D (New Wing Ground Floor)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: Orange, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. IP65				
91	Surge arrestors - Class 2	No.	3		
92	Three phase Circuit breaker - 60A - 10kA	No.	1		
93	Three phase Circuit breaker - 40A - 10kA	No.	1		
94	Circuit breaker 1P - 20A - 5kA (Indoor Units)	No.	3		
95	Circuit breaker 1P - 20A - 5kA (HR Branch Boxes)	No.	2		
96	Circuit breaker 1DP - 20A - 5kA (Fresh Air Fans)	No.	1		
97	Digital Time Switchers with 24/7 weekly programmer	No	1		
	AC DB - OD02 (New Wing Plantroom)				
	Outdoor Unit DB's (Busbar rating: 180A, Fault level: 5kA, N+PE, 3P, Service Access: Front & Rear, Colour: Orange, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. IP65				
98	Surge arrestors - Class 2	No.	3		
99	Three phase circuit breaker - 200A - 10kA	No.	1		
100	Three phase Circuit breaker - 150A - 10kA	No.	1		
101	Circuit breaker 3TP - 60A - 5kA (Outdoor Units)	No.	3		
	TOTAL AMOUNT CARRIED TO THE NEXT PAGE :				

INSTALLATION OF AIR CONDITIONING AND VENTILLATION SYSTEM: ELECTRICAL BILL

ITEM NO	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	BROUGHT FORWARD FROM PREVIOUS PAGE:				
	AC DB-C (New HR Building)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: Orange, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. IP65				
102	Surge arrestors - Class 2	No.	3		
103	Three phase circuit breaker - 100A - 10kA	No.	2		
104	Three phase Circuit breaker - 80A - 10kA	No.	1		
105	Circuit breaker 1P - 20A - 5kA (Indoor Units)	No	4		
106	Circuit breaker 1P - 20A - 5kA (HR Branch Boxes)	No.	1		
107	Circuit breaker 1DP - 20A - 5kA (Fresh Air Fans)	No.	2		
108	Digital Time Switchers with 24/7 weekly programmer	No	2		
	WIRING				
	Supply and install 4mm² x 2 core PVC cable + 2.5mm² PVC insulated copper earth wire from the DB's on the wire mesh cable tray to each isolator next to each cassette units as indicated on site or shown on the drawings including cutting, thread couplings, bushes, locknuts and fixing accessories installed in various lights in close roof space, cast into concrete, fixed onto bricks/concrete with raised saddles, chased or built into				
109	Material	m	3000		
110	Labour	m	3000		
	WIRE MESH CABLE TRAYS (Medium duty 300 x 50mm x 3m)				
	Supply and install 200mm medium duty (Tee's, bends internal, Alice clamps, Cup square bolts and nuts and hold down saddles including hanging brackets) for the internal refrigeration piping to various heat recovery boxes,indoor cassette units and connecting wiring. The electrical contractor must coordinate with the mechanical contractor before installing the trays.				
	Complete Wire Mesh & splice clamps (300mm width)				
111	Material	m	200		
112	Labour	m	200		
	P9000 GALVANISED STEEL TRUCKING (127 x 76mm)				
	Supply and install P9000 galvanised steel trucking for the rising main refrigerant pipes from the outdoor condenser plant positioned on the ground and roof top plantrooms floor. The contractor must make allownce the covers, bends ,splice, internal & external bends, end caps and all asseccories				
113	Material	m	50		
114	Labour	m	50		
	Complete Cable ladders (Light duty 55 x 100 x 3000m)				
115	Material	m	30		
116	Labour	m	30		
	ISOLATORS				
	Supply and install internal isolator switch complete with box and associated materials and connection				
	20A single pole Air Con isolator				
117	Material	No.	59		
118	Labour	No.	59		
	Supply and install IP66 waterproof isolator switch complete with box and associated materials and connection				
	20A triple pole condensing units isolator				
119	Material	No.	1		
120	Labour	No.	1		
	Supply and install IP65 waterproof isolator switch complete with box and associated materials and connection				
	60A triple pole condensing units isolator				
121	Material	No.	7		
122	Labour	No.	7		
97	Digital Time Switchers with 24/7 weekly programmer	No	1		
	AC DB - OD02 (New Wing Plantroom)				
	Outdoor Unit DB's (Busbar rating: 180A, Fault level: 5kA, N+PE, 3P, Service Access: Front & Rear, Colour: Orange, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. IP65				
98	Surge arrestors - Class 2	No.	3		
99	Three phase circuit breaker - 200A - 10kA	No.	1		
100	Three phase Circuit breaker - 150A - 10kA	No.	1		
101	Circuit breaker 3TP - 60A - 5kA (Outdoor Units)	No.	3		
	TOTAL AMOUNT CARRIED TO THE NEXT PAGE :				

INSTALLATION OF AIR CONDITIONING AND VENTILLATION SYSTEM: ELECTRICAL BILL					
				BROUGHT FORWARD FROM PREVIOUS PAGE:	
ITEM NO	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	AC DB-C (New HR Building)				
	Indoor Units DB (Busbar rating: 60A, Fault level: 10kA, N+PE, 1P, Service Access: Front & Rear, Colour: Orange, Spare space: 20%, Incoming & Out Going Entry: Bottom/Top/Side, Floor Standing/ Recessed legend card, labels, etc. IP65				
102	Surge arrestors - Class 2	No.	3		
103	Three phase circuit breaker - 100A - 10kA	No.	2		
104	Three phase Circuit breaker - 80A - 10kA	No.	1		
105	Circuit breaker 1P - 20A - 5kA (Indoor Units)	No	4		
106	Circuit breaker 1P - 20A - 5kA (HR Branch Boxes)	No.	1		
107	Circuit breaker 1DP - 20A - 5kA (Fresh Air Fans)	No.	2		
108	Digital Time Switchers with 24/7 weekly programmer	No	2		
	WIRING				
	Supply and install 4mm² x 2 core PVC cable + 2.5mm² PVC insulated copper earth wire from the DB's on the wire mesh cable tray to each isolator next to each cassette units as indicated on site or shown on the drawings including cutting, thread couplings, bushes, locknuts and fixing accessories installed in various lights in close roof space, cast into concrete, fixed onto bricks/concrete with raised saddles, chased or built into				
109	Material	m	3000		
110	Labour	m	3000		
	WIRE MESH CABLE TRAYS (Medium duty 300 x 50mm x 3m)				
	Supply and install 200mm medium duty (Tee's, bends internal, Alice clamps, Cup square bolts and nuts and hold down saddles including hanging brackets) for the internal refrigeration piping to various heat recovery boxes,indoor cassette units and connecting wiring. The electrical contractor must coordinate with the mechanical contractor before installing the trays.				
	Complete Wire Mesh & splice clamps (300mm width)				
111	Material	m	200		
112	Labour	m	200		
	P9000 GALVANISED STEEL TRUCKING (127 x 76mm)				
	Supply and install P9000 galvanised steel trucking for the rising main refrigerant pipes from the outdoor condenser plant positioned on the ground and roof top plantrooms floor. The contractor must make allownce the covers, bends ,splice, internal & external bends, end caps and all asseccories				
113	Material	m	50		
114	Labour	m	50		
	Complete Cable ladders (Light duty 55 x 100 x 3000m)				
115	Material	m	30		
116	Labour	m	30		
	ISOLATORS				
	Supply and install internal isolator switch complete with box and associated materials and connection				
	20A single pole Air Con isolator				
117	Material	No.	59		
118	Labour	No.	59		
	Supply and install IP66 waterproof isolator switch complete with box and associated materials and connection				
	20A triple pole condensing units isolator				
119	Material	No.	1		
120	Labour	No.	1		
	Supply and install IP65 waterproof isolator switch complete with box and associated materials and connection				
	60A triple pole condensing units isolator				
121	Material	No.	7		
122	Labour	No.	7		
	TOTAL AMOUNT CARRIED TO THE NEXT PAGE :				

INSTALLATION OF AIR CONDITIONING AND VENTILLATION SYSTEM: ELECTRICAL BILL					
				BROUGHT FORWARD FROM PREVIOUS PAGE:	
ITEM NO.	DESCRIPTION	UNIT	QTY	RATE	TOTAL
	LIGHTNING PROTECTION & EARTHING				
	Supply, install and test a complete class 2 lightning protection installation including Cu conductors, test joints, still conduits, earth electrodes etc.				
123	4mm x 40mm Aluminium Strip along roof edge	M	50		
124	100 x 100 conduit box	Each	6		
125	16mm² green insulated down conductor	M	50		
126	70mm² anti-theft composite stranded earth conductor equivalent to 10mm² BCEW	M	100		
127	1200mm long 16mm Ø earth rods	Each	32		
128	20mm galvanized conduits	m	32		
129	Finial Type Air Terminals	Each	16		
130	Joints for electrical continuity	Each	30		
131	Test and certifying by Specialist	Each	3		
132	Soil Resistivity test	Each	3		
133	Earthing	Sum	3		
	TOTAL AMOUNT CARRIED OVER TO THE ELECTRICAL FINAL SUMMARY PAGE :				

DEPARTMENT OF PUBLIC WORK - NORTHERN CAPE

ELECTRICAL SUMMARY

Electrical Services: Schedule of Quantities

DPWI KIMBERLEY REGIONAL OFFICE REPLACEMENT OF AIRCONDITIONING SYSTEM

New VRV Air Conditioning and Ventilation Installation

ITEM	DESCRIPTION	TOTAL AMOUNT
1	Preliminary and General	
2	Total Electrical Installation amount carried forward from bill of Quantities	
3	**Sub-Total: B**	
4	**TOTAL AMOUNT CARRIED FORWARD TO THE FINAL SUMMARY PAGE (Excl VAT)**	

NB: Only contractors whose ECB Registration is for Three Phaseelectrical installations will be considered.

NAME OF TENDERER: .....

NAME OF COMPANY: .....

ADDRESS: .....

.....

.....

TELEPHONE NO.: .....

Name of Registered Person / Firm at ECB:..... Registration No.: .....

SUBMIT ACCREDITATION PAPERS OF THE ELECTRICAL CONTRACTOR WITHIN FOURTEEN DAYS OF BEING APPOINTED

Signature of person authorised to sign the tender:

SIGNATURE: ..... **DATE:** .....

NB: Tenderer's are requested to return this document and the summary with the tender form.

FINAL SUMMARY PAGE

KIMBERLEY: DPWI-NC KIMBERLEY REGIONAL OFFICES REPLACEMENT OF AIRCONDITIONING SYSTEM

1.0 TENDER PRICE

Having examined the Conditions of Contract, Specifications, and Drawings listed in this document for the above named works, I / We, the undersigned are willing to contract for, perform and complete the whole of the works required to be done in the repairs, renovations guarantee of the general mechanical Installation and to complete to the Engineers and Client satisfaction.

Tender Price R ……., ……c

In words:

……

……

made up as follows:

1.	Net amount for Mechanical Installation from the Bills of Quantities	R……
2.	Net amount for Electrical Installation from the Bills of Quantities	R……
3.	Add VAT at 15%	R……
3.	**TOTAL TENDER PRICE.**	**R……**

(Total Amount Carried forward to the DPW-07 (EC) form of offer and acceptance)

Name of Tenderers:

……

……

…… …… ……

Name Signature Date

public works
& infrastructure
Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY DPWI REGIONAL OFFICE: REPLACEMENT OF AIR CONDITIONING SYSTEM

SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

COMPREHENSIVE CONTRACT

SITE INFORMATION

AIR CONDITIONING AND ELECTRICAL INSTALLATIONS

PG-03.1 (EC) SITE INFORMATION – (GCC (2010) 2nd EDITION: 2010)

Project title:	***Kimberley: DPWI N/C Regional Office Replacement of air conditioning system***		
Tender no:	*KIM16/2021*	**Reference no:**	*19/2/4/2/2327/485*

C4 Site Information

The site is located within the Municipal Boundaries of Kimberley.

21-23 Market Square and Phakamile Mabija Street, Kimberley, Sol Plaatje Municipality Word 20, 8301, RSA

Latitude: -28.737157

Longitude: 24 76367

public works
& infrastructure
Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

KIMBERLEY DPWI REGIONAL OFFICE: REPLACEMENT OF AIR CONDITIONING SYSTEM

SPECIFICATION FOR THE MECHANICAL AND ELECTRICAL INSTALLATION

COMPREHENSIVE CONTRACT

ELECTRICAL DRAWING

AIR CONDITIONING AND ELECTRICAL INSTALLATIONS