MHSC

MINE HEALTH AND SAFETY COUNCIL

Electrical, Solar and UPS Solutions for the MHSC Offices

BID No.: MHSC 012/2025-26

ELECTRICAL INSTALLATION DETAILED SPECIFICATION

SECTION A: GENERAL

5A1 SCOPE OF WORK

The scope of works includes the supply, delivery to site, installation, testing, commissioning and handing over in proper working order as outlined below and as described elsewhere in this document. In summary, the scope of works for this contract includes:

1. LV Distribution Boards
2. LV Reticulation for HVAC upgrading
3. Small Power and lighting installation
4. General earthing & bonding
5. Fire detection wireways
6. Alterations to the existing small power to desks and workstations.
7. Alterations to the existing access control & security and ICT installations
8. Alterations to the existing generator installation.
9. Alterations to the existing UPS installation.
10. Scalable Solar PV and Battery energy storage
11. Sleeves 50mm diameter and below
12. Preparation for ICT in

The following sections are **NOT** included:

1. Alterations to the existing power supply.
2. Alterations to the existing power plant room.

5A2 NATURE OF BUILDING AND SCOPE OF WORKS

.1 General

The current building consists of a basement parking and plant room level (excluded from this scope), with the ground and first floors divided by a double-volume open atrium that houses reception. Each floor is split into an east and west suite, with ablutions in the centre core of the building on each floor between the suites, as indicated on the drawings. The second floor not spanning the entire floor is accessed by stairs. The server/UPS room on ground floor will be relocated as per drawings.

The existing suspended lighting in the office areas is to be replaced with surface mounted 1240 x 150 LED type lighting and LED downlighter. Additional power outlets will be provided for the new HVAC system.

The building will be prepared to 'second-fix' stage by the client, in accordance with the client's signed space planning layout.

Refer to the detailed drawings prepared for the building together with the overall site plan which are considered part of this tender document.

.2 Suspended Ceilings

The existing ceiling throughout the building will remain as is for majority of the areas and all service wherepossible will be reticulated via the suspended ceilings and perimeter power skirting.

The electrical contractor shall co-ordinate his installation with other contractors, prior to installation, to ensure thatclashes do not occur with other services in the ceiling voids.

.3 Other Services

Construction, HVAC, ICT, fire detection and suppression services will be installed in the building and the electrical contractor shall co-ordinate his installation with other contractors and the principal contractor, prior to installation to ensure that clashes do not occur.

5A3 COMMENCEMENT OF INSTALLATION

Construction work will commence on site as soon as all tender procedures are complete, and the successful tenderer will be required on site shortly after the Contract is awarded.

5A4 SCHEDULE OF DRAWINGS

See attached drawing register.

5A5 HANDOVER OF PROJECT

Upon final handover of the project the electrical contractor shall provide 3 x sets of comprehensive as-built drawings, maintenance manuals together with a full set of infra-red scans of all distribution boards.

All documentation is to be prepared in both hard and soft copies.

Note that the contract will not be considered complete until such documentation is accepted by the Engineer and Client.

5A6 BUILDING COMMISSIONING

The electrical contractor shall allow to commission the entire electrical installation in terms of SANS specifications together with the Engineer. The electrical Contractor shall commission and test the entire installations at his own expense, including provision of all test equipment, such testing to be done in the presence of the Engineer who shall have been notified of the dates and approximate duration of the tests sufficiently early to allow them to witness tests if necessary.

The electrical Contractor shall properly test and call for inspection by the Engineer, any work which is to be covered, concealed, built-in, otherwise closed or rendered inaccessible, before such closing up takes place. The g Engineer may require any work of this nature which they have not been called on to inspect before closing, to be uncovered or made accessible to its inspectors entirely at the Contractor's expense, making good included.

The Enginees reserves the right to inspect any item of equipment during manufacture or before delivery to site. The Contractor shall make available any item for such inspection. The Engineer shall also be furnished with manufacturer's test certificates whenever these are required by lawor called for by the

Engineer.

The electrical Contractor shall commission the complete installation prior to inviting the Engineers to accept it, commissioning including inter alia the following services, as relevant:

- Record all motor running currents and set overload protection devices to correct values.
- Adjust and set all time clocks, time delay relays, automatic control devices and check their function for correctness and response.
- Re-check alignment of all equipment drives prior to setting into operation.
- Check and set all transformer voltages and balance loads on all phases throughout the installation.
- Remedy any defects apparent on the installation prior to calling upon the Engineers toaccept the plants.

SECTION B: ELECTRICITY SUPPLY AND DISTRIBUTION BOARDS

5B1 MAIN ELECTRICITY SUPPLY

.1 General

The existing incoming supply is provided by ESKOM in the basement and will not be altered.

.2 Attendance by ESKOM

The electrical contractor shall allow the necessary attendance by ESKOM if required.

.3 Details of Supply

The electrical supply is existing and will not be altered.

.4 Earthing

.1 The main earthing system is to be tested and recertified and the lightning protection to be certified by a lightning protection specialist.

.2 The electrical contractor shall be responsible for all general earthing and bonding within the building including cable trays, trunking, power skirting, etc.

5B2 MV INSTALLATION

The MV installation does not form part of this contract and is existing.

5B3 STANDBY GENERATOR INSTALLATION

The existing generator will have to be tested and recertified. The battery needs to be replaced before any test can be conducted.

5B4 LV DISTRIBUTION BOARDS

Main LV Distribution Board (MLV Panel)

.1 General

This distribution board is existing and shall be upgraded and altered to provide the new power supply required for the HVAC system.

.2 Fault level

The board and its equipment shall be rated for a fault level of not less than 5 kA at 400V unless otherwise indicated.

.3 Equipment on board

See PC Sum provided

The electrical contractor shall allow for the purchase, attend to timeous delivery and for handling and storage on site of the distribution boards and additional equipment. All distribution boards are to be constructed in accordance with the specification.

The electrical contractor's mark up and attendance and the cost of the installation of the boards shall be completed as separate items in the Bill of Quantities.

New Distribution Boards – DB-HA/HAE (Ground Floor)

.1 General

This board shall be of the floor standing type, arranged for front access only, with lockable doors, suitable for bottom entry cables with exit top and bottom. Colour of finish to be white with red for emergency sections.

.2 Fault level

The board and its equipment shall be rated for a fault level of not less than 5 kA at 400V unless otherwise indicated.

.3 Equipment on board

See PC Sum provided

New Distribution Board – MBD & DB-HB/HBE (Ground Floor)

.1 General

This board shall be of the floor standing type, arranged for front access only, with lockable doors, suitable for bottom entry cables with exit top and bottom. Colour of finish to be white with red for emergency sections.

.2 Fault level

The board and its equipment shall be rated for a fault level of not less than 5 kA at 400V unless otherwise indicated.

.3 Equipment on board

See PC Sum provided

New Submain Local Boards – SMDB's (Solar Room, Kitchen, Server Room, etc.)

.1 General

These boards shall be of the surface wall mounted type, with lockable doors, suitable for bottom entry cables with exist top and bottom. Colour of finish to be white with red/blue for emergency/UPS respectively sections.

.2 Fault level

These boards and equipment shall be rated for a fault level of not less than 5 kA at 400V unless otherwise indicated.

.3 Equipment on board

See PC Sum provided

The electrical contractor shall allow for the purchase, attend to timeously delivery and for handling and storage on site of the distribution boards and additional equipment. All distributions boards are to be constructed in accordance with the specification.

The electrical contractor's mark up and attendance and the cost of the installation of the boards shall be completed as separate items in the Bill of Quantities.

B5 METERING

The electrical contractor shall take extra caution to ensure that all metering is correctly installed and properly wired. It shall be their responsibility to ensure that all metering is operating correctly.

Any loss in revenue to the Client resulting out of incorrect installation of metering shall be deemed to be the electrical Contractors' responsibility.

SECTION C: DISTRIBUTION

5C1 SCHEDULE OF MAINS

The Mains LV cable reticulation in the building is measured in the relevant provisional bills of quantities. The cable schedule below details the proposed cabling within the building.

From	To	Description
Main Metering Kiosk	MDB & DB-HA/HAE	Existing Cables + New emergency cables (2 x 70 mm2 4core PVC SWA Cu cable + 2 x 35 mm2 BCEW)
DB-HA/HAE	DB-HB/HBE	Existing Cables + New emergency cables (1 x 95 mm2 4core PVC SWA Cu cable + 50 mm2 BCEW)
MDB	Submain DB's	1 x 25 mm^2 4core PVC SWA Cu cable + 16 mm^2 BCEW

5C2 TYPE OF CABLE

.1 "Unarmoured cables" shall be PVC/SWA/PVC with copper conductors.
.2 All other conductors and wiring shall be copper.
.3 All cabling shall carry the SABS mark.
.4 All cabling shall be Low Smoke and Fume (LSF) cabling.

5C3 EARTHING

Where cables are run in groups it is only necessary to run one earth wire per group of cables, provided that the maximum earth wire relating to the group is used.

Where teeing off from the main earth is done, this shall be to the satisfaction of the Engineer.

5C4 CABLE ROUTES

All cable routes shall be confirmed with the Engineer and the Architect prior to installation. All cables installed under paving or pathways shall be installed in PVC sleeves.

SECTION D: GENERAL LV INSTALLATION

5D1 LUMINAIRES

The Engineer has allowed for luminaire supply under this tender, including, light switches, lamps, etc.. The electrical contractor shall allow for the purchase, timeous delivery and storage on site, of luminaires.

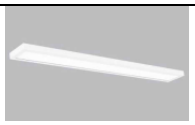
Note that the Prime Cost amount as provided excludes any contractor's mark-up and is therefore net.

The following schedule forms a general description of the luminaires as indicated on the drawings, and items such as "cabtyre" and "plug top" are therefore indicative of the type of outlet and final connection to be allowed for.

The Electrical contractor is to note that quantities are subject to detailed designs and plans. The electrical contractor shall be allowed to mark up the position of thedownlighters, and the cutting of the ceiling will be completed by the principal contractor.

Electrical Installation Detailed Specification

Luminaire Schedule

Luminaire Type	Description	Image
LD 1/E	ROUND RECESSED LED DOWNLIGHT. SIZE: 130mm DIAMETER COLOUR TEMPERATURE: 4000K. BODY MATERIAL: DIE CAST ALUMINIUM BODY COLOUR: WHITE CUTOUT: 115 DIAMETER DIFFUSER: PMMA - CLEAR SYSTEM WATTAGE: 20W LUMINOUS FLUX: 3013 Lm REFLECTOR: HIGH QUALITY ALUMINIUM BEAM ANGLE: 45 DEGREES CRI: 90	
LD 2/E	ROUND RECESSED LED DOWNLIGHT DIMMABLE SIZE: 130mm DIAMETER COLOUR TEMPERATURE: 4000K. BODY MATERIAL: DIE CAST ALUMINIUM BODY COLOUR: WHITE CUTOUT: 115 DIAMETER DIFFUSER: PMMA - CLEAR SYSTEM WATTAGE: 20W LUMINOUS FLUX: 3013 Lm REFLECTOR: HIGH QUALITY ALUMINIUM BEAM ANGLE: 45 DEGREES CRI: 90	
LI 1	LAY IN RECESSED LED PANEL LIGHTING SIZE: 595X595mm COLOUR TEMPERATURE: 4000K. BODY MATERIAL: POWDER COATED ALUMINIUM BODY COLOUR: WHITE DIFFUSER: PMMA WATTAGE: 30W LUMINOUS FLUX: 3900 Lm LOW GLARE –FLICKER FREE LED	
LI 2	SURFACE MOUNTED PANEL LIGHT IP20 SIZE: 1240X150X34 mm COLOUR TEMPERATURE: 4000K. BODY MATERIAL: METAL BODY COLOUR: WHITE DIFFUSER: POLYCARBONATE MOUNTING: SURFACE MOUNTED WATTAGE: 32W LUMINOUS FLUX: 3200 Lm AVERAGE CRI: >80 PF: 0.5	

Electrical Installation Detailed Specification

LI 3	FASTBAT LED BATTEN SIZE: 1230X66X68D mm COLOUR TEMPERATURE: 4000K. BODY MATERIAL: METAL BODY COLOUR: BLACK DIFFUSER: POLYCARBONATE MOUNTING: SURFACE MOUNTED WATTAGE: 40W LUMINOUS FLUX: 5800 Lm AVERAGE CRI: 80	
LI P1	CYLINDER GLASS PENDANT GLASS COLOUR: AMBER LAMP: E27 FILAMENT DIAMETER: 140mm SHADE HEIGHT: 168cm SHADE – 31cm BASE VOLTAGE: 230V WATTAGE: 60W COLOUR TEMPERATURE: 4000K	
LI P2	MESH SHADE DECORATIVE PENDANT LIGHT. SIZE: 250mm DIAMETER X 230mm HEIGHT MATERIAL: STONE & BLACK MESH COLOUR: BLACK (MIDNIGHT) IP RATING: 20 WATTAGE: 40W. VOLTAGE: 230V LAMP: LED E27 LAMP. WARRANTY: MIN 1 YEAR INSTALLATION: CEILING MOUNTED FITTING CUP.	
LI P3	SENSU METAL WIRE MULTI-PENDANT CLUSTER COLOUR: BLACK. LAMP: 3X E14 SHADE SIZE: 140mm DIAMETER X 250mm HEIGHT PER SHADE VOLTAGE: 230V WATTAGE: 40W COLOUR TEMPERATURE: 4000K	
LI P4	CYLINDER SHAPED BELLS SMALL TUBE PENDANT SIZE: 65mm DIAMETER 230mm HEIGHT LAMP: GU10 VOLTAGE: 230V WATTAGE: 7.5W COLOUR TEMPERATURE: 4000K BODY: ALUMINIUM COLOUR: BLACK DIFFUSER: ACRYLIC SUSPENSION: 3m CHIP WARRANTY: 1 YEAR	

Electrical Installation Detailed Specification

LI P5	ANTIQUE BRASS BASE PENDANT WITH COLOUR GLASS TRIO MULTI-PENDANT CLUSTER FITTING LAMP: 3X ES FILAMENT CEILING CUP DIAMETER: 350mm WIDTH: 400mm VOLTAGE: 230V WATTAGE: 60W COLOUR TEMPERATURE: 4000K	
LL 1	LINEAR SUSPENDED LED PANEL IP20 LIGHT. EXTRUSION DIMENSIONS: 40X70mm LENGTH: 1200mm COLOUR TEMPERATURE: 4000K. LIGHTING DIRECTION: DOWN ONLY BODY MATERIAL: EXTRUDED ALUMINIUM BODY COLOUR: BLACK (POWDER COATED) DIFFUSER: PC MATT OPAL DIFFUSER INSTALLATION: SUSPENDED ON STAINLESS STEEL WIRE AND CABTYRE. ADJUSTABLE WATTAGE: 36W LUMINOUS FLUX: 2880 Lm CRI >80, PF: 0,5	
LL 2	OVAL CENTAURUS SUSPENDED VERSATILE LINEAR LED LIGHTING SYSTEM. EXTRUSION DIMENSIONS: 80X80mm UP DOWN FRAME WIDTH: 1200mm LENGTH: 7000mm COLOUR TEMPERATURE: 4000K. BODY MATERIAL: EXTRUDED ALUMINIUM BODY COLOUR: BLACK (POWDER COATED) DIFFUSER: PC MATT OPAL DIFFUSER –TRANS >85% INSTALLATION: SUSPENDED FROM CEILING. STANDARD 3m SUSPENSION KIT. WATTAGE: 460W (DOWN) | 230W (UP) LUMINOUS FLUX: 41400 Lm(DOWN) | 20700 Lm(UP) CRI: 80 COLOUR CONSISTENCY: 3-STEP MACADAM INTERNAL DRIVERS CONTRACTOR TO ALLOW FOR ALL REQUIRED DRIVERS.	
LM 1	PIR RECESSED MOTION DETECTOR SENSOR. SIZE: 73mm DIAMETER X 73mm HEIGHT COLOUR: WHITE IP RATING: 20 RANGE: MAX 6m TIME DELAY: 10s –7min (ADJUSTABLE) DETECTION RANGE: 360 DEGREE WATTAGE: RATED LOAD 1200W (INCADESCENT) | 300W (ENERGY SAVING) VOLTAGE: 220-240V WARRANTY: 5 YEAR INSTALLATION: RECESSED INTO CEILING CUT OUT: 60mm	

Emergency luminaires

Emergency type luminaires will be provided with battery backup and therefore to be wired with an additional live conductor. All emergency luminaires will be supplied with an auto-test driver.

The electrical contractor shall allow for all testing of emergency lighting and the integration of the emergency systems with the fire detection and smoke detection/ventilation system in the building.

5D2 POWERSKIRTING

.1 General

In general, the power skirting will be replaced with new skirting to suit new office space.

5D3 SWITCHED SOCKET OUTLETS (SSO's)

.1 General

In general, the existing sockets and switches will not be altered.

Where alterations and additions are required, the installation is to match the approved interior designers/architects look and feel.

5D4 GEYSERS

As per the standard general and technical specification.

5D5 CONDUITS

All conduits shall be PVC or solid drawn or welded heavy gauge screwed type, to SABS specifications. No conduit less than 20 mm overall diameter shall be used. Conduit fittings and boxes shall be of malleable iron with screwed entries, finished galvanized or black enameled as specified. No solid inspection bends, tees or elbows will be permitted. Unless otherwise specified, PVC conduit shall be used only in concealedsurface mounted applications, e.g., ceiling voids.

Flexible conduit shall only be used where specifically permitted by the Engineer. In all cases a 2,5 mm² earth wire shall be drawn through any flexible conduit and secured at either end. Where flexible metal conduits are used, only brass connectors shall be used for connecting flexible conduit to solid conduit. The connectors shall either be brazed or soldered to the flexible conduit, and in addition, a 2,5 mm² earth wire shall be brazed or soldered to the brass connectors on the outside of the flexible tubing.

All conduit ends shall be reamed, and all joints tightly screwed together. Running joints with long threads, provided only where required, are to be fitted with locknuts to ensure enough mechanical strength and electrically continuous bonded joints. All conduit connections shall be red-leaded to prevent rust, after joints have been made.

No wiring shall be done until the entire conduit installation has been completed and inspected. No wires shall be drawn through before conduits have been thoroughly cleaned of all debris and moisture.

Conduit in roof spaces shall be installed parallel and at right angles to the roof members and shall be

secured by means of saddles which shall be fixed to these members by means of clout nails or screws. All conduit terminations in ceilings for lighting outlets shall be firmly supported.

Future extensions: All conduits for future requirements or extensions shall terminate in boxes with blank overlapping cover plates, or they shall be fitted with a coupling and brass plug where they project above slabs or from walls. Conduit terminations in exposed positions shall be sealed and protected with waterproofing paint.

Draw-wires: All unwired conduit, e.g., for communications provisions or other services, shall be fitted with galvanized steel draw-wires.

5D6 CIRCUIT WIRING

Wiring shall only be carried out after the conduit installation and plaster work is completed, but before paint work commences. Circuit wiring shall be of the loop-in system, and no joints of wiring will be permitted except at outlet points.

Unless specifically permitted no more than one circuit shall be run in one conduit.No open wiring will be permitted anywhere.

5D7 ELECTRICAL WIRING

All cabling and wiring shall be installed in accordance with the Standard General and Technical Specification

Earthing is to be done to wiring regulations, earthing connections being executed with appropriate copper earthing strip using brass bolts, nuts and washers. Ensure continuity to main building earth provided by others.

All electrical wiring shall comply with SANS 'Standard Regulations for the Wiring of Premises' as amended to date, applicable ancillary regulations of local authorities having jurisdiction over the site and be in accordance with best modern Codes of Practice.

5D8 SWITCHES

Switches shall generally be 16 Ampere 250V rated, single pole type, unless otherwise specified.

Flush switches shall be fitted in recessed rust-proofed sheet metal boxes and provided with cover plates as specified. Switches shall be installed in such a manner that toggle or rocker action is vertical.

Surface type switches consist of heavy gauge pressed steel boxes and covers with all corners and sides rounded. The switch toggle or rocker must be shrouded where it protrudes through the cover.

Mounting heights for switches shall be generally 1,200 mm from finished floor to the center of outlet box. Special consideration has been made to cater for paraplegics in this regard. Refer to layout drawings.

5D9 MOUNTING OF LUMINAIRES

All luminaires shall be installed symmetrically and shall be fixed strictly level or plumb on ceiling, unistrut support or parallel to building lines.

The positions of lighting outlets as indicated on drawings are approximate only; and the electrical sub-contractor shall establish final positions of luminaires on the site, in collaboration with the Engineer, if any doubt exists as to the correct location of outlets.

Where luminaires fall directly on ceiling cover strips, under no circumstances shall such strips be cut to accommodate wooden blocks or ceiling type galleries but blocks and galleries shall be neatly slotted to fit over the ceiling strips. (Strips to be cut preferably by a carpenter).

Fluorescent luminaires shall be fixed by means of conduit boxes, bolts cast into concrete or screws. Fixing of fluorescent luminaires to "hollow block" slabs shall be by means of "butterfly" nuts and screws. For all fluorescent luminaires, minimum two fixing points shall be used.

Luminaires exceeding 250 mm in widthshall be fixed by pairs of screws or bolts at each end, to permit accurate levelling.

5D10 FLUORESENT LUMINAIRES

All fluorescent luminaires shall be of the electronic control gear (ECG) type unless otherwise specified by the Engineer. All ECG shall be SABS approved and comply with SANS 10114-1 and 2, SANS 1464-22 and SANS 60598-1 as amended.

5D11 CONNECTIONS OF GEYSERS

In general, the existing geyser installations will not be altered and are existing.

Geysers will normally be installed and fixed by others. The electrical contractor shall tube, wire, and connect the geyser. Each geyser shall be protected on the distribution board by means of 250 Volts S.P. MCB.

A conduit box is to be provided near the geyser and connection from this box to the geyser shall be by means of PVC wire in screwed conduit.

5D12 CONNECTIONS OF STOVES

In general, the existing stove installations will be altered and accommodate new space layout.

Conduit to stoves shall terminate approximately 450 mm above floor in such a position that it will be at theback of the stove. The conduit shall either be set out of the wall, pointing vertically downwards; or shallterminate in a flush round conduit box.

Connection from this point to the stove shall be made by means of PVC wiring in flexible conduit, of enough length to allow the stove to be moved at least 1,000 mm from its normal position. A separate earth connection shall be provided for each stove.

A 60 Amp double pole isolator shall be provided in a box, mounted flush adjacent to the stove and in the run of the tubing above tiling work, if any, but not less than 1,000 mm above floor level.

5D13 CONNECTIONS OF MOTORS

Where connections to machines and motors are specified, they shall include connections to isolator and starter and connections from starter to motor terminals. A metal clad isolator of specified rating shall be supplied and fixed for every motor. Tenderers shall allow for supplying and fixing angle iron or "Unistrut" channels for mounting of starters and/or isolators where motors are positioned in the middle of the floor.

Final connections from isolator to starter and motor terminals shall be made with PVC-SWA cable,allowing enough slack to permit adjustment of motors. No flexible conduit shall be permitted.

Starters will normally be supplied by others, but they shall be fixed and connected by the electrical contractor, who shall set and adjust the overload trips and time delays to suit the motors. After installation of any motor, the electrical sub-contractor shall ensure the correct rotation of the motor.

5D14 LIGHTNING/SURGE ARRESTORS

The electrical contractor shall supply and install lightning arrestors where required in the Specificationand SANS 10142.

Lightning arrestors shall be of the silicon avalanche diode, metal oxide varistor (SAD/MOV) type with indication if they become defective, mounted inside the main board, one for each phase and neutral, and they shall be effectively earthed.

5D15 TELEPHONE REQUIREMENTS

The telephone system is existing and will be altered to accommodate the new spacing layout.

All additional telephone outlets shall consist of 100 x 100 x 50 mm flush boxes, mounted at the same height as switch plug outlets where applicable. Overlapping cover plates shall be supplied and fixed by the electrical contractor for all telephone outlets, except where otherwise stated.

5D16 CHASING OF WALLS

All chasing and cutting shall be carried out by the electrical contractor, but no chasing shall be done without the prior permission of the Engineer, in writing. All chasing shall be done with proper tools and with the minimum damage to the building structure.

All chases in plaster and brickwork will be made good by the Principal Contractor.

5D17 EXCLUDED ITEMS

Unless specified in the Detailed Technical Specification to the contrary, the electrical contractor must assume that all of the following items would be provided by others, at no cost to the electrical Contractor, details only for same to be provided by the electrical Contractor where relevant:

- The provision of all equipment areas shown on the drawings, complete with level floors, lighting, airtight access doors, and any other builder's work, as relevant.
- The architectural concealment of any equipment, such as false ceilings to hide ductwork, etc...
- Any item, comprised of timber, bricks, mortar or concrete, which can reasonably be construed as builder's work. Any other item mentioned in this specification or on the accompanying drawings as being expressly for the provision of others.
- Where details are to be prepared by the successful tenderer for work or services falling beyond the scope of his Contract, such information shall be given timeously and with due regard to the general programme for the project.
- Failure by the electrical Contractor to make known his requirements for work by others at a sufficiently early stage to allow it to be carried out without incurring additional costs shall make him liable for any extra expenditure pursuant thereto.

5D18 AS-BUILT DRAWINGS

The electrical contractor shall carry out a final 'as built' survey of the cable and all other installations, including conduit and draw boxes, outlets etc. and submit to the Engineer 'as built' route plans of the complete installation.

The following information shall be reflected on the plans or submitted as separate schedules with the plans:

- Overall length of each cable
- Locations of all joints (if any) in relation to permanent reference points.
- Locations of all cable markers in relation to permanent reference points.

The works will be deemed incomplete until all 'as built' drawings and information have been submitted to the Engineer.

5D19 VOLTAGE CHECK

Upon switch-on the electrical contractor shall establish the voltage and ensurethat transformer tap settings are correct before energizing the LV systems.

5D20 BALANCING OF SUPPLY

The electrical contractor shall ensure that the entire electrical installation is balanced as closely aspossible and report the readings to the Engineer in writing.

5D21 MAINTENANCE AND INSTRUCTION MANUALS

The electrical contractor shall prepare and hand over to the Engineer on practical completion 3 x sets of operating and maintenance instruction manuals in both hard and soft copy.

The requirement of these manuals is detailed in the standard general and technical specification; however, tenderers are to note that these handover manuals are to include the following:

- Full infra-red scans of all MDB and Distribution Boards
- Colour Photographs of each MDB Panel and Distribution Board
- A copy of the completed typed legend card for each MBD Panel and DB
- Copies of all guarantees and warrantees related to the installation.

5D22 INSTALLATION

The entire installation shall comply with the requirements of the SANS 10142 (as amended) Code of Practice, as well as with those of the Local Authority.

5D23 WIREWAYS

The electrical contractor is to ensure that the installation method of the necessary wireways conform to the relevant suppliers designs and the standard Structural Engineers approved suspension method.

The wireways will be suspended from concrete slab or trusses above and will be installed at a minimum level of 2800 mm AFFL or as indicated on the relevant drawings.

The electrical contractor is to ensure that rates allow for any additional height etc. taking notes of the relevant section/elevations.

5D24 SMALL POWER AND LIGHTING INSTALLATION

.1 General

The work carried out within the building will be re-measured on a "per point basis" as detailedin the Bills of Quantities.

Unless otherwise specified, sub-circuits shall be wired with PVC insulated conductors of the following sizes:

- Lighting — 2,5 mm² + 2,5 mm² earth wire
- Switch socket plugs — 2,5 mm² + 2,5 mm² earth wire.
- Convection heaters — 4 mm² + 2,5 mm² earth wire
- Unit heaters — 4 mm² + 2,5 mm² earth wire
- Water heaters (geysers) — 4 mm² + 2,5 mm² earth wire

❖ Incinerators	4 mm² + 2,5 mm² earth wire
❖ Bells	2,5 mm²
❖ Clocks	2,5 mm²
❖ Signs	2,5 mm² + 2,5 mm² earth wire
❖ Motors - single phase	2,5 mm² + 2,5 mm² earth wire
❖ Three phase (up to 7kW)	2,5 mm² + 2,5 mm² earth wire
❖ Single phase fans	2,5 mm² + 2,5 mm² earth wire
❖ Smoke extraction fans	4 mm² + 2,5 mm² earth wire
❖ Water pumps	4 mm² + 2,5 mm² earth wire
❖ Stoves	6 mm² + 4 mm² earth wire (unless otherwise specified)

.2 Electrical Point Rates

.1 Lighting outlets

Wire from the floor distribution board with 2,5vmm^2 PVC/Cu conductors plus 2,5 mm² BCEW via the P9000 power trunking in the ceiling void and allow to terminate as follows:

- ❖ A 6 A un-switched socket outlet in the ceiling void for recessed LED downlighters.
- ❖ A 50 mm round box for surface mounted fluorescent and bulkhead fittings.

All labour, materials, wiring and terminations are to be included for in this point rate.

.2 Light Switches

Wire from the floor distribution board with 2,5 mm² PVC/Cu conductors plus 2,5 mm² BCEW via the P9000 power trunking in the ceiling voids.

A typical "light switch" will control one or more luminaires on the same circuit, and shall include accessing the circuit, extension boxes if required, wiring, conduit box, switch and cover plate.

.3 Master Light Switches

Wire from the floor distribution board with 2,5 mm² PVC/Cu conductors plus 2,5 mm² BCEW via the P9000 power trunking in the ceiling voids.

The switches shall be mounted in a common switch box and wiring between the contactors in the boards and the switches shall be with 1,5 mm^2 PVC conductors.

.4 Switch Socket Outlets (SSO's)

Wire from the floor distribution board with 2,5 mm² PVC/Cu conductors plus 2,5 mm² BCEW via the P9000 power trunking in the ceiling voids.

The electrical layouts have been provisionally circuited, however a maximum of 4 outlets may be connected to a single power circuit.

Supply and install switched socket outlet complete including wiring, materials, labelling, labour and terminations in this rate.

.5 Duo 16A switched socket outlet in brick walls

These will typically be provided in kitchens and wired from the distribution board through the ceiling void in the P9000 power trunking or conduit.

Allow 2 no. per circuit, 4mm^2 conductors with 2,5 mm^2 BCEW, circuit breaker elsewhere. Further allow chasing not exceeding 2,000 mm per outlet.

.6 Weatherproof 16A switched socket outlet

These are envisaged for external areas if required. Wire from the floor distribution board with 2,5 mm² PVC/Cu conductors plus 2,5 mm² BCEW via the P9000 power trunking in theceiling voids.

Allow fiberglass box (e.g. "York" or equivalent). Making good of brickwork by others.

.7 Wall mounted workstation outlets (Type A)

These flush wall mounted workstation outlets shall comprise 2-off 100 x 100 mm draw boxes chased into brickwork mounted 25 mm apart with 1 x 25 mm conduit link from each draw box to the P9000 power trunking for power and 1x25 mm conduit link to the P8000 Comms/Fire/Security trunking in the ceiling void.

Outlets for these workstations are indicated on the electrical drawings. Allow to wire from the local distribution board in 2,5 mm conductors + 2,5 mm BCEW and allow for termination in the socket outlets. Data outlets will be as per .11 below.

.8 Air-Conditioning Outlets

Wire from the floor distribution board with 4 mm² PVC/Cu conductors plus 2,5 mm² BCEWvia the P9000 trunking in the ceiling voids.

A maximum of 2 x outlets may be connected to one power circuit.

Supply and install switched 30A isolator outlet complete including wiring, materials, labelling, labour and terminations in this rate.

.9 Data & Voice Outlets

Where not on power skirting, install 25mm conduit and draw wire from P8000 Comms/Fire/Security trunking in the ceiling void to the final outlet.

Terminate in a 100x100 mm box with cover plate. The punching of these cover plates for

the installation of data & voice cabling will be by others.

Supply and install outlet complete including wiring, materials, labelling, labour and terminations in this rate.

.10 Geyser Outlets

Wire from the floor distribution board with 2,5 mm² conductors together with a 2,5 mm² earth conductor in 25 mm conduit and/or existing trunking via the ceiling void.

Terminate the in a 100x50 mm box for the installation of a 20 A isolator mounted to later detail. Allow for the connection of the equipment once installed.

.11 Stove/Kitchen Equipment Outlets

Wire from the floor distribution board with 2,5 mm² conductors together with a 2,5 mm² earth conductor for 20 A outlets and 4 mm^2 conductors together with a 2,5 mm^2 BCEW in 25 mm conduit for a 30 A outlet and/or P9000 power trunking via the ceiling void.

Terminate the in a 100x50 mm box for the installation of a 20 A or 30 A isolator mounted to later detail. Allow for the connection of the equipment once installed.

.12 Photocell Outlets

Allow to supply, install and connect Royce Thomson photocells located on external walls.

Wire from DB to photocell in 4c 1,5 mm^2 PVC SWA Cu cable using 1 core as earth and terminate onto photocell.

.13 Motion Sensors

Wire from the light fitting to the motion sensor in 1,5 mm² conductors for lighting control via P9000 power trunking or conduiting via the ceiling void.

Allow for the connection of the motion sensor once installed. Motion sensors are to be set for 30 minutes as a default setting.

.14 Extractor Fan Outlets

Wire from the floor distribution board with 2,5 mm² conductors together with a 2,5 mm² earth conductor in 25 mm conduit and/or P9000 trunking via the ceiling void.

Terminate the in a 100x50 mm box for the installation of a 20 A isolator mounted to later detail. Allow for the connection of the equipment once installed.

SECTION E: ICT SERVICES PROVISIONS

5E1 GENERAL

Data & Voice cabling, CCTV, access control & security installations are existing and will not be altered unless required by the alterations required for fire compliance.

The fire detection system will be completely removed and a new installation in accordance with SANS requirements will be installed in the building.

The electrical contractor shall allow to supply and install all wireways and conduiting required for these installations as detailed in the bill of quantities and allow the necessary attendance on the various specialist contractors.

All wireways supplied and installed by the electrical contractor for these installations shall be providedwith draw wires to allow these specialist contractors to complete their installations.

5E2 TRENCHING & SLEEVES

No trenching or sleeves are envisaged as part of this contract. The existing installation will remain.

5E3 MANHOLES

No additional manholes are envisaged as part of this contract. The existing installation will remain.

5E4 TRUNKING

The electrical contractor shall be allowed to supply and install all P8000 trunking as indicated on the electrical drawings and as detailed in the bills of quantities and ensure the required earthing and bonding of these installations.

5E5 CONDUITING

The electrical contractor shall be allowed to supply and install all conduiting and draw boxes as indicated on the electrical drawings and as detailed in the bills of quantities.

5E6 COMMS DISTRIBUTION BOARDS

Communications installations are existing and will not be altered unless required by the alterations required for fire compliance. The electrical contractor shall allow the necessary attendance on the various specialist contractors if required.

5E7 SECURITY DISTRIBUTION BOARDS

CCTV, access control & security installations are existing and will be altered as per the latest design issued by the ICT manager. The electrical contractor shall allow the necessary attendance on the various specialist -contractors if required.

5E8 FIRE DETECTION DISTRIBUTION BOARDS

Electrical Installation Detailed Specification

The electrical contractor shall be allowed to supply and install all Fire Detection cabling distribution boards required for these installations as detailed in the bills of quantities and allow the necessary attendance on the various specialist contractors.