



public works

Department:  
Public Works  
REPUBLIC OF SOUTH AFRICA

**BILLS OF QUANTITIES &  
SPECIFICATION FOR  
COMPREHENSIVE SERVICES  
INCORPORATING  
ELECTRICAL INSTALLATIONS**

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**BILLS OF QUANTITIES &  
SPECIFICATION FOR  
COMPREHENSIVE SERVICES  
INCORPORATING  
ELECTRICAL INSTALLATIONS**

(PROVISIONAL) BILLS OF QUANTITIES  
FOR  
THE INSTALLATION OF FACILITIES FOR PEOPLE WITH DISABILITIES  
AT  
WESTVILLE PRISON

**CONSISTING OF:**

**PART B: ELECTRICAL WORK**

SECTION 1: Electrical Installation

**See separate documents for:**

PART A. Building work  
PART C. Mechanical work  
PART E. Returnable schedules

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**BILLS OF QUANTITIES**

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## **PART B: ELECTRICAL WORK**

### **NOTICE TO TENDERERS**

1. The tenderer for the principal contract shall submit additional information regarding the installer of the Electrical Installation together with the returnables enclosed with the tender enquiry documents
2. The Contractor, on acceptance of his tender for the principal contract shall submit within the period stated, the information indicated on the forms following immediately after the Summary of the bills of quantities for this installation.

# SPECIFICATION FOR ELECTRICAL WORK

## PART 1 - GENERAL

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## **PART 1 - GENERAL**

### **1. TESTS**

After completion of the works and before first delivery is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installations will be inspected and the Contractor shall make good, to the satisfaction of the Representative/Agent, any defects which may arise.

The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installations at completion.

### **2. MAINTENANCE OF INSTALLATIONS**

With effect from the date of the First Delivery Certificate the Contractor shall at his own expense undertake the regular servicing of the installation during the maintenance period and shall make all adjustments necessary for the correct operation thereof.

If during the said period the installations is not in working order for any reason for which the Contractor is responsible, or if the installations develops defects, he shall immediately upon being notified thereof take steps to remedy the defects and make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installations otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Representative/Agent or the Director-General, at his own expense replace the whole of the installations or such parts thereof as the Representative/Agent or the Director-General may deem necessary with apparatus specified by the Representative/Agent or the Director-General.

### **3. REGULATIONS**

The installation shall be erected and tested in accordance with the Acts and Regulations as indicated in the scope of works

### **4. NOTICES AND FEES**

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority.

On production of the official account, only the net amount of the fee charged by the Supply Authority for connection of the installation to the supply mains, will be refunded to the Contractor by the Department.

### **5. SCHEDULE OF FITTINGS**

In all instances where schedule of light, socket outlet and power points are attached to or included on the drawings, these schedules are to be regarded as forming part of the specification.

### **6. QUALITY OF MATERIALS**

Only materials of first class quality shall be used and all materials shall be subject to the approval of the Department. Departmental specifications for various materials to be used on this Contract are attached to and form part of this specification.

Wherever applicable the material is to comply with the relevant South African Bureau of Standards, specifications, or to British Standard Specifications, where no SABS Specifications exist.

Materials wherever possible, must be of South African manufacture.

## **7. CONDUIT AND ACCESSORIES**

The type of conduit and accessories required for the service, i.e. whether the conduit and accessories shall be of the screwed type, plain-end type or of the non-metallic type and whether metallic conduit shall be black enamelled or galvanised, is specified in Part 2 of this specification.

Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted.

The conduit and conduit accessories shall comply fully with the applicable SABS specifications as set out below and the conduit shall bear the mark of approval of the South African Bureau of Standards.

- a) Screwed metallic conduit and accessories: SABS 1065, parts 1 and 2.
- b) Plain-end metallic conduit and accessories: SABS 1065, parts 1 and 2.
- c) Non-metallic conduit and accessories: SABS 950

All conduit fittings except couplings, shall be of the inspection type. Where cast metal conduit accessories are used, these shall be of malleable iron. Zinc base fittings will not be allowed.

Bushes used for metallic conduit shall be brass and shall be provided in addition to locknuts at all points where the conduit terminates at switchboards, switch-boxes, draw-boxes, etc.

Draw-boxes are to be provided in accordance with the "Wiring Code" and wherever necessary to facilitate easy wiring.

For light and socket outlet circuits, the conduit used shall have an external diameter of 20mm. In all other instances the sizes of conduit shall be in accordance with the "Wiring Code" for the specified number and size of conductors, unless otherwise directed in part 2 of this specification or indicated on the drawings.

Only one manufactured type of conduit and conduit accessories will be permitted throughout the installation.

Running joints in screwed conduit are to be avoided as far as possible and all conduit systems shall be set or bent to the required angles. The use of normal bends must be kept to a minimum with exception of larger diameter conduits where the use of such bends is essential.

All metallic conduit shall be manufactured of mild steel with a minimum thickness of 1,2mm for plain-end conduit and 1,6mm in respect of screwed conduit.

Under no circumstances will conduit having a wall thickness of less than 1.6mm be allowed in screeding laid on top of concrete slabs.

Bending and setting of conduit must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems. Damage to conduit resulting from the use of incorrect bending apparatus or methods applied must on indication by the Department's inspectorate staff, be completely removed and rectified and any wiring already drawn into such damaged conduits must be completely renewed at the Contractor's expense.

Conduit and conduit accessories used for flame-proof or explosion proof installations and for the suspension of luminaires as well as all load bearing conduit shall in all instances be of the metallic screwed type.

All conduit and accessories used in areas within 50 km of the coast shall be galvanised to SABS 763.

Tenderers must ensure that general approval of the proposed conduit system to be used is obtained from the local electricity supply authority prior to the submission of their tender. Under no circumstances will consideration be given by the Department to any claim submitted by the Contractor, which may result from a lack of knowledge in regard to the supply authority's requirements.

## **8. CONDUIT IN ROOF SPACES**

Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1,5m by means of saddles screwed to the roof timbers.

Nail or crampets will not be allowed.

Where non-metallic conduit has been specified for a particular service, the conduit shall be supported and fixed with saddles with a maximum spacing of 450 mm. The Contractor shall supply and install all additional supporting timbers in the roof space as required.

Under flat roofs, in false ceilings or where there is less than 0,9m of clearance, or should the ceilings be insulated with glass wool or other insulating material, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit runs from distribution boards shall, where possible terminate in fabricated sheet steel draw-boxes installed directly above or in close proximity to the boards.

## **9. SURFACE MOUNTED CONDUIT**

Wherever possible, the conduit installation is to be concealed in the building work; however, where unavoidable or otherwise specified under Part 2 of the specification, conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

The use of inspection bends is to be avoided and instead the conduit shall be set uniformly and inspection coupling used where necessary.

No threads will be permitted to show when the conduit installation is complete, except where running couplings have been employed.

Running couplings are only to be used where unavoidable, and shall be fitted with a sliced couplings as a lock nut.

Conduit is to be run on approved spaced saddles rigidly secured to the walls.

Alternatively, fittings, tees, boxes, couplings etc., are to be cut into the surface to allow the conduit to fit flush against the surface. Conduit is to be bedded into any wall irregularities to avoid gaps between the surface and the conduit.

Crossing of conduits is to be avoided, however, should it be necessary purpose-made metal boxes are to be provided at the junction. The finish of the boxes and positioning shall be in keeping with the general layout.

Where several conduits are installed side by side, they shall be evenly spaced and grouped under one purpose-made saddle.

Distribution boards, draw-boxes, industrial switches and socket outlets etc., shall be neatly recessed into the surface to avoid double sets.

In situations where there are no ceilings the conduits are to be run along the wall plates and the beams.

Painting of surface conduit shall match the colour of the adjacent wall finishes.

Only approved plugging materials such as aluminium inserts, fibre plugs, plastic plugs, etc., and round-head screws shall be used for fixing saddles, switches, socket outlets, etc., to walls, wood plugs and the plugging in joints in brick walls are not acceptable.

## 10. CONDUIT IN CONCRETE SLABS

In order not to delay building operations the Contractor must ensure that all conduits and other electrical equipment which are to be cast in the concrete columns and slabs are installed in good time.

The Contractor shall have a representative in attendance at all times when the casting of concrete takes place.

Draw-boxes, expansion joint boxes and round conduit boxes are to be provided where necessary. Sharp bends of any nature will not be allowed in concrete slabs.

Draw and/or inspection boxes shall be grouped under one common cover plate, and must preferably be installed in passages or male toilets.

All boxes, etc., are to be securely fixed to the shuttering to prevent displacement when concrete is cast. The conduit shall be supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete slabs and/or beams.

Before any concrete slabs are cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

## 11. FLEXIBLE CONNECTIONS FOR CONNECTING UP OF STOVES, MACHINES, ETC.

Flexible tubing connections shall be of galvanised steel construction, and in damp situations of the plastic sheathed galvanised steel type. Other types may only be used subject to the prior approval of the Department's site electrical representative.

Connectors for coupling onto the flexible tubing shall be of the gland or screw-in types, manufactured of either brass or cadmium or zinc plated mild steel, and the connectors after having been fixed onto the tubing, shall be durable and mechanically sound.

Aluminium and zinc alloy connectors will not be acceptable.

## 12. WIRING:

Except where otherwise specified in Part 2 of this specification, wiring shall be carried out in conduit throughout. Only one circuit per conduit will be permitted.

No wiring shall be drawn into conduit until the conduit installation has been completed and all conduit ends provided with bushes. All conduits to be clear of moisture and debris before wiring is commenced.

Unless otherwise specified in Part 2 of this specification or indicated on the service drawings, the wiring of the installation shall be carried out in accordance with the "Wiring Code". Further to the requirements concerning the installation of earth conductors to certain light points as set out in the "Wiring Code", it is a specific requirement of this document that where plain-end metallic conduit or non-metallic conduit has been used, earth conductors must be provided and drawn into the conduit with the main conductors to all points, including all luminaires and switches throughout the installation.

Wiring for lighting circuits is to be carried out with 1,5mm<sup>2</sup> conductors and a 1,5mm<sup>2</sup>-earth conductor. For socket outlet circuits the wiring shall comprise 4mm<sup>2</sup> conductors and a 2,5mm<sup>2</sup>-earth conductor. In certain instances, as will be directed in Part 2 of this specification, the sizes of the aforementioned conductors may be increased for specified circuits. Sizes of conductors to be drawn into conduit in all other instances, such as feeders to distribution boards, power points etc., shall be as specified elsewhere in this specification or indicated on the drawings. Sizes of conductors not specified must be determined in accordance with the "Wiring Code".

The loop-in system shall be followed throughout and no joints of any description will be permitted.

The wiring shall be done in PVC insulated 600/1000 V grade cable to SABS 150.

Where cable ends connect onto switches, luminaires etc., the end strands must be neatly and tightly twisted together and firmly secured. Cutting away of wire strands of any cable will not be allowed.

### **13. SWITCHES AND SOCKET OUTLETS**

All switches and switch-socket outlet combination units shall conform to the Department Quality Specifications, which form part of this specification.

No other than 16 A 3 pin sockets are to be used, unless other special purpose types are distinctly specified or shown on the drawings.

All light switches shall be installed at 1,4m above finished floor level and all socket outlets as directed in the Schedule of Fittings which forms part of this specification or alternatively the height of socket outlets may be indicated on the drawings.

### **14. SWITCHGEAR**

Switchgear, which includes circuit breakers, iron-clad switches, interlocked switch-socket outlet units, contactors, time switches, etc., is to be in accordance with the Departmental Quality Specifications which form part of this specification and shall be equal and similar in quality to such brands as may be specified.

For uniform appearance of switchboards, only one approved make of each of the different classes of switchgear mentioned in the Quality Specifications shall be used throughout the installations.

### **15. SWITCHBOARDS**

All boards shall be in accordance with the types as specified, be constructed according to the detail or type drawings and must be approved by the Department before installation.

In all instances where provision is to be made on boards for the supply authority's main switch and/or metering equipment the contractor must ensure that all requirements of the authorities concerned in this respect are met.

Any construction or standard type aboard proposed, as an alternative to that specified must have the prior approval of the Department.

All busbars, wiring, terminals, etc., are to be adequately insulated and all wiring is to enter the switchgear from the back of the board. The switchgear shall be mounted within the boards to give a flush front panel. Cable and boxes and other ancillary equipment must be provided where required.

Clearly engraved labels are to be mounted on or below every switch. The working of the labels in English and Afrikaans, is to be according to the lay-out drawings or as directed by the Department's representative and must be confirmed on site. Flush mounted boards to be installed with the top of the board 2,0m above the finished floor level.

### **16. WORKMANSHIP AND STAFF**

Except in the case of electrical installations supplied by a single-phase electricity supply at the point of supply, an accredited person shall exercise general control over all electrical installation work being carried out.

The workmanship shall be of the highest grade and to the satisfaction of the Department.

All inferior work shall, on indication by the Department's inspecting officers, immediately be removed and rectified by and at the expense of the Contractor.

## 17. CERTIFICATE OF COMPLIANCE

On completion of the service, a certificate of compliance must be issued to the Department's Representative/Agent in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

## 18. EARTHING OF INSTALLATION

### Main earthing

The type of main earthing must be as required by the supply authority if other than the Departments, and in any event as directed by the Department's representative, who may require additional earthing to meet test standards.

Where required an earth mat shall be provided, the minimum size, unless otherwise specified, being 1,0m x 1,0m and consisting of 4mm diameter hard-drawn bare copper wires at 250mm centres, brazed at all intersections.

Alternatively or additionally earth rods or trench earths may be required as specified or directed by the Department's authorised representative.

Installations shall be effectively earthed in accordance with the "Wiring Code" and to the requirements of the supply authority. All earth conductors shall be stranded copper with or without green PVC installation.

Connection from the main earth bar on the main board must be made to the cold water main, the incoming service earth conductor, if any and the earth mat or other local electrode by means of 12mm x 1,60 mm solid copper strapping or 16 mm<sup>2</sup> stranded (not solid) bare copper wire or such conductor as the Department's representative may direct. Main earth copper strapping where installed below 3m from ground level, must be run in 20 mm diameter conduit securely fixed to the walls.

All other hot and cold water pipes shall be connected with 12mm x 0,8mm perforated for solid copper strapping (not conductors) to the nearest switchboard. The strapping shall be fixed to the pipework with brass nuts and bolts and against walls with brass screws at 150-mm centres. In all cases where metal water pipes, down pipes, flues, etc., are positioned within 1,6m of switchboards an earth connection consisting of copper strapping shall be installed between the pipework and the board. In vertical building ducts accommodating both metal water pipes and electrical cables, all the pipes shall be earthed at each distribution board.

### Roofs, gutters and down pipes

Where service connections consist of overhead conductors, all metal parts of roofs, gutters and down pipes shall be earthed. One bare 10mm<sup>2</sup> copper conductor shall be installed over the full length of the ceiling void, fixed to the top purlin and connected to the main earth conductor and each switchboard. The roof and gutters shall be connected at 15m intervals to this conductor by means of 12mm X 0,8mm copper strapping (not conductors) and galvanised bolts and nuts. Self-tapping screws are not acceptable. Where service connections consist of underground supplies, the above requirements are not applicable.

### Sub-distribution boards

A separate earth connection shall be supplied between the earth busbar in each sub-distribution board and the earth busbar in the Main Switchboard. These connections shall consist of a bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors. Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised where specified or approved.

### Sub-circuits

The earth conductors of fall sub-circuits shall be connected to the earth busbar in the supply board in accordance with SABS 0142.

### **Ring Mains**

Common earth conductors may be used where various circuits are installed in the same wire way in accordance with SABS 0142. In such instances the sizes of earth conductors shall be equivalent to that of the largest current carrying conductor installed in the wire way, alternatively the size of the conductor shall be as directed by the Engineer. Earth conductors for individual circuits branching from the ring main shall be connected to the common earth conductor with T-ferrules or soldered. The common earth shall not be broken.

### **Non-metallic Conduit**

Where non-metallic conduit is specified or allowed, the installation shall comply with the Department's standard quality specification for "conduit and conduit accessories".

Standard copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including metal switch boxes, socket-outlet boxes, draw-boxes, switchboards, luminaires, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

### **Flexible Conduit**

An earth conductor shall be installed in all non-metal flexible conduit. This earth conductor shall not be installed externally to the flexible conduit but within the conduit with the other conductors. The earth conductor shall be connected to the earth terminals at both ends of the circuit.

### **Connection**

Under no circumstances shall any connection points, bolts, screws, etc., used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided.

Unless earth conductors are connected to proper terminals, the end shall be tinned and lugged.

## **19. MOUNTING AND POSITIONING OF LUMINAIRES**

The Contractor is to 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 luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings must be adhered to as far as possible and must be confirmed with the Department's representative.

Fluorescent luminaires 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  $\frac{3}{4}$  of the length of the luminaires apart.

Fluorescent luminaires to be mounted on board ceilings shall be secured by means of two 40mm x No. 10 round head screws and washers. The luminaires shall also be bonded to the circuit conduit by means of locknuts and brass bushes. The fixing screws are to be placed  $\frac{3}{4}$  of the length of the fitting apart.

Earth conductors must be drawn in with the circuit wiring and connected to the earthing terminal of all fluorescent luminaires as well as other luminaires exposed to the weather in accordance with the "Wiring Code".

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs. Against board ceilings the luminaires shall be secured to the bracing or joists by means of two 40mm x No. 8 round head screws.

## **PART 2: INSTALLATION DETAILS**

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## **PART 2: INSTALLATION DETAILS**

### **1. CABLE SLEEVE PIPES**

Where cables cross under roadways, other services and where cables enter buildings, the cables shall be installed in asbestos-cement pipes, earthenware or high-density polyethylene pipes.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

### **2. NOTICES**

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, Telkom, S.A. Transport Services, Provincial or National Road Authorities and other authorities as may be required with respect to the installation.

### **3. ELECTRICAL EQUIPMENT**

All equipment and fittings supplied must be in accordance with the attached quality specification (Part 3 of this document), suitable for the relevant supply voltage, and frequency and must be approved by the Department's representative.

### **4. DRAWINGS**

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being built in.

### **5. BALANCING OF LOAD**

The Contractor is required to balance the load as equally as possible over the multiphase supply.

### **6. SERVICE CONDITIONS**

All plant shall be designed for the climatic conditions appertaining to the service.

### **7. SWITCHES AND SOCKET OUTLETS**

The installation of switches and socket outlets must conform to clause 13 of Part 1 of this specification. All socket outlets must comply with the South Africa Compulsory Specification VC8008, and shall bear the SABS mark.

All switched socket outlets shall be double outlets with 1 x SANS 164-1 outlet (traditional) and 1 x 164-2 outlet (new) under a single cover plate. Both outlets shall be individually switched.

Socket outlets and switches shall be of the Crabtree Classic range or equal and approved. Cover plates must be held in place by two screws. Clip-on covers will only be accepted if it can be proved that a tool is required to remove the cover plate. Should the contractor install clip-on cover plates, the contractor shall be liable for all missing or damaged cover plates for the duration of the maintenance period (12 months), regardless of the cause. The contractor shall apply for approval prior to tender closing.

## **8. SENSORS**

PIR occupancy sensors shall be type Cosine Developments CD IR41 or equal and approved. The sensor must be able to detect motion in a 360° range at 6m. The sensor shall be able to switch 1200W of resistive load, or 300W of energy saving lamp load. The lux setting shall be set at minimum, and the time setting shall be set at 5 minutes.

## **9. LIGHT FITTINGS AND LAMPS**

The installation and mounting of luminaires must conform to clause 19 of Part 1 of this specification.

All fittings to be supplied by the Contractor shall have the approval of the Department. All luminaires supplied must have the SABS safety mark, as required by SANS 10142.

The light fittings must be of the type specified in the Schedule of Light Fittings.

## **10. EARTHING AND BONDING**

The Contractor will be responsible for all earthing and bonding of the building and installation. The earthing and bonding is to be carried out strictly as described in clause 18 of Part 1 of this specification and to the satisfaction of the Department's representative.

## **11. MAINTENANCE OF ELECTRICAL SUPPLY**

All interruptions of the electrical supply that may be necessary for the execution of the work, will be subject to prior arrangement between the Contractor and the user Department and the Department's representative.

## **12. EXTENT OF WORK**

The work covered by this contract comprises the complete electrical installation, in working order, as shown on the drawings and as per this specification, including the supply and installation of all fittings and also the installation of such equipment supplied by the Department.

## **13. SUPPLY AND CONNECTION**

The existing supply to all buildings is at 400/230 Volt 50Hz.

No new supplies or connections are required.

## **14. CONDUIT AND WIRING**

Conduit shall be PVC conduit and galvanised Bosal conduit in accordance with SABS 162, 763 and 1007 respectively. Conduit boxes shall be galvanised steel boxes or PVC, as defined by the conduit type. PVC conduit may be used in brickwork and ceiling voids. Conduit cast into concrete, or fixed to surface, shall be galvanised steel.

All conduits, regardless of the system employed, shall be installed strictly as described in the applicable paragraphs of clauses 4 to 8 of Part 1 of the specification. Wiring of the installation shall be carried out as directed in clause 9 part 1 of this specification.

Where plain end conduit is offered all switches and light fittings must be supplied with a permanent earth terminal for the connection of the earth wire.

Lugs held by switch fixing screws or self-tapping screws will not be acceptable.

#### 14.1 Power Trunking

The Contractor shall be responsible for the supply and installation of all power trunking complete with corner pieces, end pieces, junction pieces, supply conduits, cover plates and power outlets as specified and indicated on the drawings.

The power trunking must comply with SABS 1197. The Contractor must ensure that the power trunking is installed to satisfaction of the Department's representative before commencing with the wiring of the power trunking.

#### 15. POWER POINTS

Allow for the installation of power points and equipment as listed in the schedule, indicated on the drawings and described below:

##### 15.1 Fans

The Contractor must supply, install and electrically connect the extract fan in the Admin Block, as specified and listed in the Schedule of Power Points.

##### 15.2 Lift

The Contractor must allow to electrically connect the paraplegic lift in the Admin Block, as specified and listed in the Schedule of Power Points.

#### 16. DISTRIBUTION BOARDS

There are NO new distribution boards required for this installation.

In certain areas, the contractor must add new circuit breakers to the existing distribution boards, as indicated on the drawings and listed in the Distribution Boards Schedule

##### Schedule of Distribution Boards:

BOARD	TYPE	FAULT LEVEL	NEW LOAD	WORK REQUIRED
DB-FS1 (Female Quarters) Normal power	Surface wall mounted with doors	5 kA	1120 W	Add 1 x 20 Amp, SP, 5 kA circuit breaker off existing earth leakage unit for new plug circuit.
DB-M1 (Male Quarters) Normal power	Surface wall mounted with doors	5 kA	1120 W	Add 1 x 20 Amp, SP, 5 kA circuit breaker off existing earth leakage unit for new plug circuit
DB-HQ1 (Admin building) Standby power	Flush wall mounted with doors	5 kA	2250 W	Add 1 x 16 Amp, SP, 5 kA circuit breaker for new lift circuit, Add 1 x 10 Amp, SP, 5 kA circuit breaker off existing earth leakage unit for new plug circuit for access control

#### 17. SCHEDULE OF LIGHT FITTINGS

The light fittings and accessories are to be according to the quality specifications in Part 3 and shall be approved by the Department.

Type B1: Surface mounted, enclosed decorative fluorescent luminaire, complete with prismatic

diffuser and 2 x 36W lamps. *Existing Fitting only*

Type G1: **Existing Fitting:** Round Bulkhead luminaire with die cast aluminium base and black die cast aluminium decorative trim and opal diffuser, complete with 2 x PL 9W lamps.  
**New Fitting:** Round LED Bulkhead luminaire with die cast aluminium base and die cast aluminium decorative trim and opal diffuser to match existing. Colour temp to be 4000 K. Trim on external fittings to be black. Trim on internal fittings to be white.

Type BEKA Series 31 LED 17W

Type G2: Round Bulkhead luminaire with high pressure die-cast aluminium body and opal diffuser and 21W warm white sealed LED compartment.

Type Beka Series 300 – 21W LED or equal and approved.

Type F1: Recessed LED downlight with aluminium heat sink, integral 10W LED lamp and driver, white die-cast aluminium trim, and opal diffuser. Beam angle to be 53°, and colour temperature to be 4000 K

Type Lighting Innovations Atom Diffuse 10W 4000K or equal and approved.

Type H1: LED recessed wall luminaire with charcoal-grey die-cast aluminium body and opal high-impact acrylic diffuser. To be rated IP65. To be supplied complete with galvanised steel mounting box. Power to be 6W, to provide >950 lm with a colour temperature of 4000K.

Type Regent Lotis Frame 6W LED or equal and approved.

Type H2: Wall mounted, round, narrow beam Up/Down light, with charcoal-grey die-cast aluminium body and IP65 rating. Light source to be 2 x 25W, 3000K, warm white LED, with 12° optic and integral driver.

Type Regent Beam Double LED 2x25W, 12° 3000K or equal and approved.

## 18. SCHEDULE OF POWER POINTS

BOARD	POWER POINT	TYPE	SIZE OF CABLES, CONDUIT AND WIRING	LOAD WATTS
DB-HQ2	On light circuit	<b>Extract Fan:</b> Wall mounted extract fan, duty 70 l/s, with wall sleeve and backdraught shutter. Model Xpelair EXC 9 or similar	20mm dia. conduit with 2 x 2.5mm <sup>2</sup> conductors and 2.5mm <sup>2</sup> earth wire	150
DB-HQ1	L1	Paraplegic Lift	16x25 EGA trunking and 20 mm dia. conduit with 2 x 4mm <sup>2</sup> conductors and 2.5mm <sup>2</sup> earth wire	2000

## 19. SCHEDULE OF WORK

### 19.1 Work Package A: Recreation Centre Ramp

19.1.1 No electrical work required for the access ramp.

### 19.2 Work Package B: Recreation Centre – Paraplegic Toilet

19.2.1 Lower light switch and replace fitting for Paraplegic Toilet:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting.
- Disconnect and remove existing light fitting and hand over to the prison maintenance department.
- Install a new light fitting in the position of the existing fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Builder to patch wall where chasing occurs.

19.2.2 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

### 19.3 Work Package C: Female Single Quarters - Guest Apartment

19.3.1 Supply and install foot lights to side of ramp:

- Supply and install all conduit, boxes, wiring and light fittings, to provide lighting on the sides of the ramp.
- All conduit shall be cast in concrete, or built in brickwork. Conduit shall be heavy duty 20mm diameter galvanised Bosal conduit. Conduit boxes shall be galvanised steel.
- Identify and make safe the existing parking area lighting circuit, and circuit the ramp lighting to the closest pole mounted light fitting.
- Conduit between the ramp and the pole shall be buried in ground, at a minimum depth of 300mm below finished ground level.

19.3.2 Lower light switch and replace fitting for Paraplegic Toilet:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting.
- Disconnect and remove existing light fitting and hand over to the prison maintenance department.
- Install a new light fitting in the position of the existing fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Builder to patch wall where chasing occurs.

19.3.3 Take load readings on the existing DB, and balance the loads across the phases.

19.3.4 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

### 19.4 Work Package D: Female Single Quarters - Guest Apartment 2

Convert existing entrance hall to new guest apartment. Modify access ramp on side of building.

19.4.1 Modifications to the existing installation:

- Identify the circuit, make safe, disconnect and remove the existing bulkhead luminaire in the entrance hall area (L2). This light point is to be re-used for the bedroom lighting.
- Make safe, disconnect and remove the existing light switches in the entrance area (S2 and S3). Also remove the conduit boxes. The builder is to make good the wall. Cut into the conduit at high level to provide access to the external luminaire (L1) wiring.
- Rewire the existing external bulkhead luminaire (L1) outside the existing entrance to the passage lights, via conduit in the ceiling space, and EGA trunking in the passage.

19.4.2 Supply and install bulkhead luminaire to side of ramp:

- Supply and install all conduit, boxes and wiring to provide lighting on the sides of the ramp, as shown on the plan. Supply and install a new bulkhead fitting in the position shown.
- All conduit shall be built or chased in brickwork. Conduit shall be 20mm diameter PVC conduit. The conduit shall be chased into the wall to inside the entrance way.

- Provide 16 x 16mm EGA trunking from the conduit, along the soffit of the slab, to the existing bulkhead fitting outside the door.
- Wire this bulkhead fitting to the existing bulkhead fitting (L3).

**19.4.3 Replace existing fittings with new:**

- Make safe, disconnect and remove existing light fittings numbered L1, L3, L4, L5 and L6 on the drawing. Hand over removed fittings to the maintenance department.
- Supply and install new bulkhead light fittings in existing positions.
- Disconnect and remove the existing light switch at the entrance, and install a new light switch.

**19.4.4 New Electrical Installation inside the apartment:**

- Supply and install 2 x new type G2 Bulkhead luminaires, fixed to the ceiling. Wire to the existing light point.
- Supply and install 2 x new 1 lever, 1 way light switches, at +1000 AFFL to the top of the cover plate, to switch the light fittings.
- Supply and install 2 x new double switched socket outlets, at +500 AFFL. Wire back to the existing DB. Install a new 20 Amp, SP, 5kA circuit breaker off an earth leakage unit, in the existing DB to supply this plug circuit.
- Provide a 5A socket outlet and conduit for the access control system, as shown on the detailed drawing. Circuit the socket outlet to the new plug circuit.
- All conduit in the guest apartment and for the access control shall be chased/built into brickwork, or run in the ceiling void, unless trunking is shown.
- Trunking shall be installed in the corner between the wall and the soffit of the slab.

19.4.4 Take load readings on the existing DB, and balance the loads across the phases.

19.4.5 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

**19.5 Work Package E: Existing Mess Building**

No electrical work required at the existing Mess building.

**19.6 Work Package F: Male Single Quarters - Guest Apartment**

Convert existing bedroom to new guest apartment. Provide new access ramp.

19.6.1 No electrical work required for the access ramp.

**19.6.2 Modifications to the existing installation:**

- Identify the circuit, make safe, disconnect and remove the existing switched socket outlet (P1), and the existing light switch (S4), in the bedroom, including the removal of all wiring, conduit in the wall, and the conduit boxes. This outlet and switch are on a wall which is to be demolished.
- Lower light switches S1 and S3: Identify the circuit, and make safe the existing light circuit for the passage lighting and all lighting in the area to be modified (L4, L5 and L6). Remove the existing light switches S1 and S3, including the conduit box and wiring between the switches and light fittings. Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate. Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Replace existing luminaires: Make safe, disconnect and remove the existing light fittings L1, L2 and L3, and hand over to the maintenance department. Supply and install new fittings in existing positions.
- Disconnect and remove the existing light switch in the passage (S2), including the removal of all wiring, conduit in the wall, and the conduit boxes.
- Make safe, disconnect and remove existing light fittings L4, L5 and L6, and hand over to the maintenance department.

#### 19.6.2 New Electrical Installation:

- Supply and install new type G2 fittings, in positions as indicated, once the ceiling has been installed. Supply and install an additional type G2 fitting in the bedroom
- Supply and install a new light switch for the bathroom lighting, at +1000 AFFL, in the position as shown. Conduit is to be built in the wall, up to ceiling level, and then to run in the ceiling void to the light fittings.
- Supply and install 2 x new double switched socket outlets, at +500 AFFL. Wire back to the existing DB. Install a new 20 Amp, SP, 5kA circuit breaker off an earth leakage unit, in the existing DB to supply this plug circuit.
- Provide a 5A socket outlet and conduit for the access control system, as shown on the detailed drawing. Circuit the socket outlet to the new plug circuit.
- Supply and install a new bulkhead luminaire (Type G1) on external wall, at height to match existing, in position shown.
- All conduit in the guest apartment and for the access control shall be chased/built into brickwork, or run in the ceiling void. The passages have a 600 x 1200mm grid lay-in ceiling.

19.6.3 Take load readings on the existing DB, and balance the loads across the phases.

19.6.4 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

#### 19.7 Work Package G: Clinic

##### 19.7.1 Paraplegic Toilet:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting. This wall is to be demolished.
- Disconnect and remove the existing light fittings, and hand over to the maintenance department.
- Move one existing light point, to middle of room. 1 x existing light fitting is to remain in position. Add 1 x new light point in position as shown.
- Supply and install 3 x new light fittings in the positions shown.
- Supply and install 2 x 1 lever, 1 way light switches, including conduit box, conduit and wiring. Rewire the lighting circuit to suit switching arrangement as shown.
- Builder to patch wall where chasing occurs.

19.7.2 Take load readings on the existing DB, and balance the loads across the phases.

19.7.3 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

#### 19.8 Work Package H: Entrance Gate

19.8.1 No electrical work required for the access ramps or parking.

##### 19.8.2 Paraplegic Toilet 1:

- Make safe existing light circuit.
- Remove existing light switch, conduit box and wiring.
- Builder to patch wall where existing light switch box was situated.
- Disconnect and remove existing light fitting (base and lamp only).
- Supply and install new bulkhead fitting - Type G1, in the centre of the room. Connect to the existing light point.
- Supply and install a new 1 lever, 1 way light switch in the position as shown on the drawing. The conduit box is to be mounted flush in the wall, and the conduit shall be chased in the wall from the light switch to the ceiling void. Provide conduit in the ceiling void to the light fitting.

##### 19.8.3 Paraplegic Toilet 2:

- Make safe existing light circuit.
- Remove existing light switch, conduit box and wiring.
- Builder to patch wall where existing light switch box was situated.

- Disconnect and remove the existing cord, which used to supply the light fitting.
- The builder shall install a new ceiling to replace the existing, which has collapsed.
- Supply and install new bulkhead fitting - Type G1, in the centre of the room. Connect to the existing light point.
- Supply and install a new 1 lever, 1 way light switch in the position as shown on the drawing. The conduit box is to be mounted flush in the wall, and the conduit shall be chased in the wall from the light switch to the ceiling void. Provide conduit in the ceiling void to the light fitting.

19.8.4 Take load readings on the existing DB, and balance the loads across the phases.

19.8.5 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

## 19.9 Work Package I: Logistics

19.9.1 No electrical work required for the access ramps.

19.9.2 Lower light switch and replace fitting for Paraplegic Toilet:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting.
- Disconnect and remove existing light fitting and hand over to the prison maintenance department.
- Install a new light fitting in the position of the existing fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Builder to patch wall where chasing occurs.

19.9.3 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

## 19.10 Work Package J: Juvenile Block

19.10.1 Lower light switch and replace fitting for Juvenile Staff Paraplegic ablution:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting.
- Disconnect and remove existing light fitting and hand over to the prison maintenance department.
- Install a new light fitting in the position of the existing fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Builder to patch wall where chasing occurs.

19.10.2 Juvenile Visitors Paraplegic Ablution:

- Supply and install a new Type G1 bulkhead luminaire on the wall at +2500 AFFL, in the position as shown.
- Identify and make safe existing light circuit. Remove existing light switch, conduit box, conduit and wiring between switch and light fitting. This is on a wall which is to be demolished and rebuilt.
- Disconnect and remove the two existing bulkhead fittings and hand over to the maintenance department. Supply and install 2 x new type G1 bulkhead fittings in the existing positions.
- Supply and install new conduit box and 2 lever, 1 way light switch. Wire the paraplegic ablution light fitting to the new switch. Circuit to the existing light fitting, and provide switching as shown.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate, and midway between door openings.
- All conduit shall be built in new walls and chased in existing walls.
- Builder to patch wall where chasing occurs.

19.10.3 Take load readings on the existing DB, and balance the loads across the phases.



19.10.4 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

**19.11 Work Package K1: Admin Block - Lower Ground Floor – Paraplegic Toilet**

19.11.1 Lower light switch and replace fitting for Juvenile Staff Paraplegic ablution:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting.
- Disconnect and remove existing light fitting and hand over to the prison maintenance department.
- Install a new light fitting in the position of the existing fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Builder to patch wall where chasing occurs.

**19.12 Work Package K2: Admin Block - Lift Lobbies & Lift Shaft**

19.12.1 Electrical supply to new lift:

- Supply and install 1 x 16 Amp, single phase, 5 kA, circuit breaker into the existing DB-HQ1, on the Maintained Supply side, directly off the busbars for the new Lift power supply.
- Run a 2 x 4mm<sup>2</sup> conductors + 2.5mm<sup>2</sup> EW from the new circuit breaker to the isolator in the Lift controller. The wiring shall run inside 16 x 25mm EGA trunking, which shall be fixed to the soffit of the slab above, along the route shown. Where the wiring enters the lift lobby, it shall run in conduit in the ceiling void.
- Supply and install a new 20A DP isolator, surface mounted adjacent to the lift controller.
- Connect the supply to the isolator in the lift controller unit.

19.12.2 Lighting to Lift Lobbies:

- Supply and install LED downlighters in the lift lobbies, including all wiring, conduit, boxes and light fittings.
- Lower Ground floor: Identify and make safe existing lighting circuit in the Waiting room. Circuit the lower ground floor lobby lighting to this circuit.
- Ground Floor: Identify and make safe existing lighting circuit in the Registry office. Circuit the ground floor lobby lighting to this circuit.
- First Floor: Identify and make safe existing lighting circuit in the HR office. Circuit the ground floor lobby lighting to this circuit.
- Supply and install a PIR occupancy sensor in each lift lobby to switch the lighting.

19.12.3 Electrical supply to access control doors:

- Supply and install 1 x 10 Amp, single phase, 5 kA, circuit breaker into the existing DB-HQ1, on the Maintained Supply side, off an existing earth leakage unit for the access control doors.
- Run a 2 x 2.5mm<sup>2</sup> conductors + 2.5mm<sup>2</sup> EW from the new circuit breaker to the socket outlets for the door controllers. The cable shall run with the lift supply cable.
- Supply and install all conduit, conduit boxes, wiring and 5 Amp unswitched socket outlets for the access control system as shown on the detailed drawing.

19.12.4 External Lighting:

- Identify, make safe, disconnect and remove the existing balcony light fittings in positions to be occupied by the new lift lobbies. Hand the light fitting over to the maintenance department. Use the light point conduit box as a junction box to connect the wiring from either side of the removed light fitting.
- Supply and install all conduit, boxes, wiring and new Type H2 Up/Down lights on external face of lift shaft, at +6900mm AFFL to the centre of the fitting.
- Identify and make safe the existing balcony lighting circuit on the upper ground floor, and circuit the new up/down lights to this circuit.

19.12.5 All conduit for the access control and lighting shall be chased/built into brickwork, or run in the ceiling void, unless trunking is shown.

- 19.12.6 Access control to be supplied and installed by a specialist subcontractor, to the three lift lobby doors.
- 19.12.6 Take load readings on the existing DB, and balance the loads across the phases.
- 19.12.7 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

**19.13 Work Package K-3: Admin Block – Access Ramps**

- 19.13.1 Supply and install foot lights to side of ramp:
  - Supply and install all conduit, boxes, wiring and light fittings, to provide lighting on the sides of the ramp, as shown on the plan.
  - All conduit shall be cast in concrete, or built in brickwork. Conduit shall be heavy duty 20mm diameter galvanised Bosal conduit. Conduit boxes shall be galvanised steel.
  - Identify and make safe the existing external lighting circuit, and circuit the ramp lighting to the closest existing light fitting, in the position shown.
  - Conduit between the ramp and the existing light fitting shall be chased into the slab and up the column. Builder to make good all chasing.

**19.14 Work Package K-4: Admin Block – Upper Ground Paraplegic Toilets**

- 19.14.1 Modifications to the existing ablutions installation:
  - Identify and make safe the existing lighting circuit. Disconnect and remove the existing fluorescent luminaire at the entrance to the ablutions. This light fitting is to be re-used in the paraplegic toilet.
  - Make safe, disconnect and remove the existing light switch at the entrance. Also remove the conduit box and wiring. This wall is to be demolished.
- 19.14.2 New Paraplegic ablutions Electrical Installation:
  - Supply and install 1 x new type G1 Bulkhead luminaire, in position as shown, circuit to the existing fluorescent light fitting in the male ablutions.
  - Re-install the existing fluorescent from the entrance into the new paraplegic toilet as shown.
  - Supply and install 2 x new 1 lever, 1 way light switches, flush mounted, at +1000 and +1400 AFFL to the top of the cover plate, to switch the light fittings. The conduit to these switches shall be chased into the existing brickwork, and build into the new brickwork.
  - Supply and install 1 x new 20 Amp, double pole isolator, adjacent to the extract fan in the paraplegic toilet. Circuit to the light fitting.
  - Supply and install a Wall mounted extract fan, duty 70 l/s, with wall sleeve and backdraught shutter, type Model Xpelair EXC 9 or similar and connect to the isolator.
  - All wiring shall be installed under ceiling strips, or in conduit to light switches.
- 19.14.3 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

**19.15 Work Package K-5: Admin Block – Refuge Areas**

Provide lighting in new refuge areas on Ground Floor and First Floor.

- 19.15.1 Lighting to Refuge area - GF:
  - Supply and install wall mounted bulkhead luminaires, including all wiring, conduit, boxes and light fittings.
  - Identify and make safe existing lighting circuit in the Passage. Circuit the ground floor refuge area lighting to this circuit.
- 19.15.2 Lighting to Refuge area - FF:
  - Supply and install wall mounted surface fluorescent fitting, including all wiring, conduit, boxes and light fittings.
  - Identify and make safe existing lighting circuit in the Passage. Circuit the first floor refuge area lighting to this circuit.

19.15.3 All conduit for the access control and lighting shall be chased/built into brickwork, or run in the ceiling void, unless trunking is shown.

19.15.4 Take load readings on the existing DB, and balance the loads across the phases.

19.15.5 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

#### 19.16 **Work Package L: Medium C Block**

19.16.1 Lower light switch and replace fitting for Staff Paraplegic abluion:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting.
- Disconnect and remove existing light fitting and hand over to the prison maintenance department.
- Install a new light fitting in the position of the existing fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Builder to patch wall where chasing occurs.

19.16.2 Medium C Visitors Paraplegic Ablution:

- Modify the wiring of the circuit to change the existing switching to the new arrangement as shown on the drawing.
- Supply and install a new 1 lever, 1 way light switch for the paraplegic abluion. Conduit is to be chased into the wall.
- Builder to patch wall where chasing occurs.

19.16.3 Take load readings on the existing DB, and balance the loads across the phase.

19.16.4 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

#### 19.17 **Work Package M: Medium B Block**

19.17.1 No electrical work to new ramp.

19.17.2 Lower light switch and replace fitting for Staff Paraplegic abluion:

- Identify and make safe existing light circuit.
- Remove existing light switch, conduit box and wiring between switch and light fitting.
- Disconnect and remove existing light fitting and hand over to the prison maintenance department.
- Install a new light fitting in the position of the existing fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the new switch to the light fitting.
- Builder to patch wall where chasing occurs.

19.17.3 Medium B Visitors Paraplegic Ablution:

- Identify and make safe existing light circuit. Remove existing light switch, conduit box and wiring between switch and light fitting.
- Chase conduit in wall to new light switch position, at lower level of +1000 AFFL to top of switch cover plate, and 150mm from door frame.
- Supply and install new conduit box and 1 lever, 1 way light switch. Wire the paraplegic abluion light fitting to the new switch.
- Builder to patch wall where chasing occurs.

19.16.4 Take load readings on the existing DB, and balance the loads across the phases.

19.6.2 Test and commission the installation. Provide a Certificate of Compliance as per SANS 10142.

## 20. ACCESS CONTROL

The access control system shall be supplied and installed as a complete system. The access control shall be installed by a specialist subcontractor.

The system shall comprise a controller, readers, push-to-exist button, break-glass unit, transformer and power supply, mag lock and all wiring and accessories. The door closer shall be supplied by others. The difference between the single door system and the double door system shall be the quantity of wiring required, as only one side of the double door shall be controlled.

### 20.1 Admin Building

The access control system shall be type IMPRO – Access Portal Lite (HCW935-0-0-GB) or equal and approved.

The system shall control the three doors to the paraplegic lift lobbies.

The three doors shall be clustered to a Portal Lite controller. The controller shall have an onboard LCD for tag programming and database management.

The controller shall be supplied with a Wiegand reader module (HMW901-0-0-GB), and two additional reader modules are to be supplied for add on to the cluster controller. The controller shall also be provided with a 12 V dc, 7.2 Ah Battery.

The keypads shall be type IMPRO MDK: HRW901-5-0-GB keypad readers with passive proximity and code input.

Emergency, green, resettable break glass units shall be installed inside each lift lobby to enable egress in the event of a malfunction. (Code PT-FR02)

The system shall be supplied complete with a mag lock, complete with a Z-bracket. The mag lock shall be the 300kg unit with LED indication. The bracket shall be type ZL600.

### 20.2 Guest Rooms

The access control to the guest rooms shall be by means of a smart lock, with access code, type Smartguard Keypad Black LK91-5 or equal and approved.

The external units shall be supplied complete with a Rainshield for Smartguard, LK90-2.

The units shall be supplied complete with a PS49-3 3 Amp, 12V dc power supply, and a 12 V dc, 7.2 Ah battery.

Emergency, green, resettable break glass units shall be installed inside each secure space to enable egress in the event of a malfunction. (Code PT-FR02).

The system shall be supplied complete with a mag lock, complete with a Z-bracket. The mag lock shall be the 300kg unit with LED indication. The bracket shall be type ZL600.

## 21. AUTOMATIC FIRE DETECTION SYSTEM

The fire detection system shall be an automatic, addressable analogue system and shall comply fully with SANS 10139: 2003, as amended.

The system shall be installed in accordance with the specifications below and the drawings.

Fire detection is required in the existing Admin Building. The building shall be split into 5 separate zones, two each per floor for the Ground and Lower Ground Floors, and one zone for the First floor.

## 21.1 Equipment

All individual components of the system shall be mutually compatible, and shall conform to the relevant standards.

The system shall be an automatic, addressable analogue system of the type Ziton or other approved.

Model numbers for the equipment are:

Fire Panel:	ZP2-F2-99 Ziton ZP2 Fire Panel 2 Loop
Optical Sensors:	ZP730-2P
Heat Sensors:	ZP720-3P
Surface Mounting Base:	ZP7-SB1-P
Red Analogue Call Point:	ZP785-3
Sounder Beacon:	ZP755BV-4P
Mini Relay Unit:	A51E-1 A Series

All accessories shall be supplied to match the above items.

Fire rate wiring shall be used for the installation, and shall be run in the ceiling space, in conduit and wiring trunking. P 2000 trunking has been provided in the ceiling void on each floor. Conduit and trunking shall be supplied and installed by the electrical sub-contractor.

The system shall be provided with an automatic link to the Prison main security, by means of the telephone line. A fault warning shall be given in the event of failure on the lines or of the equipment.

Detector types shall consist of Ionisation detectors for general use, and heat detectors in the kitchens and plant rooms. All detectors shall be supplied complete with bases.

A two loop analogue addressable fire panel, including batteries shall be supplied and installed in the Reception. The fire panel shall have a mimic diagram printed on the front panel, with LED indicators. Drawings of the panel shall be submitted for approval prior to manufacture commencing.

Signals shall be provided to air conditioning units, to shut them down in the event of a fire.

## 22. EVACUATION AND PUBLIC ADDRESS

### 22.1 General

The quoted system shall comply to the SANS 7240 parts: 4 and 16, EN 54 parts: 4, 16 and 24, and/or BS 5839 part 8 Standards, whichever one applies, as specified below. Certification to be provided, where indicated.

The system shall be installed in accordance with the specification below and the drawings.

Fire detection is required in the existing Admin Building. The building shall be split into 5 separate zones, two each per floor for the Ground and Lower Ground Floors, and one zone for the First floor.

### 22.2 Equipment - General

The system shall include all key elements and features required for the full functioning of the system.

All equipment shall be Edwards EST range or other approved. Approval for alternative equipment shall be obtained in writing, in the form of an addendum to the tender, prior to tender closing.

Model numbers for the equipment are:

PAVA Unit:	Edwards EST-VES-4001-L Compliant Mini PAVA Unit, including rack, Fireman's Microphone, Battery Charger and Audio Input Module
Zone Microphone	EST-DMS
Fire Rated Speakers:	EST-S206B

All accessories shall be supplied to match the above items.

**PART 3: QUALITY SPECIFICATION FOR MATERIALS AND EQUIPMENT OF ELECTRICAL INSTALLATIONS**

*"Part 3: Quality specification for materials and equipment" manual of the Department of Public Works is applicable for this Contract and the manual can be obtained from the Department of Public Works.*

*[ONLY ITEMS OF MATERIAL applicable to the Contract are Included in Part 3]*

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4.	Circular Type Boxes.....	
5.	Switch Boxes And Socket Outlet Boxes .....	
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## **PART 4: BILLS OF QUANTITIES**

### **PREAMBLE**

#### **TYPICAL ITEMS/PREAMBLES TO BE INSERTED IN THE BILLS OF QUANTITIES**

1. The conditions of contract and the application of the Contract Price Adjustment Provisions (if applicable) shall be as set out in Part A: Section 1: Preliminaries.
2. The descriptions in these bills of quantities shall be read in conjunction with the specification.
3. The unit rate for each item in the Bills of Quantities shall include for all materials, labour, profit, transport, etc., everything necessary for the execution and complete installation of the work in accordance with the description.
4. The Bills of Quantities shall not be used for ordering purposes. The Contractor shall check the lengths of cables and overhead conductors on site before ordering any of the cables. Any allowance for off-cuts shall be made in the unit rates.
5. The rates shall exclude Value-Added Tax and the total carried over to the final summary in PART A.
6. All material covered by this **Specification** shall, wherever possible, be of South African manufacture.

**WESTVILLE PRISON - PARAPLEGIC FACILITIES  
ELECTRICAL INSTALLATION**

**SCHEDULE OF QUANTITIES**

**BILL 1:**

Includes the following sub-installations:

- B: Recreation Centre - Paraplegic toilet
- C: Female Single Quarters - Guest apartment 1
- D: Female Single Quarters - Guest apartment 2
- F: Male Single Quarters - Guest apartment
- G: Clinic - Paraplegic toilet
- H: Entrance Gate - Paraplegic toilets
- I: Logistics - Paraplegic toilet
- J: Juvenile cell block - Paraplegic toilets
- K: Admin Building - Paraplegic lift, entrance ramp and toilets
- L: Medium C cell block - Paraplegic toilets
- M: Medium B cell block - Paraplegic toilets

Includes the following sections:

<u>Section:</u>	<u>Description:</u>
1	LV Distribution and Distribution Boards
2	Wireways & Wiring
3	Fittings & Outlets
4	Modifications to Existing Installation
5	Access Control
6	Fire Detection and Evacuation

**ELECTRICAL BILL OF QUANTITIES  
SECTION 1**

**LV DISTRIBUTION & DISTRIBUTION BOARDS**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
	<b>SECTION 1 : LV DISTRIBUTION &amp; BOARDS</b>						
1.1	<b>ELECTRICAL DISTRIBUTION BOARDS - CIRCUIT BREAKERS</b>  Supply, deliver and install the following circuit breakers into existing distribution boards including all jumpers, wiring, busbar extensions and connections. To include final circuit connection to DB, and conduit termination.						
1.1.1	20 Amp, single pole, 5 kA miniature circuit breaker installed on earth leakage unit in existing DB, for plug circuits	No	3				
1.1.2	16 Amp, single pole, 5 kA miniature circuit breaker installed directly off busbars in emergency section of DB-HQ1 for lift	No	1				
1.1.3	10 Amp, single pole, 5 kA miniature circuit breaker installed on earth leakage unit in emergency section of existing DB	No	2				
1.1.4	40 Amp, double pole, 5 kA miniature circuit breaker plus Earth Leakage unit installed in existing DB	No	1				
1.2	<b>GENERAL ITEMS</b>						
1.2.1	Update legend card in existing Distribution boards to include new circuit breakers.	-	Sum				
1.2.2	Balance loads in existing DBs, where the electrical load has increased overall.	No	13				
1.2.3	Certificates of Compliance for the new electrical installation for each DB in accordance with SANS 10142	No	13				
<b>Carried Forward to Summary of Sections</b>							

**ELECTRICAL BILL OF QUANTITIES**  
**SECTION 2**
**WIREWAYS AND WIRING**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
	<b>SECTION 2 : WIREWAYS AND WIRING</b>						
2.1	<b>CONDUIT</b>						
	<b>Supply and install PVC conduit, including bending, fixing, reaming and waste, fixed as specified:</b>						
2.1.1	20 mm diameter - built in brickwork	m	40				
2.1.2	20 mm diameter - fixed in ceiling void	m	165				
2.1.3	20 mm diameter - fixed in chase in brickwork or concrete, including chasing, but excluding making good.	m	70				
2.1.4	25 mm diameter - fixed in chase in brickwork or concrete, including chasing, but excluding making good.	m	10				
2.1.5	25 mm diameter - fixed in ceiling void	m	60				
	<b>Supply and install Galvanised Bosal conduit, including bending, fixing, reaming and waste, fixed as specified:</b>						
2.1.6	20 mm diameter - cast in concrete	m	40				
2.1.7	20 mm diameter - fixed to surface of wall or soffit of concrete slab	m	10				
2.1.8	25 mm diameter - fixed to surface of wall or soffit of concrete slab	m	120				
2.1.9	25 mm diameter - fixed in ceiling void	m	120				
2.2	<b>CONDUIT BOXES</b>						
	<b>Supply and install PVC conduit boxes, in brickwork, or in ceiling, including conduit terminations, but excluding cover plates.</b>						
2.2.1	60 mm round, 25 mm deep, for 20 or 25 mm diameter conduit, 1-, 2-, 3-, or 4-way or back entry as required	No	50				
2.2.2	60 mm round, 60 mm deep, for 20 or 25 mm diameter conduit, 1-, 2-, 3-, or 4-way or back entry as required	No	30				
2.2.3	100 x 50 mm x 50 mm deep	No	30				
2.2.4	100 x 100 mm x 50 mm deep	No	14				
Carried Forward to next page							

ELECTRICAL BILL OF QUANTITIES  
SECTION 2

## WIREWAYS AND WIRING

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
Brought Forward							
2.2.5	100 x 200mm surface mounted box, powder coated white, fixed to wall, or in ceiling void.	No	5				
2.2.6	410 x 410 x 165mm polyester enclosure, flush mounted in brickwork.  <b>Supply and install galvanised steel conduit boxes, in brickwork, or in ceiling, including conduit terminations, but excluding cover plates.</b>	No	2				
2.2.1	60 mm round, 25 mm deep, for 20 or 25 mm diameter conduit, 1-, 2-, 3-, or 4-way or back entry as required	No	5				
2.2.2	60 mm round, 60 mm deep, for 20 or 25 mm diameter conduit, 1-, 2-, 3-, or 4-way or back entry as required  Supply and install epoxy powder coated steel cover plates for conduit boxes	No	122				
2.2.7	Oversize cover for 60mm round conduit box	No	25				
2.2.8	100 x 100mm	No	5				
2.2.9	Supply and install a Terminal block inside a conduit box for L,N & E conductors	No	30				
2.3	<b>PVC TRUNKING</b>  Supply and install white PVC trunking fixed to surface of walls or soffit of slab, including all bends, ends, Tees and cross pieces.						
2.3.1	25 x 40 mm trunking	m	110				
2.3.2	25 x 40mm internal angle	No	12				
2.3.3	25 x 40mm external angle	No	4				
2.3.4	25 x 40mm Tee piece	No	2				
2.3.5	25 x 40mm flat angle	No	2				
2.3.6	16 x 25 mm trunking	m	20				
2.3.7	16 x 25mm internal angle	No	2				
2.3.8	16 x 25mm flat angle	No	2				
2.3.9	48 x 13 mm half-moon trunking (for ceiling strip)	m	30				
Carried Forward to next page							

**ELECTRICAL BILL OF QUANTITIES**  
**SECTION 2**
**WIREWAYS AND WIRING**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
Brought Forward							
<b>2.4</b>	<b>STEEL TRUNKING</b>						
	Supply and install galvanised steel trunking, with PVC cover plates, fixed to surface of walls or soffit of slab, including all bends, ends, Tees and cross pieces.						
2.4.1	P2000 Trunking	m	165				
2.4.2	P2000 internal angle - 90°	No	1				
2.4.3	P2000 external angle - 170°	No	4				
2.4.4	P2000 Tee piece	No	4				
<b>2.5</b>	<b>CONDUCTORS</b>						
	Supply and install PVC insulated conductors in required colours, drawn into conduit.						
2.5.1	2.5 mm <sup>2</sup> insulated EW	m	710				
2.5.2	2.5 mm <sup>2</sup>	m	460				
2.5.3	4 mm <sup>2</sup>	m	270				
2.5.4	2.5 mm <sup>2</sup> x 3 core Surfex	m	60				
2.5.5	4 mm <sup>2</sup> x 3 core Surfex	m	60				
<b>2.6</b>	<b>DRAW WIRE</b>						
	Supply and Install galvanised draw wire, drawn into conduit.						
2.6.1	Draw wire	m	310				
<b>2.6</b>	<b>SUNDRIES</b>						
2.6.1	Earthing of the complete installation	-	Sum				
2.6.2	Test and Commission the complete installation as included in this section	-	Sum				
<b>Carried Forward to Summary of Sections</b>							

Bill 1: Electrical Installation

**ELECTRICAL BILL OF QUANTITIES**  
**SECTION 3**

**FITTINGS AND OUTLETS**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
	<b><u>SECTION 3 : FITTINGS AND OUTLETS</u></b>						
3.1	<b>SWITCHES</b>  Supply and Install Switches as specified, including steel cover plate, fixings and all accessories. Connect up switch.						
3.1.1	16 Amp, 1 lever, 1 way light switch - flush	No	21				
3.1.2	16 Amp, 2 lever, 1 way light switch - flush	No	1				
3.1.3	16 Amp PIR occupancy sensor - recessed in ceiling	No	3				
3.2	<b>LIGHT FITTINGS</b>  Supply, deliver and install Light Fittings, including control gear, transformers, lamps and all accessories, as specified. Connect up light fitting.						
3.2.1	Type F1 - recessed LED downlight	No	6				
3.2.2	Type G1 - surface decorative bulkhead	No	24				
3.2.3	Type G2 - surface decorative bulkhead	No	10				
3.2.4	Type H1 - recessed LED bricklight	No	9				
3.2.5	Type H2 - Up/down narrow beam wall light	No	2				
3.3	<b>SOCKET OUTLETS</b>  Supply and install Socket Outlets as specified, including cover plate, fixings and all accessories. Connect up socket outlet.						
3.3.1	16 Amp, double Switched Socket Outlet in flush wall box (164-1 + 164-2 outlets)	No	4				
3.3.2	5 Amp, Unswitched Socket Outlet in a flush 60mm round conduit box	No	5				
3.3.3	16 Amp, dedicated Red SSO in flush wall box	No	2				
Carried Forward to next page							

ELECTRICAL BILL OF QUANTITIES  
SECTION 3

## FITTINGS AND OUTLETS

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
Brought Forward							
<b>3.4</b>	<b>GENERAL PURPOSE ISOLATORS</b>						
	Supply and install Isolators as specified, including cover plate, fixings and all accessories. Connect up Isolator.						
3.4.1	20 Amp, DP Isolator - flush mounted in wall complete with cabtyre connection to fan	No	3				
<b>3.5</b>	<b>EXTRACT FAN</b>						
	Supply and install a wall mounted extract fan, complete with wall sleeve and backdraught shutter. Connect up fan						
3.5.1	Xpelair EXC 9: duty 70 l/s	No	1				
<b>3.6</b>	<b>ELECTRICAL CONNECTIONS</b>						
3.6.1	Provide electrical connection to lift. Lift Isolator to be supplied and installed by others in lift shaft. Include all terminations	No	1				
<b>3.8</b>	<b>SUNDRIES</b>						
3.8.1	Earthing of the complete installation	-	Sum				
3.8.2	Test and Commission the complete installation as included in this section	-	Sum				
3.8.3	Three sets of O&M manuals	-	Sum				
Carried Forward to Summary of Sections							



**ELECTRICAL BILL OF QUANTITIES**  
**SECTION 4**

**MODIFICATIONS TO EXISTING INSTALLATIONS**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
	<b><u>SECTION 4 : MODIFICATIONS TO EXISTING INSTALLATIONS</u></b>						
4.1	<b>IDENTIFY AND MAKE SAFE</b>						
4.1.1	Identify existing circuits to be worked on, and make safe for duration of work.	No	35				
4.2	<b>MOVE LIGHT SWITCH DOWNWARD ONLY</b>						
4.2.1	Extra-over for Labour only to move a light switch to a lower position as detailed below, but excluding all materials measured elsewhere.  - remove existing light switch and conduit box - remove existing wiring between switch and light fitting - chase in wall to extend conduit to new light switch position at +1000 AFFL to top of switch cover plate. - install new conduit box and light switch - install new wiring between light switch and light fitting	No	2				
4.3	<b>MOVE LIGHT SWITCH DOWN AND SIDEWARDS</b>						
4.3.1	Labour only to move a light switch to a lower position to the side of the existing position, as detailed below, but excluding all materials measured elsewhere. - remove existing light switch and conduit box - remove existing wiring between switch and light fitting - exposed conduit in section of wall to be demolished, and terminated into a box above the door. - chase in wall to provide conduit to new light switch position at +1000 AFFL to top of switch, and 200mm from the door opening. - install new conduit box and light switch - install new wiring between light switch and light fitting	No	7				
Carried Forward to next page							

**ELECTRICAL BILL OF QUANTITIES  
SECTION 4**

**MODIFICATIONS TO EXISTING INSTALLATIONS**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
Brought Forward							
4.4	<b>REMOVE LIGHT SWITCH</b>						
4.4.1	Labour only to remove an existing light switch on a wall that is to be demolished. - remove existing light switch and conduit box - remove existing wiring between switch and light fitting - exposed conduit in section of wall to be demolished, and terminated into a box at the slab soffit or in the ceiling void.	No	10				
4.5	<b>REMOVE SWITCHED SOCKET OUTLET</b>						
4.5.1	Labour only to remove an existing SSO on a wall that is to be demolished. - remove existing SSO and conduit box - remove existing wiring between SSO and adjacent outlets - exposed conduit in section of wall to be demolished, and terminated into a box at the slab soffit or in the ceiling void. - rewire to adjacent outlets, using the box as a drawbox.	No	1				
4.6	<b>MOVE LIGHT POINT</b>						
4.6.1	Labour only to move an existing light point as detailed below, but excluding all materials measured elsewhere. - remove existing light fitting - terminate wiring to adjacent fittings into terminal blocks in the conduit box. - Install a cover plate of the conduit box. - provide conduit and wiring to new light fitting position, and reconnect to existing adjacent circuits.	No	1				
4.7	<b>REMOVE LIGHT FITTING</b>						
4.7.1	Labour only to remove an existing light fitting as detailed below, but excluding all materials measured elsewhere. - remove existing light fitting - terminate wiring to adjacent fittings into terminal blocks in the conduit box. - install a cover plate of the conduit box.	No	6				
Carried Forward to next page							

**ELECTRICAL BILL OF QUANTITIES  
SECTION 4**

**MODIFICATIONS TO EXISTING INSTALLATIONS**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
Brought Forward							
4.8	<b>REPLACE LIGHT FITTING</b>						
4.8.1	Labour only to remove an existing light fitting as detailed below, but excluding all materials measured elsewhere. - make safe, disconnect and remove existing light fitting - Hand over fitting to the Prison Maintenance department for their future use. - ensure wiring is safe for new fitting to be installed.	No	26				
4.8	<b>CONNECT NEW CIRCUIT TO EXISTING LIGHT FITTING - CEILING VOID</b>						
4.8.1	Labour only to connect a new light fitting or switch into an existing light circuit as detailed below, but excluding all materials measured elsewhere. - remove existing fitting or conduit box cover and terminate conduit for new light fitting or switch into existing conduit box of the existing light fitting. - connect new wiring to existing circuit.	No	9				
4.9	<b>CONNECT NEW CIRCUIT TO EXISTING LIGHT FITTING - SLAB SOFFIT</b>						
4.9.1	Labour only to connect a new circuit into an existing light fitting as detailed below, but excluding all materials measured elsewhere. - remove existing light fitting, and chase slab for entry of new conduit or trunking. - terminate conduit for new light fitting into existing conduit box of existing light fitting. - connect wiring to existing circuit. - reinstall existing light fitting	No	16				
Carried Forward to next page							

**ELECTRICAL BILL OF QUANTITIES  
SECTION 4**

**MODIFICATIONS TO EXISTING INSTALLATIONS**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
Brought Forward							
4.11	<b>MODIFY SWITCHING CIRCUIT</b> Labour only to rewire a lighting circuit to exclude an existing light fitting from the switching circuit, so that it can be switched individually, or as part of another circuit, as detailed on the drawings						
4.11.1	Female guest apartment 2	-	Sum				
4.11.2	Juvenile Cell Block - Visitor's toilet	-	Sum				
4.11.3	Medium C Cell Block - Visitor's toilet	-	Sum				
4.12	<b>STRIPPED MATERIALS</b>						
4.12.1	Hand over existing light fittings that have been removed to the Maintenance department	No	3				
4.12.2	Remove from site all other materials stripped from the existing installations.	-	Sum				
<b>Carried Forward to Summary of Sections</b>							

**ELECTRICAL BILL OF QUANTITIES  
SECTION 5**

**ACCESS CONTROL**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
5.1	<b>SMART KEYPAD - STAND ALONE DOORS</b> Supply and Install stand-alone access control systems to three doors						
5.1.1	Smartguard Keypad (LK91-5)	No	4				
5.1.2	Rainshield for Smartguard Keypad (LK90-2)	No	2				
5.1.3	3 Amp, 12 Vdc Power Supply (PS49-3)	No	2				
5.1.4	12 Vdc 7.2 Ah Battery	No	2				
5.2	<b>IMPRO PORTAL LITE - CLUSTER DOORS</b>						
5.2.1	Impro Portal Lite Cluster Controller with LCD, Entrolment reader & 1 x Wiegand Reader Module (HCW935-0-0-GB)	No	1				
5.2.2	Wiegand Reader Module - IPS (HMW901-0-0-GB)	No	2				
5.2.3	MDK Multi-Discipline Keypad Reader (HRW901-5-0-GB)	No	6				
5.1.4	12 Vdc 7.2 Ah Battery	No	3				
5.3	<b>BREAKGLASS UNITS</b>						
5.3.1	Emergency Green Break-glass unit, resettable (PT-FR02)	No	5				
5.4	<b>MAG LOCKS</b>						
5.4.1	Mag-lock 300 kg with LED indication	No	5				
5.4.2	Z Bracket for the above mag-lock (ZL800)	No	5				
5.5	<b>CABLING</b>						
5.5.1	Maylar Screened Cable	m	300				
5.5.2	1mm Ripcord	m	150				
5.6	<b>GENERAL</b>						
5.6.1	Programming, testing and commissioning of the Access Control system	No	5				
5.6.2	Training of staff	-	Sum				
5.6.3	Provide 3 sets of O&M Manuals	-	Sum				
5.6.4	Health and Safety plan and Contract Management	-	Sum				
<b>Carried Forward to Summary of Sections</b>							

**ELECTRICAL BILL OF QUANTITIES  
SECTION 6**

**FIRE DETECTION AND EVACUATION**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
<b>6.1</b>	<b>FIRE ALARM PANEL</b>  Supply and install the addressable fire alarm panels, including all power supplies, network cards, batteries, fixings, accessories and wiring terminations, as specified.						
6.1.1	ZP2-F2-99 Zlton ZP2 Fire Panel 2 Loop	No	1				
6.1.2	ZP2-ZI-40 Zlton ZP2 40 zone LED card	No	1				
6.1.3	12 Vdc 18 Ah Battery	No	4				
6.1.4	Zlton ZP-L1 address labels	No	1				
<b>6.2</b>	<b>FIELD EQUIPMENT</b>  Supply and install all field equipment, including fixings, accessories and wiring terminations. All equipment to be Zlton.						
6.2.1	Optical Sensor	No	54				
6.2.2	Heat Sensor	No	1				
6.2.3	Surface Mounting base	No	55				
6.2.4	Red Manual call points	No	8				
6.2.5	Surface mount box, red with earth connector	No	8				
6.2.6	Hinged call point cover	No	8				
6.2.7	Resettable element for Manual Call points	No	8				
6.2.8	Base Sounder Beacon	No	11				
6.2.9	Pluggable base	No	11				
6.2.10	Mini-relay unit (AHU)	No	2				
6.2.11	Surface box for module, IP66	No	2				
<b>6.3</b>	<b>FIRE DETECTION CABLING</b>						
6.3.1	PH30 Cable, 1mm Red Fire cable	m	1346				
<b>Carried Forward to next page</b>							

**ELECTRICAL BILL OF QUANTITIES  
SECTION 6**

**FIRE DETECTION AND EVACUATION**

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY	RATE INSTALL	TOTAL	AMOUNT
Brought Forward							
6.4	<b>VOICE EVACUATION (Compliant System)</b> Supply and install the head-end equipment including the Amp, Fireman's Microphone, Battery charger and audio input module, and including the rack and cabinet						
6.4.1	Edwards Compliant Mini PAVA Unit, 320W Amp & 320W Standby Amp, EST-VES-4001-L, including Rack, Fireman's Microphone, Battery Charger & Audio Input Module, as specified	No	1				
6.4.2	Zone Microphone	No	1				
6.4.3	12V 45 AH Battery	No	4				
6.5	<b>SPEAKERS &amp; CABLING</b> Supply and install all field equipment, including fixings, accessories and wiring terminations.						
6.5.1	Fire rated Ceiling Speaker	No	48				
6.5.2	Cutting of holes for speakers in existing ceilings	No	48				
6.5.3	PH30 Cable 1mm White Fire Cable	m	1346				
6.5.4	Cat-5e Cable	m	30				
6.5	<b>GENERAL</b>						
6.5.1	Programming of the Fire panel as per client requirements	--	Sum				
6.5.2	Programming of the Action Event log	--	Sum				
6.5.3	Programming of the Voice Evacuation system	--	Sum				
6.5.4	Test and Commission the Fire Detection and Evacuation systems in accordance with applicable regulations	--	Sum				
6.5.5	Certificate of Compliance for the works	--	Sum				
6.5.6	Training of staff	--	Sum				
6.5.7	Provide 3 sets of O&M Manuals	--	Sum				
6.5.8	Health and Safety plan	--	Sum				
6.5.9	Contract Management and Supervision	--	Sum				
Carried Forward to Summary of Sections							

**WESTVILLE PRISON - PARAPLEGIC FACILITIES**

**ELECTRICAL INSTALLATION**

**SUMMARY OF SECTIONS**

<b>SECTION NO</b>	<b>DESCRIPTION</b>	<b>AMOUNT</b>
1	<b>SECTION 1 : LV DISTRIBUTION &amp; DISTRIBUTION BOARDS</b> Brought forward from page 2	
2	<b>SECTION 2 : WIREWAYS AND WIRING</b> Brought forward from page 5	
3	<b>SECTION 3 : FITTINGS AND OUTLETS</b> Brought forward from page 7	
4	<b>SECTION 4 : MODIFICATIONS TO EXISTING INSTALLATIONS</b> Brought forward from page 11	
5	<b>SECTION 5 : ACCESS CONTROL</b> Brought forward from page 12	
6	<b>SECTION 6 : FIRE DETECTION &amp; EVACUATION</b> Brought forward from page 14	
<b>TOTAL BILL 1 : ELECTRICAL INSTALLATION</b> Carried forward to Summary of Bills		



## **PART 5: ELECTRICAL WORK MATERIAL SCHEDULE**

The Contractor shall complete the following schedules and submit them to the Representative/Agent within 21 days of the date of the acceptance of the tender.

The schedules will be scrutinised by the Representative/Agent and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

**NB:** Only one manufacturer's name to be inserted for each Item.

<b>Item</b>	<b>Material</b>	<b>Make or trade name</b>	<b>Country of origin</b>
1.	Circuit breakers 1P, 2P, 3P		
2.	Conduit		
3.	Conduit boxes		
4.	16A flush switches		
5.	16A flush socket outlets		
	<b>Luminares</b>		
6.	Type F1		
7.	Type G1		
8.	Type G2		
9.	Type H1		
10.	Type H2		
11.	Extract Fan		
12.	Access Control System		

ANNEXURE A

**SCHEDULE OF IMPORTED MATERIALS AND EQUIPMENT TO BE COMPLETED BY TENDERER**

<b>Item</b>	<b>Material/Equipment</b>	<b>Rand (R) (Excluding VAT)</b>
1		
2		
3		
4		
5		
6		

The Contractor shall list imported items, materials and/or equipment, which shall be excluded from the Contract Price Adjustment Provisions (if applicable) and shall be adjusted in terms of currency fluctuations only. Copies of the supplier's quotations for the items, materials or equipment (provided that such costs shall not be higher than the relevant contract rate as listed above) should be lodged with the Representative/Agent of the Department within 60 (sixty) days from the date of acceptance of the tenders. No adjustment of the local VAT amount, nor the contractor's profit, discount, markup, handling costs, etc shall be allowed.

These net amounts will be adjusted as follows

**FORMULA:**

The net amount to be added to or deducted from the contract sum:

$$A = V \left( \frac{Z}{Y} - 1 \right)$$

A = the amount (R) of adjustment

V = the net amount (supplier's quotation) (R) of the imported item

Y = exchange rate at the closing date of tender submission

Z = exchange rate on the date of payment.

**PARTICULARS OF ELECTRICAL CONTRACTOR**

**ONLY REGISTERED ELECTRICAL CONTRACTORS WILL BE APPOINTED FOR ELECTRICAL WORK.**

(To be completed by tenderers and submitted together with the tender form. Failure to submit this form will result in the tender being disqualified.)

TENDER NO: \_\_\_\_\_ REFERENCE: \_\_\_\_\_

SERVICE: \_\_\_\_\_

NAME OF ELECTRICAL CONTRACTOR: \_\_\_\_\_

ADDRESS \_\_\_\_\_

ELECTRICAL CONTRACTOR'S REGISTRATION NUMBER AT THE ELECTRICAL CONTRACTING BOARD OF S.A.:

\_\_\_\_\_

\_\_\_\_\_  
DATE

\_\_\_\_\_  
SIGNATURE OF TENDERER

## **PART 6: DRAWINGS**

<b>DRAWING NUMBER</b>	<b>DESCRIPTION</b>
EE10414-BI-01	B: Recreation & I: Logistics – Electrical Layout
EE10414-C-01	C: Female Single Quarters – Guest Apartment 1 – Electrical Layout
EE10414-D-01	D: Female Single Quarters – Guest Apartment 2 – Electrical Layout
EE10414-F-01	F: Male Single Quarters – Guest Apartment – Electrical Layout
EE10414-GJ-01	G: Clinic & J: Juvenile Cell Block – Electrical Layout
EE10414-H-01	H: Entrance Building – Electrical Layout
EE10414-K-01	K: Admin Lower Ground Paraplegic Toilet – Electrical Layout
EE10414-K-02	K: Admin Lift Lobbies & Lift Shaft – Electrical Layout
EE10414-K-03	K: Admin Access Ramp & Upper Ground Paraplegic Toilet – Electrical Layout
EE10414-K-04	K: Admin Refuge Areas – Electrical Layout
EE10414-LM-01	L: Medium B Cell Block & M: Medium C Cell Block – Electrical Layout
EE10414-S-01	Site Plan
EE10414-S-02	Access Control Details
EE10414-K-01	Lower Ground Floor – Electrical Installation
EE10414-K-05	Admin Block – Fire Detection Installation



