Project Number : XDN.E.0037

Project : Port of Durban, Refurbishment of Queens Warehouse

Document Title : Works Information

Discipline : Electrical Lighting and Power

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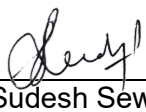
| **Prepared by**: | | | 24/07/2026 |
| | Zahra Docrat | Engineer | Date |
| **Reviewed by**: | | | 24/07/2026 |
| | Phila Mkhize | Technician | Date |
| **Approved by:** |  | | 24/07/2026 |
| | Sudesh Sewdayal | Senior Engineer | Date |

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| 0A | 2024-11-05 | Issued for Tender |
| **Rev** | **Date** | **Revision Details** |

## 4.3 Electrical Engineering Works

### 4.3.1 Scope of Work

The scope to be carried out by the *Contractor* at Queens Warehouse shall include but not be limited to the following:

- Dismantling and stripping of existing electrical equipment including lights, socket outlets, conduit and associated electrical installation where indicated.
- Supply, delivery and installation of exterior luminaires.
- Supply, delivery and installation of interior luminaires for all buildings and facilities.
- Supply, delivery and installation of cabling, distribution boards, wire ways and associates.
- Supply, delivery and installation of new earthing test points and associates for existing lightning protection system.
- Commissioning and testing of the entire installation and hand over to the Employer.

If required, the *Contractor* may undertake designs and submit them to the *Employer's* responsible personnel for approval. The high-level designs by the *Employer*, which illustrates the overall design methodology, is detailed and shown in the drawings and specifications accompanying this document. The *Contractor* shall read this document in conjunction with all the drawings and the specifications mentioned herein this document.

### 4.3.2 General

- Transnet National Port's Authority electrical appointed personnel shall perform all the required switching and control work permits.
- For any required switching, the Contractor shall submit a notification to the Project Manager seven days prior to the required work being performed.

### 4.3.3 Standard of Work, Equipment and Materials

- The electrical installation shall conform to the requirements of the latest edition and amendments of SANS 10142-1 Code of Practice for the Wiring of Premises and any additional requirements thereto, described in this specification.

- All equipment and material used shall be of high quality and the work shall be of a high standard of workmanship carried out by qualified staff under proper supervision by experienced and competent officers.
- All equipment and material shall comply with the relevant National or International standard specification. Where equipment does not comply, it shall be submitted to the Project Manager for approval.
- All installations, testing and terminations must be approved by the Transnet National Port's Authority (TNPA) Engineer prior to commissioning.

### 4.3.4 Generic Specifications

All designs undertaken, and all plant, equipment and materials supplied by the Contractor, in agreement with the Employer and for the execution of the Works detailed in this document, shall comply with all applicable Transnet Specifications listed below. Where the requirements of a Transnet Specification are more stringent than the applicable SANS standards, the Contractor shall comply with the Transnet Specification. Where the requirements of the applicable SANS standard are more stringent than those of the relevant Transnet Specification, the Contractor shall comply with the SANS standard. The Contractor shall also verify all site details provided in the Employer's drawings. All equipment and plant supplied by the Contractor for these Works shall, as a minimum, comply with or exceed the performance requirements specified in the following Specifications and Performance Specifications:

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|---|---|
| TPD-001-EL&PSPEC | Technical specification for electrical installations to building other than dwelling houses |
| TPD-002-DBSPEC | Technical specification for low voltage distribution boards |
| TPD-003-CABLESPEC | Technical specification for medium and low voltage cables |
| TPD-004-EARTHINGSPEC | Technical specification for earthing and the protection of buildings and structures against lightning |
| TPD: A06-LUM01PERFSPEC | Performance Specification: LED TASK Luminaire With Integrated Controls |
| TPD_A07-LUM02PERFSPEC rev0 Up Down Light | Performance Specification: LED UP AND DOWN Wall Mounted Luminaire |
| TPD_A08-LUM01PERFSPEC rev0 Vapour Proof | Performance Specification: INDUSTRIAL LED Vapour-Proof Luminaire |
| TPD_A09-LUM01PERFSPEC rev0 Large Downlighter | Performance Specification: LED Circular Downlight Luminaire (TYPE 1) |
| TPD_A09-LUM02PERFSPEC rev0 Med Downlighter | Performance Specification: LED Circular Downlight Luminaire (TYPE 2) |

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| TPD_A09-LUM03PERFSPEC rev0 Surface Downlighter | Performance Specification: LED Circular Downlight Luminaire (TYPE 3) |
| TPD_A10-LUM01PERFSPEC rev0 Pendant Disc | Performance Specification: LED PENDANT Luminaire (TYPE 1) |
| TPD_A10-LUM02PERFSPEC rev0 Circular LED Pendant | Performance Specification: LED PENDANT Luminaire (TYPE 2) |
| TPD_A10-LUM03PERFSPEC rev0 Large Circular Pendant | Performance Specification: LED PENDANT Luminaire (TYPE 3) |
| TPD_A10-LUM04PERFSPEC rev0 Small cylindrical Pendant | Performance Specification: LED PENDANT Luminaire (TYPE 4) |
| TPD_A11-LUM01PERFSPEC rev0 Recessed Office | Performance Specification: LED PANEL Luminaire With Integrated Controls (TYPE 1) |
| TPD_A12-LUM01PERFSPEC rev0 Industrial Lowbay | Performance Specification: INDUSTRIAL LED LOWBAY Luminaires |
| TPD_A13-LUM01PERFSPEC rev0 White LED Strip | Performance Specification: LED STRIP LIGHTING Systems (TYPE 1) |

### 4.3.5 Service Conditions

The equipment shall be designed and rated for continuous operation under the following conditions:

#### 4.3.5.1 Ambient/Environment Conditions:

All equipment offered shall be rated for continuous operation under the following conditions:

- Altitude : 0 to 1800m Above Sea Level.
- Ambient temperature : -5°C to +40°C (daily average +35°C).
- Relative humidity : As high as 96%.
- Lightning conditions density of : Severe, with a maximum lightning ground flash 11 flashes per km² per annum.
- Atmosphere : Salt laden and corrosive industrial chemical and dust laden nature. Frequent heavy rains driven by wind reaching speeds of 100 Km/h and above.

#### 4.3.5.2 Electrical Conditions:

- The Low voltage supply will be three phase, 4 wire, 50 Hz alternating current with earthed neutral at a nominal voltage of 400 / 230V.

- The voltage may vary within the range of 95% to 105% of the nominal and all equipment installed shall be suitably rated.

#### 4.3.5.3 Lightning conditions

All lightning protection equipment offered shall be rated to withstand the following conditions:

- Current : The peak lightning current and its rate of rise shall be regarded as severe when $i_{max}$ = 200kA.
- Voltage : The highest cloud potential shall be assumed to be more that 100MV, where; Q = CV, where Q is assumed at 100C and C to be $10^{-7}$ F.

### 4.3.6 Governing Codes, Standards and Specifications

#### 4.3.6.1 Normative References

The following legislation, standards, codes of practice and specifications, including all applicable amendments, supplements and revisions, shall apply to the Works where contextually applicable. Unless otherwise specified, the latest edition applicable at the time of tender shall be used.

| Standard No. | Description |
|---|---|
| SANS 767-1 | Earth leakage protection units – Part 1: Fixed earth leakage protection circuit-breakers |
| SANS 950 | Unplasticized polyvinyl chloride (PVC) rigid conduit and fittings for use in electrical installations |
| SANS 1063 | Earth rods, couplers and connections |
| SANS 1085 | Wall outlet boxes for the enclosure of electrical accessories |
| SANS 1091 | National colour standards |
| SANS 1213 | Mechanical cable glands |
| SANS 1433-1 | Electrical terminals and connectors – Part 1: Terminal blocks having screw and screwless terminals |
| SANS 1433-2 | Electrical terminals and connectors – Part 2: Flat push-on connectors |
| SANS 1507 series | Electric cables with extruded solid dielectric insulation for fixed installations (300/500 V to 1 900/3 300 V) |
| SANS 60669-2-1 | Switches for household and similar fixed-electrical installations – Part 2-1: Particular requirements – Electronic switches |
| SANS 60669-2-4 | Switches for household and similar fixed-electrical installations – Part 2-4: Particular requirements – Isolating switches |
| SANS 60998 series, where | Connecting devices for low-voltage circuits for household and |

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| applicable | similar purposes |
| SANS 10142-1 | The wiring of premises – Part 1: Low-voltage installations |
| SANS 10199 | The design and installation of earth electrodes |
| SANS 10313 | Protection against lightning – Physical damage to structures and life hazard |
| SANS 62305 series | Protection against lightning |
| SANS 10064 | The preparation of steel surfaces for coating |
| SANS 763 | Hot-dip zinc coatings (galvanizing), where applicable |
| SANS 152, where applicable | Low-voltage air-break switches, switch-disconnectors and fuse combination units |
| SANS 60269 series, where applicable | Low-voltage fuses |
| SANS 61386 series | Conduit systems for cable management – Electrical installation conduit systems |
| SANS 61439 series | Low-voltage switchgear and controlgear assemblies |
| SANS 60529 | Degrees of protection provided by enclosures (IP Code) |
| SANS 60598-1 | Luminaires – Part 1: General requirements and tests |
| SANS 60598-2-5 | Luminaires – Part 2-5: Particular requirements – Floodlights |
| SANS 475 | Luminaires – Performance requirements |
| SANS 1239 | Plugs, socket-outlets and couplers for industrial purposes |
| SANS 742, where applicable | Isolating transformers and safety isolating transformers |
| SANS 10114-1 | Interior lighting – Part 1: Artificial lighting of interiors |
| SANS 10114-2 | Interior lighting – Part 2: Emergency lighting |
| SANS 10389-1 | Exterior lighting – Part 1: Artificial lighting of exterior areas for work and safety |
| Occupational Health and Safety Act, 1993 (Act 85 of 1993) | Occupational Health and Safety Act and applicable Regulations |
| Electrical Installation Regulations | Regulations issued under the Occupational Health and Safety Act, as amended |
| Electrical Machinery Regulations | Regulations issued under the Occupational Health and Safety Act, as amended |

#### 4.3.6.2 Codes of Practice

All design, construction, excavation, installation, testing and commissioning works undertaken by the Contractor in connection with the Works shall comply, as a minimum, with the requirements of the applicable legislation, standards and Codes of Practice listed below. Where reference is made to a standard or Code of Practice, such reference shall be deemed to include the latest applicable edition, including all amendments, supplements and revisions thereto, unless specifically stated otherwise.

| Standard / Regulation | Description |
|---|---|
| Occupational Health and Safety Act, 1993 (Act 85 of 1993) | Occupational Health and Safety Act and applicable Regulations |
| Electrical Installation Regulations | Regulations issued under the Occupational Health and Safety Act, as amended |
| SANS 10142-1 | The wiring of premises – Part 1: Low-voltage installations |
| SANS 10114-1 | Interior lighting – Part 1: Artificial lighting of interiors |
| SANS 10114-2 | Interior lighting – Part 2: Emergency lighting |
| SANS 10313 | Protection against lightning – Physical damage to structures and life hazard |
| SANS 62305 series | Protection against lightning |
| SANS 10389-1 | Exterior lighting – Part 1: Artificial lighting of exterior areas for work and safety |
| SANS 10199 | The design and installation of earth electrodes |

### 4.3.7 INTERIOR WORKS

#### 4.3.7.1 Ground Floor

This works information shall be read in conjunction with the drawings listed in section 4.3.9, SANS standards, codes of practice, and Transnet specifications listed herein this document.

All works to be carried out shall be performed with full adherence to safe practice of electrical installations as stipulated in SANS 10142-1, SANS 10142-2 and OHS Act 85 of 1993 (Electrical Installation Regulations).

a) DISTRIBUTION BOARD

- Existing DB-A, DB-B and DB-C circuitry to be verified by *Contractor* before work commences.
- The *Contractor* shall make additions and alterations to existing DB-A as per drawing no: XDN.E.0037-1-100-E-LA-0004-01-0A.
- The Contractor shall replace all existing large-frame 6kA circuit breakers with narrow-frame 6kA circuit breakers in order to create additional space in existing DB-B.
- The *Contractor* shall make additions and alterations to existing DB-B as per drawing no: XDN.E.0037-1-100-E-LA-0002-01-0A.

- The *Contractor* shall test and verify all electrical circuits at DB-A, DB-B and DB-C. The *Contractor* shall also re-label DB-A, DB-B and DB-C ensuring that all circuit schedules are accurate and up to date.
- The *Contractor* shall ensure that the existing power supply to the park homes being removed is disconnected, removed and made safe.

b) LIGHTING INSTALLATION

- The *Contractor* shall uninstall existing luminaires in areas where new luminaires are indicated, and issue the removed items to the TNPA maintenance manager at the TNPA Power Supplies and Services Depot (1 Kuwait road). The *Contractor* shall inspect and test all existing wiring and circuitry. Damaged wires shall be replaced.
- The *Contractor* shall supply and install luminaries as shown on drawing XDN.E.0037-1-100-E-LA-0001-01-0A-0A and XDN.E.0037-1-100-E-LA-0004-01-0A-0A. The *Contractor* shall design, supply, deliver and install SABS approved, PVC conduit flush mounted in the wall. The PVC conduit shall be used as a wireway, linking all flush mounted 4x2 PVC boxes to the distribution board and luminaires. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure a safe neat link for the conduit system.
- The *Contractor* shall retain and re-use existing lighting circuitry where stated as shown in drawing XDN.E.0037-1-100-E-LA-0001-01-0A and XDN.E.0037-1-100-E-LA-0004-01-0A-0A.
- The *Contractor* shall supply, deliver, offload and install SABS approved PVC insulated house wire for all lighting circuits as shown in drawing XDN.E.0037-1-100-E-LA-0001-01-0A and XDN.E.0037-1-100-E-LA-0004-01-0A-0A. The PVC insulated wire shall comply with Transnet specification TPD-003-CABLESPEC.
- The light switch boxes and the conduit droppers if required shall be recessed into the wall, unless otherwise stated. All conduit terminations to light switch boxes shall be done using a PVC male adaptor and a suitable PVC washer.
- All luminaires shall be installed according to SANS 10142-1 and specification No. TPD-001-EL&PSPEC; Specification for electrical installations to buildings other than dwelling houses.
- The *Contractor* shall supply, deliver, and install occupancy sensors as detailed in drawing number XDN.E.0037-1-100-E-LA-0001-01-0A. The time delay DIP switch setting on the occupancy sensors shall be set at thirty (30) minutes.

- All electrical works pertaining to the electrical lighting should be done in accordance with the referenced drawing, if clarity is needed in any regard the Electrical Engineer should be contacted prior to any commencement of work.

c) LIGHT SWITCHES

- The *Contractor* shall supply, deliver and install light switches as shown on drawing number XDN.E.0037-1-100-E-LA-0001-01-0A and XDN.E.0037-1-100-E-LA-0004-01-0A-0A.
- The Contractor shall label all light switches to clearly indicate the relevant circuit numbers as per the updated DB schedule.

d) SWITCHED SOCKET OUTLETS

- The *Contractor* shall supply and install switched socket outlets as shown on drawing number XDN.E.0037-1-100-E-LA-0002-01-0A.
- The *Contractor* shall retain and re-use existing socket outlet circuitry where stated and shown in drawing XDN.E.0037-1-100-E-LA-0002-01-0A.
- The power supply to the socket outlet shall be installed in existing PVC conduits recessed into the wall or slabs, unless otherwise stated. The mounting height for the power points is as specified in the drawing.
- The conduit droppers and the socket outlet boxes if required shall be cast into concrete and built into brick walls. All conduit terminations to socket outlet boxes shall be done using a PVC male adaptor and a suitable PVC washer.
- All PVC conduits, couplers, male adaptors, boxes and PVC adhesives shall be SABS approved.
- All socket outlets shall be installed according SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.
- The Contractor shall label all socket outlets to clearly indicate the relevant circuit numbers as per the updated DB schedule.

e) SWITCHED ISOLATORS

- The *Contractor* shall supply, deliver, offload and install switched disconnectors (isolators) as shown in drawing number XDN.E.0037-1-100-E-LA-0002-01-0A. The isolators shall be installed at various heights as shown in drawing number XDN.E.0037-1-100-E-LA-0002-01-

0A.

- The *Contractor* shall retain and re-use existing isolator circuitry where stated and shown in drawing XDN.E.0037-1-100-E-LA-0002-01-0A.
- The *Contractor* shall design, supply, deliver and install SABS approved PVC conduits flush mounted in the wall. The PVC conduit shall be used as a wireway, linking all isolators to the distribution board. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure a safe neat link for the conduit system.
- The *Contractor* shall supply, deliver, offload and install SABS approved PVC insulated house wire for all isolator circuits as shown in drawing XDN.E.0037-1-100-E-LA-0002-01-0A. The PVC insulated wire shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduit.
- The Contractor shall label all isolators to clearly indicate the relevant circuit numbers as per the updated DB schedule.

f) CABLE AND CABLE WAY SYSTEM

The *Contractor* shall supply, deliver and install 32mm$^2$ and 20mm$^2$ PVC sleeve pipes which will be chased into the floor as shown in drawing number XDN.E.0037-1-100-E-LA-0002-01-0A.

#### 4.3.7.2 First Floor

This works information shall be read in conjunction with the drawings listed in section 4.3.9, SANS standards, codes of practice, and Transnet specifications listed herein this document.

All works to be carried out shall be performed with full adherence to safe practice of electrical installations as stipulated in SANS 10142-1, SANS 10142-2 and OHS Act 85 of 1993 (Electrical Installation Regulations).

a) DISTRIBUTION BOARD

- Existing DB-D, DB-E, and DB-F circuitry to be verified by *Contractor* before work commences.
- The *Contractor* shall make additions and alterations to existing DB-D as per drawing no: XDN.E.0037-1-100-E-LA-1002-01-0A.
- The *Contractor* shall test and verify all electrical circuits at DB-D, DB-E and DB-F. The *Contractor* shall also re-label DB-D, DB-E and DB-F ensuring that all circuit schedules are accurate and up to date.

b) LIGHTING INSTALLATION

- The *Contractor* shall uninstall existing luminaires in areas where new luminaires are indicated, and issue the removed items to the TNPA maintenance manager at the TNPA Power Supplies and Services Depot (1 Kuwait road). The Contractor shall inspect and test all existing wiring and circuitry. Damaged wires shall be replaced.
- The *Contractor* shall straighten the existing Unistrut to ensure uniformity and alignment of all new luminaires.
- The *Contractor* shall supply and install luminaries as shown on drawing XDN.E.0037-1-100-E-LA-1001-01-0A. The *Contractor* shall design, supply, deliver and install SABS approved, PVC conduit flush mounted in the wall. The PVC conduit shall be used as a wireway, linking all flush mounted 4x2 PVC boxes to the distribution board and luminaires. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure a safe neat link for the conduit system.
- The *Contractor* shall retain and re-use existing lighting circuitry where stated and shown in drawing XDN.E.0037-1-100-E-LA-1001-01-0A.
- The *Contractor* shall supply, deliver, offload and install SABS approved PVC insulated house wire for all lighting circuits as shown in drawing XDN.E.0037-1-100-E-LA-1001-01-0A. The PVC insulated wire shall comply with Transnet specification TPD-003-CABLESPEC.
- The light switch boxes and the conduit droppers if required shall be recessed into the wall, unless otherwise stated. All conduit terminations to light switch boxes shall be done using a PVC male adaptor and a suitable PVC washer.
- All luminaires shall be installed according to SANS 10142-1 and specification No. TPD-001-EL&PSPEC; Specification for electrical installations to buildings other than dwelling houses.
- The *Contractor* shall supply, deliver, and install occupancy sensors as detailed in drawing number XDN.E.0037-1-100-E-LA-1001-01-0A. The time delay DIP switch setting on the occupancy sensors shall be set at thirty (30) minutes.
- All electrical works pertaining to the electrical lighting should be done in accordance with the referenced drawing, if clarity is needed in any regard the Electrical Engineer should be contacted prior to any commencement of work.

c) LIGHT SWITCHES

- The *Contractor* shall supply, deliver and install light switches as shown on drawing number XDN.E.0037-1-100-E-LA-1001-01-0A.
- The *Contractor* shall label all light switches to clearly indicate the relevant circuit numbers as per the updated DB schedule.

d) SWITCHED SOCKET OUTLETS

- The *Contractor* shall supply and install switched socket outlets as shown on drawing number XDN.E.0037-1-100-E-LA-1002-01-0A.
- The Contractor shall retain and re-use existing socket outlet circuitry where stated and shown in drawing XDN.E.0037-1-100-E-LA-1002-01-0A.
- The power supply to the socket outlet shall be installed in existing PVC conduits recessed into the wall or slabs, unless otherwise stated. The mounting height for the power points is as specified in the drawing.
- The conduit droppers and the socket outlet boxes if required shall be cast into concrete and built into brick walls. All conduit terminations to socket outlet boxes shall be done using a PVC male adaptor and a suitable PVC washer.
- All PVC conduits, couplers, male adaptors, boxes and PVC adhesives shall be SABS approved.
- All socket outlets shall be installed according SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.
- The *Contractor* shall ensure that the socket outlets on the power skirting are mounted on the electrical services part of the power skirting and shall comply with the requirements mentioned above.
- The Contractor shall label all socket outlets to clearly indicate the relevant circuit numbers as per the updated DB schedule.

e) SWITCHED ISOLATORS

- The *Contractor* shall supply, deliver, offload and install switched disconnectors (isolators) as shown in drawing number XDN.E.0037-1-100-E-LA-1002-01-0A. The isolators shall be installed at various heights as shown in drawing number XDN.E.0037-1-100-E-LA-1002-01-0A.

- The *Contractor* shall retain and re-use existing isolator circuitry where stated and shown in drawing XDN.E.0037-1-100-E-LA-1002-01-0A.
- The *Contractor* shall design, supply, deliver and install SABS approved PVC conduits flush mounted in the wall. The PVC conduit shall be used as a wireway, linking all isolators to the distribution board. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure a safe neat link for the conduit system.
- The *Contractor* shall supply, deliver, offload and install SABS approved PVC insulated house wire for all isolator circuits as shown in drawing XDN.E.0037-1-100-E-LA-1002-01-0A. The PVC insulated wire shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduit.
- The *Contractor* shall label all isolators to clearly indicate the relevant circuit numbers as per the updated DB schedule.

#### 4.3.7.3 Second Floor (Including Queen Elizabeth Boardroom)

This works information shall be read in conjunction with the drawings listed in section 4.3.9, SANS standards, codes of practice, and Transnet specifications listed herein this document.

All works to be carried out shall be performed with full adherence to safe practice of electrical installations as stipulated in SANS 10142-1, SANS 10142-2 and OHS Act 85 of 1993 (Electrical Installation Regulations).

a) DISTRIBUTION BOARD

- Existing DB-G, and DB-H circuitry to be verified by *Contractor* before work commences.
- The *Contractor* shall replace all existing large-frame 6kA circuit breakers with narrow-frame 6kA circuit breakers to create additional space in existing DB-G.
- The *Contractor* shall make additions to existing DB-G as per drawing no: XDN.E.0037-1-100-E-LA-2002-01-0A.
- The *Contractor* shall upgrade and make additions to existing DB-H as per drawing no: XDN.E.0037-1-100-E-LA-2003-01-0A.
- The *Contractor* shall test and verify all electrical circuits at DB-G and DB-H. The *Contractor* shall also re-label DB-G and DB-H ensuring that all circuit schedules are accurate and up to date.

b) LIGHTING INSTALLATION

- The *Contractor* shall uninstall existing luminaires in areas where new luminaires are indicated and issue the removed items to the TNPA maintenance manager at the TNPA Power Supplies and Services Depot (1 Kuwait road). The *Contractor* shall inspect and test all existing wiring and circuitry. Damaged wires shall be replaced.
- The *Contractor* shall supply and install luminaries as shown on drawing XDN.E.0037-1-100-E-LA-2001-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A. The *Contractor* shall design, supply, deliver and install SABS approved, PVC conduit flush mounted in the wall. The PVC conduit shall be used as a wireway, linking all flush mounted 4x2 PVC boxes to the distribution board and luminaires. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure a safe neat link for the conduit system.
- The *Contractor* shall supply and install LED strip lighting as per drawing XDN.E.0037-1-100-E-LA-2003-01-0A.
- The *Contractor* shall retain and re-use existing lighting circuitry where stated as shown in drawing XDN.E.0037 -1-100-E-LA-2001-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A.
- The *Contractor* shall supply, deliver, offload and install SABS approved PVC insulated house wire for all lighting circuits as shown in drawing XDN.E.0037 -1-100-E-LA-2001-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A. The PVC insulated wire shall comply with Transnet specification TPD-003-CABLESPEC.
- The light switch boxes and the conduit droppers if required shall be recessed into the wall, unless otherwise stated. All conduit terminations to light switch boxes shall be done using a PVC male adaptor and a suitable PVC washer.
- All luminaires shall be installed according to SANS 10142-1 and specification No. TPD-001-EL&PSPEC; Specification for electrical installations to buildings other than dwelling houses.
- The *Contractor* shall supply, deliver, and install occupancy sensors as detailed in drawing number XDN.E.0037-1-100-E-LA-2001-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A. The time delay DIP switch setting on the occupancy sensors shall be set at thirty (30) minutes.
- All electrical works pertaining to the electrical lighting should be done in accordance with the referenced drawing, if clarity is needed in any regard the Electrical Engineer should be contacted prior to any commencement of work.

c) LIGHT SWITCHES

- The *Contractor* shall supply, deliver and install light switches as shown on drawing number XDN.E.0037-1-100-E-LA-2001-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A.
- The *Contractor* shall supply, deliver and install RGBW LED Controller's for the LED strip lighting as shown on drawing number XDN.E.0037-1-100-E-LA-2001-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A.
- The *Contractor* shall label all light switches to clearly indicate the relevant circuit numbers as per the updated DB schedule.

d) SWITCHED SOCKET OUTLETS

- The *Contractor* shall supply and install switched socket outlets as shown on drawing number XDN.E.0037-1-100-E-LA-2002-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A.
- The *Contractor* shall retain and re-use existing socket outlet circuitry where stated and shown in drawing XDN.E.0037-1-100-E-LA-2002-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A.
- The power supply to the socket outlet shall be installed in existing PVC conduits recessed into the wall or slabs, unless otherwise stated. The mounting height for the power points is as specified in the drawing.
- The conduit droppers and the socket outlet boxes if required shall be cast into concrete and built into brick walls. All conduit terminations to socket outlet boxes shall be done using a PVC male adaptor and a suitable PVC washer.
- All PVC conduits, couplers, male adaptors, boxes and PVC adhesives shall be SABS approved.
- All socket outlets shall be installed according SANS 10142-1 and specification No. TPD: 001-EL&PSPEC; Technical specification for the supply and installation of electrical lighting and power in buildings other than dwelling houses.
- The *Contractor* shall ensure that the socket outlets on the power skirting are mounted on the electrical services part of the power skirting and shall comply with the requirements mentioned above.
- The *Contractor* shall label all socket outlets to clearly indicate the relevant circuit numbers as per the updated DB schedule.

e) SWITCHED ISOLATORS

- The *Contractor* shall supply, deliver, offload and install switched disconnectors (isolators) as shown in drawing number XDN.E.0037-1-100-E-LA-2002-01-0A and XDN.E.0037-1-

100-E-LA-2003-01-0A. The isolators shall be installed at various heights as shown in drawing number XDN.E.0037-1-100-E-LA-2002-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A.

- The *Contractor* shall retain and re-use existing isolator circuitry where stated and shown in drawing XDN.E.0037-1-100-E-LA-2002-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A.
- The *Contractor* shall design, supply, deliver and install SABS approved PVC conduits flush mounted in the wall. The PVC conduit shall be used as a wireway, linking all isolators to the distribution board. All necessary accessories such as fasteners, bends, junction boxes, adaptors, etc shall be included to ensure a safe neat link for the conduit system.
- The *Contractor* shall supply, deliver, offload and install SABS approved PVC insulated house wire for all isolator circuits as shown in drawing XDN.E.0037-1-100-E-LA-2002-01-0A and XDN.E.0037-1-100-E-LA-2003-01-0A. The PVC insulated wire shall comply with Transnet specification TPD-003-CABLESPEC. The PVC insulated house wire shall be installed in conduit.
- The *Contractor* shall label all isolators to clearly indicate the relevant circuit numbers as per the updated DB schedule.

#### 4.3.7.4 Earthing and Lightning Protection (Roof)

- The *Contractor* shall supply, deliver, offload and install new earthing test points and bond existing lightning protection, including stainless steel test joints, install new insulated copper conductors and bond existing conductors using bimetallic lugs, fixtures etc.
- The *Contractor* shall supply, deliver, offload and install new earthing test points and bond existing lightning protection on parapet walls, including stainless steel test joints, install new insulated copper conductors and bond existing down conductors using bimetallic lugs, fixtures etc.
- All work to be carried out shall be performed with full adherence to SANS 10142, SANS 10313 and SANS 62561. The Contractor shall test and issue a certificate of compliance on completion of work.

### 4.3.8 Testing and Commissioning

- The *Contractor* shall conduct a Factory Acceptance Test (FAT) for all Plant's to be installed as part of the Works to be executed in this Contract prior to delivery to site. The FAT shall be conducted in the presence of the *Employer's* Engineer. The legal transfer of ownership from the Plant's supplier to the *Contractor* shall be held by the *Contractor* until the Plant is

fully installed, tested commissioned on the *Employer's* designated site.

- The *Contractor* shall conduct a Site Acceptance Test (SAT) for all Plant's supplied, offloaded and delivered to the designated *Employer's* site. The SAT shall be conducted in the presence of the *Employer's* Engineer. The legal transfer of ownership from the Plant's supplier to the *Contractor* shall be held by the Contractor until the Plant is fully installed, tested commissioned on the *Employer's* designated site.
- The *Contractor* shall test the entire installation, LV installation and the lighting installation as per SANS 10142, part 1 and 2 and hand over all relevant test certificates to the *Employers* Project Manager for acceptance. The *Contractor* shall hand over the LV certificate of compliance as per the OHS Act of 85 and SANS 10142-1 and SANS1042-2 for the installation.

### 4.3.9 LIST OF DRAWINGS

#### 4.3.9.1 Drawings issued by the Employer

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

| Drawing Number | Revision | Title |
|---|---|---|
| XDN.E.0037-1-100-E-LA-0001-01-0A | 0A | RECEPTION, Lighting Layout |
| XDN.E.0037-1-100-E-LA-0002-01-0A | 0A | RECEPTION, Power Layout |
| XDN.E.0037-1-100-E-LA-0003-01-0A | 0A | PARKING, Electrical Lighting Layout |
| XDN.E.0037-1-100-E-LA-0004-01-0A | 0A | PARKING, Electrical Power Layout |
| XDN.E.0037-1-100-E-LA-1001-01-0A | 0A | OFFICES, Lighting Layout |
| XDN.E.0037-1-100-E-LA-1002-01-0A | 0A | OFFICES, Power Layout |
| XDN.E.0037-1-100-E-LA-1003-01-0A | 0A | First and Second Floor Distribution Board Layouts |
| XDN.E.0037-1-100-E-LA-2001-01-0A | 0A | OFFICES (Second Floor), Lighting Layout |
| XDN.E.0037-1-100-E-LA-2002-01-0A | 0A | OFFICES (Second Floor), Power Layout |
| XDN.E.0037-1-100-E-LA-2003-01-0A | 0A | QUEEN ELIZABETH, Electrical Layout |