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**SCOPE OF WORKS  
FOR THE TRANSNET PIPELINES LIGHTING UPGRADE PROJECT  
AT VARIOUS TRANSNET PIPELINES SITES**

**PL 682**

**REV. 002**

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**TABLE OF CONTENTS**

1 General ..... 3

1.1 Introduction.....3

1.2 Abbreviations & Definitions .....3

1.3 General Notes .....4

1.4 Notes to Contractors .....5

1.5 Project Time Schedule .....6

1.6 Reference Documentation .....7

2 General Works Execution and Site Requirements ..... 8

2.1 Site Meetings.....8

2.2 House Keeping.....8

2.3 Materials.....9

3 General Operating Conditions ..... 9

3.1 Hazardous Area .....9

3.2 Climatic Conditions.....9

4 Scope of Works..... 9

4.1 Design .....9

4.2 Electrical, Mechanical and Civil Works .....10

4.3 Hold Points .....12

4.4 Quality Requirements.....12

4.5 Documentation .....15

4.6 Installation and Site Works.....15

4.7 Factory Inspection and Testing .....16

4.8 Site Testing, Certification and Commissioning .....16

5 Appendices .....17

6 Maintenance .....18

7 Guarantee .....18

8. Signatures.....18

## 1 General

### 1.1 Introduction

- 1.1.1 *Transnet Pipelines* (TPL) a petroleum pipeline operator intends to initialise a project to upgrade lighting at various sites in need of improved lighting. The objective is to ensure compliance to the Occupational Health and Safety Act, 85 of 1993 as amended (OHSAAct) in areas found to be non-compliant during lighting surveys conducted in 2018/19 by an Approved Inspection Authority (AIA).
- 1.1.2 This enquiry is for the appointment of an electrical *Contractor* to repair, relocate, correct and where required to supply and install additional lighting with poles, associated cabling and equipment to ensure lighting compliance in areas identified in the respective AIA lighting survey reports of 2018/19.
- 1.1.3 This scope of work covers the supply, ascertainment, manufacture, erection, application, delivery, handling, hauling, unloading / receiving, installation, construction, assembly, system testing, quality assurance and commissioning of the works at the sites tendered for. Depending on the site the work may include lighting in manifolds, tank lighting, area lighting and other site lighting that may be required in terms of compliance to the requirements of the OHSAAct as identified as non-compliant in the AIA lighting survey reports of 2018/19.
- 1.1.4 TPL has included with this scope of works a “Bill of Quantities (BOQ)” to assist *Contractors* with costing the various items and/or tasks.
- 1.1.5 The *Contractor* shall also note that certain items of the BOQ will be free issued by TPL as indicated under the column “material supplied by” of the BOQ, the *Contractor* will have to insert the labour rate only for such items.
- 1.1.6 The *Contractor* shall also note that other items of the BOQ will be issued by the *Contractor* as indicated under the column “material supplied by” of the BOQ, the *Contractor* will have to insert both the material and the labour rate for such items.
- 1.1.7 **The *Contractor* shall be paid for work done to date as per the BOQ items and rates and a proportion of each lump sum which is the proportion of the work covered by the item which the *Contractor* has completed.** TPL has included with this scope of works a “**Required Lux levels and drawings**” to further assist the *Contractors* with the BOQ pricing.

### 1.2 Abbreviations & Definitions

For the purpose of understanding this scope of works, the following abbreviations apply in addition to the NEC.

<b>Abbreviation</b>	<b>Meaning given to the abbreviation</b>
AIA	Approved Inspection Authority
BOQ	Bill of Quantities
Pr Eng	Professional Engineer
Pr Tech	Professional Engineering Technologist
CAD	Computer Aided Design
COC	Certificate of Compliance
COVID-19	Corona Virus Disease 2019
FAT	Factory Acceptance Test

GA	General Arrangement
LED	Light Emitting Diode
LV	Low Voltage
NEC	New Engineering Contract
OHSAct	Occupational Health and Safety Act, 85 of 1993
PDF	Portable Document Format
PPE	Personal Protective Equipment
SAT	Site Acceptance Test
SHE	Safety, Health and Environment
TPL	Transnet Pipelines
PQP	Project Quality Plan
QCPs	Quality Control Plans
QCP	Quality Control Plan
FICs	Field Inspection Checklists
WPS	Welding Procedure Specifications
NCR	Non-Conformance Reporting
QA	Quality Assurance
QC	Quality Control

### 1.3 General Notes

- 1.3.1 All work as described in this specification represents works on existing facilities that will or may be in operation during the course of the Contract, for this reason all necessary precautions are to be taken to ensure that normal pipeline and work operation is not disrupted in any way. *Contractors* are thus required to note that access to the site will be limited and dependent on operational constraints. *Contractors* will therefore be required to co-operate responsibly with operational staff, and to schedule their work programmes so as to achieve as early as completion of the project as possible.
- 1.3.2 *Contractors* are to note that work shutdown periods shall be scheduled according to TPL operational constraints and may fall over weekends/public holidays. TPL will not be held responsible, in terms of cost, for any site delay that may arise from petroleum line operations enforced by TPL.
- 1.3.3 The *Contractor* shall supply adequate and competent labour, supervision, tools, equipment, services, testing devices for each and every item necessary to complete the work. TPL reserves the right to terminate the contract at any point if it is found that the *Contractor's* performance, supervision, tools, equipment, services, testing devices and material do not comply with specified requirements. The *Contractor* will only be allowed to claim for work completed to the specified acceptable standard.

- 1.3.4 *Contractors* are to note that the responsibility for the Selection (BOQ identified items), Design, Supply (BOQ identified items), Installation and Commissioning of all elements of Equipment as included in the *Contractors* offer shall remain with the *Contractor*. In this regard, the *Contractor* is required to satisfy himself that all applicable elements of the Equipment offered is capable of complying with all specifications and reports (required Lux levels) as included or mentioned in the Tender Documents. Failure to meet specification shall render the successful *Contractor* liable to rectify the problem at no cost to TPL.
- 1.3.5 The successful *Contractor* is to note that TPL reserves the right to free-issue certain items of equipment as listed on the BOQ. Free issuing of these items, once accepted by the *Contractor*, in no way diminishes the *Contractor* responsibilities as detailed in the contract documentation. The *Contractor* shall conduct quality checks as to familiarise himself with the working condition and cosmetic appearance of the free issue items. Acceptance of free-issued equipment by the *Contractor* shall include the following:
- Acceptance of responsibility in terms any damages or losses from date/time of handover until end of project handover phase.
  - Acceptance to be indicated in writing.
- 1.3.6 The *Contractor* is to note with regards to works onsite, that responsibility for the protection of all existing equipment and services shall rest solely with the *Contractor*. The *Contractor* shall be required to bear all cost which may arise as result of damage which may have been caused to equipment or services or which may arise as a result of his operation on the respective sites.
- 1.3.7 The *Contractor* shall only utilise testing devices and measuring equipment that are certified and carries a valid calibration certificate as issued by an approved calibration authority. Documentation reflecting the type, name and calibration certificate of the test equipment that will be utilised to complete the work, shall be available at the request of the *Project Manager*.
- 1.3.8 Where control equipment, peripherals or instrumentation from various suppliers or manufacturers are offered for controlling the various sub-systems or portions of a sub-system, it shall be the responsibility of the *Contractor* to ensure the various portions are fully integrated into a single coherent system. Where specific project development is required, TPL shall first approve these.
- 1.3.9 *Contractors* are to note that no system or sub-systems shall be designed especially for this project, as it is a requirement that only proven systems and sub-systems be installed.
- 1.3.10 The *Contractor* shall submit the required Safety, Health and Environment (SHE) Compliance File for approval by TPL, before any works can commence. The content of the SHE Compliance File is dictated by the work undertaken and shall ensure full compliance to the requirements of applicable legislation and best practice standards. The *Contractor* is also to refer to the attached SHE Compliance file review-guidelines for the SHE Compliance file in order to fulfil the requirements of applicable legislation and best practice standards.
- 1.3.11 The *Contractor* and his personnel/sub-contractors shall attend the compulsory TPL induction training, before commencement of the work. Standing time approximately 2 hours. The induction training can either be conducted at TPL Pinetown/Alrode workshop or at an alternative TPL facility as arranged by the *Project Manager*.

## **1.4 Notes to Contractors**

- 1.4.1 The *Contractor* shall submit a LUMP SUM price for completion of all elements of the works. *Contractors* are to note that TPL will entertain no additional claims of any nature.

- 1.4.2 The *Contractor* shall supply a detailed breakdown of all costs to complete all the work as specified for the specific site(s). With reference to the attached BOQ pricing schedule, cost shall include all travel, accommodation, labour, supervision, tools, equipment, services, testing devices and specified equipment as outlined in the BOQ. *Contractor* to note, TPL will not entertain any additional claims for labour cost over weekends, public holidays or after hours labour. Any work not complying with specifications as contained herein and elsewhere in the contract document shall be redone at the *Contractor's* own expense. *Contractors* are required to return together with their tenders fully completed BOQ. The tender document will be deemed incomplete if either one of the above documents are not fully completed and contains as a minimum the items as per the respective documents supplied with the tender documents.
- 1.4.3 The *Contractor* to note that for materials and parts not included in this document the *Contractor* shall provide an installed price for these parts at cost plus a predetermined mark-up. This predetermined mark-up is to be supplied by the *Contractor* with a supplier's invoice before payment will be approved. If the *Contractor* is an agent of a particular range of products their price lists are to be included in the tender documentation. The *Contractor* must note this is an installed price and must include travelling, accommodation, site installation, labour, materials and all equipment involved. Please note no further claims of any nature will be allowed and cost prices of items will be verified with suppliers before payment is approved.
- 1.4.4 The *Contractor* shall supply day and hourly work rates for the various grade of staff required.
- 1.4.5 The *Contractor* shall furnish proof of actual experience in the class of work for which they have tendered and must submit with the tender on the relevant form attached to the tender documents, a statement of works recently carried out. The list shall include the value of previous contracts, completion dates, contact names and telephone numbers.
- 1.4.6 The *Contractor* to note that incomplete tender documents will not be considered.

## **1.5 Project Time Schedule**

### **1.5.1 Programme To Be Furnished After Contract Award**

- 1.5.1.1 The order in which the works are to be carried out shall be as directed by the *Project Manager*. Within fourteen (14) days after the acceptance of his Tender, the *Contractor* shall submit to the *Project Manager* for his approval a detailed work programme conforming to the *Project Manager's* requirements, showing the order of procedure and method in which he proposes to carry out the works, and shall, whenever required by the *Project Manager*, furnish for his information, particulars of the *Contractor's* arrangement for carrying out the works, of the construction plant and temporary works which the *Contractor* intends to supply, use or construct as the case may be. The programme shall cater for duration(s) by which information is to be supplied by the *Project Manager*. This programme shall be referred to as the Programme, be issued as a Gantt chart based on a detailed activity linked programme and be subdivided into operations of day(s) or week(s) duration. The programme shall be manloaded by crafts and craft mix ratio of skilled and unskilled. The submission to and approval by the *Project Manager* of such programme or the furnishing of such particulars, shall not relieve the *Contractor* of any of his duties or responsibilities under the Contract.
- 1.5.1.2 This programme, when accepted by the *Project Manager* will be binding on the *Contractor*. Amendment to the programme can only be effected by the *Project Manager's* acceptance of the *Contractor's* revised programme.
- 1.5.1.3 The programme shall be used to monitor progress. The programme shall remain in force but the resources to achieve the programme shall be updated at each site meeting and the *Contractor* shall report progress to date and what steps shall be taken to ensure adherence to programme.

1.5.1.4 Should the successful *Contractor* at any time during the contract fall behind the approved programme, then the *Project Manager* may require the *Contractor* to adjust his manner of working and/or employ additional staff, at NO additional cost to TPL, in order that the approved programme can be achieved.

#### 1.5.2 Programme To Be Furnished With Tender

1.5.2.1 The tender programme shall be in Gantt chart format programme. Contract award shall be designated week 0. The tender programme shall not be less than the contract award, kick-off meeting, access to site, meetings, design, procurement, manufacture, delivery to site, installation, inspections and testing, factory acceptance testing, site acceptance testing, defect correction, commissioning and handover periods for each site at a time. This programme shall also be cost loaded to indicate expected cashflow.

#### 1.5.3 Programme on Which Tenders Are To Be Based

1.5.3.1 Various key elements of the entire project are indicated below:-

- Contract award
- Kick-off meeting
- Access to site (only after TPL Induction and Site Specific Induction)
- Meetings
- Design
- Procurement
- Manufacture
- Delivery to site
- Installation
- Inspections and testing
- Factory acceptance testing
- Site acceptance testing
- Defect correction
- Commissioning & Handover

## 1.6 Reference Documentation

1.6.1 The requirements of the materials, design, installation, commissioning, examination, inspection and testing of equipment and facilities onsite shall be in accordance with the relevant sections of the below mentioned codes.

1.6.2 Where Government, Local authorities and other statutory body's regulations, laws and requirements are more stringent than those specified hereunder, the aforementioned regulations, laws and requirements shall take precedence.

1.6.3 Where no specific rules, regulations, codes or requirements are contained in this specification nor covered by the below mentioned codes, the *Contractor* shall, in consultation with TPL, adhere to internationally accepted engineering practices or original manufacturers specification.

1.6.4 The TPL issued drawings will be for information, ascertainment and/or construction and does not relieve the *Contractor* of any responsibility to submit to TPL, prior to construction, all Pr Eng or Pr Tech approved drawings for TPL acceptance and obtaining a TPL signature of acceptance prior to any construction.

1.6.5 For the purpose of understanding these Standards, the following abbreviations apply.

- SANS - South African National Standards
- SABS - South African Bureau of Standards
- BS - British Standards
- IEC - International Electrotechnical Commission
- NEC - New Engineering Contract

**General:**

TITLE	SANS	IEC	BS	OTHER
Code of Practice for Wiring of Premises and incorporated standards	SANS 10142			
The installation and Maintenance of Electrical Equipment used in explosive atmospheres.	SANS 10086-1			
Explosive Atmospheres	SANS 60079			
Protection against lighting: Physical damage to structures and life hazard	SANS 10313			
Protection against lighting	SANS 62305			
Protection against lighting (EMI)	SANS 61312			
Hot dipped galvanised coatings on fabricated iron and steel articles.	SANS 121:2011			
Occupational Health and Safety Act and Regulations. 85 of 1993				
Conditions of Contract				NEC

1.6.6 The latest revision of the following TPL standard specifications, where applicable, shall apply. It is a requirement that *Contractors* comply with all applicable clauses of the specifications in the execution of the work they undertake.

- PL100 Drawing Standard Document
- PL101 Plant & Equipment Tag Numbering Standards
- PL102 Equipment, Instrument & Electrical Symbology Standards
- PL103 General Drawing Standards
- PL631 Specification for Low Voltage Distribution Boards and Switchgear
- PL666 Electrical Design Criteria
- PL727 Specification for Cable, Racking, Trenching & Earthing Reticulation
- PL711 Specification for Equipment Cabinets to House Electronic Equipment
- PL804 General welding specification

**Note:** Copies are available on request.

## 2 General Works Execution and Site Requirements

### 2.1 Site Meetings

2.1.1 The *Contractor* shall attend site meetings when convened by the *Project Manager*. Such meetings will be for the purpose of discussing progress, delays, materials, conditions and specifications, as well as the co-ordination of site activities. The meetings will be chaired by the *Project Manager* or his Deputy and the proceedings shall be noted and circulated by the *Project Manager*.

### 2.2 House Keeping

2.2.1 The *Contractor* shall maintain the work sites clean and tidy at all times.

2.2.2 The *Contractor* shall take all reasonable precautions to protect existing equipment while work is in progress. Protection of existing equipment shall include protection against dust or any other harmful matter.



## **2.3 Materials**

- 2.3.1 The *Contractor* shall ensure that all metal items other than stainless steel or other non-ferrous metals are hot dipped galvanised.
- 2.3.2 The *Contractor* shall ensure that precaution is taken against electrolytic corrosion where different metals are used on items of equipment.

## **3 General Operating Conditions**

### **3.1 Hazardous Area**

- 3.1.1 All areas demarcated as Ex areas are to be treated as hazardous and *Contractors* shall ensure that the necessary care is taken to prevent damage and fire.

### **3.2 Climatic Conditions**

- 3.2.1 Unless otherwise specified, all control equipment, peripherals and ancillary equipment shall be capable of operating in an uncontrolled environment, and at ambient temperatures, which vary between -5 degrees Celsius and 40 degrees Celsius.
- 3.2.2 *Contractors* must state the heat, power and environment requirements for all equipment offered in the tender.
- 3.2.3 The equipment must operate satisfactorily between sea level and 2000 metres above sea level.
- 3.2.4 The equipment must be capable of operating in a relative humidity range from 5% RH to 95% RH.
- 3.2.5 Dust and vapours accumulate rapidly and selection of equipment and installation thereof shall be given careful consideration to minimise the detrimental effects of this.
- 3.2.6 Severe lightning occurs in certain of the areas in which the equipment will operate. TPL will not regard damage to equipment resulting from a lightning strike or a power surge as unavoidable except where such a strike is a "direct strike".

## **4 Scope of Works**

### **4.1 Design**

- 4.1.1 TPL will issue the *Contractor* proposed lighting schematic drawings, proposed lighting layout with proposed cable routing and zoning drawings, typical light poles drawings and the relevant BOQ per respective TPL site.
- 4.1.2 The TPL issued drawings will be for information, ascertainment and/or construction and does not relieve the *Contractor* of any responsibility to submit to TPL, prior to construction, all Pr Eng or Pr Tech approved drawings for TPL acceptance and must obtain a TPL signature of acceptance prior to procurement and construction.
- 4.1.3 The *Contractor* shall also ascertain if the proposed lighting layout drawing outlined on clause 4.1.1 meet the required lux levels per area which are indicated by the attached required lux levels spread sheet (found on BOQ with required lux levels and technical scoring spread sheet). This is to be done using a suitable lighting design software that will be used in generating a detailed lighting design software simulation report. The detailed lighting design software simulation report must show detailed predicted lighting levels across the respective areas and the type of light used in those respective areas. During commissioning the actual installed lighting will be measured (at night) to confirm compliance to accepted designs. The detailed lighting design software simulation report must be submitted for TPL acceptance.

- 4.1.4 The *Contractor* shall ensure that all zoning is strictly followed and the correct zoned light is used on the respective zoned area as per SANS 10086-1 since most of the work is conducted in hazardous zoned areas.
- 4.1.5 Where relocation, correction or additional lighting is required, the *Contractor* shall submit all Pr Eng or Pr Tech approved lighting schematic drawings, proposed lighting layout with proposed cable routing and lighting zoning drawings and detailed lighting design software simulation report to TPL for acceptance.
- 4.1.6 The *Contractor* shall submit all respective Pr Eng or Pr Tech approved as build drawings as outlined on clause 4.1.1 and/or 4.1.5 and the detailed as built lighting design simulations report per respective TPL site.
- 4.1.7 The *Contractor* shall ensure that all detailed lighting design simulation report and drawings are submitted to the *Project Manager* for acceptance prior to procurement, manufacture, supply and commencement of any work. The *Project Manager* will require a minimum of five (5) working days to accept detailed lighting design simulation report and drawings (as outlined on clause 4.1.1.).

## **4.2 Electrical, Mechanical and Civil Works**

- 4.2.1 The *Contractor* shall supply and install new equipment and fittings as per the BOQ submitted during the respective tender, the approved designs as per this scope of works and the associated approved drawings.
- 4.2.2 The *Contractor* shall ensure that a suitable zone 1 luminaire is used under zone 1 hazardous areas application and will require TPL approval prior to procurement (Confirm with the TPL *Project Manager* prior to procurement). The suitable luminaire must be a minimum of 98W, be a LED type, be zone 1 certified, must be Ex, must be minimum of 8820lm, must have a life span of 50 000hr or greater, must be atleast IP65, must have a minimum of 5-years warranty and must not weight more than 9.1kg.
- 4.2.3 The *Contractor* shall ensure that a suitable zone 2 luminaire is used under zone 2 hazardous areas application and will require TPL approval prior to procurement (Confirm with the TPL *Project Manager* prior to procurement). The suitable luminaire must be a minimum of 70W, be a LED type, be zone 2 certified, must be Ex, must be minimum of 8495lm, must have a 10kV/10kA surge arrester, must have a life span of 100 000hr or greater, must be atleast IP65, must have a minimum of 5-years warranty and must not weight more than 5kg.
- 4.2.4 The *Contractor* shall ensure that a suitable luminaire is used under normal areas application and will require TPL approval prior to procurement (Confirm with the TPL *Project Manager* prior to procurement). The suitable light luminaire must be a minimum of 148W, be a LED type, must be floodlight, must be SABS Approved, must be minimum of 23125lm, must have a 10kV/10kA surge arrester, must have a life span of 90 000hr or greater, must be atleast IP65, must have a minimum of 5-years warranty.
- 4.2.5 The *Contractor* shall ensure that the suitable luminaire is mounted on the suitable pole as indicated by the lighting layout drawing per site and the respective poles drawings which is to be ascertained by the *Contractor* and accepted by TPL. There are three different types of poles which are rail mount pole, stand-alone/free standing pole and bund wall mount pole with either zone 1 or zone 2 light luminaire as indicated by the different light poles drawings. These suitable poles are to be mounted on the rail (rail mount pole) as well as on the concrete (stand-alone/free standing pole and bund wall mount pole).
- 4.2.6 The *Contractor* shall also note that most parts of the rail mount pole will be free issued by TPL as well as certain part of the other poles (stand-alone/free standing pole and bund wall mount pole) as indicated on the poles drawings. The *Contractor* is to issue item listed as “purchase” on these drawings as well as other BOQ items listed to be supplied by the *Contractor*.
- 4.2.7 The *Contractor* shall also note that certain items of the BOQ will be free issued by TPL as indicated under the column “material supplied by” of the BOQ, the *Contractor* will have to insert the labour rate only for such items.

- 4.2.8 The *Contractor* shall also note that other items of the BOQ will be issued by them as indicated under the column “material supplied by” of the BOQ, the *Contractor* will have to insert both the material and the labour rate for such items.
- 4.2.9 The *Contractor* shall ensure that the cable routing follow the TPL proposed or accepted cable routing as it make use of the best possible cable routing with existing cable sleeves, trenches and racking. Where no racking exist in the manifold a BOQ listed angle iron is to be used.
- 4.2.10 Where no lighting cable exist to the manifold and tanks, the *Contractor* shall ensure that a three phase with neutral lighting cable (as per BOQ) is connected on the manifold and tanks emergency lighting breaker terminals of the LV panel and is distributed accordingly to all the manifold and tanks lighting to ensure a balance three phase load.
- 4.2.11 The *Contractor* shall ensure that a blue stripe, 4 core, armoured, 2.4mm<sup>2</sup> and/or 4mm<sup>2</sup> and/or 6mm<sup>2</sup> cable is used and must be in compliance with TPL PL727 specification.
- 4.2.12 The *Contractor* shall ensure that a 1 core, 16mm<sup>2</sup> green and yellow earth cable is used for all earthing and bonding and that all earthing and bonding must be in compliance with TPL PL727 specification except for the TPL Waltloo first small tank (tank 4).
- 4.2.13 The *Contractor* shall ensure that when conducting earthing and bonding to the TPL Waltloo first small tank (tank 4), a nonconductive material (minimum IP65) is used to link the light poles with the tanks rails since this tank is used for cathodic protection and needs not to be earthed and bonded. All earthing and bonding are to be done on the light fittings, poles and other metals connected to the poles only, except on existing onsite metals and must be in compliance with TPL PL727 specification.
- 4.2.14 All manifold and tanks lighting must be controlled by a photo-cell. If one already exist onsite, the *Contractor* shall use it otherwise the *Contractor* shall provide a new one.
- 4.2.15 The *Contractor* shall ensure that a suitable IP65 light switch is installed (as indicated on the BOQ and accepted drawings) on the TPL advised location outside of the control room, to safely switch on and off all the proposed and existing manifold and tank(s) lighting. (Confirm with the TPL *Project Manager*)
- 4.2.16 The *Contractor* shall ensure that 3 ways and/or 4 ways Ex junction boxes with 6 ways Ex terminal boxes are positioned on the light poles as shown by the respective light poles drawings and others must be positioned as advised by TPL *Project Manager* on the cable racking, sleeves and/or angle iron as the case may be.
- 4.2.17 The *Contractor* shall ensure that all fittings, poles, fasteners and any other metal parts shall be hot dipped galvanised as per SANS 121 standard.
- 4.2.18 The *Contractor* shall ensure that all other material used except for poles, cables and angle Iron must be Ex such as glands, terminals and M20 plugs. The glands must also be CCG armortex.
- 4.2.19 The *Contractor* shall have in his employment a trade tested Electrician who shall be responsible for all work done onsite.
- 4.2.20 The *Contractor* shall have in his employment a registered Master Installation Electrician who shall be responsible for general supervision, testing and issuing electrical Certificate of Compliance (COC) for all work done onsite. Tests must also include SANS 60079-17 table 1 & table 2.
- 4.2.21 The *Contractor* shall ensure that welding is conducted in compliance with TPL PL804 specification.
- 4.2.22 The *Contractor* shall ensure that all site hot works is conducted in the present of a fire standby.

4.2.23 Where required and accepted by the TPL *Project Manager*, the *Contractor* shall ensure that all excavations and trenching are done and completed by hand (machines not permitted). Allowance is to be included to detect services along a route prior to trenching. Any existing services damaged during excavation will be repaired at the *Contractor's* cost.

The *Contractor* shall ensure that all excavations and trenching across road crossings/hardened surfaces are re-instated such that the previous finish and all layer works are matched. The excavations and trenching are to comply with the TPL PL727 specification.

4.2.24 The *Contractor* shall ensure that all circuits and equipment are labelled according to TPL PL727 specification.

4.2.25 The *Contractor* shall ensure that all cables are labelled at both ends according to TPL PL727 specification. (laser engraved 316 stainless steel tags, tied with stainless steel cable ties).

4.2.26 The *Contractor* shall be responsible for issuing COC's on completion of the work. (Classification certificates are required for all equipment installed in hazardous areas).

### **4.3 Hold Points**

4.3.1 Prior to commencement of procurement and manufacture, design acceptance shall be obtained from the *Project Manager*. Hold points for acceptance to proceed shall entail as a minimum submission of the following documentation: -

- Detailed lighting design simulation report
- Lighting schematic drawings showing the new lighting design layout.
- Lighting layout with cable routing and zoning drawings.
- General Arrangement Drawings of equipment in or on panels, boards and cubicles.
- Equipment and material lists.
- Construction drawings of any equipment that will be manufactured.

4.3.2 The *Contractor* should take note that acceptance by the *Project Manager* of submitted drawings does not relieve the *Contractor* of responsibility for errors in design documents or drawings issued.

4.3.3 The *Contractor* shall note that all documentation and drawings issued by TPL are supplied in good faith, and may not be complete in every detail. The *Contractor* shall be responsible for ascertaining the validity and correctness of all drawings issued.

### **4.4 Quality Requirements**

4.4.1 This section outlines the minimum requirements to ensure that products and services supplied to TPL are manufactured, provided, constructed or installed in accordance with all specified requirements as defined in this scope of works.

4.4.2 The *Contractor* is responsible for all quality activities necessary to ensure the work meets the requirements specified in this scope of works, and shall manage and coordinate all quality aspects of the work in accordance with the requirements of this scope of works, together with the *Contractor's* PQP and QCPs once reviewed and accepted by TPL.

#### **4.4.3 Project Quality Plan**

The PQP shall entail the following as a minimum:

- Overview and understanding of scope of works and key requirements
- Organogram with positions, roles and responsibilities
- Procedures:
  - Document control – the *Contractor* to provide a description of how documents provided by TPL will be managed e.g. management tools and databases,

internal and external distribution of documents to TPL, third parties, internal review and approval routes and authorities, receipts, registration and maintained, codes, standards and specifications.

- Design control – where the *Contractor* is responsible for any aspects of design related to the scope of works, they must provide procedures for the control of these design activities. This must also factor in the roles and responsibilities
  - Project Schedule - As per this scope of works requirements
  - Commissioning and training plan.

#### 4.4.4 Quality Control Plans

The QCPs shall be submitted before the commencement of the project.

QCPs must clearly identify all inspections, tests and verification requirements to meet this scope of works including destructive and non-destructive testing, witness and hold points. The *Contractor* prepares and submits QCPs to TPL for review in accordance with the requirements of this scope of works and PQP.

The QCP shall include:

- QCPs shall include reference to all tests specified in the scope of works.
- **Inspection and Testing**
  - The *Contractor* is responsible for the conduct of all *Contractor* inspections and tests. This responsibility includes:
    - Documenting inspection and test results in the QCPs and relevant FICs.
    - Progressively inspecting the quality of the scope of works performed, including that of all Sub-Contractors.
    - Inspecting to meet all scope of works requirements, in number, type and form
    - Inspecting day to day activities, material receipts, issue of material for installation, in-process inspections, and final inspections.
  - Schedule of Inspection - The *Contractor* shall submit a schedule showing the proposed dates for inspections and tests nominated in the QCP where witness and hold points are required. The schedule shall be regularly updated with progress and issued to TPL to show the current inspection and test status.
  - Field Inspection Checklists - For site installation and construction activities, the *Contractor* prepares FICs to permit inspection and testing of installed equipment and constructed facilities in accordance with the respective QCPs.
  - Inspection Points - The QCP identifies points in the fabrication, manufacturing and/or installation process that are selected for inspection. Hold Point (H), Witness Point (W) Review Point (R), Surveillance (S). A TPL Sample QCP can be used as a reference which is attached to this scope of works.
  - Welding Procedures - Where the *Contractor's* scope of works includes fabricated weldments, WPS defining the method, preparation and sequences

to be adopted to achieve a satisfactory welded joint shall be provided for all weld types required in the execution of this scope of works.

- Material Traceability - Where, and to the extent that material traceability is required, the *Contractor* shall provide its procedures for the maintenance of material identification throughout all phases of manufacture.
- Material Certification - Where specified in this scope of works the following certificates shall also be provided to TPL: certificates of compliance, certificates issued by a laboratory or test facility independent of the *Contractor's* work, any other form of certification affecting the scope of works.

- **Non-Conforming Products**

The *Contractor* shall establish and maintain procedures to control material or products that do not meet the specified requirements.

All *Contractor* product and/or materials identified as not conforming to requirements shall be dealt with promptly as follows:

- If the *Contractor* discovers material or product which is not in accordance with the requirements of the scope of works e.g. a non-conformance, the *Contractor* shall immediately initiate the non-conformance procedure. If TPL or its agent identifies a non-conformance, a *Transnet* NCR may be raised.

- **Corrective and Preventative Action**

- If the *Contractor* proposes a disposition of any non-conforming materials or product which varies from the requirements of this scope of works, such a proposal shall be submitted in writing to TPL whose decision on the proposal shall be obtained in writing before the non-conforming material or product is covered up or incorporated into the works, or is the subject of any other disposition.
- The disposition of non-conformances which do not vary the requirements of the *Contract*, specification or drawings may be approved by the *Contractor* following discussion and agreement with TPL.

- **Inspection, Measuring and Test Equipment**

Calibration - The *Contractor* shall ensure the calibration of test and measuring equipment is performed and maintained in accordance with the relevant *Contractor* procedures and/or the equipment manufacturer's specifications.

Use of Inspection, Measuring and Test Equipment - The *Contractor* shall ensure that authorized equipment users:

- Use the equipment in accordance with manufacturer's instructions, and accepted industry practices
- Ensure the equipment is covered by a current calibration certificate
- Conduct the measurements or tests in accordance with the equipment manufacturer's specifications or other relevant specification
- Prior to commencement of each inspection or test activities:
  - Identify the measurements to be made
  - Determine the accuracy required

- Select the appropriate inspection, measuring or test equipment for this scope of works.

#### 4.4.5 Quality Records

*Contractors* shall maintain quality records necessary to provide objective evidence that demonstrates and verifies achievement of the QA/QC requirements associated with this scope of works. All quality records including original source material test certificates and non-destructive test reports, shall be retained by the *Contractor* during the project, and be provided to TPL at the times, and in the quantities specified in this scope of works.

#### 4.5 Documentation

The *Contractor* shall supply the documentation listed below:-

- Two (2) complete sets of the following (in files) and one soft copy on a separate memory sticks for each TPL site (Documents must be printable, drawings must also include PDF and CAD versions) :-
  - Detailed as built drawings (all drawings types that are outlined on clause 4.1.1 and/or 4.1.5)
  - Detailed as built lighting design simulation report
  - Required lux levels spread sheet/PDF with measure night lux levels
  - All luminaire datasheets
  - Comprehensive maintenance manuals
  - Detailed spares catalogues
  - Electrical Certificate of Compliance (Original and a copy of the COC) (including equipment certificates).
  - Factory inspection and testing documents
  - Site testing, certification, commissioning and completion documents
  - Equipment warranty certificates.
  - Classification certificates are required for all equipment installed in hazardous areas.
  - PQP & QCP.
- A formal completion certificate signed and dated by both the *Contractor* and the *Project Manager* shall be provided.

#### 4.6 Installation and Site Works

- 4.6.1 The *Contractor* shall prior to making any design changes to the existing equipment and proposed drawings submit drawings and detailed lighting design simulation report to the *Project Manager* for prior acceptance. Drawings shall include equipment schedules detailing all major components as per clause 4.1 requirements.
- 4.6.2 The *Contractor* shall ensure that all equipment arrive timeously onsite. The *Contractor* shall be responsible for any damages to equipment prior to completion and hand over. Should such a delay occur, the *Contractor* shall immediately inform the *Project Manager* in writing such that action can be taken to mitigate the delay.

- 4.6.3 The *Contractor* shall ensure that all onsite and work specific safety protocols and precautions are followed at all times. The *Contractor* shall also ensure that the relevant PPE is worn at all times. The *Contractor* is also to note that in all sites the work will include working at height up to 2.4m and in other sites like Waltoo, Tarlton, Langlaagte, Alrode OPS and Alrode Workshop the work will include working at height on Tanks and the Workshop of up to 30m and 10m respectively. The tanks have a safety rail. The *Contractor* is also to ensure compliance to COVID-19 related regulations and mitigations where applicable. The *Contractor* will need to provide their COVID-19 management and risk plan. The COVID-19 risk are also outlined on the attached Lighting Upgrade Project Baseline Assessment with COVID-19 Risks (IMS risk assessment register).
- 4.6.4 The *Contractor* shall ensure at all times compliance with SHE requirements prescribed by applicable legislation and best practice standards. The *Contractor* will be responsible for the SHE requirements that TPL may require to be implemented. The *Contractor* shall ensure that no person or employees are allowed to enter any of the work sites on their behalf, unless that employee or person has undergone SHE induction pertaining to the hazards prevalent to the site at the time of entry.
- 4.6.5 The *Contractor* shall, in the presence of the *Project Manager* and any other Transnet staff deemed necessary test and commission the upgraded installation and all associated equipment.

#### **4.7 Factory Inspection and Testing**

- 4.7.1 It shall be the responsibility of the *Contractor* to compile a complete Factory Acceptance Test Schedule prior to scheduling a Factory Acceptance Testing (FAT). This schedule shall be used for FAT of the equipment supplied by the *Contractor*.
- 4.7.2 Factory Acceptance Test schedule/s shall be comprehensive and must cover all aspects of the equipment to be tested and shall be submitted to the *Project Manager* for acceptance at least two weeks prior to commencement of FAT.
- 4.7.3 The *Project Manager* reserves the right to add or delete any item or test on the Factory Acceptance Test schedule in order to verify that the supplied equipment complies with specification.
- 4.7.4 The *Contractor* shall perform the FAT at the supplier's manufacturing facility under their supervision, in accordance with standard specifications.
- 4.7.5 The *Contractor* shall be responsible for providing all test equipment and facilities required for the period of the FAT such as the *Project Manager* may deem necessary, and to produce a report of the tests completed.
- 4.7.6 Should the Factory Acceptance Tests be suspended due to the failure of any test or as a result of equipment failure, re-scheduling of the Factory Acceptance Tests shall be at the discretion of the *Project Manager*. Failure of Factory Acceptance Tests may result in the *Contractor* being back-charged for the man hours expended by the TPL representatives witnessing the tests.
- 4.7.7 The Factory Acceptance Test schedule will include as a minimum, the following checks and tests:
- 4.7.7.1 Inspections
- A physical check of all equipment shall be made against the applicable drawings.
  - Non-compliance will be marked in red on drawings for correction before acceptance.

#### **4.8 Site Testing, Certification and Commissioning**

- 4.8.1 It shall be the responsibility of the *Contractor* to compile a complete Site Acceptance Test and Commissioning Schedule to be used for site acceptance testing, certification and commissioning of the equipment to be installed by the *Contractor*.



- 4.8.2 The Site Acceptance Test and Commissioning schedule shall be comprehensive and shall cover all aspects of the equipment to be tested and commissioned and shall be submitted to the *Project Manager* for acceptance, prior to commencement of Site Acceptance Testing (SAT).
- 4.8.3 The *Contractor* shall be responsible for providing all test equipment and facilities required for the period of the SAT such as the *Project Manager* may deem necessary, and to produce a report of the tests completed.
- 4.8.4 The *Project Manager* reserves the right to add or delete any item or test on the Site Acceptance Test and Commissioning schedule in order to verify that the installed equipment complies with the applicable specification.
- 4.8.5 The *Contractor* shall perform the SAT, electrical compliance certification and commissioning of the supplied/installed equipment. The *Contractor* shall at his own expense rectify all defects. Should a defect result in time delays and additional material/labour cost, such additional cost incurred shall be for the *Contractor's* account.
- 4.8.6 The *Contractor* shall perform lighting tests (Lux levels) at night in the presence of *Project Manager* or his delegated authority.
- 4.8.7 The *Contractor* shall record the results of all lighting night tests on the lighting layout drawing at the specific points on the drawing where readings are taken as well as on the attached required lux levels spread sheet under "measured lux level" column. This documentation is to be included in the documentation packs to be provided to TPL on conclusion of the project.
- 4.8.8 Site Acceptance and Handover of all items of the equipment shall be concluded once SAT, certification and commissioning of all supplied/installed equipment has been completed, all fault lists have been completed to compliance and the following documentation has been submitted to and accepted by the *Project Manager*:
- Complete FAT and SAT documentation, comprising of test schedules and commissioning report (as applicable)
  - Completed Electrical Certificates of Compliance (Original and a copy of the COC)(including equipment certificates)
  - Final Contract Documentation as outlined on clause 4.4
  - A formal completion certificate signed and dated by both the *Contractor* and the *Project Manager* shall be provided

Documentation format and number of copies shall be in accordance with TPL specifications PL 100, 101, 102, 103.

## 5 Appendices

The following TPL documentation shall be read in conjunction with this scope of works

- BOQ with required lux levels and technical scoring spread sheet.
- Lighting schematic drawings showing the new lighting design layout
- Lighting layout with cable routing and zoning drawings
- Typical rail mount pole drawing
- Typical floor mount/free standing pole drawing
- Typical bound mount pole drawing
- Typical zone 1 luminaire pole extension drawing
- Lighting Upgrade Project Baseline Assessment with COVID-19 Risks(IMS risk assessment register)
- SHE Compliance file review-guidelines
- Transnet Contractor Management Procedure TRN-IMS-GRP-PROC-014
- TPL Sample QCP

## 6 Maintenance



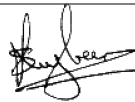
N/A

## 7 Guarantee

Guarantee initiation shall be from the date recorded on the *Contractor's* completion certificate. The completion certificate shall for validity purposes contain the signature of both the *Contractor* and the *Project Manager*.

All electrical components (luminaire excluded) supplied under this specification shall be warranted for a minimum of 12 months from the date of completion. All luminaires shall be warranted for a minimum of 5 years from the date of completion. Mechanical equipment shall be warranted for a minimum of 12 months from the date of completion. The defect period (including workmanship) shall be guaranteed for a period of 52 weeks. Upon receiving a notice from TPL, the *Contractor* shall at its own cost and expense and without reimbursement by TPL promptly correct, repair or replace the items, which are not in conformance with this specification. *Contractor's* warranty shall cover all costs (including, without limitation, those costs associated with parts, labour, technical support, travel, transportation, and shipping and handling). The *Contractor* is also to issue TPL all the respective equipment warranty certificates.

## 8. Signatures

	Name	Title	Signature	Date
Compiled by	K. Ndlela	Electrical Specialist		07/11/2022
Reviewed by	M. Du Sart	Risk Operation Manager		11.11.2022
Reviewed by	P. Selwane	Environmental Specialist		08/11/2022
Reviewed by	L. Majozi	Quality Control Auditor	S. 	09.11.2022
Approved by	S. Rugbeer	Acting Electrical Manager		11/11/2022