

**PERFORMANCE SPECIFICATION: LED UP AND DOWN WALL MOUNTED LUMINAIRES
(TYPE 2)**

Signatures						
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1.0 SCOPE

- 1.1 This specification defines the performance and technical requirements for the supply of LED up and down wall-mounted luminaires for TNPA facilities.
- 1.2 This includes luminaire construction, materials and finishes, LED light sources, power supplies/drivers, optics, ingress protection, wiring, earthing, electromagnetic compatibility, packaging, and associated documentation.
- 1.3 The luminaires are intended for use in TNPA port environments, which are characterised by high humidity, saline atmospheres, and demanding operational conditions. All equipment supplied shall be designed and manufactured to withstand these conditions and provide reliable, long-term service.
- 1.4 This specification covers LED up and down wall-mounted luminaires with polycarbonate construction, suitable for indoor and outdoor commercial applications, including building entrances, facades, walkways, and general architectural lighting as indicated in the relevant lighting design schedules.
- 1.5 The luminaires shall be supplied complete with all necessary mounting hardware, LED drivers, and all required certification and test documentation as specified herein.

2.0 REFERENCES

The following standards and documents are referenced in this specification. Where reference is made to a specific clause of a standard, the latest edition of that standard shall apply.

Luminaires & Performance

SANS 475 – Luminaires for interior lighting, street lighting and flood lighting – Performance requirements

SANS 60598-1 – Luminaires – Part 1: General requirements and tests

SANS 60598-2-1 – Luminaires – Part 2-1: Particular requirements – Fixed general purpose luminaires

Enclosures & Protection

SANS 60529 – Degrees of protection provided by enclosures (IP Code)

SANS 62262 – Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK Code)

Electrical Safety & Wiring

SANS 10142-1 – The wiring of premises – Part 1: Low-voltage installations

Photometry & Lighting Design

IES LM-79 – Optical and Electrical Measurements of Solid-State Lighting Products

IES LM-80 – Measuring Lumen Maintenance of LED Light Sources

IES TM-21 – Projecting Long-term Lumen Maintenance of LED Light Sources

SANS 10098 – Public lighting – The lighting of public thoroughfares and certain specific areas

Electromagnetic Compatibility (EMC)

SANS 61000-3-2 – Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions

SANS 61000-3-3 – Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems

SANS 61000-4-5 – Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test

IEC 55015 – Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

IEC 61547 – Equipment for general lighting purposes – EMC immunity requirements

Materials & Finishes

ISO 12944 – Paints and varnishes – Corrosion protection of steel structures by protective paint systems

Quality & Compliance

ISO 9001 – Quality management systems – Requirements

OHSACT (Act 85 of 1993) – Occupational Health and Safety Act – Electrical Machinery Regulations (Earthing requirements)

3.0 SERVICE CONDITIONS

3.1 The luminaires shall be designed and manufactured to operate reliably under the following service conditions typically encountered in TNPA port facilities (e.g., building entrances, facades, walkways, and general architectural applications):

3.1.1 Environmental Conditions

- a. Ambient temperature range: 0°C to +35°C
- b. Relative humidity: 10% to 95% (non-condensing)
- c. Coastal environment: Saline coastal environment with potential for airborne salt spray and dust ingress
- d. Dust and particulate matter: moderate to high levels typical of industrial port facilities
- e. Exposure: Suitable for outdoor and indoor commercial applications

3.1.2 Electrical Supply Conditions

- a. Nominal supply voltage: 230 V AC $\pm$ 10%
- b. Supply frequency: 50 Hz $\pm$ 5%
- c. Voltage fluctuations and surges: Typical of industrial power networks with potential for switching transients

3.1.3 Mechanical Conditions

- a. Vibration: Low to moderate levels typical of buildings
 - b. Mounting: Wall-mounted installation
- 3.2 All luminaires supplied shall be suitable for continuous operation under the above conditions without degradation of performance, reduction of service life, or failure of components.
- 3.3 The luminaire's corrosion protection (polycarbonate construction, stainless steel fasteners, etc.) shall be sufficient to withstand the saline coastal atmosphere without deterioration during the warranted period.

4.0 STANDARD OF EQUIPMENT

- 4.1 Equipment shall be of a high-quality design and manufacture and shall comply with the relevant specifications and recommendations mentioned in this specification.
- 4.2 Every reasonable precaution and provision shall be incorporated in the design of the equipment for the safety and security of the system and of those concerned with its

operation and maintenance.

- 4.3 Any proposed alternative equipment or material not strictly complying with the specified requirements shall be submitted to the TNPA's Technical Officer for prior written approval. Such approval will not diminish the tenderer's responsibility to meet the performance requirements.

5.0 MATERIALS AND FINISHES

- 5.1 The luminaire body shall be manufactured from high-quality polycarbonate and ABS, providing excellent durability and corrosion resistance for coastal environments.
- 5.2 The luminaire shall be available in the following colour options, as specified in the tender schedule:
- Black
 - White
- 5.3 The diffuser shall be manufactured from polycarbonate, providing uniform light distribution and protection against environmental ingress.
- 5.4 All external fasteners (bolts, screws, nuts, washers) shall be manufactured from stainless steel grade AISI 304 or higher.
- 5.5 The luminaire shall be classified as "Coastal Quality" and shall be suitable for installation in saline coastal environments.

6.0 SYSTEM DESCRIPTION

- 6.1 The luminaire shall be an LED up and down wall-mounted fitting with polycarbonate body and diffuser.
- 6.2 The luminaire shall bear the SANS 60598-1 safety mark and shall comply with the specifications as per SANS 60598-2-1.
- 6.3 The luminaire shall be of the totally enclosed type.
- 6.4 Luminaires shall be delivered fully assembled with housing, LED driver and LED module.
- 6.5 The luminaire shall be designed for wall surface mounting.
- 6.6 The luminaire shall provide both upward and downward light distribution for architectural and facade lighting applications.
- 6.7 The luminaire shall be suitable for indoor and outdoor applications.
- 6.8 The luminaire shall have a design for ease of installation without compromising product lifetime.

7.0 FUNCTIONAL AND PERFORMANCE REQUIREMENTS

7.1 Luminaire Construction

- 7.1.1 The luminaire housing shall be manufactured from polycarbonate and ABS, providing excellent corrosion resistance and durability.
- 7.1.2 The luminaire shall be of the up and down wall-mounted type, providing symmetrical light distribution both upward and downward.
- 7.1.3 The luminaire shall incorporate an aluminium heat sink for passive cooling of the LED light source. Active cooling (fans) or liquid cooling is prohibited.
- 7.1.4 The design of the external surfaces shall prevent the accumulation of dirt and dust.
- 7.1.5 All parts requiring maintenance and cleaning shall be easily accessible.
- 7.1.6 The luminaire shall be designed with a low profile, aesthetically appealing appearance.

7.2 Dimensions

- 7.2.1 The luminaire shall have the following nominal dimensions as detailed in table 1:

Table 1: Luminaire Dimensions

Configuration	Width (W)	Height (H)	Depth (D)
Up and Down Light (12W)	200 mm	125 mm	40 mm
Down Light (6W)	240 mm	80 mm	40 mm

7.3 LED Light Source

- 7.3.1 The luminaire shall be available in the following power and lumen configurations:

Configuration	Wattage	Lumens (Lm)	Description
Up and Down Light	12 W	Min 700 Lm	Symmetrical up and down light distribution
Down Light	6 W	Min 480 Lm	Downward light distribution only

- 7.3.2 The effective wattage of the fitting shall be as specified in the tender schedule.
- 7.3.3 The light source shall be available in the following correlated colour temperatures (CCT) as specified in the tender schedule:
 - 4000K (Neutral white 840)
 - 3000K (Warm white 830)
- 7.3.4 The Colour Rendering Index (CRI) shall be 30 minimum (CRI ≥30).
- 7.3.5 The LED lifetime @ T_q 25°C shall be 30,000 hours minimum.
- 7.3.6 The LED chip warranty shall be a minimum of 3 years.

7.4 Power Supply / Driver

- 7.4.1 The luminaire shall be equipped with an integrated LED driver suitable for the specified LED modules.
- 7.4.2 The driver shall be of the constant-current type.
- 7.4.3 The driver shall incorporate the following protection features:
 - Overload protection
 - Short circuit protection
- 7.4.4 The driver shall support the following electrical characteristics:
 - Rated supply voltage: 230 V AC
 - Mains frequency: 50 Hz
 - Rated power: As specified in the tender schedule

7.5 Electrical Safety and Classification

- 7.5.1 The luminaire shall be Class II insulation (double insulated), providing protection against electric shock without the need for an earth connection.
- 7.5.2 The luminaire shall be designed to operate on a 230 V AC supply.
- 7.5.3 The lamp base type shall be LED (integrated LED module).

7.6 Ingress Protection (IP)

- 7.6.1 The luminaire shall have an Ingress Protection (IP) rating of IP65 minimum, providing:
 - Complete protection against dust ingress
 - Protection against the effects of water jets
- 7.6.2 The IP65 rating shall be suitable for outdoor and indoor commercial applications.
- 7.6.3 The LED compartment shall form a seal to prevent the entry of dust, moisture, and insects.
- 7.6.4 The IP rating shall be certified by a test report for the specific luminaire model.

7.7 Optics and Diffuser

- 7.7.1 The luminaire shall be equipped with a polycarbonate diffuser, providing uniform light distribution.
- 7.7.2 The diffuser shall provide the required optical distribution for the specified application.
- 7.7.3 The diffuser shall be UV-stabilised to prevent discolouration over time.

7.8 Wiring and Electrical Connections

7.8.1 The internal wiring of the luminaires shall be flexible and suitably insulated to withstand the voltage and temperature encountered in service.

7.8.2 The supply terminals shall accept the appropriate conductor sizes and be easily accessible.

7.9 Earthing

7.9.1 The luminaire shall be Class II insulation rated.

7.9.2 All metal parts that may become live in the event of an insulation fault shall be permanently and reliably connected to an earthing terminal, complying with the test specified in SANS 60598-2-1.

7.10 Electromagnetic Compatibility

7.10.1 The luminaire shall comply with IEC 55015 (Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment).

7.11 Packaging and Transport

7.11.1 The luminaires shall be packed in a manner that ensures protection during handling and transport by road, rail, or sea.

7.11.2 The packaging shall be designed to prevent vibration damage to the LED modules and control gear during transit.

7.11.3 Where sea transport is involved, a suitable dehydrating agent (desiccant) shall be included in the packaging to prevent corrosion.

8.0 CERTIFICATION AND TEST REPORTS

8.1 The tenderer shall provide the following documentation:

- a. Product data sheets, catalogues, and operation/maintenance manuals
- b. Report conforming to SANS 60598-2-1 (or applicable part) read in conjunction with SANS 60598-1, explicitly confirming the declared Ingress Protection (IP) rating.
- c. Test reports for the SANS 475 performance mark (if applicable).
- d. LM-79 compliant absolute photometric report (including IES/LDT files reflecting true fixture performance).

9.0 WARRANTY AND DOCUMENTATION

9.1 The tenderer shall guarantee all equipment supplied against this specification for a period of three (3) years (36 months) from the date of delivery or as otherwise agreed in the purchase order. The tenderer shall explicitly state their compliance herewith.

- 9.2 This guarantee shall cover all materials, parts, workmanship, performance, and efficiency of the equipment supplied, including the LED module and driver.
- 9.3 The LED chip warranty shall be a minimum of 3 years.
- 9.4 Should any part or equipment fail during the 36-month guarantee period due to defective materials or workmanship, the supplier shall immediately replace such part or equipment free of charge, including all costs for transport and associated logistics.
- 9.5 The Contractor shall submit all required documentation as detailed in Section 8.0.

10.0 QUALITY ASSURANCE

- 10.1 The design, assembly, and testing of the luminaire shall be undertaken in an ISO 9001:2015 certified facility.
- 10.2 The Contractor's quality management system shall comply with the requirements of SANS/ISO 9001. These requirements are mandatory for all items supplied against this specification.
- 10.3 All products shall be factory tested and quality-assured prior to dispatch.
- 10.4 All devices shall operate without perceptible delay, flicker, or interference under normal service conditions.
- 10.5 Prior to bulk delivery, the Contractor shall supply a full set of sample luminaires for inspection and approval by the Engineer. Samples shall be subject to testing to verify compliance with the performance requirements specified herein.