

4. LIGHT FITTINGS

A local government owned testing organization shall check each LED fitting and test reports shall be submitted along with the sample.

The Contractor shall provide Samples, IES files and data sheets of fitting, LED chip and LED driver of each LED lamp fitting (obtained from the manufacturer) to the Consultant for approval.

LED fitting shall have minimum manufacturer warranty as indicated below. The Contractor shall provide written documents for the Warranty.

The LED Chip shall have IES LM 79 and IES LM 80 test reports and shall be submitted for approval.

The LED driver shall be of constant current type. The harmonic content of the fitting shall be below 40%. It shall have inbuilt circuitry for line isolation, lightning protection, over voltage protection and filtering circuit for Electromagnetic interference. The data sheet obtained from the manufacturer shall be submitted. The warranty period of the driver should be similar to the same of the light fitting.

Written documents shall be available to support the following data.

4.1. 900lm Recessed Mounted LED Down Light



Colour of the Body	:	White
Body	:	Aluminium/ Aluminium alloy or substantially equivalent
Shielding angle	:	≥ 20
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	900lm
Luminous Efficacy	:	≥ 80 lm/W
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥ 80
Operating voltage	:	230V, 50Hz, 1-phase

UGR Rating	:	≤ 19
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
Beam Angle	:	$\geq 70^{\circ}$
IP rating	:	IP 20
Warranty	:	3 years

4.2.1200lm Recessed Mounted LED Down Light



Colour of the Body	:	White
Body	:	Aluminium/ Aluminium alloy or substantially equivalent
Shielding angle	:	≥ 20
Standard Deviation Colour Matching	:	< 05
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	1200lm
Luminous Efficacy	:	$\geq 80\text{lm/W}$
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥ 80
Operating voltage	:	230V, 50Hz, 1-phase
UGR Rating	:	≤ 19
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
Beam Angle	:	$\geq 70^{\circ}$
IP rating	:	IP 20
Warranty	:	3 years

4.3.1200lm Dimmable Recessed Mounted LED Down Light



Special Functions	:	Step Dimmable driver
Colour of the Body	:	White
Body	:	Aluminium/ Aluminium alloy or substantially equivalent
Shielding angle	:	≥ 20
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	1200lm
Luminous Efficacy	:	≥ 80 lm/W
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥ 80
Operating voltage	:	230V, 50Hz, 1-phase
UGR Rating	:	≤ 19
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
Beam Angle	:	$\geq 70^{\circ}$
IP rating	:	IP 20
Warranty	:	3 years

4.4.2000lm Recessed Mounted LED Down Light-External Corridor



Colour of the Body	:	White
Body	:	Aluminium/ Aluminium alloy or substantially equivalent
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	2000lm
Luminous Efficacy	:	≥ 80 lm/W
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	3,000 K
Colour rendering index	:	≥ 80
Standard Deviation Colour Matching:	:	< 05
Operating voltage	:	230V, 50Hz, 1-phase
UGR Rating	:	≤ 19
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
Beam Angle	:	$30^{\circ} - 40^{\circ}$
IP rating	:	IP 20
Warranty	:	3 years

4.5.500lm Fixed LED Spotlight



Colour of the Body	:	White
Body	:	Aluminium/ Aluminium alloy or substantially equivalent
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	500 Lm
Luminous Efficacy	:	≥60lm/W
Lifetime	:	≥35,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥80
Standard Deviation Colour Matching	:	< 05
Operating voltage	:	230V, 50Hz, 1-phase
Power factor	:	≥0.7
Surge Protection	:	2.5 kV
Beam Angle	:	30 ⁰ - 40 ⁰
IP rating	:	IP 20
Warranty	:	3 years

4.6.700lm Adjustable, Dimmable LED Spotlight



Colour of the Body	:	White
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Body	:	Aluminium/ Aluminium alloy or substantially equivalent
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	700 Lm
Luminous Efficacy	:	≥60lm/W
Lifetime	:	≥35,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥80
Standard Deviation Colour Matching:	:	< 05
Operating voltage	:	230V, 50Hz, 1-phase
Power factor	:	≥0.7
Surge Protection	:	2.5 kV
Beam Angle	:	30 ⁰ - 40 ⁰
IP rating	:	IP 20
Warranty	:	3 years

4.7.900lm Surface Mounted LED Down Light



Colour of the Body	:	White
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	900lm
Luminous Efficacy	:	≥80lm/W
Lifetime	:	≥35,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥80
Operating voltage	:	230V, 50Hz, 1-phase
Power factor	:	≥0.8

Surge Protection	:	2.5 kV
IP rating	:	IP 20
Beam Angle	:	80 ⁰ - 110 ⁰
Warranty	:	3 years

4.8.1200lm Surface Mounted LED Down Light



Colour of the Body	:	White
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	1200lm
Luminous Efficacy	:	≥ 80lm/W
Lifetime	:	≥35,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥ 80
Operating voltage	:	230V,50Hz, 1-phase
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Beam Angle	:	80 ⁰ - 110 ⁰
Warranty	:	3 years

4.9.1100lm Surface Mounted Cylindrical LED Down Light (Staircase)



Colour of the Body	:	White
Body	:	Aluminium /Aluminium Alloy or substantially equivalent
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	1100lm
Luminous Efficacy	:	$\geq 80\text{lm/W}$
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥ 80
Operating voltage	:	230V,50Hz, 1-phase
Power factor	:	≥ 0.5
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Beam Angle	:	$\geq 60^\circ$
Warranty	:	3 years

4.10. Lamp Replaceable Single LED Batten (1200mm) Light Fitting-Without Diffuser



Colour of the Body	:	White
Material of the Body	:	Steel body with White gloss powder coated finish
Diffuser	:	No Diffuser
Mounting Type	:	Suspended
Lumen output of LED Tube	:	2100 lm
Luminous Efficacy of LED Tube	:	≥ 80 lm/W
Lifetime of LED Tube	:	$\geq 35,000$ Hours
Colour Temperature of LED Tube	:	6,500K
Colour rendering index of LED Tube	:	≥ 80
Operating voltage of LED Tube	:	230V, 50Hz, 1-phase
Power factor of LED Tube	:	≥ 0.8
IP rating	:	IP 20
Surge Protection	:	2.5 kV
Warranty of LED Tube	:	2 years

4.11. Lamp Replaceable LED Double Batten (1200mm) Light Fitting-Without Diffuser



Colour of the Body	:	White
Material of the Body	:	Steel body with White gloss powder coated finish
Diffuser	:	No Diffuser
Mounting Type	:	Suspended
Lumen output of LED Tube	:	2100 lm
Luminous Efficacy of LED Tube	:	≥ 80 lm/W
Lifetime of LED Tube	:	$\geq 35,000$ Hours
Colour Temperature of LED Tube	:	6,500K
Colour rendering index of LED Tube	:	≥ 80
Operating voltage of LED Tube	:	230V,50Hz, 1-phase
Power factor of LED Tube	:	≥ 0.8
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Warranty of LED Tube	:	2 years

4.12. 3000lm, (600x600mm) Recessed Mounted Type LED Panel Light



Colour of the Body	:	White
Material of the Body	:	Aluminium frame
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	3000lm
Luminous Efficacy	:	≥ 100 lm/W
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	6,500K
Colour rendering index	:	≥ 80
Operating voltage	:	230V,50Hz, 1-phase

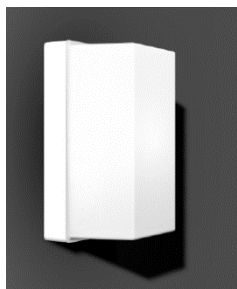
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Beam Angle	:	$\geq 100^{\circ}$
UGR Rating	:	≤ 19
Warranty	:	3 years

4.13. 3000lm, (600x600mm) Surface Mounted Type LED Panel Light



Colour of the Body	:	White
Material of the Body	:	Aluminium frame
Diffuser	:	PMMA / Virgin Polycarbonate
Material of the heat sink	:	Metal
Lumen output	:	3000lm
Luminous Efficacy	:	$\geq 100\text{lm/W}$
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	6,500K
Colour rendering index	:	≥ 80
Operating voltage	:	230V, 50Hz, 1-phase
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
Beam Angle	:	$\geq 100^{\circ}$
UGR Rating	:	≤ 19
IP rating	:	IP 20
Warranty	:	3 years

4.14. Wall Mounted LED Light (Staircase)



Colour of the Body	:	White
Lumen output	:	900lm
Luminous Efficacy	:	≥ 80 lm/W
Lifetime	:	$\geq 25,000$ Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥ 80
Operating voltage	:	230V, 50Hz, 1-phase
Power factor	:	≥ 0.7
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Impact Protection	:	IK04
Warranty	:	2 years

4.15. Wall Mounted LED Bulkhead Light-Lamp Replaceable



Material of the Body	:	Die cast Aluminium or substantially equivalent.
Lumen output (Lamp)	:	900lm
Holder Type	:	E27
Luminous Efficacy	:	≥ 80 lm/W
lifetime	:	$\geq 25,000$ Hours

Colour Temperature	:	3,000K
Colour rendering index	:	≥70
Operating voltage	:	230V, 50Hz, 1-phase
Power factor	:	≥0.7
Surge Protection	:	2.5 kV
IP rating	:	IP 44
Impact Protection	:	IK04
Warranty (Lamp)	:	1 year

4.16. LED Duct Mounted Bulkhead Light -Lamp Replaceable



Lumen output (Lamp)	:	1100lm
Holder Type	:	E27
Luminous Efficacy	:	≥80lm/W
lifetime	:	≥25,000 Hours
Colour Temperature	:	6,500K
Colour rendering index	:	≥70
Operating voltage	:	230V, 50Hz, 1-phase
Power factor	:	≥0.7
Surge Protection	:	2.5 kV
IP rating	:	IP 44
Impact Protection	:	IK04
Warranty(lamp)	:	1 years

4.17. Floor Mounted IP 67 IN Ground LED Light



Colour of the Body	:	Black
Material of the Body	:	Die cast Aluminium or substantially equivalent.
Material of the Bezel	:	Stainless Steel
Material of the heat sink	:	Die cast Aluminium
Lumen output	:	1500lm
Luminous Efficacy	:	≥80lm/W
Lifetime	:	≥25,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥80
Operating voltage	:	230V,50Hz, 1-phase
Beam Angle	:	≤20°
Power factor	:	≥0.7
IP rating	:	IP 67
Driver	:	IP65 Drivers
Warranty	:	3 years

4.18. LED Wall Recessed Step Light



Colour of the Body	:	White
Diffuser	:	Aluminium Reflector

Material of the Body	:	Die cast Aluminium or substantially equivalent.
Lumen output	:	200lm
Lifetime	:	≥25,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥80
Operating voltage	:	230V,50Hz, 1-phase
Power factor	:	≥0.5
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Impact Protection	:	IK06
Warranty	:	3 years

4.19. LED Step Light



Colour of the Body	:	White
Material of the Body	:	Die cast Aluminium or substantially equivalent
Lumen output	:	(40-100) lm
Width of luminaire	:	≤200 mm
Lifetime	:	≥25,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥80
Operating voltage	:	230V,50Hz, 1-phase
Power factor	:	≥0.5
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Impact Protection	:	IK10
Beam Angle	:	≤70 ⁰
Warranty	:	3 years

4.20. LED Strip Light and Driver



4.20.1. LED strip Light

Lumen output	:	700lm/m
Luminous Efficacy	:	≥ 80 lm/W
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥ 80
Operating voltage	:	230V,50Hz, 1-phase
Power factor	:	≥ 0.8
Surge Protection	:	2.5 kV
IP rating	:	IP 20
Beam Angle	:	≥ 110
Warranty	:	3 years

4.20.2. LED Driver

Output Voltage	:	12/24 V DC
Driver technology	:	Constant current
Surge Protection	:	2.5 kV
Lifetime	:	$\geq 35,000$ Hours
Colour Temperature	:	3,000 K
Colour rendering index	:	≥ 80
Operating voltage	:	230V,50Hz, 1-phase
Power factor	:	≥ 0.8
Ripple current	:	$\leq 5\%$
IP rating	:	IP 20
Warranty	:	3 years

4.21. NON MAINTAINED TYPE LED WALL MOUNTED EMERGENCY LAMP



Lamp	:	3W x 2 LED
Colour of the body of the Luminaire	:	White
CCT	:	3000K
Operating voltage	:	230V,50Hz, 1-phase
Battery type	:	Sealed Lead acid/NiCad
Operating Voltage	:	230V/50Hz/1-Phase
Battery autonomy	:	1.5 hrs.
Warranty	:	2 years
Standards	:	EN, IEC 60598–2–22, EN, IEC 61951-3
Indicators	:	3 indicator light status: lighting under main power, charging and fault (sound-light alarm) and test button shall be available.

4.22. LED Flood Light



Colour of the Body	:	Black (RAL 7021)
Material of the Body	:	Die-casting aluminium or substantially equivalent
Diffuser	:	Glass
Material of the heat sink	:	Die cast Aluminium or substantially equivalent

Lumen output	:	4000lm
Luminous Efficacy	:	≥80lm/W
Lifetime	:	≥35,000 Hours
Colour Temperature	:	3,000k
Colour rendering index	:	≥70
Operating voltage	:	230V,50Hz, 1-phase
Power factor	:	≥0.7
IP rating	:	IP 65
Impact Protection	:	IK07
Surge protection	:	2.5 kV
Beam Angle	:	≥100
Driver	:	IP54 Drivers
Warranty	:	2 years
Applications	:	Wall washer and general lighting

4.23. Aircraft Warning Light

The aircraft warning light shall be Low intensity obstacle light with minimum intensity of 32 candelas.

Type	:	Static LED Beacon
Horizontal / Vertical beam	:	360° / 10°
Base and Lens material	:	Polycarbonate
Material of the heat sink	:	Metal
Luminous Intensity: Red	:	≥10 Cd
Approximate power consumption	:	1W-4W
Lifetime	:	≥100,000 Hours
Operating voltage	:	230V, 50Hz, 1-phase
IP rating	:	≥IP 65
Warranty	:	5 years
Flash Rate	:	≥ 40 fpm
Surge Protection	:	2.5 kV
RULES OF COMPLIANCE	:	EN/IEC 60079-0; EN/IEC 60079-1; EN/IEC 60079-

4.24. LED Strobe Light

Light source & Operation	:	LED Strobe
Operating Voltage	:	DC 12/24V
Flash rate	:	30 per minute
Diffuser	:	Polycarbonate or substantially equivalent
Diameter	:	≤ 120 mm
Height	:	≤ 120 mm
Certificates	:	CE
Warranty (Strop Light)	:	2 years
Power Supply Unit (output Voltage)	:	12/ 24 Volt
Power Supply Unit (input Voltage)	:	230V, 50Hz, 1-phase
Power Supply Unit power	:	25 W
Warranty (Power Supply Unit)	:	2 years

4.25. Motion sensor

Technology	:	passive infrared sensors
Mounting Method	:	Wall
Specified detection distance	:	≥ 8 m
Field of view	:	110°
Minimum Object size	:	700 x 250mm
Operating voltage	:	230 V AC/ 50 Hz
Adjustable time delay	:	10 s to 10 min.
Light level threshold	:	10 to 1000 lux
Warranty	:	2 years
Warranty (Power Supply Unit)	:	2 years

4.26. Presence Detector

Technology	:	passive infrared sensors with Automatic control of lighting depending on presence and brightness
Mounting Method	:	Wall
Specified detection distance	:	≥ 8 m (walking)
Field of view	:	180°
Adjustable time delay	:	10 s to 20 min.
Light level threshold	:	10 to 1500 lux
Operating voltage	:	230 V AC/ 50 Hz
Type of protection	:	IP 54
Warranty	:	2 years
Warranty (Power Supply Unit)	:	2 years

5. SUBMITTALS

Following submissions shall be made at each stage.

5.1.BIDDING STAGE

The bidder shall submit following along the bid.

- The technical datasheets of each product and catalogue which indicate a clear pictorial view of the product shall be submitted with the bid for evaluation.
- The IES files of the fittings requested in Technical Schedule shall be submitted along the bids via CD copy.
- Samples of following light fittings along the bid.
 1. 900 lm LED Recessed Down light (BOQ Item 1.01).
 2. 1200lm Recessed Mounted LED Down Light (BOQ Item 1.02).
 3. 1200lm Dimmable Recessed Mounted LED down Light (BOQ Item 1.03).
 4. 2000lm Recessed Mounted Led Down Light-External Corridor (BOQ Item 1.04).
 5. 500lm Fixed LED Spotlight (BOQ Item 1.05).
 6. 700lm Adjustable, Dimmable LED Spotlight (BOQ Item 1.06).
 7. 900 lm LED Surface Mounted Down light (BOQ Item 1.07).
 8. 1200 lm LED Surface Mounted Down light (BOQ Item 1.08).
 9. 1100lm Surface Mounted Cylindrical LED down Light (Staircase) (BOQ Item 1.09).
 10. Surface mounted type 4 ft. LED single batten fitting (BOQ Item 1.10).
 11. Surface mounted type 4 ft. LED double batten fitting (BOQ Item 1.11).

Section V – Schedule of Requirements

12. Recessed mounted type of 3000 Lm (600*600 mm) LED Panel fitting (BOQ Item 1.12).
13. Surface mounted type of 3000 Lm (600*600 mm) LED Panel fitting (BOQ Item 1.13).
14. Wall Mounted LED Light (Staircase) (BOQ Item 1.14).
15. Wall Mounted LED Bulkhead Light-Lamp Replaceable (BOQ Item 1.15).
16. Duct mounted LED light fitting-Lamp Replaceable (BOQ Item 1.16).
17. Floor Mounted IP 67 IN Ground Light (BOQ Item 1.17).
18. LED Wall Recessed Step Light (BOQ Item 1.18).
19. LED Step Light (BOQ Item 1.19).
20. Non Maintained Type LED wall mounted emergency Lamp (BOQ Item 1.21).
21. 4000 lm LED flood light (BOQ Item 1.22).