

BOQ - Technical Specification

Schedule Item No	Material Code	Material Long Description / Technical Specification
Schedule - 1	M8211010205	Technical Specifications : 20 W LED Batten Tube Light 4Ft. (1200mm +/- 10%) 1. System Power/Wattage : 20 W +/- 10% 2. Power Factor : >0.95 3. CRI (Color Rendering Index) : >= 80 4. CCT (Corelated Color Temperature) : 5700 +/- ANSI tolerance* 5. System efficacy : >100 lm/w 6. Lumens Output: Wattage X System Efficacy 7. IP (Ingress Protection): IP20 8. Operating Voltage : 230 V AC +/- BIS Tolerance 9. Color Designation Cool Day Lamp 10. LED Tube -Integral Batten Type. 11. Beam Angle (Nom) 120 ° 12. RoHS (Restriction of Hazardous Substances) RoHS Compliance 13. Operating temperature : 0-50 Deg C 14. Housing Material : Plastic / Glass/Polycarbonate 15. Minimum impact protection: IK-02 16. Surge Protection device : 2.5kV 17. LED Chip Efficacy : >135lm/w
Schedule - 2	M8211010101	Technical Specifications : 10 W LED Batten Tube Light (2ft+/- 10%) 1. System Power/Wattage : 10 W 2. Power Factor : >0.95 3. CRI (Color Rendering Index) : >= 80 4. CCT (Correlated Color Temperature) : 5700 +/- ANSI tolerance* 5. System efficacy : >100 lm/w 6. Lumens Output: Wattage x System Efficacy 7. IP (Ingress Protection): IP20 8. Operating Voltage : 230 V AC +/- BIS Tolerance 9. Color Designation Cool Day Lamp 10. LED Tube -Integral Batten Type. 11. Beam Angle (Nom) 120 ° 12. RoHS (Restriction of Hazardous Substances) RoHS Compliance

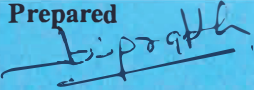
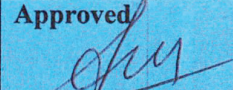
		13. CE Mark NA 14. Operating temperature : 0-50 Deg C 15. Housing Material : Plastic / Glass/ Polycarbonate 16. Minimum impact protection: IK-02 17. Surge Protection device : 2.5kV 18. LED Chip Efficacy : >135lm/w
Schedule - 3	M8211050516	LAMP,LED TYPE : RECHARGABLE LED BULB CONNECTION : BAYONET CAP RATING,VOLTAGE : 220 V RATING,POWER : 9 W COLOUR : WHITE BASE STYLE : LED B22 BULB BASE LIFE HOURS : 1 YEAR INVERTER TYPE RECHARGEABLE BULB 9 W (+/- 10%) SYSTEM EFFICACY:>=100 LM/W POWER FACTOR:>/= 0.9 POWER BACK-UP:3 TO 4 HOURS
Schedule - 4	M8225120680	Technical Specifications :LED BASED STREET LIGHT FITTING : 110W (minimum) 1. System Power/Wattage : 110 W +/- BIS tolerance 2. Power Factor : > 0.95 3. CRI (Color Rendering Index) : > 70 4. CCT (Correlated Color Temp) : 5700 K +/- ANSI tolerance 5. Surge Protection device : 20 KV / 10KA a. Internal >= 4 KV b. External External 10 KA, 20 KV 6. Cable : As per Manufacturer Standard 7. IP (Ingress Protection) :IP 66- Waterproof, dustproof, Impact proof & corrosion proof features meeting requirement of outdoor application. IP66 8. Input Voltage : 230 V AC +/- BIS Tolerance 9. Driver efficacy : > 85 % 10. System efficacy : > 110 lm/W 11. Lumens Output- Wattage X System Efficacy 12. Warranty : 3 Years 13. Optical Cover/Lens Type: Polycarbonate-High impact resistant & less glare meeting Impact Protection Code-IK08 /

		Polycarbonate micro lens optic Polycarbonate-High impact resistant & less glare meeting Impact Protection Code-IK07 / Polycarbonate micro lens optic 14. THD <10% 15. Housing: High Pressure die-cast aluminium housing/heat sink which gives rugged feature for industrial application. High Pressure die-cast aluminium housing (ADC 12) 16. Mounting device : Suitable for diameter up to 52 mm to 58 mm 17. Operating Temperature: 0-50 Deg C 18. RoHS (Restriction of Hazardous Substances) compliance RoHS compliance 19. CE Mark NA 20. Protection class IEC : Safety Class I 21. LED CHIP EFFICACY : > 135 lm/W Note: PDI Applicable
Schedule - 5	M8225127432	Technical Specifications :LED BASED FLOOD LIGHT FITTING : 190W (minimum) 1. System Power/Wattage : 190 W +/- BIS tolerance 2. Power Factor : > 0.95 3. CRI (Color Rendering Index) : > 70 4. CCT (Correlated Color Temp) : 5700 K+/- ANSI tolerance 5. Surge Protection device : 20 KV / 10KA a. Internal >= 4 KV b. External External 10 KA, 20 KV 6. Cable : As per Manufacturer Standard 7. IP (Ingress Protection) :IP 66- Waterproof, dustproof, Impact proof & corrosion proof features meeting requirement of outdoor application. IP66 8. Input Voltage : 230 V AC +/- BIS Tolerance 9. Driver efficacy : > 85 % 10. System efficacy : > 110 lm/W 11. Lumens Output- Wattage X System Efficacy 12. Warranty : 3 Years 13. Optical Cover/Lens Type: Polycarbonate-High impact resistant & less glare meeting Impact Protection Code-IK08 / Polycarbonate micro lens optic Polycarbonate-High impact resistant & less glare meeting Impact Protection Code-IK07 / Polycarbonate micro lens optic 14. THD : < 10 % 15. Housing: High Pressure die-cast aluminium housing/heat sink which gives rugged feature for industrial application. High Pressure die-cast aluminium housing (ADC 12)

		16.Mounting device : Angle Adjuster 17. Operating Temperature: 0-50 Deg C 18. RoHS (Restriction of Hazardous Substances) compliance RoHS compliance 19. CE Mark NA 20. Protection class IEC : Safety Class I 21.LED CHIP EFFICACY : > 135 lm/W Note: PDI Applicable
Schedule - 6	M8225700082	LUMINAIRE TYPE : LIGHT FIXTURE TYPE,LAMP : BOLLARD RATING,POWER : 10 W RATING,VOLTAGE : 220 TO 240 VAC DIMENSION : LG 900 TO 1000 MM APPLICATION : GARDEN/AREA INGRESS PROTECTION : IP65 LAMP HOLDER : B22 / SMD LED MOUNTING : SURFACE SHAPE : GLOBE / CONICAL / CYLINDRICAL MATERIAL,HOUSING : UV STABILIZED POLYCARBONATE DIFFUSER BODY - DIE CAST ALUMINIUM,FINISH:GRAPHITE GREY POWDER COATED.COLOUR TEMPERATURE OF EACH LIGHT SOURCE:6000 +/-500K(COOL DAY),4000 +/-275K (WARM WHITE).PROTECTION AGAINST SURGES AND TRANSIENTS:EXTERNAL 10 KV.LENGTH OF ISI MARKED THREE CORE CONNECTING WIRE:1METRE,WARRANTY FOR FREE REPLACEMENT OF LIGHTING SYSTEMS INCLUDING LIGHT SOURCE (IN YEARS):3 YEARS IN CASE B 22 COMPATIBLE BOLLARD VENDOR HAS TO SUPPLY LED BULB ALONG WITH IT. Note: PDI Applicable
Schedule - 7	M8225127654	Technical Specifications :LED BASED FLOOD LIGHT FITTING :500 W 1. System Power/Wattage : 500W +/- BIS Tolerance 2. Power Factor : > 0.95 3. CRI (Color Rendering Index) : >= 70 4. CCT (Correlated Color Temp) : 5700 K +/- ANSI tolerance 5. Surge Protection device :

		a. Internal ≥ 4 KV b. External ≥ 10 KV 6. Cable : As per Manufacturer Standard 7. IP (Ingress Protection) :IP 66- Waterproof, dustproof, Impact proof & corrosion proof features meeting requirement of outdoor application. IP66 8. Input Voltage : 230 V AC +/- BIS Tolerance 9. Driver efficacy : $> 85\%$ 10. System efficacy : > 110 lm/W 11. Lumens Output- Wattage X System Efficacy 12. Warranty : 3 Years 13. Optical Cover/Lens Type: Optic lense materal (UV stabilised) : Poly Carbonate Lense. 14. THD : $< 10\%$ 15. Housing: High Pressure die-cast aluminium housing/heat sink which gives rugged feature for industrial application. High Pressure die-cast aluminium housing (ADC 12) 16.Mounting device : Angle Adjuster 17. Operating Temperature: 0-50 Deg C 18. RoHS (Restriction of Hazardous Substances) compliance RoHS compliance 19. CE Mark NA 20. Protection class IEC : Safety Class I 21. LED CHIP EFFICACY : > 135 lm/W Note: PDI Applicable
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STANDARD QUALITY PLAN

	Item: -LED Lighting fixtures (Luminaires)	SQP NO:	CPG-QA-SQP-E003		P 1/2	Prepared	Approved
		Rev.	00	Date	24.04.2022	 (Jai Prakash Maurya)	 (Sunil Malani)

SL. NO.	COMPONENT/ OPERATION	CHARACTERISTICS	QUANTUM OF CHECK		REFERENCE DOUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	D	AGENCY		REMARKS
			M	N					M	N	
A)	Raw Material / Bought out items and Process / Assembly Checks										
1	LED Chip	Efficacy, CRI, CCT & Lifetime of LED chip TM 21 (L80).	Mfr std	Mfr std	NTPC Approved Drg./ DS / Tender Tech. Spec./PO	TC		V	V		
2	LED Driver	Compatibility with LED module/chip, Controls & protection features, THD and Power factor check.	Mfr std	Mfr std	NTPC Approved Drg./ DS / Tender Tech. Spec./PO	TC/IR		V	V		
3	Castings	Freedom from defects, blow holes, surface blisters, cracks and cavities	Mfr std	Mfr std	NTPC Approved Drg./ DS / Tender Tech. Spec./PO	TC/IR		V	V		
4	Sheet metal forming and fabrication	Freedom from defects.	Mfr std	Mfr std	NTPC Approved Drg./ DS / Tender Tech. Spec./PO	TC/IR		V	V		
5	Pre-treatment and powder coating	Pre-treatment process checks, Powder coating finish, thickness, uniformity of coating & adhesion.	Mfr std	Mfr std	NTPC Approved Drg./ DS / Tender Tech. Spec./PO	TC/IR		V	V		
B)	Finished Product / Final Inspection										
1	Visual	Markings-Rated voltage, IP class, type, wattage	100%	1Sample /type	NTPC Approved Drg./ DS / Tender Tech. Spec./PO	IR		P	W		
2	Acceptance tests	LED chip -make	100%	100%	Type tested make (LM80/LM79)	COC	Y	P	W		
		Constructional features including, Internal wiring, terminal block, earthing terminal, safety chain.	Mfr Std / IS 16103	1Sample /type	NTPC Approved Drg./ DS / Tender Tech. Spec./PO	IR		P	W		
		Resistance to dust and water ingress test /class of IP test.	Mfr std / IS 16103	1Sample /type	NTPC Approved Drg./ DS / Tender Tech. Spec./PO/ IS10322 Part-1	IR	Y	P	W		

STANDARD QUALITY PLAN

	Item: -LED Lighting fixtures (Luminaires)	SQP NO:	CPG-QA-SQP-E003		P 2/2	Prepared <i>Jai Prakash</i> (Jai Prakash Maurya)	Approved <i>Sunil Malani</i> (Sunil Malani)
		Rev.	00	Date	24.04.2022		

SL. NO.	COMPONENT/ OPERATION	CHARACTERISTICS	QUANTUM OF CHECK		REFERENCE DOUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	D	AGENCY		REMARKS
			M	N					M	N	
		Electrical characteristics check incl IR & HV test.	Mfr std / IS 16103	1 Sample /type	NTPC Approved Drg./ DS / Tender Tech. Spec./PO/ LM79, IS 16106, IS16107, IS 10322, IEC/PAS 62722		IR	Y	P	W	
		Dimensions, paint shade, thickness & adhesion check by cross hatch.	Mfr std / IS 16103	1 Sample /type	NTPC Approved Drg./ DS / Tender Tech. Spec./PO		IR	Y	P	W	
		LED driver: THD and PF check. Precision current control check. Simulation check for Open circuit protection, Short circuit protection, Over temperature protection, and Overload protection.	Mfr std / IS 16103	1 Sample /type	NTPC Approved Drg./ DS / Tender Tech. Spec./PO		IR	Y	P	W	
		LED driver: Surge protection compliance check & System efficacy. Photometry Test	Mfr std / IS 16103	1 Sample /type	NTPC Approved Drg./ DS / Tender Tech. Spec./PO		TC/COC	Y	P	V	
C)	Following needs to be verified during final inspection: 1. Type Test clearance from NTPC site as envisaged by tender/PO spec. 2. In case of Flameproof fittings, CIMFR,Dhanbad certification in compliance to IS/IEC 60079-1:2007.										

Notes:-

- Y mark in Column 'D' means such document shall be furnished by the manufacturer / supplier.
- Calibrated equipments required for performing the tests in presence of NTPC or authorized representative, shall be arranged by the supplier without any extra cost.
- Reference and Acceptance norms shall be derived from following in the same sequence a) NTPC Approved drawing / data sheet; b) NTPC tech specs; c) Purchase Order; d) Relevant national standard. e) Relevant International standard; f) Manufacturer's standard g) Good Engineering practices.
- Witness by NTPC/authorized representative (wherever applicable) shall be on randomly chosen sample/s. NTPC shall review MFRs test report for balance Qty

Abbreviations: -

M/ Mfr	Manufacturer	P	Perform	IR	Inspection Record / Report	DS	Data Sheet
N	NTPC Ltd or authorized representative	W	Witness	TC	Test Certificate	PO	Purchase Order
CoC	Certificate of Conformance	V	Review of records	Std	Standard	Drg	Drawing