TECHNICAL SPECIFICATION

OF

ELECTRICAL MATERIALS

LIGHT FITTINGS

"GROUP – G"

Tender Notice No. NESCO Utility / O&M Materials/58 / 8267, dtd.17.7.15

Group-G

Sl no.	Material Description	Unit	Quantity
1	2x40 W florescent light fittings	Set	200
2	LED light fittings (48 W)	Set	300

NB: 1. Bidders should put their authorized signature with office seal on each page of the documents.

2. Bidders should put their offer in the Guaranteed particulars column furnished in the tender documents.

3. Purchaser may ask to the bidder who will qualify in Techno- Commercial evaluation of the tenders for submission of Samples for verification , if required.

4. Purchaser reserves the right to increase or decrease the above quantities during placement of purchase order or may cancel any item/items without assigning any reason thereof .

Dy. General Manager (C&P)
NESCO Utility, Balasore, Odisha

TECHNICAL SPECIFICATION FOR LIGHT FITTINGS

1**.0 GENERAL:** This specification covers the design, manufacture, testing, inspection and delivery at site and installation of lighting fittings and their associated accessories and commissioning the same. The light fittings and their associated accessories such as lamps/tubes, reflector housings, ballasts etc. shall comply with the latest applicable standards. All luminaries, lamps and accessories shall be of the same make for the particular site as directed by Engineer-In-Charge.

2.0 GENERAL REQUIREMENTS: Fittings shall be designed for continuous trouble-free operation under hot humid atmospheric conditions, at an ambient of 50o C, without reduction in lamp life or without deterioration of materials and internal wiring. Outdoor fittings shall be weather proof and rain proof type. The fittings shall be designed so as to facilitate easy maintenance, including cleaning, replacement of lamps/starters etc. Connectors between different components shall be made in such a way that they will not work loose by vibrations. The fittings shall be supplied complete with lamps.

The fittings and accessories shall be designed to have low temperature rise, the temperature above the ambient temperature shall be as indicated in the relevant standards. All mercury vapour and metal halide fittings she be complete with accessories like lamps, ballast, power factor improvement capacitors, starter/igniter wherever applicable, etc. Outdoor type fittings shall be provided with outdoor type control gear box the fittings shall be power factor corrected to 0.95 logging (maximum). Each fitting shall have a terminal block suitable for loop-in, loop-out and on-off connection. The internal wiring shall be complete by the contractor by means of stressed copper wire and terminated on the terminal block. All hardware used in the luminaries shall be cadmium plated.

3.0 EARTHING: Each light fitting shall be provided with an earthing terminal suitable for connection to the earthing conductor. All metal of enclosed parts of the housing shall be bonded to the earthing terminal so as to ensure satisfactory earth continuity throughout the fixture. 5.4

4.0 PAINTING : All surfaces in the fittings shall be thorough cleaned and degreased. The fitting shall be free from scale, rust, sharp edges and burns. The housing shall be stove-enameled/ epoxy stove-enameled/ vitrous enameled /oxidised as indicated under various types of fitting. The finishing of the fitting shall such that no bright /dark spots are produced either by direct light or by reflection.

FLUORESCENT TUBE LIGHT:

It shall be suitable AC 220V Electronic 2x40W Fluorescent Lamp Light Ballast comprised of wall mounted / hanging type frame incorporating electronic ballasts, starter, capacitors and connector block. It shall be specially used in electrical control rooms.

TECHNICAL SPECIFICATIONS OF LED LIGHT

1. APPLICABLE STANDARDS

The tendered materials should confirm the following Indian standard specification.

Sl No.	IS No.	Specification
1	IS 16102(Part I and II)	Performance and safety requirement for self –ballasted LED lamps for General Lighting Services
2	IS 16105	Measurement of lumen maintenance of LED sources
3	IS 15885 (Part I and II)	Safety of Lamp control gear
4	IS 16104	Performance requirement for Electronic control gear for LED modules
5	IS 16106	Method of electrical and photometric measurements of solid state lighting products
6	IS 16108	Photo biological safety of lamps and lamp systems

Materials meeting with the requirements of other authoritative standards, which ensure equal or better quality than the standards mentioned above, shall also be considered. In such case the salient points of difference along with advantages between the standards adopted and the specified standards shall be clearly brought out in a schedule.

For values not available in relevant IS values indicated in the GTP/ Tender specification shall be valid.In case of discrepancies between values of IS and GTP the better will prevail.

2.0 TECHNICAL REQUIREMENT FOR LED STREET LIGHTS

2.1 GENERAL:

Application	;	Street lighting
Rated voltage (Vref)	:	230 volts 1 ph AC
Rated frequency	:	50 Hz
Usage	:	Continuous
Colour	:	White

However, the materials should be robust enough to withstand and work satisfactorily with the following system variations:

Voltage	:	Vref + 30% to – 30%
Frequency	:	50 Hz +/- 5%

2.2 CONSTRUCTION:

The lamps should be robustly built with adequate mechanical strength, heat resistance, insulation resistance and flame resistant material complying with relevant clauses of IS 16102. It should be made of Die cast Aluminium/ Aluminium extrusion/Aluminium sheet with toughened glass cover suitable for mounting on a pole pipe bracket with complete locking arrangement. The complete housing of the lamp should have an ingress protection level of IP

65/66 for the lamp compartment as well as the driver circuit.

The viewing angle of the luminaries shall be 120X70 degrees suitable for street lighting applications to achieve uniformity. Lead wire of a minimum length of 1 meter to be provided for electrical connection.

2.3 MARKING ON THE LAMP:

The lamps should be clearly and durably marked with the following mandatory markings:

a. Manufacturer's name

b. Rated voltage (marked "V" or volt)

c. Rated wattage(marked "W" or watts)

d. Rated lumen

e. Rated frequency(marked "Hz")

f. "Not for sale - BEE's LED Village Campaign, Odisha".

2.4 TOTAL HARMONIC DISTORTION:

Should be less than 15%

2.5 LAMP EFFICACY:

Should not be less than 100 lumens per watt.

2.6 POWER FACTOR:

Should be greater than 90 % including the driver circuit.

2.7 COLOUR RENDERING INDEX:

Minimum CRI of 70

2.8 DRIVER CIRCUIT EFFICIENCY:

Should be greater than 85%

2.9 CORRELATED COLOUR TEMPERATURE

Should be between 4000º K to 7000°K

2.10 POWER CONSUMPTION:

Should be maximum 48 watt excluding the driver circuit so that the lux level below the lamp(from a height of 4 mtr) is not less than 20 lux and not less than 15 lux using a 9 point or appropriate method. The lamp complies with minimum lumen requirement of 4800 lumens.

2.11 LIFE EXPECTANCY:

Should be 50000 glow hours at normal ambient conditions and lumen maintenance of category 3 or better for L70 as per IS 16102 (Part-2):2012.

2.12 WORKING CONDITIONS:

4.1.1	Temperature:	- 5 to 50°C
4.1.2	Humidity:	10% to 90% RH

2.13 SWITCHING:

Photosensitive automatic switching device for operation in night hours only. Additional manual control mechanism to be also provided and manual control should always prevail over the auto control

3.0 GENERAL REQUIREMENTS FOR BOTH HOME LIGHTING AND VILLAGE STREET LIGHTING:

I. Only **NICHIA/ OSRAM/ SEOUL/ PHILIPS/ LUMILEDS/ LEDNIUM/CREE**

LED's shall be used for the LED lamps and street lights.

II. The luminaire casing/housing shall be of stainless sheet steel SS304 grade or aluminium having high conductivity preferably to grade 5000 or similar to high conductivity heat sink material.

III. The electronic components used shall be as follows:-

- IC (Integrated circuit) shall be of industrial grade or above.
- Metallic film / Paper/Polyester Capacitor shall be rated for a sustained operating temperature of 105ºC.
- The resistors should be preferably made of metal film of adequate rating. The actual rating versus loading shall be by a factor of 3.
- The junction temperature of the Switching devices such as transistors and MOSFETs etc. shall not exceed 125ºC (allowing thermal margin of 25 ºC).
- The protective cum adhesive coating used on PCBs should be cleared and transparent and should not affect colour code of electronic components or the product code of the company.
- The construction of PCBs and the assembly for components for PCBs should be as per IS standards.
- The electronics covered for this equipment shall pass all the tests called for in the above specification. The bidder shall indicate the deviation or compliance otherwise the offer shall not be considered for evaluation.

- The infrastructure for Quality Assurance facilities as called for in the above specification must be available at the manufacturing facility. In- house testing facility for Quality Assurance should be present. The compliance shall be indicated clearly in the tender itself.

IV. The connecting wires used inside the luminaire, shall be low smoke halogen free, fire retardant e-beam cable and fuse protection shall be provided in input side.

V. Care shall be taken in the design that there is no water stagnation anywhere and entire housing shall be dust and water proof having IP65/66 protection as per IEC 60529.

VI. The LED Module(s), Driver gear, etc. shall be designed in such a way so that temperature of heat sink shall not exceed 150C above the ambient temperature.

VII. All the material used in the luminaire shall be halogen free and fire retardant confirming to UL94.

VIII. Lumen maintenance of 70% for at least 50000 hours for Interior as well as exterior applications. Data sheet showing lumen maintenance in the LED shall also be submitted.

IX. The manufacturer /firm should also offer Annual Maintenance Contract (AMC)

package(s) for the post Warranty period.

X. All the supplied lamps, luminaries and fittings shall carry permanent marking as "**Not for sale - BEE's LED Village Campaign, Odisha**".

4.0 TEST AND TEST CONDITIONS:

4.1 Type Test

The materials offered shall be fully type tested at independent laboratories by the bidder as per the relevant standards referred to in this document. The test reports should not be one year old from the date of opening of bid. The bidder shall furnish two sets of type test reports along with the bid. **Bid without type test reports shall be treated as non- responsive.**

4.2 Acceptance Test:

All acceptance tests as stipulated in the relevant standard shall be carried out by the supplier in the presence of the Purchaser's representative.

5.0 **INSPECTION:**

5.1 The supplier will keep the Purchaser informed in advance of the time of the starting and the progress of manufacture of equipment in its various stages so that arrangement could be made for inspection. The accredited representative of the PURCHASER will have access to the supplier's or his subcontractor's work at any time during working hours for the purpose of inspecting the materials during manufacturing of the materials / equipment and testing and may select test samples from the materials going into plant and equipment. The supplier will provide the facilities for testing such samples at any time including access to drawings and production data at no charge to Purchaser. As soon as the materials are ready the supplier will duly send intimation to PURCHASER by Regd. Post and carry out the tests in the presence

of representative of the PURCHASER. If PURCHASER feels necessary may select one sample from the lot at factory to send for testing at CPRI/NTL or any other standard NABL accredited laboratory.

5.2 The PURCHASER may at its option get the materials inspected by the third party if it feels necessary.

5.3 The dispatches will be effected only if the test results comply with the specification. The dispatches will be made only after the inspection by the PURCHASER Officer is completed to the PURCHASER satisfaction or such inspection is waived by the competent authority.

5.4 The acceptance of any quantity of materials will in no way relieve the supplier of its responsibility for meeting all the requirements of this specification and will not prevent subsequent rejection if such materials are later found to be defective or deviation from specification/IS.

5.5 The supplier will give 15 days advance intimation to enable the Purchaser depute his representative for witnessing the acceptance tests If necessary.

5.6 Should any inspected or tested materials / equipment fail to conform to the specification, the Purchaser may reject the materials and supplier will either replace the rejected materials or make alterations necessary to meet specifications requirements free of costs to the Purchaser.

5.7 After delivery of materials at PURCHASER's Store the materials may be verified/retested in full or taking one random sample before acceptance. In case of any deviation to the specification, GTP, IS found during the tests the lot will be rejected or will be replaced by supplier without any additional cost to NESCO UTILITY.

6.0 GENERAL:

6.1 **Technical deviations**: All deviations to the technical specifications and commercial terms and conditions should be specifically and clearly brought out in the deviation form.

6.2 **Guaranteed technical parameters**: The GTP as per Appendix 8(Part A and

Part B) duly filled in shall be submitted along with the offer. Bids without the above information shall be treated as non-responsive and shall be rejected

7.0 RELAXATION OF TECHNICAL REQUIREMENT:

Authority reserves the right to ignore/ relax minor deviations in the technical specifications mentioned above, if it does not materially affect the quality of material to be supplied. The decision of NESCO Utility on such matters shall be final and binding on the supplier.

GUARANTEED TECHNICAL PARTICULARS (LED STREET LIGHT) (TO BE SUBMITTED BY THE BIDDER)

Sl no	Parameters	Purchasers value	Guaranteed Value
1	LED Operating voltage	**230 v+30%to -30%**	
2	LED operating frequency	**50 Hz+/- 1Hz**	
3	Beam Angle of luminaire	**120X70 degrees**	
4	Avg. Lux Level of luminaire (4mtr)	**20 lux**	
5	Luminous efficacy in lumens per watt	**>100**	
6	Wattage excluding driver circuit	**Maximum 48 watt**	
7	Output lumens	**>4800**	
8	Driver circuit Efficiency	**>85%**	
9	Total harmonic distortion	**<15%**	
10	Colour rendering index	**>70**	
11	Lumen maintenance	**80% or better**	
12	Dimension	**Similar to standard HPSV lamps**	
13	Insulation resistance between live and accessible parts of the lamp	**Not less than 4MΩ as per IS**	
14	Conformity with IP-65/66 Fixtures	**Required**	
15	LED Life	**50000 hrs**	
16	Power factor	**>0.9**	
17	Automatic ON and OFF switching device with photosensors	**Required**	

Signature of the Bidder with Seal

NB:1. For values not available in relevant IS; values indicated in the GTP/ Tender specification shall be valid.

2. In case of discrepancies between values of IS and GTP the better will prevail.

3. Pertinent type test reports, literatures, catalog, photometry etc. as required to substantiate the above, and List and index for comprehensive reference should be attached.