

**BHARAT HEAVY ELECTRICALS LIMITED  
BHEL ESTATE OFFICE**

**BHEL- TOWNSHIP, SECTOR-17  
NOIDA- 201301**



**TENDER DOCUMENT**

**FOR**

**SUPPLY OF LED BASED SOLAR LIGHT SYSTEM  
IN BHEL TOWNSHIP, SECTOR-17, NOIDA.**

**NIT NO.-16:AA:NOI:ADMN.: Solar Light: 112:2011-12  
Dated :06/01/2012**

**CONTENTS**

1. Notice Inviting Open Tender
2. Techno commercial Bid – Part -A
3. Price Bid – Part B

<b>Last date for Submission : 25/01/2012 at 1500</b>
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भारत हेवी इलेक्ट्रिकल्स लिमिटेड  
**Bharat Heavy Electricals Ltd.**

सम्पदा कार्यालय, सेक्टर-17, नोएडा-201 301 (यू०पी०) भारत  
BHEL Township : Estate Office, Sector-17, Noida-201 301 (UP) INDIA  
फोन (का०) 2515429, 2517488 फैक्स: 2510271 Tel : 2515429, 2517488 (Fax) 2510271

**NOTICE FOR INVITING OPEN TENDER**

Sealed tenders are invited in two parts bid for the supplying of following items in BHEL Township, Sector-17, Noida.

**Title** : Supply of LED based Solar light System in BHEL Township, Sector-17, Noida.

**NIT NO.** : 16:AA:NOI:ADMN.: Solar Lights: 112:2011-12  
Dated: 06/01/2012

**Delivery Period** : Within One Month from the date of placement of order.

**DATE OF SUBMISSION & OPENING OF TENDER**

**Last date for submission of sealed tender at** : 25/01/2012 at 1500 Hrs.  
**Estate Office, BHEL Township, Sector-17, Noida**

**Date of opening the Tender (Techno- commercial Bid)** : 25/01/2012 at 1530 Hrs.

**Venue for opening of Tender** : Estate Office, BHEL  
Township, Sector-17,  
Noida

The sealed tender may be sent either by registered post or by hand in the office of Dy. Manager (HR-TAX), Estate Office, Sector – 17, NOIDA – 201301(U.P.) between 9.00 AM to 5.30 PM on any working day till the due date and time. This tender document can also be downloaded from the web site.

(Farrukh Jamal)  
Dy. Manager (HR-TAX)  
On behalf of “BHEL”

# **PART 'A' – TECHNO- COMMERCIAL BID**

## **INSTRUCTIONS FOR TENDERER:**

1. The offer shall be submitted as per the instructions of tender document. Only one set of tender document duly signed by authorized representative of tenderer and signed & stamped on each page shall be submitted as detailed further. Tenderer should note specifically that all pages of tender document, including the NIT page for this particular tender shall be submitted by them (after signing/ stamping on each page) as a part of their offer. Price shall not be mentioned by them anywhere in the techno-commercial portion of offer. Price shall be mentioned in the relevant price bid only and submitted in separate sealed envelope. In case of any clarification, bidder may contact this office.
2. No overwriting / correction in tender documents by tenderer shall be allowed. However if correction is unavoidable, the same must be signed by authorized signatory.
3. Tender must be submitted in two parts, i.e., (i) Techno-Commercial Bid along with un-price bid and (ii) Price Bid. The tenderer must submit their tenders in two separate sealed envelopes prominently super scribed as Part – A 'Techno- commercial bid' and Part-B 'Price Bid', and the NIT No. & due date on each of the envelope. These two separate envelopes shall together be kept in third envelop super scribed with NIT No. & due date of opening.
4. Techno-commercial bid should contain all the documents like, signed tender document having NIT page, Instructions for tenderer, technical requirement, General terms & conditions, un-price bid, all the annexure duly filled & signed by the tenderer.
5. Price Bid should contain only the "Part-B, Price Bid Format" after quoting the rates as specified in the price bid format.
6. Rates must be quoted in figures as well as in words.
7. On the date of opening of tender, only Techno-Commercial Bid shall be opened. Price bids of only those tenderers, whose bids are found technically acceptable, will be opened. The opening date for price bid will be informed to the technically qualified tenderers separately by phone, post or e-mail.
8. Tender documents are also available on web site i.e. [www.bhel.com](http://www.bhel.com) and the same can be downloaded and used as tender document for submitting the bid.
9. BHEL reserves the right to accept or reject any or all offer without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter.
10. In case any typing error/other clerical errors is noticed by the tenderer, in the tender documents, the same must be pointed out and got clarified before submission of offer, or else, BHEL's interpretation shall prevail & shall be binding on the tenderer.
11. Any queries regarding this tender may be clarified from Dy. Manager (HR-TAX), on Mobil No. - 9958253366 / e-mail : [farrukh@bhel.in](mailto:farrukh@bhel.in)
12. The tenderers or their representative may attend the opening of both the Bids (Part A & B).
13. In case you are not submitting your offer against this enquiry, we request you to send a regret letter.

## **PRE- QUALIFYING REQUIREMENT:**

Each tender shall be accompanied by the following information/ documents with sufficient details to enable the purchaser to make an appraisal of the quality and suitability of the material offered.

1. Acceptance to supply the materials as per the technical specification enclosed with the tender document by signing the documents.
2. Test Certificates and Results of PV module, LED luminary, Electronic Device (Charge Controller) and Battery as per relevant Indian standards for the materials offered shall be furnished by the tenderer along with the tender.
3. Bidder should be ISO certified. The copy of certificates in proof of same must be submitted.

4. Bidder should have VAT & TIN No. The copy of certificates in proof of same must be submitted.
5. Manufacturer's literature, brochures, catalogues etc.
6. Declaration certificate as enclosed at annexure-E
7. No deviation certificate as enclosed at annexure-F

### **TECHNICAL SPECIFICATION OF WHITE – LED BASED SOLAR LIGHTING SYSTEMS**

Each set of LED based solar lighting system consists of 01 no. PV Module, 01 no. control electronic (Charge Controller), 01 no. battery, 04 nos. W-LED based luminaries, 01 set connecting cable. The battery is charged by electricity generated through the PV Module during the day time and the luminaries provide the light from dusk to down.

One set of solar light system is used for lighting the four storey staircases. The approximate height of one storey is 3 meters.

### **BROAD PERFORMANCE SPECIFICATIONS:**

The broad performance specifications of a W-LED light source based solar lighting system are given below:

Light Source	White Light Emitting Diode(W-LED)
Light Out put	White color (color temperature 5500°-6500°K) minimum 15 LUX when measured at the periphery of 2.5 meter diameter from a height of 2.5 meter. At any point within area of 2.5 mtr diameter periphery the light level should not be more than three times of the periphery value. The illumination should be uniform without dark bands or abrupt variations, and soothing to the eye. Higher output would be preferred.
Mounting of light	Wall or ceiling
Electronics	Min 85% efficiency
Average duty cycle	Dusk to Down
Autonomy	3 days (Minimum 42 operating hours per permissible discharge)

### **FOUR WHITE LED BASED SOLAR LIGHT SYSTEM :**

PV Module 80 Wp under STC, measured at 16.4 V as load. Module Voc minimum of 21 V. Battery low maintenance type, 12V-75 Ah @ C/20, Max DoD-75%.

### **OTHER DETAILS :**

#### **Duty Cycle :**

The LED Solar Lighting System should be designed to operate from dusk to down, under average daily isolation of 5.5 KWH/Sq.M. on a horizontal surface.

#### **White LED based Luminaries:**

- i) The luminary will be of white LED type. **The luminous performance should not be less than 90 lumen/watt.** The power rating of each luminary should be 03 watts, 12V. The color temperature of W-LEDs used in the system should be in the range of 5500°K-6500°K. Use of LEDs which emits ultraviolet light will not permitted.
- ii) The light output from the W- LED light source should be constant throughout of the duty cycle.

- iii) The lamps should be housed in an assembly suitable for indoor use with an appropriate heat sink to dissipate heat generated during operation. The temperature of LED should not increase more than 10° above room temperature. This condition should be compiled for 5 hours of operation of the lamp at a stretch while battery operating at any voltage between the loads disconnect and the charge regulation set point.
- iv) The make, model number, country of origin and technical characteristics (including IESNA LM-80 report) of White LEDs used in the lighting system must be furnished by the vendor.

#### **Battery:**

- i) Low Maintenance Solar tubular battery, 12V, 75Ah suitable for solar application of makes Exide/ Okaya/ Sukam/ OR Luminouse. Battery should conform to latest BIS standards.
- ii) It is also mandatory for the battery manufacturers to comply with batteries (Management and handling) Rules 2001 of MOEF, as amended.
- iii) At least 75% of the rated capacity of the battery should be between fully charged & load cut off conditions.

#### **Electronics:**

- i) The total electronic efficiency should be at least 85%
- ii) Electronics should operate at 12V and should have temperature compensation for proper charging of the battery throughout the year.
- iii) The light output should remain constant with variations in the battery voltages.
- iv) Necessary lengths of wires/cables, switches suitable for DC and fuses should be provided.
- v) The rating of Electronics system should be sufficient to operate four nos. of three watt luminaries system.
- vi) Electronic should have dusk to down circuit.

#### **PV Module:**

- i) The PV module (s) shall contain mono/ multi crystalline silicon. The crystalline silicon solar cells module should be as per IEC 61215 specifications or equivalent National or International Standards. In case the supplied PV module is not a module of regular production of the manufacturer and does not have certificate as above then the manufacturer should have the required certification for at least one of the irregular modules. Further, the manufacturer should certify that the supplied module is also manufactured using the same material, design and process similar to that of certified PV module.
- ii) The power output of the PV module must be reported under standard test Conditions (STC) at 16.4 Volt loading voltage. I-V curve of the sample module should be submitted at the time of system qualification testing.
- iii) The open circuit voltage of the PV modules under STC should be at least 21.0 Volts.
- iv) The terminal box on the module should have a provision for opening for replacing the cable, if required.
- v) Identification and Traceability: Each PV module must use a RF identification (RFID) tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).
  - a) Name of the Manufacturer or distinctive Logo
  - b) Model or Type No.
  - c) Serial No.
  - d) Year of manufacture

#### **Electronic Protections:**

- i) The system should have protection against battery overcharge and deep discharge conditions. The numerical values of the cut off limits must be specified.

- ii) Fuses should be provided to protect against short circuit conditions.
- iii) A blocking diode should be provided as part of the electronics, to prevent reverse flow of current through the PV module(s). In case such diode is not provided with the PV module, full protection against open circuit, accidental short circuit and reverse polarity should be provided.
- iv) Electronics should operate at 12 V and should have temperature compensation for proper charging of the battery throughout the year.

### **Electric Cable:**

The electric cable used shall be PVC insulated copper cable of suitable size ( at least 2.0 Sq mm ) for solar light system. The battery lead should be provided with the suitable battery clip.

### **Mechanical Components:**

- i) It should be possible to mount the light source on a wall or ceiling or hang it from the ceiling in a stable manner.
- ii) A vented plastic box with acid proof for housing the storage battery indoors should be provided.
- iii) The Electronics system should be housing in a dust proof enclosure.

### **Other Features:**

- i) The total device used for the solar light system should be compatible with each other.
- ii) The system should be provided with two LED indicators: a green light to indicate charging in progress and a red LED to indicate deep discharge condition of the battery. The green LED should glow only when the battery is actually being charged.
- iii) There will be a Name Plate on the system body which will give:
  - a) Name of the Manufacturer or Distinctive Logo.
  - b) Model Number
  - c) Serial Number
  - d) Year of manufacture

### **Quality And Warranty:**

- i) Components and parts used in W-LED based solar lighting systems should conform to the latest BIS/ International specifications, wherever such specifications are available and applicable. A copy of the test report/ certificate stating conformity of BIS/ International standards must be submitted.
- ii) The PV module will be warranted for a minimum period of 20 years from the date of supply. The W-LED solar lighting system (excluding battery) will be warranted for a period of at least 5 years from the date of supply.
- iii) The low maintenance battery should be warranted for a period of at least two years (DOD 25 to 30%).
- iv) The manufacturers of W-LED based solar lighting system are required to provide a detailed report on the tests performance by them and the actually measured values of PV module, electronics, LEDs and battery and other related parameters,

### **DOCUMENTATION :**

An Operation, Instruction and Maintenance Manual, in English, should be provided with the solar system. The following details must be provided in the Manual:

- a) About Photovoltaic's.
- b) A small write up (with a block diagram) on PV Module, electronics, lamps and battery.
- c) About W-LED solar lighting system- its components and expected performance. The make, model number, country of origin and technical characteristics of W-LEDs should be stated in the product data sheet.

- d) Clear instructions about mounting of Pole, Grouting details, fixing of PV module, battery box and luminary. Clear wiring instructions with line diagram.
- e) About significance of indicators.
- f) DO's and DON'T's.
- g) Clear instructions on regular maintenance and the trouble shooting of the system.
- h) Name and address of the person or service center to be contacted in case of failure or complaint.

## **GENERAL TERMS AND CONDITIONS:**

1. The NIT No. & due date must be legibly super scribed on the envelopes.
2. The quoted rate should be inclusive of all taxes, duties and F.O.R. BHEL Township Store Sector-17, Noida.
3. The criteria of evaluation of bids will be on the basis of overall L1 rates. However, BHEL shall be under no obligation to accept the lowest or any other tender and shall be entitled to accept or reject any tender in part or full without assigning any reason whatsoever.
4. Late tenders or delayed Tenders (received after Due Date & time) will be rejected.
5. Price quoted shall be valid for 90 days from the date of opening of technical bid.
6. Price shall be quoted as per enclosed 'Price Format' only. Quotations not filled in Price Format' are likely to be rejected.
7. The rate should be indicated both in words and figures. All entries in the Tenders must be written in ink or typewritten. Over-writing should be avoided. Corrections, if any, should be attested with signature by the bidder.
8. Rates quoted by the vendor will be firm. No price variation and escalation due to increase in labour / material cost will be allowed.
9. If any information/documents submitted by the contractor are found false/fake at any stage, the tender will be cancelled.
10. At the time of installation the party will arrange the visit of their technical experts for supervision at least one time or more as per requirement and no extra payment for the visit will be made to the party.
11. **CORRECTION OF ARITHMETIC ERRORS:** Provided that the bid is substantially responsive, BHEL shall correct arithmetical errors on the following basis:
  1. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the BHEL there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.
  2. If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.
  3. If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
  4. If any bidder does not accept the correction of errors, their bids will be disqualified.
12. **INSPECTION:** The inspection of materials will be carried out at the destination/ BHEL's works by the authorized inspecting Officer.
13. **REJECTION:** In case of rejection of materials either full or in part, no payment will be made for the rejected materials. It will be the responsibility of vendor to dispose off the rejected materials at its own cost from BHEL's works within one month after rejection of materials. After the expiry of one month no claim/ correspondence will be entertain for the rejected materials.

14. **TERMS OF PAYMENT:** Payment will normally be made within 15 days of receipt of materials & bill by NEFT or cheque. All payment will be subject to deduction of taxes at source as per applicable rules. No advance payment shall be made by BHEL. The party will submit the bank details along with the cancelled cheque for NEFT.
15. **L.D. FOR DELAY IN SUPPLY:** In case the materials are not supplied as per the delivery schedule, a penalty of 1/2% per week delay subject to maximum of 10% of the total order value will be deducted as L.D. The extension of time for supply of materials may be granted by BHEL where delay is not attributable to the party.
16. **RISK PURCHASE :** In the event the supplier has failed to deliver or dispatch whole of the materials or any part within the time stipulated or if the same were not available in his stock, the best and the nearest available substitute thereof may be purchased/arranged by BHEL from elsewhere at the risk and the cost of the vendor. The purchaser at his option will be entitled to terminate the contract and vendor shall be liable for any loss which the BHEL may sustain by reason of such risk purchases.
17. **GUARANTEE/ WARRANTY:** The PV module will be warranted for a minimum period of 20 years from the date of supply. The W-LED solar lighting system(excluding battery) will be warranted for a period of at least 5 years from the date of supply. The battery will be warranted for a period of at least 02 years from the date of supply. During this period, if any defect is found due to bad workmanship or wrong material used, the vendor shall replace or repair the same, free of cost.
18. **TEST CERTIFICATES:** Test certificate for Solar PV module as per IEC Standards, test certificate for complete Solar LED lighting system shall be submitted by the vendor along with the supply.
19. **INSURANCE:** The vendor will insure the materials for all transit risks upto supply of the materials at the final destination at its own cost.
20. **RECOVERY FROM THE VENDOR:** Whenever under the contract, any sum of money shall be recoverable from or payable by the vendor, the same may be deducted from any sum then due or which at any time there after may become due to the contractor under the contract or under any other contract with BHEL or from his security deposit, or he shall pay the claim on demand without any terms & conditions.
21. **POST TECHNICAL AUDIT OF SUPPLY AND BILLS:** BHEL reserves the right to carry out a post payment audit and technical examination of the supply and the bills including all supporting vouchers, abstracts etc. and to enforce recovery of any sums becoming due as a result thereof in the manner provided into the proceeding sub-paragraph provided however, that no such recovery shall be enforced after three years of passing the final bill.
22. **ARBITRATION / CONCILIATION:** In the event of any dispute arising between the parties hereafter referred as BHEL and contractor in respect of or connected with this contract, General & Special terms & conditions of tender, then the same shall be referred to Arbitration and arbitrator will be nominated by the Head of Administration of BHEL Corp. Office, New Delhi, whose decision shall be final and binding on both the parties. However, any differences or doubt pertaining to meaning/ interpretation of any phrase word used in terms or in the schedule of services, their nature and manner of rendering of such services shall be the excepted matter and be referred to the Head of Administration of BHEL Corp. Office, New Delhi, whose decision shall be the final and binding. The provisions of Arbitration and Conciliation Act, 1996 or any statutory modification and re-enactment thereof will apply to such arbitration provided however, in all matters the venue of proceedings will be Delhi and only Delhi or appropriate Courts will have jurisdiction over the same.

## UNPRICE BID

**Title** : Supply of LED based Solar light System in BHEL Township, Sector-17, Noida.

**NIT NO.** : 16:AA:NOI:ADMN.: Solar Lights: 112:2011-12  
Dated: 06/01/2012

**Delivery Period** : Within One Month from the date of placement of order.

[illegible]

I/ we have gone through all the instructions, Pre-qualifying requirement, technical specifications of Solar Light & all the General terms & Conditions enclosed with this tender document and agree to abide by these.

( Engineer Incharge)

(Signature & seal of the bidder)

**DECLARATION**

I / We hereby declare that no case is pending with the police/ court against the bidder/ firm/ company (Agency). Also I /We have not been suspended / blacklisted by any PSU / Government Department / Financial Institution / Court etc.

**(Signature & seal of the bidder)**

Place:

Date:

**ESTATE OFFICE: BHEL TOWNSHIP: NOIDA**

NIT No. 16: AA:NOI:ADMN.: Solar Lights:112:2011-12

Date: 06.01.2012

**No Deviation Certificate**

Notwithstanding anything mentioned in our bid, we hereby accept all the terms and conditions of this tender. We hereby undertake and confirm that we have understood the specifications properly and shall be supplied the material mentioned in this tender enquiry.

**(Signature & seal of the bidder)**

## PART 'B' – PRICE BID

**Title** : Supply of LED based Solar light System in BHEL Township, Sector-17, Noida.

**NIT NO.** : 16:AA:NOI:ADMN.: Solar Lights: 112:2011-12  
Dated: 06/01/2012

**Delivery Period** : Within One Month from the date of placement of order.

[illegible]

I/ we have gone through all the instructions, Pre-qualifying requirement, technical specifications of Solar Light & all the General terms & Conditions enclosed with this tender document and agree to abide by these.

( Engineer Incharge)

(Signature & seal of the bidder)

