OFFICE OF THE SUPERINTENDING ENGINEER (E)
ELECTRICAL CIRCLE-3, DDA, VIKAS MINAR,
NEW DELHI.

No. F68(9)pt.II/EE(P)/EC3/DDA/2015-16/06 Dt 20.01.2016

MINUTES OF MEETING

Name of work:- M/o Various scheme under N.A.-II,East Zone.

SH- S/I/T/C of street lights at Garg Hospital to Railway Reservation Centre AGCR Enclave & Kotakkala Hospital.

NIT No. 32/EE/ELD-1/DDA/2015-16

Estimated cost:- ₹ 70,59,435/-

Pre-bid meeting was held for the above work on 20.01.2016 at 12:30 PM in the chamber of SE (Elect.)-3 wherein following officers of DDA were present.

1. Sh. P.K. Solanki, SE (Elect.)-3 In Chair
2. Sh.M.C Saxena, EE(E)Plg./EC-3
3. Sh. Bhagwan Singh EE(E)/ELD-1
4. Sh. S. K. Garg, AE(E)/ ELD-1

Name of Contractor-

1. Sh Anil Goel , M/s Goel Electricals
2. Sh Nikhil Kalani, M/s N.K.Engg. works
3. Sh Saranbir Singh, M/s Bajaj Electricals

After due deliberation & discussion, during the meeting the following changes have been decided.

1. Outer diameter of the single arm bracket shall be suitable for fixing the LED fitting instead of 60.3 mm Dia mentioned in the drawing of NIT.
2. On the request of contractors in the pre-bid meeting, in the list of approved makes, the makes of LED street light fitting shall be reads as:-Phillips/ Schreder/ Osram/ Surya/Crompton/Bajaj instead of Phillips/Schreder/Osram/Surya/Crompton mentioned in NIT.
3. In the technical specification at Sr.No. 2 (i), the lumens/watt. (System Efficacy) as per LM 79 report (luminaire Efficacy) shall be more than 100 lumens/watt. instead of ≥ 85 lumens/watt.
4. In the technical specification at Sr. No. 2 (ii), Surge protection shall be read as 4 KV internal/10 KV using external configuration protection instead of 4 KVA internal/10 KVA using external configuration protection.

5. In the schedule of work, item no5.02 of HDPE pipe shall be read as 110 mm outer dia nominal size instead of 120 mm outer dia nominal size.

This letter shall be part of the tender. Therefore, **this letter duly stamped and signed by the tenderers in lieu of their acceptance, shall be submitted by all tenderers failing which their tenders will not be opened. This MOM shall be uploaded by EE/ELD-1 to DDA website.**

AE(E)/ELD-V EE(E)/ELD-I EE(E)/Plg./EC-3 SE(E)/EC-3

Copy to:-

1. EE/ELD-1/DDA.
2. M/s N.K. Engineering Works.
3. M/s Bajaj Electricals.
4. M/s Goel Eletricals.
5. Office copy.

ADDITIONAL TERMS AND CONDITIONS

General Works

1. GENERAL

1.1 The contractor must get acquainted with the proposed site for the work and study specifications, conditions and drawings carefully. The work shall be executed in close coordination with the progress of building work.

1.2 The work, as indicated in the schedule of work with specification attached herewith including any modification/addition/alteration ordered subsequently, shall be carried out as per the specification indicated below and in the following order of preference.

i) Indian Electricity rules 2005 amended up to date.
ii) Technical specifications attached.
iii) Relevant BIS standards as modified up to date.
iv) General specifications for Electrical works Part I & II.

1.3 In case of any conflict - the schedule of work, additional terms and conditions, standard specification & clauses of agreement shall prevail in the preceding order

1.4 All equipments shall be delivered with (i) manufacturer's test certificate, (ii) manufacturer's technical catalogues, and instruction (O&M) manuals.

1.5 Scaffolding & any other T & P required for execution of work shall be arranged by the tenderers.

1.6 For item/equipment requiring initial inspection at manufacturer's works, the contractor will intimate the date of testing of equipments at the manufacturer's works before dispatch. The successful tenderer shall give sufficient advance notice regarding the dates proposed or such tests to the department's representatives to facilitate his presence during testing. The Engineer-in-Charge at his discretion may witness such testing. Equipments will be inspected at the Manufacturer/Authorized Dealers premises, before dispatch to the site by the contractor. The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make the arrangements for the same.

2. SCOPE OF WORK

The following shall be deemed to be included within the scope of work for which nothing shall be paid extra.

i) Cutting of pukka portion for laying of DWC pipe.

ii) Responsibility to ensure safety of materials against pilferage and damage till the installation are handed over to the department.

3. SUBMISSION AND OPENING OF TENDER

3.1 Pre-Bid Conference It is proposed to hold a pre-bid conference with the prospective tenderer to enable them to seek clarification in the technical specification & in tender document that they may consider necessary for submission of tenders . All clarification sought for will be finalized during the per-bid conference and confirmatory minutes for the pre-bid conference will be circulated among all tenderers who have been issued the tender documents. The date and time of pre-be conference will be informed to the tenderers at the time of issue of the tenders. It is up to the prospective tenderer to take part in the pre-bid conference. Non attendance of pre bid conference does not debar the prospective tenderer from participating and submission of tender.

3.2 The tenderer are advised not to deviate from the technical specifications / item, commercial terms and conditions of NIT like terms of payment, guarantee, inspection, arbitration clause, escalation etc.

4. INSPECTION BEFORE DISPATCH

All routine tests shall be conducted before dispatch of equipments. No. equipment shall be dispatched from the manufacture‘s premises without such tests being conducted and test result recorded. These test certificates shall be given along with the supply of equipments. The Engineer-in-Charge shall, if he so desires inspect and witness the pre-delivery tests. For this purpose, the contractor shall give 15 days’ advance information. Agency shall arrange for inspection by the department. Department shall bear expenses for inspection as far as traveling and boarding/lodging is concerned. However, waiver if any for inspection shall be at the discretion of the department without any cost implication but TYPE TEST Certificate shall have to be submitted for equipments.

Prior to dispatch, all equipment shall be adequately protect for the whole period of transit, storage and erection against corrosion and incidental damaged etc. from the effect of vermin, sun light, rain, heat and humid climate.

5. INSURANCE

The contractor shall include storage cum erection including third party insurance right from the storage to commissioning of various equipment. All insurance which the contractor is required to inter into under the contract shall be effect with any authorized general insurance company and the contractor shall produce the policies of insurance.

6. REMEDY OF FAILURE TO INSURE

If the contractor fails to effect the keep in force the insurance referred to in the preceding sub-clause, the department may effect and keep in force any such insurance and pay such premium as may be necessary for that purpose and from time to time deduct the amount, so paid by the department, from any money due or which may become due to successful tenderer or recover the same as debit from the successful tenderer bill.

7. SUPPLY OF MATERIAL

Supply of material shall be phased in such a manner that erection work is not hampered for want of material.

i) All tools and tackles required for unloading of equipment and erection at site shall be the responsibility of sub-contractor.

ii) The acceptable makes of various equipments/components/ accessories have been indicated. The alternative makes are not acceptable. Other than these the materials to be used in the site of works shall be ISI marked, where material bearing ISI marked, are not available, material conforming to ISI shall be used with prior approval of the Engineer In-charge.

iii) Suitable and open storage accommodation shall be provided by the department free of cost to the agency. However, temporary structure if any required by the contractor for safe and lockable storage of material shall be allowed at his own cost.

iv) The department will not be liable for any damage, losses and compensation payable at law in respect of or in consequence of any accident or injury to any person.

Schedule of procurement of material/equipment shall be submitted by successful tenderer within 15 days from the date of award of work. Procurement of material shall be as per the approval of Engineer- in-charge.

8. QUALITY OF MATERIAL AND WORKMANSHIP

All parts of the equipment shall be of such design, size and material so as to function satisfactorily under all rated conditions of operation. All components of the equipments shall have adequate factor of safety. The work of fabrication and assembly shall conform to sound engineering practice and on the basis of "Fail Safe Design". The mechanical parts subject to wear and tear shall be easily replaceable type. The construction of the equipments shall be such as to facilitate easy operation, inspection, maintenance and repairs. All connections and contacts shall be designed to minimize risk of accidental short circuits caused by animals, birds and vermin etc. All identical items and their component parts should be completely, interchangeable including spare parts.

9. INSPECTION AND TESTING AT SITE

i) The installation shall be subject to necessary inspection during every stage of erection, by the Engineer In-charge or his authorized representative. The successful tenderer shall provide all facilities and assistance for the purpose.

ii) The completed installation shall be inspected and tested by the Engineer-in-charge in the manner as will be laid down by him, in consultation with the contractor.

iii) All instruments and facilities necessary for the tests shall be provided by the contractor.

10. COMPLETENESS OF TENDER

All fittings, equipments, accessories, hardware, foundation bolts, terminal lugs for electric connections, cable glands and items which are necessary for efficient assembly, shall deemed to have been includedin the scope of work. The installation shall be completed in all details even where such details have not

been mentioned in these specifications.

11. GUARANTEE

All equipments shall be guaranteed for a period of 12 months from the date of acceptance and taking over of the installation by the Department against un-satisfactory performance and/or breakdown due to defective design, material, manufacture, workmanship or installation. The equipment or component or any part thereof so found defective during the guarantee period shall be repaired or replaced free of cost to the satisfaction of the Engineer in-charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of Engineer-in-charge in this regard shall be final.

12. <u>PAYMENT TERMS:</u>

The Following percentage of contract rate shall be payable against the stages of work shown herein. Deduction/release of security deposit shall be as per standard relevant clause.

S. No.	Stage of Work	Pole, Fitting, Feeder Pillar, Cable	All other items
1.	After initial inspection (wherever specified) and delivery at site in good condition on pro rata basis.	85%	75%
2.	After completion of installation in all respect.	10%	20%
3.	After testing commissioning trial run and handing over	5%	5%

13. <u>COMPLETION PLAN & DATA:</u>

i) The contractor shall give three copies of ***completion plans*** & data as per details below within one month after actual date of completion failing which as amount @ 2.5% of tendered cost subject to maximum of Rs.15,000/- shall be deducted from any amount due to the contractor.

ii) The contractor shall submit ***completion certificate*** as per Appendix –E of the General Specification for Electrical Works Part-1 (Internal) within one month after actual date of completion failing which an amount @ 1% of tendered cost subject to maximum of Rs.10,000/- shall be deducted from any amount due to the contractor.

14. Security / Safety of installation shall be the responsibility of agency.

TECHNICAL SPECIFICATIONS

1. Polygonal Poles:

This shall be octagonal in shape and shall be designed to sustain basic wind speed of 47Mtr./sec(3 second gust) as measured at a height of 10Mtr. The safety factor for wind load in ultimate limit state shall be taken as 1.5. The structure shall confirm to IS 875- Part-3: 1987 relating to wind load on structure and conform BSEN 40-1: 1992 relating to general construction.

The grade of the steel used shall be S-355 as per BSEN-10025 or equivalent Indian standards. Manufacturing of poles shall be done out of a manufacture supplied straight to eliminate of deformity due to de-coiling of rolls.

Pole Shaft:

The pole shaft shall have Octagonal cross section and shall be continuously tapered with the single longitudinal welding. There shall not be any circumferential welding. The sheets shall be cut in required profile on CNC Plasma cutting machine. The welding of the pole shaft shall be done by submerged are welding process. The base plate shall be fixed by welding to the pole shaft at two locations i.e. from inside and outside. The pole shall be single dip hot galvanized as per IS 2629/IS 2633/IS 4759 standards. In order to attain the best quality of the galvanization there should be an uniform and consistent control of zinc in bath. The pole shall be with an average coating thickness of 70 microns. The galvanizing shall be done with single dipping. Bending of the sheet in to polygonal shape done through a CNC controlled, laser aligned single blade bending process.

Door opening: Polygonal poles shall have door of suitable size at the elevation of 500mm from the base plate. The door shall be flush with hinged and locking facility.

The pole shall be additionally reinforced with a welded steel section, so that the section at door is unaffected and undue bucking of the cut section is prevented.

Base Flange: The base plate shall be fabricated from steel plate from laminations.

Foundation:

i) The coarse sand stone aggregate for pole foundation should be sound quality, containing siliceous material, clean shape free from earth, organic material and slat, mixture of concrete shall be stiff & such as to produce sound & compact water proof concrete. It should be free from grit & dirt. All foundation shall be made by using ready mix cement concrete mixture. The cube test of **C.C**. shall be done as per CPWD specifications . Cold twisted bar used in foundation shall be as per makes mentioned . In case of any other ISI mark used a recovery of D 2/- per Kg. shall be done from the agency.

ii) The pole foundation will be casted strictly as per drawing approved by department i.e. as per pole manufactures' foundation design pre casted foundation with proper specification is also allowed to be used subject to meeting all required tests.

iii) The firm shall have to provided GI foundation bolts with nuts and washers and GI arm bracket manufactured from the pole manufacturing company only.

2. Technical specifications of LEDs with respect to lighting standards

i) General requirements

Parameter	**Value**
Usage hours	Dusk to dawn (12 Hours)
Working Humidity	10-90% RH
Working Temperature	5-50°C
Lumen/watt (system efficacy)-as per LM79 report(Luminaire efficacy)	≥ 85
Overall the luminaire should meet the following standards	IS:IEC 60598-2-3: Covering Mechanical strength test, Endurance Test, Thermal Test, IP Test, Insulation Resistance, Electric Strength Test & Resistance to Heat, Fire and Tracking Test
LED fitting shall be confirm to	IS:16101, 104, 107 A-1

ii) Electrical specifications

Parameter	**Value**
Input voltage	220 - 240 V
Input Frequency	50 Hz +/- 3 Hz
Operating Voltage range	140-270 V
Power Factor	≥ 0.95
Luminaire Protection	Class I
Overall total harmonic distortion	As per EN 55015 or EN 61000-3-2
Surge protection	4KVA internal/10KVA using external configuration protection

iii) Specifications for the luminaire body

Parameter	**Value**
Index of Protection level	IP 66
Lamp Housing	High pressure die cast Aluminium with Manufacturer name embossed to allow traceability
Driver Housing	Integral

The Luminaire should meet the standard	IEC 60598-1
Cover/Glass	UV stabilized poly carbonate/Toughed glass
Screw/ fastner & Clamps	Stainless steel 304 grade

iv) Specifications for the LED

Parameter	**Value**
Life expectancy	≥ 50,000 hours at 70% lumen maintenance (L70)
Color Temperature	5,000K to 6,500K
Color Rendering Index	≥ 70
Make of LED High Power LED	Philips Lumileds / Cree / Osram / Nichia
LED should meet the standard	IEC 62471 2006-07 (Photo biological safety of Lamps and Lamp Systems)
Hot/cold factor- as per LM80 report	At junction temperature of 85°C, the lumen depreciation should not be more than 10%
Lumen/watt (hot lumens / watt)	≥ 110

v) Specifications for the Driver

Parameter	**Value**
The driver should meet standards	Performance : IEC 62384 ed.1.1, 2011 Safety : IEC 61347-2-13, 2006 in Conjunction with IEC 61347-1 ed.2.0, 2007 EMI : IEC 61547 ed.2.0, 2009, CISPR-15 EMC : IEC 61000-3-2 ed.3.2, 2009 Flicker : IEC 61000-3-3 ed.2.0, 2008
Efficiency of driver	≥ 85%
Life of the driver	≥ 50% of the life of the LED

vi) **Specifications for the optics :** For new installations (new poles with lights), a space to height ratio of (S/H) > 3 meeting Indian Lighting Level standards IS 1944 is required.

vii) **Pre-Dispatch inspection :** The Bidder should have in –house test facility/ test results from third party independent government accredited laboratories to show that all relevant driver and luminaire standards are met. Such laboratories include the ERTL (Electronic Regional Test Laboratory) labs located in all major cities in the country, the UL Lab established in Manesar near Gurgaon or any other NABL accredited laboratories.

viii) **Warranty period :** 5 years

ix) **Test Reports to be submitted by Bidder :** The bidder will submit a report containing test results for the LED product and its performance. The report shall contain all pertinent data regarding conditions of testing, type of euipement, LED products and reference standards. The report will include information on the following items:

a) Date and name of the testing agency
b) Manufacturer's name and designation of LED product under test
c) Measurement quantities measured (total luminous flux, luminous efficacy etc.)
d) Rated electrical values (clarify ac (frequency) or dc) and nominal CCT of the LED product tested.
e) Number of hours operated prior to measurement (0 h for rating new products)
f) Total operating time of the product for measurement including stabilization
g) Ambient temperature
h) Orientation (burning position) of LED product during test
i) Stabilization time
j) Photometric method or instrument used (sphere-photometer, sphere-spectroradiometer, or gonio-photometer)
k) Correction factors applied (e.g., spectral mismatch, self-absorption, intensity distribution, etc.)
l) Photometric measurement conditions (for sphere measurement, diameter of the sphere, coating reflectance, 4π or 2π geometry, for goniophotometer, photometric distance.)
m) Measured total luminous flux (lm) and input voltage (V), current (A), and power (W) of each LED product.
n) Luminous intensity distribution (if applicable)
o) Color quantities (chromaticity coordinates, CCT and / or CRI for white light products)

p) Spectral power distribution (if applicable)

q) Bandwidth of spectroradiometer, if spectral distribution and / or color quantities are reported

r) Equipment used

s) Statement of uncertainties (if required)

t) Deviation from standard operating procedures, if any and

w) ROHS cagliance

x) Photometric details

Intending agency must submit photometric information, data or diagrams that indicate the proponent's proposed luminary will meet Indian Roadway Lighting standard IS 1994. Intending agency must provide company's software or any other standard software like Dialux for modeling to get results conforming with IS 1944 standards such as average luminance (E_{avg}) and uniformity (E_{min}/E_{avg}) for the said road.

Also, the bidder is required to submit the following:

i) IES LM-79 Initial Photometric Performances

ii) Data report for the proposed luminary (sample LM-79 report)

xi) Lumen depreciation

The intending agency must submit a lifetime determination statement that indicates how many operating hours can be expected from the proposed luminary product until its light output declines to 70% of its initial output (L70) taking into account the average and maximum annual temperatures.

Such information should include:

- IES LM-80 report for the LED chip package employed in the proposed luminary product
- Performance measurements taken over a minimum of one year operation from pilot projects that have tested the proposed luminary product, or a similar luminary product, in the field.

xii) **<u>Cables:</u>** The end terminator or aluminum cables shall be made with aluminum lugs / thimbles duly taped and sleeved and termination of copper wires shall be made with copper lugs/ thimbles duly taped and sleeved.

DESIGN CRITERIA FOR STREET LIGHTING ON ROAD (OPEN PORTION)

S. No.	Road width	Road Type	Type of pole position	Pole to pole distance	Pole height	Bracket length	Tilt angle	Lighting specification
1	24 Mtr. (single carriage way width 15 mtr.)	Single Carriage way	Staggered Arrangement (Both Side)	40 Mtr.	10Mtr.	1.00 Mtr.	0-10º	35Lux / 0.4 /0.33

3. Feeder Pillar

Dimensional drawing of the feeder Pillars, detailed drawing for foundation of Poles shall be submitted for approval from Engineer in Charge.

i) Feeder pillar shall be of floor mounting, free standing cubical type suitable for outdoor installation and shall be dust, vermin and weather proof construction and as per drawing conforming to IP-54.

ii) This shall be suitable for continuous operation on 415 Volts (Nominal) 3 Phase, 4-Wire, 50Hz.

iii) The outer enclosure shall be fabricated from CRCA MS. sheet. All load bearing members shall be fabricated from 2 mm CRCA sheet.

iv) Hinged double door of the same material shall be provided on the front and rear sides, with necessary handles and in built locks with double keys. Neoprene gasket shall be provided for the doors.

v) Suitable M.S. top cover with suitable slop, overhang shall be provided for protection against rain/weather etc.

vi) Detachable cable gland plates shall be provided at the bottom having suitable knock out for compression glands. Adequate space shall be provided below the same for safe bending & termination of cables.

vii) The enclosure shall be provided with ventilation louvers covered with the wire mesh, lifting hooks, supporting legs, double earth terminals with double nuts & washers.

viii) The internal arrangement shall be compartmentalized for incoming, outgoing switch gears/bus bars & design shall be such as to permit suitable arrangement for incoming & outgoing cables.

ix) Provision shall be made for lighting inside the feeder pillar.

x) All incoming and outgoing switch gears shall be properly marked, indicating the connected load, cable sizes, and outgoing connections etc as required.

xi) The feeder pillar shall be provided with a danger notice plate as per CPWD specification for electrical works (Internal & external) 2012.

xii) Interconnection of the various mountings on the feeder pillar shall be done using PVC insulated conductor or solid strips with PVC taping / sleeving of appropriate sizes. Termination shall be made such that local heating is avoided.

xiii) Feeder pillar shall be pre-treated with 7 tank process followed by powder coating.