

**Government of India**  
**Department of Atomic Energy**  
**Global Centre for Nuclear Energy Partnership**  
**Kheri Jasaur, Bahadurgarh, Haryana 124 505**

**For Website**

---

**TENDER ENQUIRY**

Ref: GCNEP/20/8-69

Date:28/08/2020

To, GCNEP Website

1	Name of work	Fabrication, supply, installation and commissioning of street lights and feeder panels at GCNEP Bahadurgarh, Haryana as per the specifications detailed in Annexure-I.
2	Location of work	Kheri-Jasaur, Bahadurgarh, Haryana
3	Estimated Cost	Rs. 23,62,242/- (Inclusive of all taxes)
4	Period of Completion	<b>2 Months</b>
5	Security Deposit	<b>2.5 %</b> of the gross amount; deductible from the final bill of the contractor.
6	Due date & time for submission of quotations	24/09/2020 upto 16:00 Hrs
7	Place for Submission	The address on the envelope should read:  <b>Project Director, Global Centre for Nuclear Energy Partnership (GCNEP), Kheri Jasaur, Bahadurgarh, Haryana -124505</b>
8	Place of opening	Date and time will be notified later. Address: Atomic Minerals Directorate, 7, West Block, RK Puram, New Delhi, Delhi 110066
9	The quotation must be sent in a <b>Sealed Envelope Super-Scribed</b> with the <b>Reference Number &amp; Due Date</b> given above. <b>The quotations must be sent by either Registered Post OR Speed Post Services of India Post OR delivered by Hand against receipt on any working day at above address, before due date and time.</b>	

-sd-

Project Director, GCNEP

## Annexure-I (Scope of work)

**Title:** Works related to Fabrication, supply, installation and commissioning of street lights and feeder panels at GCNEP Bahadurgarh, Haryana as per the specifications detailed below:

**Description:** The proposed work is to be carried out at GCNEP, Kheri-Jasaur & Jasaur- Kheri, Bahadurgarh, Haryana. The agencies willing to take up this work can plan a visit to office site for mapping the exact requirements. Such a visit, however, must be with a prior intimation to & approval of this office.

### SECTION - 1 : GENERAL REQUIREMENT & PROJECT DATA

#### 1.1 SCOPE OF WORK:

The works involves fabrication, supply, assembly, testing before despatch and delivery at site, erection & commissioning of various equipments, earthing, etc. as detailed in schedule of quantities, drawings and specifications.

The entire work is required to be carried out in consultation with Engineer-in-charge from the date of awarding of contract. The delay in date of commissioning is subject to the liquidated damage as specified in the General conditions of contract.

**Following works are not included in present scope of work / estimate: -**

1. RCC foundation for street light poles is not included in the scope of work.

**Note: *J bolts, base plate, HDPE pipes and anchor plates are included in scope. These items are to be supplied separately before commencement of work.***

#### 1.2 HANDLING AND TRANSPORT FACILITIES AT SITE:

The contractor should be responsible for and pay for handling and transport of all parts and materials covered by this contract from makers work to the actual site of erection, including loading and unloading of materials as required. He should make his own arrangements for temporary storage of his materials and equipments before and during erection. No facility of crane etc. shall be available for installation and contractor should make his own arrangements for his purpose.

#### 1.3 GENERAL CONDITIONS:

All works covered by this specification should be carried out in accordance with the “General conditions of the contract” mentioned in Section 1.20.

#### 1.4 GUARANTEE:

The performance of all the equipment and the installation should be guaranteed at least to a minimum period of one year for defective materials or workmanship.

- 1.5 The tenderer must furnish the make of major items as per preferred make of materials given elsewhere.

- 1.6 The contractor shall have to furnish the completion certificate on completion and commissioning of the works as per enclosed format.

- 1.7 All junction boxes/ pull out boxes shall be right angle in shape or as per instructions of Engineer-in-charge.
- 1.8 All embedded boxes should be plumbed & finished level with the surface of wall and floor level. No skew installation will be accepted.
- 1.9 Exposed conduit shall be in neat straight lines. No skewing will be permitted.
- 1.10 Anchor fastener, wiring channel, lock nuts shall be plumbed in level for suspended lighting fixtures.
- 1.11 French chalk before pulling wire to be used. Fish wire shall be provided during conduit installation.
- 1.12 All junction boxes / pull out boxes shall be properly covered.
- 1.13 For single phase point metal clad socket items, necessary plug tops shall be provided along with sockets.
- 1.14 All conduits shall be ERW / PVC type as required.
- 1.15 Aluminium Hospital saddles shall be used for wiring on exposed surface.
- 1.16 The contractor has to furnish the required test certificates, test reports in the approved performa of supply authority and arrange necessary approval from the Supply Company and electrical inspector. No separate charges will be payable by department to this account.
- 1.17 All holes to be made in wall/ceiling/beam/column or other places shall be done by using drill machine only.
- 1.18 Description of item in the schedule of quantities is brief and therefore, shall be read in conjunction with the relevant drawings and the specifications and the contractor's rate shall be deemed to be for such complete work unless otherwise specified by the contractor while tendering. In case any difference or discrepancy between the description in the schedule of quantities and the specifications, the schedule of quantities shall take precedence. In case any difference or discrepancy between the description in the schedule of quantities and the drawings, the description in schedule of quantities shall take precedence. In case of any difference or discrepancy between drawing and specifications, the specifications shall take precedence.
- 1.19 APPROVALS OF ELECTRICAL INSPECTIONS ETC.:

The specifications given below pertain to the Electrical works to be carried out in GCNEP Campus, Bahadurgarh, Haryana. The entire scope of work is as per the Bill of Quantities provided in the tender document.

## PROJECT DATA:

Owner	:	GCNEP, Haryana
Elevation	:	216 m above MSL
Ambient Temp.	:	45 Degree C Maximum
	:	5 Degree C Minimum
Humidity:-	:	23 %
Avg. Rainfall	:	Approx.600 mm

**The design ambient temperature for Electrical Equipment shall be considered as 50 Degree Centigrade.**

### **1.20 General Terms and Conditions**

1. The bidder should have the experience of similar works for a minimum of three Years in reputed Departments / Autonomous Institutions / Universities /Public Sector Undertakings of the Government of India or Government of Haryana or any other State Government or Public Sector Banks or Local Bodies/Municipalities. The agency should have satisfactorily completed similar works during the last three years ending previous day of last date of submission of tenders. For this purpose, cost of work shall mean gross value the completed work including cost of material supplied by the Government/Client but excluding those supplied free of cost. This should be certified by an officer not below the rank of Project Manager/ Engineer-In-Charge or equivalent. The agency must have

Completed THREE similar works each of value not less than the amount equal to 40% of the estimated cost put to this tender.

or

Completed TWO similar works each of value not less than the amount equal to 60% of the estimated cost put to this tender.

or

Completed ONE similar work of value not less than the amount equal to 80% of the estimated cost put to this tender.

Important Notes:

- i) Similar work shall mean: **Street light & Feeder Panel installation**
- ii) 'Cost of work' shall mean gross value of the completed work including the cost of materials supplied by the Client, but excluding those supplied free of cost. The value of executed works shall be brought to the current costing level by enhancing the actual value of work at a simple rate of 7% per annum; calculated from the date of completion to the last date of receipt of applications for tender.
2. A single party based turn-key solution is invited to ensure Installation and commissioning & operational consistencies. Partial quotes/ quotes for partial works are liable to be rejected without any further correspondence.
3. The contractor shall not sub-contract any part or all the work without written consent from GCNEP, if at all required.
4. Bidders are requested to quote for above works as per the enclosed specifications given in Annexure-I.
5. Bidder should clearly confirm that all the facilities, equipment, tools are available in his factory for inspection and testing and these will be made available to the purchaser or his representative for inspection & should provide in-house test certificates along with product specifications.
6. Bidder shall quote for entire work including fabrication, supply & Installation and commissioning of the supplied items along with accessories and their integration with existing system as application as per tender specifications.

7. The works shall be subjected to inspection by our Engineer in Charge. The finished components shall not be dispatched to site prior to approval by our Engineer in charge OR departmental representative at bidder's premises.
8. The bidder shall deliver the finished components after approval by our Engineer in charge within the completion period effective from the date of issue of work order to the bidder. The items required shall be installed at GCNEP, Kheri-Jasaur, Bahadurgarh, Haryana, PIN-124505. Any delay which is attributable to the contractor is liable **for penalty @ 1%/ week after completion period.**
9. Project Director, GCNEP reserves the right to accept/reject any or all quotations without assigning any reason.
10. Quotation must also indicate the validity of offer. The offer should be valid for a **minimum of 120 days.**
11. If required, the interested bidders can plan a visit to Office Site for mapping the exact requirements but with a prior intimation & approval of Engineer in charge only. Drawings / Sketches (if any) must be returned along with the offer.
12. There is no free issue material. All items/material to be supplied/ used should be brand new and factory manufactured condition.
13. All material used including the color, texture, shade etc. wherever applicable should be with a prior approval of Engineer in charge.
14. A security deposit of 2.5 % of the gross amount is deductible from the final bill of the bidder. The security deposit shall be refunded to the contractor after the expiry of the guarantee period (i.e. one year from issue of Completion Certificate).
15. Unless otherwise specifically mentioned, design, manufacture, testing & performance of all items shall conform to the latest edition of the applicable codes/ standards.
16. The safety & security of personnel, material & machinery shall be the responsibility of the contractor. Contractor should have a qualified person carrying out the job.
17. Details of Relative in DAE (if any) (Name, Unit, Position Held, Relationship) to be provided on company letter head along with quotation. (for more information please refer Enlistment Rules, CPWD Works Manual).
18. The tenderers shall sign a declaration under the Official Secret Act-1923 for maintaining secrecy of the tender documents, drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.
19. In case of difference between unit rate & total amount, unit rate will be final.
20. Quantities of various items may be increased or decreased as per requirement.
21. Payment Terms: single bill payment after submission of following documents:
  - a. Original bills
  - b. Warranty certificates
  - c. PAN number
  - d. GST number
  - e. Canceled cheque
  - f. Stamped pre-receipt

**A. Eligibility criteria/ documents to be submitted :**

1. Copy of PAN/TAN Card
2. Copy of GST No.
3. Copy of Company registration
4. Undertaking for Non Blacklist
5. Experience certificate for similar completed work
6. Average Annual Turnover of company shall not be less than 100% of the estimated cost.
7. Details of Relative in DAE (if any) as per Section 1.20, Point No.17

Note: All documents should submit at a time of financial bid.

**B. On-site support & warranty:**

1. All material supplies, installation & workmanship should include an on-site warranty of minimum one year (or mentioned otherwise for specific items) after the satisfactory completion of the work and acceptance by Engineer-in-Charge for above work.

2. GCNEP may lodge complaints by any mode i.e. phone, e-Mail etc.
3. All items should be maintained in working/ usable condition by the bidder at no extra costs for entire warranty period. The visit of engineers/ technicians of the Agency to the office premises shall be arranged by the bidder at no extra cost during the warranty period.
4. In the event the Agency does not attend to the service calls of the office within the stipulated time, GCNEP reserves the right to get the items/parts repaired/replaced through other Agencies or individuals, the expenditure incurred thereby shall be recovered from any payments due to the Agency.
5. If at all, any asset or its part shall require to be moved out of this office premises for rectification of any complaint, then written permission is to be sought, specifying the details of the items to be taken out of office and reasons thereof. Safety & security as well as the transportation of assets to the Agency's premises and vice versa shall be at the risk and cost of the Agency.
6. Defective parts shall be replaced by new parts of the same model & make and the all cost of replacement shall be borne by the Agency. In the event of such new part not being compatible with the existing part, such existing part shall also be replaced with the new original part. The contractor shall keep sufficient stock of all spare parts of assets and standby assets.

**Note:** *Preference may be given to technically suitable Make in India/ Made in India products.* Such product(s) should have manufacturing and servicing facilities in India and should be open to technical inspection by GCNEP. The products should be competitive with standard market products in terms of performance and form factors.

**Note:** The work has to be executed on a turn-key basis. All fittings, connectors, cables etc. required for the operationalization are in the scope of the agency. If agency want to supply items other than preferred make, then it should be ensured that it is technically equivalent or better and data sheet of same should be attached along with the bid **otherwise bid is liable to be rejected.**

## **SECTION- 1 : 1.1 KV GRADE LT POWER & CONTROL CABLES**

### **1.1 SCOPE :**

This specification establishes the requirements of design, manufacture, testing at manufacturer's works and delivery to site and installation, testing at site & commissioning of 1.1 KV grade LT PVC/XLPE insulated, galvanized round wire/flat strip armoured Aluminium/copper conductor cables.

### **1.2 STANDARDS AND CODES :**

Unless otherwise specifically mentioned in the document, the design, manufacture, testing and performance of all cables shall conform with latest edition of the following standards & codes:

IS : 7098 (Part-I)	:	Cross linked polyethylene insulated PVC sheathed cable for working voltage and including 1100 Volts.
IS : 1554 (Part-I)	:	PVC insulated (heavy duty) electric cables for working voltage upto and including 1100V.
IS : 3961 (Part-II)	:	Recommended current ratings for cables.
IS : 3975	:	Mild steel wires, strips and tapes for armouring of cables
IS : 4905	:	Methods for random sampling
IS : 5831	:	PVC insulation and sheath of electrical cables.
IS : 8130	:	Conductors for insulated electrical cables and flexible cords.
IS : 10418	:	Specification for drums for electric cables.
IS : 10810	:	Method of tests for cables.
ASTM-D-2843	:	Standard test method for density of smoke from the burning or decomposition of plastics.
ASTM-D-2863	:	Standard method for measuring the minimum oxygen concentration to support E3 candle like construction plastics.
IEC-754 (Part-I)	:	Test on gases evolved during combustion of electric cables.
SS:4241475	:	Flammability testing of cables.

### **1.3 TECHNICAL PARAMETERS:**

- i) Power system details : 415 V +/-10%, 3 phase, 4 wire solidly earthed.
- ii) Frequency : 50 Hz.
- iii) Size of cable, conductor & quantity : As per S.O.Q.
- iv) Core identification : Colour scheme as per IS 1554 (part I) /88 or latest
- v) Conductor : Stranded circular/sector shape core  
Aluminium/Copper conductor

- vi) Rated voltage : 1100 Volts
- vii) Insulation : XLPE
- viii) Maximum conductor temperature at rated current. 90 degree C
- ix) Maximum conductor temperature during short circuit under hot condition 250 degree C
- x) Inner sheath Extruded PVC inner sheath
- xi) Filler material If used, shall be compatible with other materials of cable construction
- xii) Armouring Single layer galvanized steel round wire/ flat strip armoured.
- xiii) Overall serving (outer sheath) Anti-rodent and anti-termite extruded black FRLS grade PVC sheath (Type ST-2)
- xiv) Cable shall be embossed / printed on the outer sheath at every 1 m. length as under :1.1 kV, PVCA/XLPE, conductor material, No. of core and size of cable, sequential marking for the metered length of cable, make and year of manufacturing

#### **1.4 INSTALLATION OF LT CABLES IN GROUND :**

Installation of 1.1 KV grade, copper/Aluminium conductor PVCA/XLPE cables shall be laid at a depth of 900mm below ground level including excavation in all type of soil/concrete, road cutting/footpath cutting, temporary reinstatement, back filling, levelling, dewatering, consolidation, removal of excess earth within the radius of 500 m, sand bedding, cables covered on top & sides by baked bricks conforming to IS: 1077, sand cushioning all around, making good to the original finish, providing brass cable number tag including supply of bricks, sand, cable tags etc. complete as per instructions of EIC.

#### **1.5 INSTALLATION OF LT CABLES ON MS SUPPORT/TRENCHES WALL/SLAB/BEAM ETC.:**

Installation of 1.1 KV grade, copper/Aluminium conductor XLPE cables on MS. Support/trenches/sleeves/wall/Slab/ beam/pre-fabricated Trays in cable trench shall be as per IS 1255. All necessary accessories for installation of cables such as G.I. saddle / clamps/supports, screw, nuts and bolts etc.is included in the scope of work.



**1.6 END TERMINATION OF LT AND CONTROL CABLES:**

End jointing of 1.1 KV grade, Aluminium / copper conductor PVC/XLPE power / control cables with supply & installation of all jointing materials including supply of double compression type glands, crimping type long barrel heavy duty copper lugs, insulation tape etc. of sizes as detailed in schedule of quantities (SOQ). Cable gland shall be suitably earthed. Earthing of clamp should be included in the cost.

**1.7 TESTS :**

**1.7.1 Shop Tests :**

The cables shall be subjected to shop tests & witnessed by department engineer in accordance with relevant standards to prove the design and general qualities of the cables as below:

1.7.1.1 Routine tests on each drum of cables.

1.7.1.2 Acceptance tests on drums chosen at random for acceptance of the lot.

1.7.1.3 Type tests Certificates shall be submitted for particular size & design of cable .

**1.8 SITE TESTS :**

The cables after installation at site shall be subjected to HV test & Megger test as per instruction of EIC.

**1.9 DEVIATION :**

No deviation with respect to specification requirements is acceptable. Deviation if any, shall be clearly spelt out by the Bidder referring clause no.

----X-----

**SECTION – 2 : Feeder Panel**

Design, manufacture, supplying, fixing in position, testing and commissioning of feeder pillar with double door with detachable canopy, front operated, front access, 3mm thick MS CRCA sheet steel enclosed free standing, dust and vermin proof, Feeder Pillars with IP-55 protection with hinged and lockable doors complete with interconnections, copper crimping lugs, brass glands, bonding to earth and painting. Feeder Pillar shall be suitable for use at 415 volts, 3 phase 4 wire 50 Hz system, and with 25 KA rupturing capacity at 415 volts. All live accessible parts shall be shrouded and all equipment shall be finger touch proof. The busbar insulation shall be with heat shrinkable sleeves. SMC/DMC shrouds and busbar supports shall be used. Padlocking facility shall be provided. Scope includes suitable angle iron frame work for mounting arrangement 600 mm above ground level necessary grouting, PCC base etc. Also scope includes enclosing the supports by 3 mm thick MS CRCA sheet steel all around with detachable covers, etc all as per specification and instructions of E-I-C.

**Note:**

- 1) The MCCBs shall be provided with thermal magnetic based overcurrent & short circuit release.
- 2) MCCBs shall be of minimum 25 KA Ics breaking capacity.
- 3) All Feeder Pillars/Panels shall be provided with RYB indication lamps (heavy duty LED cluster type) with HRC protection fuses.

**Feeder Pillar (Near Compact Sub-station) :**

4P, 400 A MCCB - 1 no. Mounted in outdoor panel with IP- 55 protection. Above MCCB is to be connected externally with existing 250 kVA PSS. Above MCCB is to be connected to 630 A Copper Bus Bar with two runs of 185 Sq.mm, 1.1 KV grade Aluminum cable with XLPE insulation. All terminations, suitable thimbles, nut bolts, Gland plate & Glands are to be provided with suitable earthing.

Panel must have

1. 1 set ON/OFF push button
2. 1 set ON/OFF indication lamps

The panel shall be complete with suitable size interconnection PVC FRLS Cu. wires and auxiliary contactor for contact multiplication, if required.

**Feeder Pillar (Near D Type Block) :**

**Incomer :-**

i) 4P, 250 A MCCB - 1 no.

ii) 3 Nos. 250/5 A ratio, class-1, 5 VA burden cast resin current transformer

iii) Digital Multifunction meter with communication facility - 1 No.

**Bus bar**

250 A TPN tinned copper bus bar having maximum current

density of 1.24 A/sq.mm to withstand symmetrical fault

level of 25 kA at 415 V. The neutral bus bar shall have

100% capacity

**Outgoings :-**

i) 4P, 125A, MCCB - 2 nos.

ii) 4P, 63/40A, MCCB - 4 nos.

The feeder shall be complete with suitable size interconnection PVC FRLS Cu. wires and auxiliary contactor for contact multiplication, if required.

### **SECTION – 3 : OCTAGONAL STREET LIGHT POLES**

#### **3.1 DESIGN:**

The Octagonal poles shall be designed to suit structurally the max wind speed prevailing at site as per IS-875 Part III, 1987. The top loading i.e. area and the weight of fixtures are to be considered to calculate maximum deflection of the pole and the same shall meet the requirement of BS: 5649 Part VI 1982. Poles are to be designed for a design life of 25 years.

#### **3.1.1 POLE SHAFT:**

The pole shaft shall have Octagonal cross section and shall be continuously tapered with single longitudinal weld. There shall not be any circumferential welding.

All octagonal pole shafts shall be provided with the rigid flange plate of suitable thickness with provision for fixing 4 foundation bolts. This base plate shall be fillet welded to the pole shaft at two locations i.e. from inside and outside. The welding shall be done as per qualified MMAW process approved by Third Party Inspection agency.

#### **3.1.2 DOOR OPENING:**

The octagonal Poles shall have door of approximate 500 mm length at the elevation of 500 mm from the Base plate. The door shall be vandal resistance and shall be weather proof to ensure safety of inside connections. The door shall be flush with the exterior surface and shall have suitable locking arrangement. There shall also be suitable arrangement for the purpose of earthing.

The pole shall be adequately strengthened at the location of the door to compensate for the loss in section.

Incomer cable shall be terminated at the base compartment through suitable epoxy insulated terminals, MCB mounted on FRP/Bakelite sheet or as per manufacturers standard. There shall be suitable arrangement for earthing.

#### **3.1.3 MATERIAL:**

Structural steel Confirming to grade / BSEN 10025 S 355JO./ FE 510 or IS 8500.

#### **3.1.4 BASE PLATE :**

Fe 410 conforming to IS 2062 / BSEN 10027

#### **3.1.5 FOUNDATION BOLTS:**

6.8 Grade as per IS 1367.

#### **3.1.6 GALVANISATION :**

The pole shall be hot dip galvanized as per BSEN ISO 1461/IS 2629 with a minimum average coating thickness of 70 micron. The galvanization will be done in single dipping method only.

#### **3.1.7 FIXING TYPE :**

The Octagonal pole shall be bolted on RCC foundation with a set of four foundation bolts. The design of the foundation shall be got approved form E-I-C before commencement of work.

#### **3.1.8 ARM BRACKET FOR MOUNTING LIGHT FIXTURES :**

The pole shall be provided with single arm/ double arm bracket as per SOQ. The bracket pipe shall be conforming to IS 1239 medium variety or as specified in the SOQ. The bracket shall be welded to 80 NB pipe conforming to IS 1239 heavy variety or as specified in the SOQ, to fit on top of pole shaft with overlap of minimum 500 mm & top cover. The 80 NB pipe shall be fixed to the pole shaft with 3 Nos. 10mm pinch bolts 120 degrees apart. A stiffner plate of 200 x 250 x 6mm shall be fixed to reinforce the bracket joint.

#### 3.1.9 TESTING:

- Longitudinal seam weld joint of 10% number of poles along with weld joint of base plate to be tested by liquid penetration test (LPT).
- Pole shaft & fastener materials to be tested as per relevant IS standards for physical & chemical properties on the samples drawn by department representatives.
- For IS 2062 & IS 1239 material, the sample to be collected and testing shall be done in approved laboratory in absence of original correlating material certificate.

#### 3.1.10 DRAWINGS:

Fabrication drawing of sample pole with bracket shall be got approved before enmass fabrication of pole & bracket.

-----X-----

### SECTION – 4: EARTHING

#### 4.1 SCOPE:

The scope of work under this section covers the earthing of various panels, and utilization equipments.

#### 4.2 STANDARDS:

The following standards and rules shall be applicable -  
IS – 3043 (latest): Codes of practice for earthing.  
Indian Electricity Act 1910 and rules issued there under.

#### 4.3 PLATE ELECTRODES:

Plate type earth electrodes shall be provided at the location shown on drawing. The plate size shall be 600 mm. x 600 mm. x 3 mm. tinned copper plate / 600 mm. x 600 mm. x 6 mm. G.I. plate or as specified in bill of quantities. The minimum depth, type of electrode, soil treatment shall be in accordance with IS-3043 (latest) complete with masonry watering pipe, GI cover etc. The number of earthing stations shall be as shown on the drawing and as directed consultant.

#### 4.4 EQUIPMENT EARTHING :

Three phase motors and other three phase apparatus shall have two distinct earth

connection of size equal to 50% of the connecting cables. For 1HP motor and 1HP apparatus, the single earth connection shall be provided.

For all light fittings and fans, a single earth connection with 1.5 sq. mm. copper shall be provided.

#### 4.5 **EARTH CONTINUITY CONDUCTOR :**

Metallic conduit shall not be accepted as an earth continuity conductor. A separate copper earth continuity conductor of size of 50% of phase conductor or 14 SWG copper wire whichever is more shall be provided. The earth continuity conductor shall be clamped to the conduit at one meter intervals using approved copper earth clamps. Binding wire is not accepted as a substitute for earth clamps.

#### 4.5.1 **SIZE OF COPPER STRIPS/WIRES FOR EARTHING :**

Earthing of cable boxes shall be carried out as under :-

Sr.No.	Size of cable	Size of tinned copper strips/wires
1.	a) 10 sq. mm. 4 core } b) 16 sq. mm. 4 core } c) 25 sq. mm. 3.5 core } d) 35 sq. mm. 3.5 core }	2 nos. of 8 SWG tinned copper } or } 2 nos. of 4 SWG G.I. }
2.	a) 50 sq. mm. 3.5 core } b) 70 sq. mm. 3.5 core } c) 95 sq. mm. 3.5 core }	2 nos. of 4 SWG tinned copper } or } equivalent G.I. wire }
3.	a) 120 sq. mm. 3.5 core } b) 150 sq. mm. 3.5 core } c) 185 sq. mm. 3.5 core }	2 nos. of 25 x 3 mm. tinned copper } or } 2 nos. of 50 x 3 mm./25 x 6 mm G.I. }
4.	a) 225 sq. mm. 3.5 core } b) 300 sq. mm. 3.5 core } c) 400 sq. mm. 3.5 core } d) 500 sq. mm. 3.5 core }	2 nos. of 25 x 6 mm. tinned copper } or } 2 nos. of 25 x 12 mm./50 x 6 mm G.I. }

Earthing of following equipments shall be done with two number copper strips of size specified in schedule from ring main earthing tapped at different places.

1. L. T. switchgears and panels

#### **4.6 GROUNDING EQUIPMENTS :**

Ground wire/strip shall either terminate on ground lugs provided on the equipments or shall be fastened to the foundation bolt and the frame of equipment. All conduits shall be grounded with approved proper size of earthing wire/strips as requested. Ground wires terminating at every equipment shall have certain flexibility in its connection to the equipment. Suitable size of sleeves required in the wall, column etc. taking earth strips across them shall be provided by the contractor during the civil construction. After laying the earth strip, the sleeve shall be properly sealed.

#### **4.7 ERECTION:**

##### Joints:

The joint of earthing conductor shall be brazed, bolted or welded. Welded surfaces shall be painted with red oxide and then aluminium painted.

##### Termination:

Where the diameter of the bolt at the joints exceeds one quarter of the width of the earth continuity, the connection shall be made with a wider piece sandwiched between two conductors.

#### **4.8 SUPPLY AND INSTALLATION OF EARTHING SYSTEM:**

All medium voltage equipment shall be earthed by two separate and distinct earth connection using tinned copper/GI earth wire/strip of specified gauge. All conduits run for lighting & receptacle system shall be provided with continuous earth wire of 14 SWG tinned copper run along the conduit and connected to all lighting/power receptacles of 5A and 15A. Three phase, 60 Amps receptacles and associated conduit run will be earthed by 2 nos of 8 SWG tinned copper conductors or equivalent G.I. Wires/strips.

Earthing conductors, tinned copper/G.I. Earthing clamp and all other accessories required for earthing the lighting and receptacle system, conduit accessories and equipment as per drawings and specifications shall be supplied and installed by the contractor. Earth wires shall be protected against mechanical damage and possibility of corrosion particularly at the point of connection to the earthing terminals of panels and fitting.

All joints shall be made on tinned surfaces in case of copper earth system jointing earth wire shall be done only at junction boxes and equipment earthing terminals. The jointing on earth wires shall be done with approved type of connection & no twisted joint will be allowed. The whole metallic conduit system shall be electrically continuous throughout and shall be permanently and efficiently connected to earth. When earth wire runs along the conduit the earth wire shall be clamped to the conduits securely on either side of the joint to ensure electrical continuity in the conduit system. All non-current carrying metal parts of panels, lighting fixtures, junction boxes

etc. shall be efficiently connected to earth.

**4.9 GLAND EARTHING :**

The minimum thickness of gland earthing clamp shall be 3 mm thick tinned copper strip or equivalent of GI strip as directed by E.I.C. Clamp shall be in two halves and fastened to the glands by suitable size of brass nuts & bolts & washers (in case of copper earthing system) & GI nuts and bolts and washers (in case of GI earthing system) all as directed by Engineer-in-charge.

**4.10 SITE TEST :**

The following earth resistance values shall be measured with an approved earth megger and recorded.

- i) Each earthing station
- ii) Earthing system as a whole
- iii) Earth continuity conductors

**4.11 MODE OF MEASUREMENT:**

Providing an earthing station complete with excavation electrode watering pipe, soil treatment, chamber etc. shall be treated as one unit of measurement.

The following items of work shall be measured and paid at unit rate covering the cost of the earth wires/strips, clamps, labour etc :-

- Main equipment earthing grid and connection to earthing station.
- Connection to power panels, distribution boards etc.

**The cost of earthing the following items shall become part of the cost of the item itself and no separate payment for earthing shall be made: -**

- Light fittings -form part of installation of light fitting.
- Conduit / PVC casing & capping - should form part of the wiring of cabling.
- Cable glands-earthing

-----X-----

## SECTION 5 – LED LUMINAIRES

### SPECIFICATIONS OF STREET LIGHT LUMINAIRES

#### 5.0 General requirements:

##### 5.1 Luminaires:

The luminaire shall be designed and tested for general lighting application as per relevant standards.

##### 5.1.1 Housing of the luminaire:

The housing construction of luminaire shall meet safety requirements as per IS 10322. The luminaire housing shall have following minimum features:

- Extruded aluminum heat sink, designed to act as efficient heat dissipater important for LED luminaires.
- Pressure die cast aluminum cover on both sides for holding of extruded aluminum heat sink.
- Luminaire provided with heat resistant UV stabilized polycarbonate/ toughened glass diffuser.
- Control gear compartment is an integral part of luminaire. There shall be separate compartment for control gear and LED modules.
- LEDs are provided with secondary lens optics to get optimum optical performance.
- The driver used is specially designed to have sure voltage, open/short circuit protections.
- Luminaire is provided with a mounting bracket fixed on pressure die-cast aluminum covers for aiming adjustment.
- The luminaire housing shall have minimum IP 66, IK 07 and shall be preferably made up of die cast aluminum.

##### 5.1.2 Lumen maintenance and failure fraction:

The luminaire shall be designed for L70 of 50000 hrs and failure fraction of 10% (max).

##### 5.1.3 Thermal management of LED luminaire:

Luminaire shall be designed for proper thermal management of LEDs. LED die temperature is affected by PCB thermal resistance and LED spacing on the board. Designed luminaire shall be such that the LED die temperature does not exceed the maximum Junction Temperature ( $T_j$ ). Drive current should be determined for the surrounding ambient temperature ( $T_a$ ) to dissipate the heat from the product.

##### 5.1.4 Optics:

The luminaire optics shall be designed such that the lumen output shall be uniform and glare free.



### 5.1.5 LED driver:

The LED driver shall be of silicon potted & designed for operating voltage range specified below and shall have built in voltage surge protection, short Circuit, & Over Voltage protections.

## 5.2 TECHNICAL REQUIREMENTS OF LUMINAIRES:

### 5.2.1 ELECTRICAL REQUIREMENTS:

SL. NO	PARAMETER	RANGE
1.	Range of Operating Voltage	140 – 270 V AC
2.	Rated Frequency	50 Hz +/- 3%
3.	Total Harmonic Distortion	< 10%
4.	High Voltage Protection	HV cut off @ 325VAC+/- 15VAC
5.	Short Circuit Protection	Yes
6.	Open Load Protection	Yes
7.	Reverse Polarity Protection	Yes
8.	Driver Isolation	Yes
9.	Power Factor	≥0.90
10.	Input Surge Protection	≥4 KV
11.	Type of Driver	Constant Current

### 5.3 OPTICAL REQUIREMENTS:

SL. NO	PARAMETER	VALUES
1.	Luminaire Efficacy	As per Schedule of quantities
2.	Correlated Current Temperature (CCT)	As per Schedule of quantities
3.	Colour Rendering Index (CRI)	≥70
4.	LED Chip	Shall be LM 80 Certified
5.	LED Chip Efficacy	≥140 lumen/watts
6.	Diffuser	Shall be UV resistant PC/ toughened glass

### 5.4 MECHANICAL REQUIREMENTS:

SL. NO	PARAMETER	VALUES
1.	Frame/Housing	Pressure die-cast Aluminium housing
2.	Heat Sink	Highly efficient extruded aluminium heat sink

3.	IP Grade	As per Schedule of quantities
4.	Impact resistance	As per Schedule of quantities

**6.0 PHOTOBIOLOGICAL SAFETY REQUIREMENTS:**

For photo biological safety requirements, the luminaries shall comply with IS 16108.

**7.0 TESTING:**

The following tests shall be conducted on LED luminaries as per IS 16107 & sampling shall be as per IS 10322 (Part-5) from any NABL accredited Lab-

- Marking
- Total input power
- Luminaire efficacy (lm/W)
- Colour rendering index (CRI) – only initial values to be measured
- Correlated color temperature (K) – only initial values to be measured
- Chromaticity tolerance – only initial values to be measured
- Power factor
- Luminous flux
- Luminous intensity distribution

**8.0 MARKING:**

The Luminaire shall be marked with product information as per IS 16107 / IS 10322.

**9.0 WARRANTY:**

Luminaire shall have three years, as per GTP, onsite replacement warranty from the supply date including Driver / Control Gear, LED, all accessories etc.

\*\*\*\*\*

**SECTION – 6 : PREFERRED MAKES OF MATERIAL**

<b>Sr.No.</b>	<b>Description</b>	<b>Preferred makes</b>
1.	HT VCB Panel	ABB / Siemens / Schneider Electric/ L&T / Crompton Greaves /C&S / Kirloskar Electric
2.	HT RMU	ABB / Siemens /Schneider Electric/ L&T/Crompton Greaves /C&S
3.	Oil filled Transformer	Crompton Greaves / Schneider Electric /Voltamp / Kirloskar Electric / Raychem /KanoHar Electric/ Urja Transformers
4.	Dry type Transformer	Schneider Electric / Voltamp / Kirloskar Electric / Raychem /Crompton Greaves /Urja Transformers/ AmesImpex/DTPL
5.	Package (Unitized) Substation	Schneider Electric / ABB /Siemens / C&S / Crompton Greaves/ Voltamp/Kirloskar/ Raychem
6.	HT Cable	Universal / Torrent / Polycab / KEI / Havells / NICCO / Apar/KEC / RR Kabel /Ravin/Gloster/ Finolex
7.	HT / LT Cable jointing kit	Raychem / Mahindra / 3M/ Yamuna Densons
8.	Compact Sandwich type Bus duct / Air insulated Bus Duct / Rising mains	Zucchini (Legrand) / L&T (Henikwon) / C&S / Schneider Electric / Godrej/Siemens
9.	LT Cable	Universal / Torrent / Polycab / Finolex / KEI / Havells / NICCO / Apar / LAPP/ KEC / RR Kabel /Ravin/Gloster
10.	Cable glands / Cable Socket (Lugs)	Braco / Comet / Dowells / Gripper / Prabhat / Jainson / Lotus / HMI / 3D / Hex
11.	Terminal Strip / Connector	Connectwell / Elmex / Phoenix/Wago
12.	G.I Ladder/ Perforated Cable trays	OBO/ Indiana / Asian / Profab / Sadhana (Steelite group)/ Metalman / Patni / PILCO/BEC/ELCON, OM Industries / Globe Electrical
13.	Wire mesh cable tray	Legrand / OBO/ PILCO
14.	Cable Management System -Wall raceway / Floor raceway / Floor Access box & Pop up box	Legrand / MK Electric /OBO / Schneider Electric
15.	LT Panel Fabricator	OEM and authorised systems houses of L&T, Siemens, Schneider Electric, Legrand, ABB and BCH. C&S /Jakson/Arrow Engineers /Adlec/Samcon/ Marine Electricals/Tricolite/Ambit/Tenco/Ohm Energy Management System Pvt. Ltd., Sriperumpudur / Excel Power Switchgear, Chennai/Power Control Equipments, Bengaluru
16.	Air Circuit breakers	Schneider Electric / Siemens / ABB / L&T / Legrand/ C&S/HAVELLS/BCH
17.	MCCB	Schneider Electric / Siemens / ABB / Legrand / L&T /

Sr.No.	Description	Preferred makes
		C&S/HAVELLS/BCH
18.	Switch Disconnecter Fuse / Switch Disconnecter / HRC fuses/ Change Over Switch	Schneider Electric / Siemens / ABB / L&T/ C&S/ HAVELLS/HPL Socomec/BCH
19.	MCB / MCB type isolator / ELCB / Timers / DB's	Legrand / Hager / Schneider Electric / Siemens / L&T /C&S/HAVELLS/ INDO Asian/BCH
20.	Power / Control Air break Contactors	Schneider / Electric Siemens / ABB / L&T/ Legrand/C&S/Havells/BCH
21.	Numerical / Static / Electromagnetic Relays	Areva / ABB / L&T / Siemens/ Schneider Electric / Ashida / Easun – Reyrolle / Crompton Greaves/C&S
22.	APFC Relay	Epcos / Beluke / Meher / Schneider/L&T
23.	CT / PT(for LT)	Kappa / AE / Pragati / ECS / Precise / Indcoil
24.	Analogue Ammeter / Voltmeter / P.F meter	Automatic Electric (AE) / Rishab / L&T / Meco / Imp
25.	Digital Panel meters	Schneider Electric / AE / Rishab / L&T / Siemens
26.	Energy meter / Trivector meter	Secure / ABB / L&T / Schneider Electric / Universal/Landis-Gyr
27.	Indication Lamps/ Push Buttons	Siemens/L&T(ESBEE) / Teknik / Schneider Electric ABB/BCH/Crompton Greaves/C&S/ Essen Deinki / Jainsen
28.	Selector Switches	Kaycee / Siemens / L&T (Slazer)/ Switron
29.	Battery Flooded / SMF	Exide / Amara raja / HBL/Microtex/ AMCO/Tata Group/ Panasonic/Union Batteries Pune
30.	Battery Charger	Chabbi / Calydyne (Chloride) / Amara raja/ Universal /Vertiv /Dubas
31.	Capacitors	Universal / Epcos / Schneider Electric / L&T/ Siemens
32.	PVC (HMS) Conduits & accessories	Precision Plastics / Presto Plast/ RNI/ AKG/ BECPlast /Polycab
33.	MS / GI Conduits & accessories	VIMCO / BEC / BI / AKG
34.	PVC casing capping& accessories	Presto Plast / Legrand/ Precision/RNI
35.	FRLS PVC insulated Cu conductor Wires	Finolex/Havells/Apar/KEI/RR Kabel / Polycab/ BCH/Anchor/KEC/L&T
36.	Modular Switches / Sockets/Bell / Buzzer	Legrand (Arteor) / Crabtree (Murano) / L&T (ORIS) / Wipro (North West – Stylus+)/MK (wraparound)/ Anchor-Panasonic (Roma)
37.	Luminaires (indoor & outdoor)	Philips / Wipro / Crompton Greaves / Bajaj / Schreder / Binay/Lighting technologies /Havells / C&S/Surya/Halonix/ Jaquar/Keselec
38.	Ceiling Fans	Crompton Greaves / Havells / Usha / Orient / Bajaj
39.	BLDC Fans	Havells / Halonix / Versa Drives/Atomberg

Sr.No.	Description	Preferred makes
40.	Exhaust Fans / Wall mounted Fans / Pedestal Fans	Crompton Greaves / Havells / Almonard / Usha / Bajaj/Orient
41.	Industrial Switch sockets & Plugs	Legrand / Crompton Greaves / L&T / Siemens / Schneider Electric / Havells / BCH/C&S
42.	Water Heaters	Racold/Crompton Greaves/ Bajaj / AO Smith/ Jaquar/V-Guard/Venus/RR Kabel/Usha/Havells
43.	Cat-6 UTP cable/Patch cords/connectors/Patch Panels / RJ-45 I/O	Systemax / Panduit / Legrand/ Molex/ D-Link / AMP / Nordex
44.	Optical fibre cable	Sterlite / Uniflex(APAR)/Vindhya Telelinks / Aksh / Finolex / Beldon / AMP / Systemax / Polycab
45.	19" rack for LAN system	APW President / Rittal / Legrand / Valrack/Schneider Electric
46.	Telephone cable	Finolex / Delton/ RPG / Polycab / Vindhya Telelinks
47.	Telephone Tag Block (TTB) with enclosure.	Krone / Pouyet
48.	RG-6 & RG-11 Co-axial cables	Finolex / Delton/ RPG / Polycab
49.	Fire Alarm system detectors	As per VdS std. - Esser – Honeywell / Schrack / Bosch / Siemens / Simplex (Tyco)
50.	Fire Alarm Panel	
51.	Break Glass station / Sounder strobe	As per NFPA std. - Notifier / Edwards / Johnson Controls
52.	PA System	Bosch / ATIES/ Honeywell
53.	CCTV Cameras	Bosch / PELCO/AXIS/SONY
54.	Video Recording System (VRS) and server	DellEMC/HPE/Fujitsu/Lenovo /IBM/Pivot3/NetApp
55.	Layer 2/3 switches	HP/CISCO/Alcatel-Lucent/Avaya (Nortel Series)/ Alcatel-Lucent// Allied Telesis
56.	D.G. set assembler	Powerica / Jakson / Sudhir / Kirloskar / Caterpillar / Sterling Generators
57.	Alternator for DG	Stamford (CGT) / KEC / Leroy Somer
58.	Engine for DG	Cummins / Wartsila / Kirloskar / Caterpillar / Perkins / MTU
59.	AMF / Synchronizing Panel	D.G. set assembler and their authorised system house.
60.	Octagonal Poles & High Mast	Bajaj / Surya Roshni/Valmont/Aster/ Trans Rail Lighting
61.	Elevator	Otis/Schindler/Kone/Johnson/Mitsubishi/Omega /Hitachi/Thyssenkrupp
62.	UPS	Schneider/Legrand/ConsulNeowatt/Delta/Reillo/ Piller/Socomec/ Vertiv
63.	Fire Extinguishers	Minimax / Ceasefire / Safex

<b>Sr.No.</b>	<b>Description</b>	<b>Preferred makes</b>
64.	Lightning Protection System Components	DEHN/OBO/ERICO
65.	Maintenance Free Earthing System Components	DEHN/OBO/ERICO/South Asian/JEF/TEREC(SGI)/ LORESS/JMV/LPS
66	Isolator Switch	Legrand / Hager / Schneider Electric / Siemens / L&T /C&S/HAVELLS/ INDO Asian/BCH

**NOTE:**

1. In case, for any material, different makes as listed above, from that mentioned in the Schedule of Quantities, then the make mentioned in the Schedule of Quantities will only prevail and the Contractor will have to supply only that make mentioned in Schedule of Quantities.
2. If any make stated above, does not comply with the Technical Specifications given in the tender then such a make cannot be supplied at this project.
3. For items not covered in the above list, the sample shall be got approved by competent authority of department, prior to use.

Signature of Tenderer

Seal & Date



## **SECTION – 7 : CERTIFICATE OF COMPLETION AND GUARANTEE**

Electrical installation at: \_\_\_\_\_

Details to be indicated after completion of work.

Tests

- i) Insulation resistance tests on individual equipments & completed & interconnected system.
- ii) Earthing resistance of each earth station and interconnected system.
- iii) Test results of all equipments.

### **1 CERTIFICATES:**

I certify that the installation detailed above has been inspected and tested and that to the best of my knowledge and belief it complies with the latest edition of the Indian Electricity Rules and the relevant I.S. code of practices at the date of contract for the work except as stated below.

- 2 Details of departures (if any) from the above.
- 3 6 Sets of completion drawings & test reports and original tracings with CD showing the installation of as actually executed are enclosed duly certified.
- 4 The installation is guaranteed for a period of twelve months from the date of taking over by the Department against defective materials and workmanship. During the period of guarantee such defects in materials and workmanship will be rectified or replaced free of cost to the Department. The completion certificate for a particular system will be issued by the Department only on its satisfactory commissioning and the guarantee period for that system will start only from the date of the said certificate.

Signature of Contractor

Date:-



**Annexure-II**  
**Financial Bid**  
**To be Signed & Stamped on each page**

**Works: Fabrication, supply, installation and commissioning of street lights and feeder panels at GCNEP Bahadurgarh, Haryana**

**Name of the Firm/ Agency (with address):**

**Note:**

- 1) In event no rate has been quoted for any item(s), it will be presumed that the contractor has included the cost of this / these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.
- 2) The quoted rate shall be inclusive of all testing, taxes, transportation charges, delivery charges, carriage and other incidental charges. Nothing extra shall be payable other than the quoted rates.
- 3) After the completion of work, the entire surface should be in condition as hand over to tenderer.
- 4) Painting work should be match with similar surfaces.
- 5) All accessories required for installation and make the item fully functional and testing shall be included while quoting even it is not clearly mentioned in the item description.
- 6) Specifications of the all items are given in Annexure- I.
- 7) Preferred materials and make are specified in Annexure- I.
- 8) All items are as specified or item/ texture/ colour /make selected by engineer in charge.
- 9) Quantity variations in items are as per requirements and charges as per unit rate.
- 10) In case of difference between unit rate & total amount, unit rate will be final.

**Remark:** The offer should specify all-inclusive total cost of works, with GST component.

**(Please sign and stamp each page)**

Sr. No.	Item Name & Description (1)	Item Qty (2)	Unit (3)	Unit Rate (Rs) (4)	Sub-total (Rs) (5)=(2)x (4)	GST on sub-total (Rs) (6)	Total (Rs) (7)=(6)+(5)
1	<p>Design, manufacture, supplying, fixing in position, testing and commissioning of feeder pillar/Panel with double door with detachable canopy, front operated, front access, 3mm thick MS CRCA sheet steel enclosed free standing, dust and vermin proof, Feeder Pillars with IP-55 protection with hinged and lockable doors complete with interconnections, copper crimping lugs, brass glands, bonding to earth and painting. Feeder Pillar/Panel shall be suitable for use at 415 volts, 3 phase 4 wire 50 Hz system, and with 25 KA rupturing capacity at 415 volts. All live accessible parts shall be shrouded and all equipment shall be finger touch proof. The busbar insulation shall be with heat shrinkable sleeves. SMC/DMC shrouds and busbar supports shall be used.</p> <p>Padlocking facility shall be provided. Scope includes suitable angle iron frame work for mounting arrangement 800 mm <b>above ground level necessary grouting, PCC base etc.</b> Also scope includes enclosing the supports by 3 mm thick MS CRCA sheet steel all around with detachable covers, etc. all as per specification and instructions of E-I-C.</p> <p><b>Note:</b> 1) The MCCBs shall be provided with thermal magnetic based overcurrent &amp; short circuit release.</p>						

	<p>2) MCCBs shall be of minimum 25 KA Ics breaking capacity.</p> <p>3) All Feeder Pillars/Panels shall be provided with RYB indication lamps (heavy duty LED cluster type) with HRC protection fuses.</p>						
<b>1.1</b>	<p><b>Panel (Near Compact Substation):</b></p> <p>i) 4P, 400 A MCCB - 1 no. Mounted in outdoor panel with IP- 55 protection. Above MCCB is to be connected externally with existing 250 kVA PSS. Above MCCB is to be connected to 630 A Cu Bus Bar with two runs of 185 Sq.mm, 1.1 KV grade aluminium cable with XLPE insulation. Supply &amp; installation of all terminations, suitable thimbles, nut bolts, Gland plate &amp; Glands are included.</p> <p>Panel must have</p> <ol style="list-style-type: none"> <li>1) 3 nos 400/5 A ratio, class-1, 5 VA burden cast resin current transformer</li> <li>2) Digital Multifunction meter with communication facility - 1 No.</li> <li>3) 1 set ON/OFF indication lamps</li> </ol> <p><b>Note:</b> 185 Sq.mm cable is taken separately in SOQ.</p>	1	Set				
<b>1.2</b>	<b>Isolator Switch (Inside Substation):</b>	1	Set				

	400 A Isolator switch with wall mounting provision & readymade enclosure to connect 185 Sq.mm & three runs of 300 Sq.mm cables.						
1.3	<p>Feeder Pillar (Near D Type Block):</p> <p><b>Incomer: -</b></p> <p>i) 4P, 250 A MCCB - 1 no.</p> <p>ii) 3 nos 250/5 A ratio, class-1, 5 VA burden cast resin current transformer</p> <p>iii) Digital Multifunction meter with communication facility - 1 No.</p> <p><b>Bus bar</b></p> <p>250 A TPN tinned copper bus bar having maximum current density of 1.24 A/sq.mm to withstand symmetrical fault level of 25 kA at 415 V. The neutral bus bar shall have 100% capacity</p> <p><b>Outgoings: -</b></p> <p>i) 4P, 125A, MCCB - 2 nos.</p> <p>ii) 4P, 63/40A, MCCB - 4 nos.</p> <p>The feeder shall be complete with suitable size interconnection PVC FRLS Cu. wires and auxiliary contactor for contact multiplication, if required.</p>	1	Set				
	<b>TOTAL COST OF FEEDER PILLAR WORKS</b>						

2	<p>Supply, installation, testing &amp; commissioning of 1.1 KV grade aluminium/Cu stranded circular/sector shape core conductor with XLPE insulation, extruded PVC inner sheathed, G.I flat strip/wire armoured, extruded FRLS grade antirodent &amp; anti termite PVC (ST-2)outer sheathed cable conforming to IS : 1554 Part I/ IS 7098 Part-I with latest amendments, fixed on wall/column/slab/false ceiling/ existing cable tray /existing hume pipe/trench/ shaft/pit/ on 5mm thick M.S. flat /GI spacer/angle/ support fixed with coach screws/grouted in wall/anchor fasteners 2mm. thick G.I. fabricated saddle, all fixing accessories, etc. complete including painting of M.S spacers/angles and saddles or in ground at a depth of 900 mm below ground level , sand bedding, laying of baked bricks on side &amp; top-, temporary reinstatement, back filling, dewatering, consolidation, disposal of excess earth within the radius of 500 m and making good to the original finish etc. providing brass cable number tag as per enclosed detailed specifications, drawings &amp; as per instructions of the E-I-C &amp; of the following sizes.</p> <p><b>NOTE:</b></p> <p>1) Sealing of hume pipes with wooden bushes after cable laying shall be included in the scope of work.</p> <p>2) Clamping of cables on trays including supply of clamping materials as per instruction of EIC shall be included in the scope of work.</p> <p>3) Including excavation of earth</p>						
---	---	--	--	--	--	--	--

2.1	Supply of 3.5C x 185 Sq.mm Al. conductor cable	80	m				
2.2	Laying of 3.5C x 185 Sq.mm Al. conductor cable	80	m				
2.3	Supply of 4C x 25 Sq.mm Al. conductor cable	1400	m				
2.4	Laying of 4C x 25 Sq.mm Al. conductor cable	1000	m				
2.5	Supply of 3C x 4 Sq.mm Cu. conductor cable	300	m				
3	<p><b>LT Cables End Joints</b>  End jointing of following sizes of cable by crimping with supply of all jointing materials like solderless tinned copper cable socket, double compression brass cable glands, gland earthing, insulation tape, flux, duplicate interconnection between gland earthing strip &amp; to the nearest earthing bus terminals as per the drawings, specifications and as per the instructions of the Engineer-in-charge.</p>						

3.1	3.5C x 185 Sq.mm Al. conductor cable	10	Nos.				
3.2	4C x 25 Sq.mm Al. conductor cable	84	Nos.				
3.3	3.5C x 300 Sq.mm Al. conductor cable	6	Nos.				
	<b>TOTAL OF LT CABLE WORKS</b>						
4.0	<p><b>STREET LIGHT POLES:</b>  Design, manufacture, testing at works, supply, assembling, installation, and erection of Octagonal pole internally &amp; externally hot dipped galvanized, fabricated out of 3mm thick sheet as per relevant I.S, complete with built in junction box, base plate size 200X 200 X 12 mm, as per detailed specifications. Junction box should be provided 500 mm above base plate with 4 Nos brass terminals on epoxy insulator,1 no. 6A SP MCB (D-curve) &amp; 1 no. neutral link mounted on 4 mm thick bakelite sheet, gland plate etc. Base plate should have 4 nos. holes suitable for mounting on RCC foundation 200 mm above FGL. The cost of pole shall include the cost of foundation bolts, anchor plates, nuts, washers, min 2 nos. HDPE PLB pipe 40/33 mm dia. bend to shape min. 1.5 m in length, &amp; including excavation in all types of soil/foot path cutting, temporary reinstatement, back filling, dewatering, consolidation, disposal of excess earth within the radius of 500 m and making good to the</p>						

	<p>original finish etc. as per enclosed detailed specifications &amp; drawings, as required to complete the work in all respect as per instructions of the E-I-C.</p> <p><b>Note: The RCC foundation for poles is not included in the scope of this work.</b></p> <p><b>Note: J bolts, base plate, HDPE pipes and anchor plates are included in scope. These items are to be supplied separately before commencement of work.</b></p>						
4.1	<p>7m pole with one No. 1.5m bracket fabricated out of galvanized pipe of 40 NB medium class.</p> <p><b>Note: J bolts, base plate, HDPE pipes and anchor plates are included in scope. These items are to be supplied separately before commencement of work.</b></p>	27	set				
4.2	<p>3m pole without bracket</p> <p><b>Note: J bolts, base plate, HDPE pipes and anchor plates are included in scope. These items are to be supplied separately before commencement of work.</b></p>	13	set				
5.0	<p><b>Fitting &amp; luminaires for Street Light:</b> Supply, Installation, testing &amp; commissioning of following</p>						



	<p>LED luminaires on existing poles, including internal wiring with 3 Core 2.5 sq.mm FRLS PVC insulated copper conductor cable from terminal box at bottom of the pole to the luminaire, earthing of luminaire etc. as per instructions of the EIC.</p> <p>Note:  1) The scope includes providing suitable GI nipple to mount the LED luminaires on existing poles.  2) Independent wiring to be done for each fixture from terminal box.  3) No negative tolerance is allowed on the min. system performance parameters indicated in SOQ &amp; specifications.</p>						
5.1	Street light LED luminaries having a minimum efficacy of 110 lumen/watt and a minimum output of 7000 lumens, with 5700 degree K CCT & pressure die cast Aluminum housing, UV stabilized polycarbonate / toughened glass diffuser having IP66 & IK07 protection etc. as per specifications	28	Nos.				
5.2	Post top LED luminaries having a minimum efficacy of 100 lumen/watt and a minimum output of 3500 lumens, with 5700 degree K CCT, having IP65 & IK07 protection etc. as per specifications.	14	Nos.				
6.0	<b>Earthing</b>						

6.1	Earthing of street light pole with 2 nos. of 8 SWG G.I earth wires each 8 m long coiled in 1m dia. at a depth of 1400 mm below ground level complete with soldering and connections with sockets etc. all as per drawings specifications, and as per instruction of E.I.C	44	Nos.				
6.2	Earthing of 2 Feeder Pillar & one Isolator as mentioned in Specifications. Providing and laying of 600 x 600 x 6 mm GI plate with 2 Nos. 25 x 6 mm GI tape form earth electrode to inspection chamber, 20mm dia. medium class GI pipe, CI funnel with 20 gauge GI wire mesh, masonry chamber 300 x 300 mm with concrete base CI manhole cover having locking arrangement with frame painted with bitumastic paint and packing with mixtures of charcoal and common salt around plate electrode including digging of pit upto permanent moisture level but not less than 3 meter and black filling as required. The minimum depth, type of electrode, soil treatment shall be in accordance with IS-3043 (latest) complete with masonry watering pipe, GI cover etc.	4	Nos.				
6.3	EARTHING STRIP/WIRES G.I Earthing Strip/Wire: 25 X 6 mm strip	200	m				
<b>Total Cost (inclusive all taxes &amp; overheads)</b>							
<b>Total Cost (inclusive all taxes &amp; overheads) (in words)</b>							