



राष्ट्रीय विज्ञान शिक्षा एवं अनुसंधान संस्थान, भुवनेश्वर

(परमाणु उर्जा विभाग, भारत सरकार का एक स्वयं शासित संस्थान)

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, BHUBANESWAR

(AN AUTONOMOUS INSTITUTE UNDER DEPT. OF ATOMIC ENERGY, GOVT. OF INDIA)

Name of Work: -“Provision of flood light in volleyball court
(Back side of SOH-4) inside NISER
campus,Jatni”

NIT No. & Date:- NISER/IWD-ELECT /STREET LIGHT/2019-20 /002
Dtd: 24.04.2019

Estimated cost of tender: - Rs 7, 31,738.00
Earnest Money : Rs. 14,635.00

Completion time: - 90 (Ninety) days

Pre bid meeting : 01.05.2019 11.30 AM
Last date of submission of E- tender : 09.05.2019 up to 11.30 AM
Opening of Technical Bids : 09.05.2019 at 3.00 P.M

This tender documents contains 21 (Including front page) pages.



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TENDER DOCUMENTS

File No. NISER/IWD-ELECT /STREET LIGHT/2019-20 / 002

Date: 24.04.2019

Name of work: -“ Provision of flood light in volleyball court (Back side of SOH-4) inside NISER campus,Jatni”

I N D E X

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NOTICE INVITING TENDER

File No. NISER/IWD-ELECT /STREET LIGHT/2019-20 /002

Date: 24.04.2019

Director, NISER invites E- tender on two bid system (Technical Bid and Financial Bid) for the following work:-

Name of the work: “Provision of flood light in volleyball court (Back side of SOH-4) inside NISER campus,Jatni”.

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Tender can be downloaded and bided from website address: www.tenderwizard.com/NISER.

Tender documents for viewing only is also available in NISER web-site address: www.niser.ac.in.

**FIC(IWD)
NISER**

Standard eTender Terms & Conditions

1. The details of tender notification can be downloaded from www.tenderwizard.com/NISER under "Tender Free View" link.
2. Vendors should obtain the USER ID and PASSWORD from www.tenderwizard.com/NISER by clicking on "REGISTER ME" link in the homepage.
3. The Vendor registration fees has to be paid to ITI Ltd for Rs. 1180/- including GST. Using the e-payment link provided at the time of registration, and the mode of payments are Credit Card, Debit Card and Internet Banking. Vendor Registration is Valid for 1year.
4. For further details on e-Tender participation, please contact ITI Help desk on
 - Telephone: 080-49352000/9686115318
 - Email: harishkumar.kb@etenderwizard.com, ambasa@etenderwizard.com.
5. Tenders should be submitted only through e-Tender portal and obtain the Tender Acknowledgement copy as a proof of successful submission.



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(परमाणु उर्जा विभाग, भारत सरकार का एक स्वयं शासित संस्थान)
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(AN AUTONOMOUS INSTITUTE UNDER DEPT. OF ATOMIC ENERGY, GOVT. OF INDIA)

Tender Notice

Director of NISER hereby invites E- tender on two bid system (Technical Bid and Financial Bid) for the following work from **registered electrical contractors** of CPWD, MES, Railways and State PWDs and/or those who have worked for DAE or its Organizations or Govt. /Semi Government organizations and **having a valid ELBO License, Register in EPFO(Comply with labour act)** and have successfully carried out a minimum of one/two/three similar works (Supply erection testing and commissioning of street lighting system including conventional lighting, LED, high mast etc.) of 80%/60%/40% respectively of the estimated cost or above, as indicated in the prescribed format of the E-Tender portal in last seven years. The eligible contractors may submit their bid along with supporting documents of fulfilling the above conditions otherwise the bids bear the risk of not being considered.

Name of Work	Estimated Cost ₹	Earnest Money ₹	Duration of work
Name of the work: -“ Provision of flood light in volleyball court (Back side of SOH-4) inside NISER campus,Jatni NISER/IWD-ELECT /STREET LIGHT/2019-20 /002 Date: 24.04.2019	Rs 7, 31,738.00	Rs. 14,635.00	90 (Ninety) days

The Bidders are requested to give detailed tender in E-Tender portal in the prescribed forms in two Bids i.e. Part - I Technical Bid. Part - II Financial Bid.

Tender process & award of contract.

The technical bids will be evaluated to shortlist the eligible bidders. The financial bids of only the short listed bidders shall be considered for further processing. Notification of shortlisted agencies, date of financial bid opening and any corrigendum/addendum will be upload in Tender wizard and NISER website only. Agencies are requested to visit Tende Wizard and NISER website on regular interval for information/update.

The earnest money deposit as indicated against the work should be send by post or by hand to “SO(D)-ELECTRICAL,INSTITUTE WORKS DEPARTMENT , NISER,Jatni Campus, PO-Bhimpur-Padanpur,Via-Jatni,District- Khurda, PIN- 752050” so that it reaches on or before the opening of the technical bid for e-tender system in the form of Account Payee Bank Draft payable on any branch of Nationalised/Schedule Bank at Bhubaneswar/ Jatni in favour of “Director, National Institute of Science Education & Research, Jatni”, in a sealed envelope. All tenders submitted without requisite amount of earnest money and tender cost shall be rejected and their technical and financial bids shall not be opened. No interest is payable on EMD. Director of NISER, reserves the right to accept/reject any/all tenders without assigning any reason whatsoever. Part or incomplete tenders will be summarily rejected. No further correspondences whatsoever shall be entertained in this regard. Canvassing in any manner shall result in rejection of the tender.

Any dispute arising out of this shall subject to Bhubaneswar jurisdiction only.

FIC(IWD)
NISER

General Terms and Conditions:

1. Director of NISER hereby invites E- tender on two bid system (Technical Bid and Financial Bid) for the following work from **registered electrical contractors** of CPWD, MES, Railways and State PWDs and/or those who have worked for DAE or its Organizations or Govt. /Semi Government organizations and **having a valid ELBO License, Register in EPFO(Comply with labour act)** and have successfully carried out a minimum of one/two/three similar works (Supply erection testing and commissioning of street lighting system including conventional lighting, LED, high mast etc.) of 80%/60%/40% respectively of the estimated cost or above, as indicated in the prescribed format of the the E-Tender portal in the last seven years. The eligible contractors may submit their bid along with supporting documents of fulfilling the above conditions otherwise the bids bear the risk of not being considered.

In support of fulfilling all the essential conditions mentioned in the previous Para the contractor shall submit the details through E-Tender in the prescribed format the past details, mentioning the name of work, estimated cost, , date of commencement as per agreement & actual date of completion as per agreement along with schedule of quantities executed and any penalty levied due to delay in executing the work from an officer not below the rank of Executive Engineer (Electrical).

2. The estimated cost of the work is **₹ 7, 31,738.00/- (Rupees Seven Lakh Thirty One Thousand Seven hundred and Thirty Eight only.)**
3. Period for completion of the work will be 90 (Ninety) days. and the date of commencement shall be reckoned from the tenth day of issue of award letter.
4. The earnest money deposit as indicated against the work should be send by post or by hand to “SO(D)-ELECTRICAL,INSTITUTE WORKS DEPARTMENT , NISER,Jatni Campus, PO-Bhimpur-Padanpur, Via- Jatni, District- Khurda, PIN- 752050” so that it reaches on or before the opening of the technical bid for e-tender system in the form of Account Payee Bank Draft payable on any branch of Nationalised/Schedule Bank at Bhubaneswar/ Jatni in favour of “Director, National Institute of Science Education&Research,Jatni”,ina sealed envelope. All tenders submitted without requisite amount of earnest money and tender cost shall be rejected and their technical and financial bids shall not be opened. No interest is payable on EMD.

The EMD will be returned to the bidders(s)/Agents whose offer is not accepted by NISER within one month from the date of the placing of the final order(s) on the selected bidder(s). In case of the bidder(s) whose offer is accepted the EMD will be returned on submission of Performance Bank Guarantee (if applicable). However, if the return of EMD is delayed for any reason, no interest /penalty shall be payable to the bidders

5. .The details of tender notification can be download from www.tenderwizard.com/NISER under "**Tender Free View**" link. Vendors should obtain the USER ID and PASSWORD from www.tenderwizard.com/NISER by clicking on "**REGISTER ME**" link in the homepage.The Vendor registration fees has to be paid to ITI Ltd for Rs. 1180/-. Using the epayment link provided at the time of registration, and the mode of payments are Credit Card, Debit Card and Internet Banking. Vendor Registration is Valid for 1year.Tenders should be submitted only through e-Tender portal and obtain the Tender Acknowledgement copy as a proof of successful submission.

6. The Bidders are requested to give detailed tender in E-Tender portal in the prescribed forms in two Bids
i.e. Part - I Technical Bid.
Part – II Financial Bid.
Pre bid meeting : 01.05.2019 11.30 AM
7. **Last date of submission of E- tender : 09.05.2019 up to 11.30 AM.**
Opening of Technical Bids : 09.05.2019 at 3.00 P.M
8. **Tender process & award of contract.**
The technical bids will be evaluated to shortlist the eligible bidders. The financial bids of only the short listed bidders shall be considered for further processing. Bidders whose technical offer is found acceptable and meeting the eligibility requirements as specified in this tender will be informed about the date and time of the opening of the financial bid.
NISER will open financial bids of only the technically qualified bidders. The Date and Time of opening the financial Bid will be intimated only to technically acceptable Bidders for the work at a later date.
Please note, that bids submitted without tender cost and EMD are summarily being rejected.
9. Director of NISER does not bind himself to accept the lowest or any tender and reserves the right to accept the tender either in whole or in part. The decision of the Director shall be final in this regard.
10. Canvassing in any manner or form will lead to rejection of the Bid.
11. The tenderer shall not be permitted to bid for works in any unit of DAE where any of his/her relatives are employed. He shall also intimate the names of any such persons who are working with him in any capacity or subsequently employed by him and whose relatives are working in DAE or its units.
12. **Contact for Technical information:** (Only E-mail enquiries will be entertained)

Mr. Amit Kumar Panigrahi
SA_D (Electrical),
Institute Works Department, NISER.
E-Mail – amit.panigrahi@niser.ac.in

Mr. Dilip Jha
SO_D (Electrical),
Institute Works Department, NISER.
E-Mail – dilipjha@niser.ac.in

NOTE :

A person shall be deemed to be a relative of another if, (a) they are members of a Hindu undivided family; or (b) they are husband and wife; or (c) the one is related to the other in the following manner : Father, Mother (including step mother), Son (including step son), Son's wife, Daughter (including step daughter), Father's father, Son's son, Son's wife, Son's daughter, Son's daughter's husband, Daughter's husband, Daughter's son, Daughter's son's wife, Daughter's daughter, Daughter's husband, Brother (including step brother), Brother's wife, Sister (including step sister), Sister's husband.

13. The Bid shall remain valid for a minimum period of 90 days from the date of opening of the tender for the purpose of acceptance and award of work. Validity beyond 90 days from the date of opening shall be by mutual consent.
14. The tenderer should see and obtain the drawings. In case of any queries, necessary clarifications may please be sought from the office of the Scientific Officer-D (Electrical). No claim whatsoever will be entertained in this regard for any alleged ignorance, thereof.

15. Before tendering, the tenderer shall inspect the site to fully acquaint himself about the condition in regard to accessibility to site, nature and extent of ground, working condition of site and locality including stacking of materials, conditions affecting accommodations and movement of labour, etc., which are required for satisfactory execution of the work. No ignorance of the same, whatsoever shall be entertained under any circumstances.
16. EMD is liable to be forfeited if the contractor fails to commence the work as per award letter.
17. Some of the provisions of the contract are given below.
 - a).DEFECT LIABILITY PERIOD - Twelve months from the date of completion as certified by the authorized engineer.
 - b).MINIMUM VALUE OF WORK FOR THE INTERMEDIATE CERTIFICATE
Intermediate certificate for a lesser amount can be admitted for payment at the discretion of the Institute.
 - c).SECURITY DEPOSIT - A sum @ 5% of the gross amount of the bill shall be deducted from each running bill of the contractor, till the sum along with the sum already deposited as earnest money, will amount to security deposit of 5% of the tendered value of the work. In addition, the contractor shall be required to deposit an amount equal to 5% of the tendered value of the contract as **Performance Security** within the period prescribed for commencement of work in the letter of award issued to him.
 - d) COMPENSATION – In the event of any delay in completion of the work beyond the scheduled period, the contractor shall pay an amount equal to one per cent of the total cost of work or such smaller amount as decided by Director of NISER (whose decision shall be final) as compensation to the institute, for every week that the work remains un-commenced or unfinished. Compensation to be paid shall not exceed ten per cent of the estimated cost of the total work as per award letter.
18. Stores to be issued: - No material shall be issued by the Institute. The responsibility for arranging all materials from approved manufacturer as per award letter lies with the contractor.
19. There will be deduction of TAX from every RA bill and also from the final bill of the contractor at the rate prescribed by govt. of India from time to time.
20. The successful bidder will be required to submit the names, qualifications and experiences of the supervising staff to be deployed for execution of the work. In case of any changes occurring during the course of execution of the said work, the same shall also be intimated by the bidder to the institute.
21. The tenderer should also submit the detail list of tools and plants/ machineries/ equipment, etc. that he proposes to place at the site of work.
22. The Contractor shall have to make his own arrangements for storage of materials required for execution of the work and NISER in any manner shall be held responsible for the storage and safe custody of the said materials at work site.
23. Electricity will be supplied to the site of work at one point only if required and Contractor can do onward distribution with metering arrangement as per the requirement. Electricity charges; if any will be recovered from the Contractor's bill based on meter readings towards its consumption.
24. Before commencement of the work, the contractor has to submit the list of tools and plants brought to the site of work. No items other than the list submitted will be allowed to be taken out from the work site
25. All the mandatory testing charges will be borne by the contractor.
26. Cost escalation in any manner whatsoever, will not be accepted for the said work, where in the stipulated period of completion of work is 18 (eighteen) months or less.
27. The work will be executed as per CPWD guidelines and DAE works procedure under the supervision of Engineer-In-charge of NISER.
28. The price quoted in the financial bid must be inclusive all the tax. No extra claim for tax can be entertained.
29. **Contractors are advised to make a site visit before quoting for the tender.**

30. **PRE-BID MEETING** : The pre-bid meeting shall be held on 01.05.2019 in the office of SO-D (Electrical) Institute Works Department, Library Building NISER.. The pre-bid conference with the prospective tenderers is being held to enable them to seek clarification on the technical specifications and in tender documents that they may consider necessary for submission of tenders. All clarifications sought for will be finalized during the pre-bid conference and confirmatory minutes for the pre-bid conference will be uploaded on the tender website. All prospective tenderers are requested to attend the same before submission of their tender.
31. Relaxation will be given to MSME(Micro and small Enterprises) as per latest CPWD guidelines.

Technical Specifications

1. **Work should be carried out as per CPWD electrical specification revised from time to time.**
2. **Circuit wiring:** - Phase, Neutral & Earth wire shall be connected up to Switch Box.
3. In wiring, no joints in wiring will be permitted anywhere, except in switch box or point outlets, where jointing of wires will be allowed with use of suitable connector.
4. **2.5** sq mm for **points & circuit** wiring, **4** sq. mm for **power plug point** wiring, **6** sq mm & **above size** for **Sub-main** wiring, i.e. Panel to DB etc. as per site plan/project requirement as directed by Engineer-in-charge.
5. Drawing of PVC insulated copper conductor cable should not be excess from maximum capacity of conduit, as per clause [4.2.1 (ii)]
6. MCB DBs pre-wired type & brand name/make as specified in the tender only.
7. Only quality materials of reputed make as specified in the tender will be used in work.
8. The contractor shall engage suitably **skilled/licensed workmen** of various categories for execution of work & **supervised by supervisors / Engineer of appropriate qualification** & experience to ensure proper execution of work. They will carry out instructions of Engineer-in-charge & other senior officers of the Institute during progress of work.
9. **Inspection and Testing** Testing shall necessarily be carried out at factory/ manufacturer premises in presence of representative of the Department. The successful tenderer shall give a notice of minimum two weeks for carrying out such tests. The Engineer-in-charge/ or his authorized representative shall witness such inspection & testing at mutually agreed date. The cost of the representative's visit to the factory will be borne by the Department. The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make arrangements for the same.
10. All electrical works shall be carried out in accordance with the provisions of Indian Electricity Act,2003 and Indian Electricity Rules, 1956 amended to date. They shall also conform to CPWD General Specifications for Electrical Works, Part-I: Internal 2005 and Part-II External, 1994, amended to date.
11. Within ten days from the date of receipt of the letter of acceptance, the successful tenderer shall Submit his programme for submission of drawings, supply of equipments, installation, testing, commissioning and handing over of the installation to the Engineer-in-Charge.
12. **The contractor shall submit the drawings to the Engineer-in-Charge for approval before start of work.**
13. **GUARANTEE:-**All equipments shall be guaranteed, against unsatisfactory performance and/or break down due to defective design, workmanship or material, for a period of 12 months from the date of taking over the installation by the department. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith 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 attending the defect/fault removed, the same will be got done by the department at the risk cost of the contractor. The decision of the Engineer-in-Charge in this regard shall be final.

MEASUREMENT AND RA/ FINAL BILL

1. The contractor shall submit his running and final bills with detail measurement for the purpose of payment & bills shall be processed by the various offices for payment, as per existing procedure. He has to sign the MB Book as an acceptance to the measurements carried out by the engineer in charge of NISER, based on which the RA/Final Bill shall be generated for payment.
2. The contractor shall extend all possible co-operations for checking the measurement. Decision of the engineer in charge (electrical) of NISER shall prevail. In case of any dispute, the final decision lies with the Director of NISER, which shall be binding on both the parties.

OTHERS

If, the contractor has to remove/dismantle any old, damaged wiring & fixtures etc. for the purpose of execution of the said work, the same shall be deposited with NISER Stock Yard along with the list of materials under intimate to the concerned Engineer in- Charge. No extra payment will be made by the institute for this purpose.

SHEDULE OF QUANTITIES

SI No.	Systems	Unit	Qty.
1	<p><u>Supply ,erection and providing earthing connection to 9 meter GRP pole and fixing,comissioning of 2 nos of 300W led fixture on the pole as mentioed.</u></p> <p><u>POLE</u> Supply of 9 meter Single Bracketchannel (1000mm) GRP Designer Conicalpole made by CNC Filament Machine using thermo set resin having minimum 62% glass content in one piece, with IP 67 protection and provision of terminal for mounting MCB and termination of incoming and outgoing cables. Junction box should be provided 500 mm above base plate with 4 Nos terminals on epoxy insulator.The pole should be 9 mm thick.The inner diameter of the pole shold not be less than 220 mm at the bottom and less than 85 mm at the top. 4 nos terminals on epoxy insulators for mounting MCB and termination of incoming and outgoing cables1 no.neutral link. (For detailed specification of GRP pole please refer Annexure-1)</p> <p><u>FOUNDATION OF POLE</u> Erection of RCC/ PCC pole of following length in brick ballast and ramming the foundation, finishing with 150mm thick cement concrete (1 :3:6) layer on top with including excavation and refilling etc. as required.(Refer foundation drawing for detail technical specification)</p> <p><u>EARTHING OF POLE</u> Earthing of above G.I. pole with 2 nos. of 8 SWG tinned copper earth wires each 8 Mtrs long coiled in one metre dia at a depth of 1400mm. Below ground level, complete with soldering end connections with sockets, 3/8" dia 1" long GI earthing bolt fully threaded & welded on pole etc. all as per drawings, specifications and as per the instruction of EIC.</p> <p><u>LIGHT FIXTURE</u> Supply and installation of 2 NOS of LED flood light fixtures with maximum wattage 300 W simillar to make-Bajaj,Model-BARFEG 300W LED and all others accessories for illumination of tennis court. (Detail technical specification mentioned in NIT)</p> <p><u>WIRING & TERMINAL</u> Laying of 2.5 sqmm copper wire from terminal to fixture Providing two nos of 6 A to 32 A ratings, SP MCB, "C" curve, 10 kA breaking capacity</p>	Set	6
2	<p>Supply, installation, testing & commissioning of 4C x 16 Sq.mm Al. conductor armoured cable 1.1 KV grade aluminium stranded circular/ sector shape core conductor with XLPE insulation, extruded PVC inner sheathed, G.I wire/flat strip armoured, extruded FRLS grade PVC outersheathed cable conforming to IS : 1554 Part I / IS7098 Part-I with latest amendments, in ground at adepth of 900 mm below ground level, sand bedding, laying of bakedbricks on side & 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 specifications, drawings & as per instructions of the EIC</p>	Meter	140
3	<p>Supplying and making end termination with brass compression gland , aluminium lugs and gland earthing with nearest earth bus for 4 C X 16 sq mm of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 kV grade as required.4 C X 10mm</p>	Set	20
4	<p>Supply installation and comissioning of 32A Switch disconnecter fuse with SS enclousre (32 A, TP&N with SS enclosure similar to Cat. No-SK90483 of M/s L&T make) .SDF to be fixed in 9 Meter pole with necessary clamping arrangements .Double Earthing of the above SDF with 6 SWG GI wire as required</p>	Each	1

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ANNEXURE-1

DETAILED SPECIFICATION FOR GRP POLE

Product Name: Glass Fiber Reinforced Epoxy Pole

Length: 9 Meter.

Reference Standards: ANSI C – 132.20, AASHTO-LTS 4, IS: 875.

➤ **POLE**

SI No.	ITEM	NOS
1	Conical GRP Pole --- Top ID 85±2mm, Base ID 216±2mm	1 No
2	GRP Single Arm or Double Arm	1 No
3	Spray PU Coating of GRP Pole (Primer + Finish).	~50μ

➤ **APPLICABLE STANDARDS:** Pole: FES: 057L-1999, ANSI C136.

Wind Loading: AASHTO LTS4-2006 / IS: 875, IS 5649

➤ **PERFORMANCE CHARACTERISTICS:**

1. Design Wind speed of 180 km/hr.
2. Min. safety factor of 1.5 for pole & base at full load conditions.
3. All coating operations done with spray.
4. Pole designed on basis of long-term modulus.

➤ **DIMENSIONS & TOLERANCES:**

1. All dimensions in mm unless mentioned otherwise.
2. Overall Dimension Tolerance will be allowed
 - a) For Pole: +/- 2mm
 - b) For OD/ID: +/- 2mm
 - c) For Thickness: No negative tolerance.

➤ **TEST REPORTS & TESTIMONIALS**

1. Manufacturer must submit design calculations for the pole with supply.
2. Manufacturer must have at least 5 yr experience in the design, manufacture and supply of tapering GRP pole. Necessary PO copies received from any central / state government or govt. contractor to be submitted with the tender bid documents.
3. Manufacturer to supply
 - 1] Load Test Report,
 - 2] Material Test Report,
 - 3] Strength Test Report with supply.

➤ **COLOR CODE:**

Pole system to be finished in color of choice decided by the authority.

SECTION 2: MATERIAL & DESIGN

2.1 Surface protection / Finish / Color:

- Pole and bracket system to be finished in desired PU color of choice.

2.2 **Pole Insertion Ends:** The pole insertion end will be chamfered to facilitate entry of the base anchoring with the pole.

SECTION 3: PERFORMANCE CRITERIA

Strength & Factor of Safety: The fully assembled and loaded anchoring will withstand at least 1.5 times the forces induced under maximum wind conditions on the corresponding pole using the “worst case” analysis. The anchors will be made by GI/SS304 material inset with corrosion resistant GRP Pole. The tubing shall also be made thicker than the structural demands.

SECTION 4: TESTING, PACKAGING & LABELING

4.1 **Certificate:** A minimum sample will be tested to assure conformance of the pole to assure performance criteria. The testing certificate will be made available with the supplied materials.

4.2 **Labeling & Packaging:** The bracket will be wrapped in waterproof Bubble plastic paper.

SECTION 5 : DEVIATION

Deviation: to this specification will not be allowed.

POLE:

SECTION 1: GENERAL REQUIREMENT OF POLE:

- 1.1 **Description:** The pole will be round, hollow, uniform, and continuously tapering.
- 1.2 **Joints:** The pole will be in Joint less construction (bolted riveted or hinged not permissible).
- 1.3 **Manufacturer:** The manufacturer shall have at least 5 years of experience in the design, manufacture and supply of Glass filament wound GRP lighting poles.

SECTION 2: MATERIAL

2.1 **Manufacture / Construction:** The pole will be made from a minimum of 62% Wind Strand Glass Roving encapsulated in a maximum of 38% high temperature cured specially formulated corrosion and UV resistant unfilled **Epoxy Resin matrix**. The dielectric rating of the material will be at least 5kV / mm. The pole will be constructed from continuous electrical glass ravings'. The pole shall be made via the filament winding process on a 4-axis Filament Wound CNC winding machine. Winding shall be done in such a way that pole has desired stiffness and strength. Substitution by alternate manufacturing process will not be permitted.

2.2 **Thickness:** Pole shall have a thickness of min 7 mm thickness for 9 mtr besides what may be required to achieve the loading and safety specified in Clause 3.0

2.3 **Flame Resistance:** Pole will not contain chlorine (or any halogen) or other toxic materials in excess of trace levels and always less than safe OSHA (or equivalent) limits. When subjected to 2 consecutive 60 seconds flame application, it must self extinguish after the last flame application. We use Fire Retardant Resin for manufacturing pole.

2.4 **Surface Finish:** Pole will be provided with architecturally pleasing finish. It shall be provided with at least 2-part polyurethane finish. Pole will be free from defects, commercially practicable in color, shall be completely opaque, shall have a minimum density of 1.8 and other physical characteristics / properties mentioned below. In general, the pole shall be free from nicks and burrs.

2.5 **Color:** Pole shall be supplied 50-micron thickness of paint shall be done by the application of air-spray only.

SECTION 3: PERFORMANCE CRITERIA

3.1 Performance Standards:

- Pole will conform to ANSI Standard C-136.20. Wind loading calculations will be as per AASHTO – LTS4/6 “Standard Specification for Structural Supports for Highway Signs, Luminaries and Traffic Signal” and IS: 875.
- The pole shall be capable of withstanding wind load due to pressures exerted by wind blowing at a maximum speed (including gust) of 180 km/ph. The wind loading capacity of the pole shall be demonstrated by way of an actual load test.

Pole shall also have sufficient load carrying capacity.

3.2 UV Resistance:

Since the long-term cost effectiveness of the pole depends critically on the UV resistance of the pole special attention will be paid to characterize the UV resistance characteristics of the Pole. The pole will have outstanding resistance to:

- Humidity
- Atmospheric corrosion
- Chemical corrosion
- Acid rain
- Salt Spray – 1000 Hour.

Further, the pole will have negligible (<1%) water absorption (ASTM D570). Above all the pole will have a tested resistance to the Ultra Violet rays from the sun

3.3 Vertical Loading:

The pole will withstand a minimum vertical load from a luminary of 25kg per bracket arm at maximum wind speed.

3.4 Strength & Factor of Safety:

The fully assembled and loaded pole will withstand at least 1.50 times the load induced by the maximum wind conditions specified in Section 3.1 and calculated as per AASHTO standards. The pole will have

- Barcol Hardness of 52 (ASTM D253) or Shore Hardness > 100

3.5 Stiffness:

The pole will not deflect more than 15% of the free height under full load and under maximum wind speed conditions specified in Section 3.1. The pole will have a Heat Deflection Temperature of 140 °C.

3.6 Permanent Set:

The pole will not exhibit a permanent deflection of more than 1% under any dynamic wind load or static fitting load.

Section 4: Testing

In addition to the type tests mentioned above the following routine tests must also be carried out.

4.1. **Curing:** The pole must be produced on a computer controlled machine and the curing must be done at high temperatures as per pre-determined time-temperature curve. A certificate shall be provided to confirm that the pole is 100% cured.

4.2. Load Test:

The pole shall be load tested to establish the wind loading capacity of the pole. All the accessories shall also be tested to perform under the wind loading conditions specified under Section 3.1. A formal in-house load test report must be provided with the supply.

4.3. Certificate:

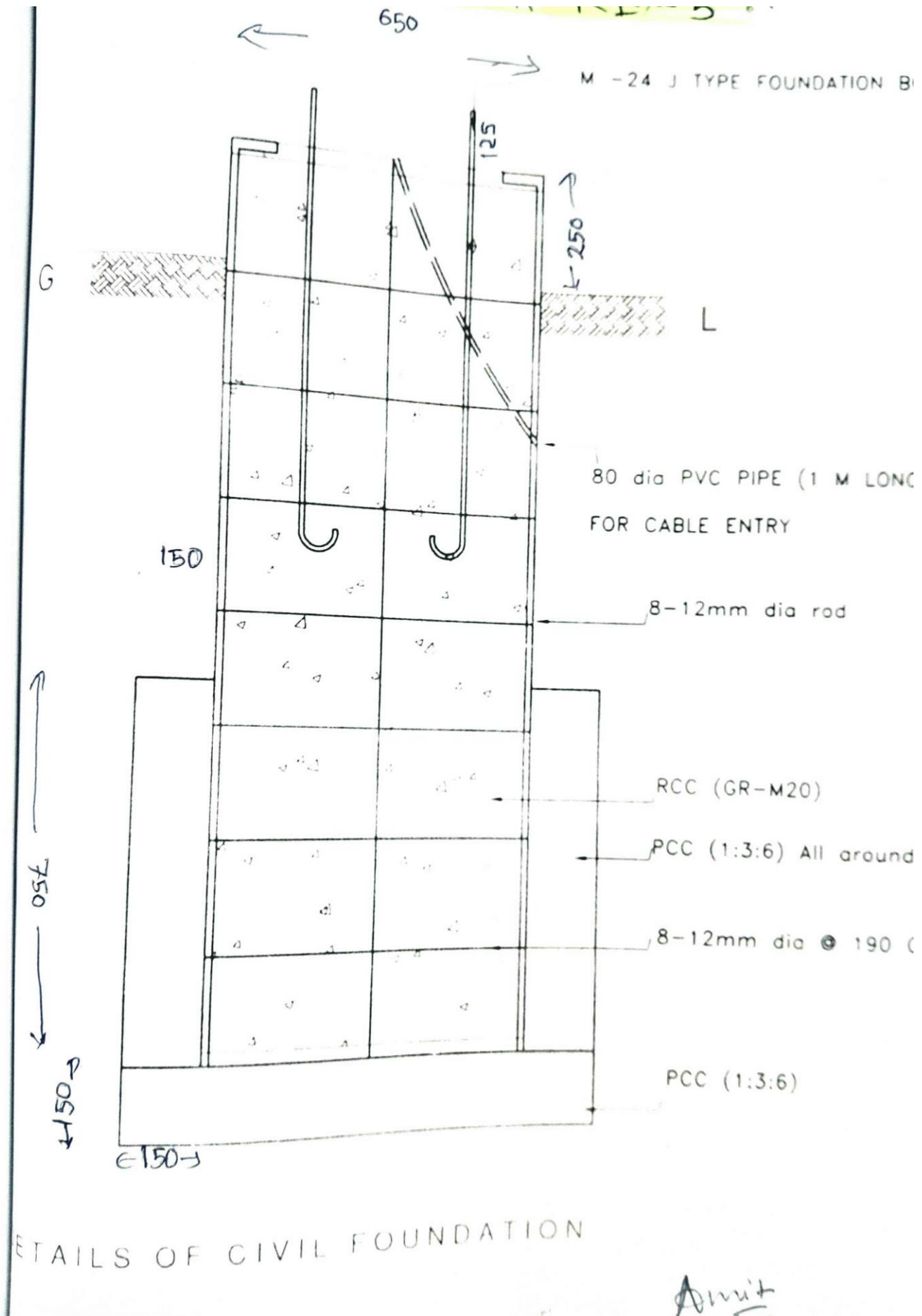
A minimum sampling will be tested to assure conformance of the pole to all performance criteria. The testing certificate will be made available with the supply. Sampling shall be done as per approved QAP.

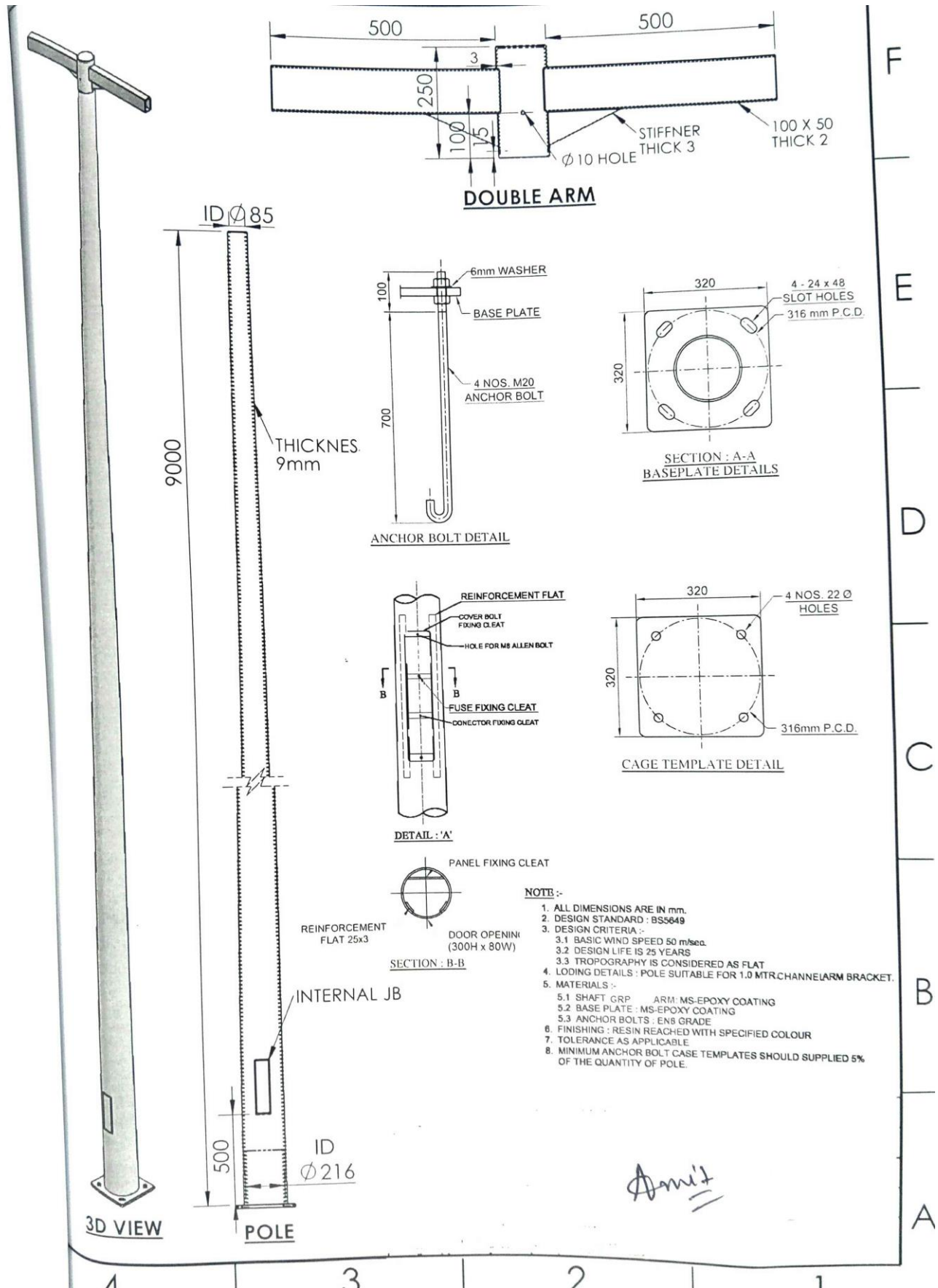
4.4. Packaging:

Each pole shall be individually wrapped in waterproof Bubble/Wrapping plastic Paper. A Pull string shall be provided to facilitate unwrapping.

DETAIL TECHNICAL SPECIFICATION FOR 300W LED LIGHT FIXTURE MENTIONED IN SL. NO. 1 OF SOQ

1	Wattage (System)	Maximum 300W
2	Voltage - AC Input Voltage Range (V)	140-280 V
3	Operating Frequency Range (Hz)	47-55
4	Total Harmonic Distortion (%)	<10%
5	Housing/ Body	Extruded Aluminium housing with pressure die cast end caps
6	System Efficacy	minimum 110 lm/W
7	IP grade	IP 66
8	Electrical insulation class	Class-1
9	System Lumen output	≥33000
10	Surge Protection differential level	5 KV + external 10KV to driver inside the fixture.
11	Heat Sink	Extruded aluminium heat sink for better heat dissipation with in luminaire & The dimensions of luminaries shall be adequate to permit sufficient heat dissipation through the body itself,so as to prevent abnormal temprature rise inside the lantren & consequential damage to cover & gasket materials,LEDs,lenses & Electronic Driver.
12	Standard considered	IEC 60598
13	Electrical Protection	Fuse / Short Circuit / No load / Over voltage
14	Front cover	Toughened Glass
15	Ambient Temperature	minus 10 deg C to + 45 deg C
16	Humidity	10-90 % RH
17	Mounting arrangement	Mounting bracket with aiming adjustment
18	Protection against Mechanical shocks	IK07
19	Led Make	LM 80 certified LED chip
20	Type of LED	High Power
21	Co-related Colour Temperature	5700 ± 300K
22	Colour Appearance	White
23	CRI	70 ± 2
24	Optical assembly	Structured LED with PMMA lens designed for optimum light Distribution
25	LED	Should have LM 80/TM 21 projection.
26	LED Driver	Constant current LED driver
27	Specification	120-280 V universal electronic driver with internal surge protection of 5KV (CM, DM)
28	IP protection	IP 66 Protected driver.
29	Number of drivers	2 nos for better safety
30	High voltage protection	Cut off 310±10VAC & Auto Reset
31	Driver Efficiency	> 90%
32	Power Factor	> 0.95
33	THD	< 10%
34	Driver	Isolated Driver with Aluminum construction
35	Driver	Compliance to safety requirements in IEC : 61347 -2-13 and as per IEC : 62384
36	LED	Compliance to requirements in IEC : 62471 & ANSI standard C78.377A
37	EMI/EMC	Compliance to IEC 61547, IEC 61000-3-2 & IEC 610003-3
38	Photo biological safety report	Compliance IEC 62471





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