INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI-110016

Dated: 27-06-2014

Open Tender Notice No. IITD/SO(SP-43)/2014

PFC (Purchase finalization Committee), Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016 on behalf of Director invites online ***Item Rate Quotation*** *from the work in two parts (Part-A Technical cum Commercial Bid, Part- B Price/ Financial Bid).*

Scope of Work	*Supply, Erection, Testing and Commissioning of 2 Nos.(2) Height High Mast Pole Lighting system of 20 m height for Cricket Practice Pitches in main stadium at IIT Delhi.*
Earnest Money Deposit to be submitted	Rs. 60,000.00/-

Tender Documents may be downloaded from Central Public Procurement Portal https://eprocure.gov.in/eprocure/app. Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the websitehttps://eprocure.gov.in/eprocure/app. The portal enrolment is free of cost. Bidders are advised to go through instructions provided in 'Instructions for online Bid Submission '.

Bidders can access tender documents on the website, fill them with all relevant information and submit the completed tender document online on the website https://eprocure.gov.in/eprocure/appas per the schedule given below:

Schedule

Tender Reference No.	IITD/SO(SP-43)/2014
Name of Organization	Indian Institute of Technology Delhi
Tender Type (Open/Limited/EOI/Auction/Single)	OPEN
Tender Category (Services/Goods/works)	Services
Type/Form of Contract (Work/Supply/ Auction/Service/Buy/Empanelment/ Sell)	Supply
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems)	Electrical Works
Re-bid submission allowed (Yes/No)	YES
Is Offline Submission Allowed (Yes/No)	No
General Technical Evaluation Allowed (Yes/No)	No
Withdrawal Allowed (Yes/No)	Yes
Is Multi Currency Allowed	No (Only INR)
Payment Mode (Online/Offline)	Offline
Date of Issue/Publishing	27/06/2014 (11:00Hrs)
Document Download/Sale Start Date	27/06/2014 (11:00Hrs)
Document Download/Sale End Date	18/07/2014 (15:00 Hrs)
Clarification Start Date	-
Clarification End Date	-
Date for Pre-Bid Conference	07/07/2014 (16:00Hrs)
Venue of Pre-Bid Conference	Sports Office, RCA Building, IIT Delhi Campus, Hauz Khas, New Delhi-110 016
Last Date and Time for Uploading of Bids	19/07/2014 (15:00Hrs)
Date and Time of Opening of Technical Bids	21/07/2014 (11:00Hrs)
Tender Fee	Rs. 1000/-
No. of Covers (1/2/3/4)	2
Bid Validity days (180/120/90/60/30)	120 days
Address for Communication	Sports Office, RCA Building, IIT Delhi Campus, Hauz Khas New Delhi-110 016

Chairman Purchase Committee
(Buyer Member)

Instructions for Online Bid Submission:

As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal (URL:https://eprocure.gov.in/eprocure/app) . The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at:

https://eprocure.gov.in/eprocure/app

REGISTRATION

1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL:https://eprocure.gov.in/eprocure/app) by clicking on the link "Click here to Enroll". Enrolment on the CPP Portal is free of charge.
2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.), with their profile.
5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
6) Bidder then logs in to the site through the secured log-in by entering their userID / password and the password of the DSC / eToken.

SEARCHING FOR TENDER DOCUMENTS

1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal.
2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.

3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF formats. Bid documents may be scanned with 100 dpi with black and white option.
4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

SUBMISSION OF BIDS

1) Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.
4) A standard BoQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
5) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
6) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered

cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done.

7) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
8) Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.

ASSISTANCE TO BIDDERS

1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 3070 2232.

General Instructions to the Bidders

1) The tenders will be received online through portal https://eprocure.gov.in/eprocure/app . In the Technical Bids, the bidders are required to upload all the documents in .pdf format.

2) Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through https://eprocure.gov.in/eprocure/app . Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site https://eprocure.gov.in/eprocure/app under the link "Information about DSC".

3) Tenderer are advised to follow the instructions provided in the 'Instructions to the Tenderer for the e-submission of the bids online through the Central Public Procurement Portal for e Procurement athttps://eprocure.gov.in/eprocure/app .

INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS , NEW DELHI-110016
QUOTATION NOTICE

No. ***IITD/SO(SP-42)/2014*** Dated :- 27.06.2014

PFC (Purchase finalization Committee), Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016 on behalf of Director invites online Item Rate Quotation from the specialized agencies/ Contractors Registered in appropriate class and category with CPWD, MES, BSNL, and Railways dealing with Electrical installation work of the following work in two parts (Part-A Technical cum Commercial Bid, Part- B Price/ Financial Bid).

Only those firm must have executed at least two sports floodlighting jobs of worth more than Rs. 20 lacs (Rupees twenty lacs) each in last three years by May 2014 in Govt./ Semi Govt/ Autonomous body organizations are eligible to apply. A proof of the same with satisfactory report from the client should be provided.

Name of work: - Supply, Erection, Testing and Commissioning of 2 Nos. X 20 Mtr. Height High Mast Pole Lighting system for Cricket Pitch in main stadium at IIT Delhi.

Earnest Money (inRs.)	**Time for Completion**	**Last date of issue of Quotation document**	**Date of Pre-bid meeting**	**Date of submission & Opening of technical bid**
60,000.00	04 months	18/07/2014	07/07/2014	21/07/2014

Earnest money i.e Rs. 60,000/- and tender fee of Rs. 1000/- (Non-refundable) should be paid in the form of pay order or Demand Draft or Banker's Cheque of scheduled bank, Guaranteed by R.B.I. and drawn in favour of Registrar IIT Delhi unless exempted by the Competent Authority. Pay Order or Demand Draft or Bankers Cheque(separate for Earnest Money and separate for Tender Fee) should not be prior to the date of NIQ.

Quotations shall be submitted online in the prescribed manner.

Envelope-I Part –A: Technical bid consisting of EMD and techno-commercial bid
Envelope-II Part –B: Financial/ Price Bid

Postal & Conditional Quotations are liable to be summarily rejected.

The INSTITUTE Reserves the right to reject or accept any application for issue of Quotation Forms without assigning any reason.
For Detail please see our website https://eprocure.gov.in/eprocure/app

CHAIRMAN
PURCHASE FINALIZATION COMMITTEE

Ch.to :PLN-04/BSA

Copy to :

1. President BSA	**2. Sports Officer**	**3. . E.E. (Electrical)**	**4. AE(E) HA**
5. D.R (A/Cs)	**6. Office Copy**	**7. Notice Board.**	

cc:

D.R.Store, IIT DELHI:- Display of Quotation notice on CPC Portal, Institute Website and leading Hindi and English News Papers of website at IIT Delhi for wide publicity.

TECHNICAL BID

The Quotation shall be submitted online duly completed in two separate covers, one for Part – I, Technical and Commercial bid and the other for Part – II Price Bid. Both these bids shall be submitted together online on or before the due date and time.

DEPOSITION OF FEE FOR TENDER DOCUMENT AND EMD

Tender document fee of Rs. 1,000/- and Earnest Money of Rs. 60,000/- in the form of Demand Draft or Bankers Cheque from any Scheduled Bank, payable to Registrar, IIT Delhi has to be deposited. Physical Demand Draft or Bankers cheque shall be delivered at the Sports Office, RCA building, IIT Delhi before the last date and time as mentioned in the schedule. A scanned copy of DD for EMD shall be uploaded along with E-Tender.

ADDITIONAL CODITIONS OF CONTRACT

Name of work: - Supply, Erection, Testing and Commissioning of 2 Nos.(two) High Mast Pole Lighting systemsof 20 m height for cricket practice pitches in main stadium at IIT Delhi.

1. SITE INFORMATION

1.1 It is proposed to illuminate the area by providing about 02Nos. high masts at the specified locations.

1.2 The locations of high masts have been proposed keeping in view the suitability to achieve the maximum utilization of high mast light for proper illumination.

1.3 The Bidders are advised to visit the sites to access the requirements of the site and probable difficulties in execution of work before Bidding.

1.4 Lighting shall be provided using Metal halide lamps, in appropriate luminaries.

1.5 Floodlighting parameters for Practice pitches:

Horizontal luminance	**GR**	**Ra (=of>)**
600 m_h, 0.7 $Emin_h/m_h$	50	65

Parameter	**Minimum Requirement**
Lamp Source	Metal Halide
Colour Temperature	Between 4000K & 5600K
Light Lost Factor	0.80
Pole Positioning	Symmetrical Arrangement- Locations to suit practice pitch floodlights. Not to be positioned directly behind bowlers arm or batsman. Floodlighting also to be positioned minimum 6.0 meters beyond sides and ends of practice pitch area.
Lighting Calculation Grid	1.0 x 1.0 meters
Reference Area (for four practice wickets)	33 x 18.5 meters

The illumination level shall be 600 lux (horizontal) average on the play field at all levels. The desirable uniformity ratio, i.e. minimum to average should not be less than 0.5 in straight runs. The minimum illumination level should be 600 lux. The design and test certificates should be got certified from the lighting manufacture company. The design of the lighting in department's Quotation papers &Quotation drawings are indicative of the requirements. The Bidder is required to quote the rates as per number of Masts, luminaries etc. as mentioned in Quotation papers.

The Bidder is required to carry-out computer aided calculation to achieve the desired illumination. The number of fittings if required may be permitted to be increased/decreased as per design calculations, but the type of luminaries will not be allowed to be changed, depending upon the suitability of site, the location of high mast can be altered.

After carrying out these modifications, the successful Bidder shall take responsibility of getting the required illumination by the lighting company and get measured in the presence of IIT Delhi staff.

2. **SUBMISSION OF QUOTATION AND OPENING OF BIDS**

2.1 The Bidder shall submit the Quotation in two separate covers **"Online"** duly complete in all respects. Both the technical bid and the price bid shall be submitted simultaneously.

2.2 **Envelope I and Envelope II i.e. "Technical bid" and "Price bid" respectively shall be complete with following**:-

a) Complete Quotation documents as purchased from IIT Delhi, duly signed for acceptance of all terms conditions.
b) Earnest money deposit.
c) Deviations, if any, from N.I.Q. and specifications.
d) Complete technical particulars for high masts and luminaries as per Annexure II
e) Type test certificate for high masts, luminaries and their accessories, lamps, ropes etc.
f) Rates of all taxes duties included in the price bid. Any other supplementary details required for the evaluation of Quotation like drawings, technical data etc.
g) Bidder should quote the prices in the given format as BOQ_XXXX in Excel sheet and upload it online on CPP Portal

Both Technical Bids and Financial Bids has to be uploaded online in the portal (https://eprocure.gov.in/eprocure/app)

2.3 The technical cum commercial bid only shall be opened first on the due date and time as specified in the Schedule, in the presence of Bidders or their authorized representatives, who wish to remain present. The price bids of only those Quotations shall be opened whose technical bids are found to be acceptable. The time and date of opening of price bid shall be intimated to them.

2.4 Scrutiny/evaluation of the technical bid shall be done by the PFC. Necessary clarification required by the department shall be furnished by the Bidder within the time given by the department for same.

2.5 It should be clearly understood by the Bidder that no further opportunity shall be given to them to modify or withdraw any stipulation at a stage after submission of Quotations.

3. RATES

3.1 The work shall be executed on indivisible works contract basis. The rates shall include all taxes, duties, including import duty for any imported items(if any), octroi, freight, insurance, all incidental charges, watch and ward charges(except service tax).

3.2 Works contract, sales tax shall not be payable on any of the items, separately.

3.3 No octoroi shall be paid separately.

3.4 If any component is imported, duties as applicable shall be included in the quoted rates. No foreign exchange shall be provided, nor any import license shall be arranged by the department.

4. PAYMENT TERMS

4.1 60% of the contract rates for the materials and equipment's supplied will be paid on initial inspection and delivery at site.

4.2 Further 30% of the contract rate shall be paid on completion of prorate installation.

4.3 Further 10% of the contract rate will be paid after, successful testing and commissioning of the installation on the basis of certificate to be issued by the PFC on proof of the work having been successfully completed and commissioned and handed over the installation for beneficial use. The guarantee period shall be reckoned from this date of handing over.

4.4 Work contract tax the department shall deduct 4% tax on the value of work done from each bill of the contractor. In lieu, the department shall issue a certificate of deduction of tax at source to the contractor in form 9.

Note-1: The contract rates referred to this Para(4) means the rates for each items of work in the schedule of work and any additional, substituted and deviated items of work under this contract.

Note-2: Security deposit shall be deducted from each bill as per relevant Quotation Clause.

Note-3: No mobilization advance shall be paid for work.

4.5 **SECURITYDEPOSIT**

Security deposit shall be deducted from each running bill and the final bill to the extent of 10 % of the gross amount payable for that bill. However the maximum amount of security deposit will be 5 % of the tendered value. The earnest money deposited shall be adjusted against this security deposit. The security deposit shall be released on the expiry of guarantee period stipulated in the contract.

4.6 **PERFORMANCE GUARANTEE**

The successful bidder shall submit an irrevocable performance guarantee of 5% of the tendered amount in addition to other deposits mentioned elsewhere in the contract in the contract for his proper performance of the contract agreement within 15 days of issued of letter of acceptance of tender. This guarantee shall be in the form of Demand draft/ Pay order or irrevocable bank guarantee of any scheduled bank in the specified format or in the form of Government security, fixed deposit pledged in favour of Registrar IIT Delhi or as specified in the letter of acceptance of tender. The performance guarantee shall be initially valid up to the stipulated date of completion plus 60 Days beyond. This bank guarantee shall be kept valid till the recoding of completion certificate for the work by the competent authority.

4.7 Sale Tax (Work Contract Tax), Income tax and Labour Cess as applicable shall be deducted from the bills of contractor.

5.0 <u>COMPLETION PERIOD</u>

The time permitted for the entire work of supply, installation, testing and commissioning complete in all respects to the satisfaction of the PFC shall be **four months,** reckoned from the 10^{th} day after award for work. Firm delivery period for the material shall be specified.

6. WORKS TO BE CARRIED OUT BY IIT DELHI

6.1 Electrical supply at the incoming switch gear of main distribution pillar for testing and commissioning.

6.2 Space for storing the luminaries, lamps, small tools etc. (but watch and ward shall be the responsibility of the contractor).

7. WORKS TO BE CARRIED OUT BY SUCCESSFUL BIDDER

In addition to the items covered by the schedule of the work and specification, the following shall also be included in the scope of work of the successful Bidder within the quoted rate.

7.1 Foundation for high masts.

7.2 Excavation of soil/soft rock/hard rock and refilling as required for cable work and for the foundation works.

7.3 Complete design of foundations of high illumination.

7.4 Detailed design of foundation for high masts for approval from competent authority.

8. POWER AND WATER SUPPLY

8.1 Power supply shall be provided at the main incomer free of cost for testing and commissioning purposes.

8.2 Water supply for erection shall be arranged by successful Bidder.

9. WATCH AND WARD OF MATERIALS AND EQUIPMENT

The contractor on supply of materials equipments for bonafide use on work at site, shall continue to be responsible for their safe custody, till they are erected in position, tested, commissioned and handed over to the PFC. The contractor shall furnish an unstamped receipt to the PFC for the items of materials and equipments so supplied.

. 10. DRAWINGS

10.1 The bidder has to inspect the site before submitting the bid.

10.2 The successful Bidder shall furnish, within one week of award of work the following drawing.

i. Drawing showing the actual layout of high masts along with computer aided design.

ii. Foundation drawing for high mast.

iii. Any other drawings considered necessary by the Bidder.

10.3 The work shall be executed as per the drawings prepared and approved by the PFC.

10.4 The Bidder shall submit completion drawing in triplicate, as per execution at site on completion of work.

11. GUARANTEE

11.1 The Bidder shall guarantee all the materials and equipment's supplied by him against any defective design, manufacture and or workmanship on the format prescribed by PFC. Minimum one year Guarantee should be given.

On expiry of guarantee period Institute may sign Annual Maintenance Contract (AMC) agreement (against 5% bank guarantee) for which five years AMC cost must be mentioned as per format given. The five years Bank Guarantee (in reference to AMC) in prescribed Proforma shall be given by the contractor for the work done which shall be 5% of the cost of work done. This will be of in addition to security deposit as per the G.C.C.The withheld amount shall be released after the completion of five years from the date of completion of work, if the performance of the work is satisfactory. The AMC clause will not be a part of financial evaluation.

11.2 The guarantee shall also cover the maintenance of the designed illumination, and the complete installation. Till handing over the high masts, the firm shall be responsible to supply and replace the defective lamps.

11.3 If any defect noticed during the guarantee period, it should be rectified by the contractor within seven days of issuing of notice by President BSA, IIT Delhi and, if not attended to, the same shall be got done through other agency at risk and cost of the contractor & recovery shall be effected from the amount retained towards guarantee. In any case, the contractor during the guarantee period shall inspect & examine the surface once in every year & make good any defects observed & confirmed the same in writing. The withheld amount can be released in full, if bank guarantee of equivalent amount, valid for the duration of guarantee period is produced & deposited with the department. (in the format supplied by department). However, security deposit which is as per G.C.C. shall be released after **completion of minimum one Year from** the date of completion of no defect is reported.

12. SPECIFICATION FOR THE WORK:-

The detailed drawing and structural design of the foundations shall be submitted by the firm. These shall be got checked by IIT Delhi and the work shall be executed only after their acceptance of design with modification if any.

12.1 The work shall be executed in strict conformity to CPWD General specifications for Electrical works Part I, internal, Part II, External(amended up to-date) and specification sub part I(General) &sub part II (technical) of the N.I.Q. papers.

12.2 The successful Bidder shall submit the lighting design with single/double ended 2000 watts metal halide flood light fittings to achieve the illumination level of 600 lux on average.

12.3 Deviation if any from the specifications shall be brought out in the Quotation, failing which it will be taken that these specifications shall be complied with.

12.4 Luminaries, accessories, lamps etc. shall conform to relevant IS/International specifications and if agreed by IIT Delhi.

13. No foreign exchange shall be provided by the department for the purpose. The Quotation should indicate clearly make of masts, luminaries and lamps lights calculated for the respective sport field as per listed manufacturer in the Quotation and submit all relevant test certificates issued by the manufacturer.

14. The successful Bidder shall be responsible for the transportation handling and erection of the Masts at site. Any special tools tackles/lifting arrangements etc. required in this connection shall also be his responsibility.

15. In case any statutory inspection is required to be got done from electrical inspectorate the same shall be got done by the successful Bidder without any extra payment by the department.

16. FOUNDATION FOR HIGH MASTS

16.1 The safe bearing capacity of the soil at depth of 2.5Mtr. below the ground level for various locations of the High Mast is 10Mt./Sq.Mt.

16.2 The design of the foundation and its drawings shall be submitted by the successful Bidder within one week of award of work with all calculation. These shall be got checked from civil wing of IIT Delhi and work shall be executed only after the acceptance of design with modification if any.

16.3 The foundation work for the high masts shall be executed conforming of CPWD specification for the works 1996 Volume I to Volume VI with up to date amendment as applicable for this work

16.4 Required foundation bolts, nuts etc. to be supplied & installed by the Bidder shall be galvanized. They shall be manufactured from high strength steel .

16.5 Mix of aggregate concrete shall be M25 & leveling coarse 15cm shall 1:4:8 mix.

16.6 The work shall be carried out in the presence of representative of department.

17. INSPECTION

A INTIAL INSPECTION

17.1 Routine test certificates from manufactures works shall be furnished for manufactured items viz, luminaries and their accessories (choke, condensers and lamps). In the case of high masts, test certificate should be furnished to satisfy the conformity to the strength design for, and the extent of galvanization.

17.2 In addition to the above, type test certificates for masts and luminaries shall be furnished, even though these may have been submitted with the Quotation.

17.3 The department reserve the right to inspect the various items at the manufactures work, for which at least 2 weeks advance notice should be given by the contractor.

B FINAL INSPECTION

17.4 On completion of 180 hours of operation of the installation, the contractor along with responsibility of the light manufacturer company and shall test the same in the presence of authorized person of PFC, the values of horizontal illumination over the various areas, so as to satisfy the requirements specified and submit the actual illumination level data sheets also.

Technical Specification of high mast

High Mast

Structure :- The High Mast shall be continuous tapered section and shall be based on proven three wire rope or two wire rope system with double drum winch. Mast shall have minimum diameter of the top end 150mm and minimum diameter at the base shall be 500mm.

Construction:- The mast shall be fabricated from mild steel plate cut & folded to form continuously tapered multi sides. The mast on complete installation shall be 20m high and shall be fabricated in three sections on assembly and the design load conditions. The section shall be fitted together at site in a manner that does not require any additional welding. The section shall be telescopically joined. The sections of the mast shall, after all welding process are completed, hot dip galvanized both internally and externally conforming to IS:2629 or equivalent BS:729 part-I. The make of the mast with vital information like base diameter, top diameter, thickness of MS plate etc. should be mentioned. The various parameters of the three sections shall be as follow :-
None of the section shall have any circumferential welded joint except bottom section which would be welded at the bottom to the base plate.
The thickness of the galvanizing shall be as under :
Bottom section 85 microns
The wall thickness of the mast shall not be less than
i) Top 4mm
ii) Middle 4mm
iii) Bottom 5mm

Base Flange: The base flange shall be fabricated from steel plate free from laminations. The base shaft shall penetrate the full depth of the base and be welded both above and below.

Base Compartments

Access: The bottom most section of the mast shall be provided with an access opening of suitable size at convenient height so as to enable convenient attending the electrical winch and for raising and lowering of the head frame using the winding arrangements installed the mast in front of the access opening. This opening shall be heavily reinforced to maintain the strength of the mast. The opening shall be provided with suitable hinged access door with in-built as well as external locking facility. A base board of suitable dimensions shall be provided inside the mast in front of the access opening, for mounting electrical control equipment.
Two earthing terminals comprising saddles bracket to hold hexagonal head bolt shall be suitably provided inside the mast base.

Head frame : The head frame shall be of welded steel construction hot dip galvanized after fabrication. Pulleys in LM6 aluminum alloy with stainless steel shaft shall be provided for the hoist rope and electrical power supply cable. Close fittings guards shall provided over the pulleys to ensure correct locations of the ropes and cables in their groves during operation. Additionally a pair of rollers shall also be provided to guide the electric supply cables towards centre of the shaft. The head frame assembly shall be provided with aluminum canopy section secured to the frame by the stainless steel bolts. The roller arrangements should be provided for balance of lantern carriage.

Dynamic loading for the Mast : The mast structure shall be suitable to sustain an assumed maximum reaction arising from a wind speed as per IS 875 (3second gust), and shall be measured at a height of 10 meters above ground level. The design life of the mast shall be minimum of 25 years.

Lantern Carriage : The lantern carriage which is the structural frame designed to carry required number of luminaries shall be fabricated steel construction, hot dip galvanized after fabrication. The carriage shall be in the form of a ring capable of heading up and down the mast in the horizontal plan.
The outside face of the ring shall be provided with necessary spigots of supporting brackets welded to it, depending on the number of luminaries to be accommodated 4 sets of double rollers on the inside of the ring which engage with the guides on the mast shall be provided, to ensure that when the carriage is fully home there is no
movement between the carriage and the head frame. Additionally a buffer section shall be provided for protection of the mast during lowering of the carriage. The top pulley assembly shall be of large dia to ensure safety of insulation of flexible muticore cable. Pulley shall run on self lubricating bearing with stainless steel axle.

Electrical Junction boxes : A cast aluminum junction box located on the lantern carriage housing connections to the lantern carriage shall be provided. The junction box shall also have provision for connection of the flexible mast electrical cables. The junction box shall be of gasketed contraction, to ensure complete protection against weather.

Wiring Ducts: A Wiring duct shall be provided which should carry electrical wiring from the junction box to the luminaries.

Electrical Cables: Each High Mast shall be provided with one flexible multi core copper cable. The conductor core shall be insulated with ethylene propylene rubber and the complete cable core shall be sheathed in heavy duty plychloroprene. The cable shall be minimum 8 core, 4sqmm copper wire and shall be of reputed make. The cable should terminate with suitable metallic socket plug and complete, fitted with guard ring.

Electrical disconnect: An electrical disconnect shall be provided at the base of mast comprising a socket with coupling ring and threading plug. It shall be possible that while lowering of lantern carriage, the electrical cable is disconnected at the base so that it is free to level within the same.

Double Drum Winch: The double drum winch shall have a minimum safe working load of 750Kgs for each drum at operating speed, however gear ratio may according to manufacturer's standards. The winch shall be capable of handling total loads of upto 1500Kgs and shall be completely self sustaining with power tool. The worn reduction gear boxes shall be provided, which shall be filled with lubricant in the factory and should require no further attention at site.
The drum shall be fabricated from steel, to ensure correct rope stacking. A minimum four turns of rope shall remain on the drums after the lantern carriage has been lowered to its lowest position. The control arrangement shall allow two sets of gears and their drums to be rotated simultaneously only. Function shall permit the lower drum to be rotated independently for leveling the lantern carriage. Additional safety features shall include disc brake on both gear shafts and automatic gravity latches, which separately lock each drive shaft. Each winch shall be numbered and a test certificate shall be submitted.

Power Tool for the Winch: A suitable high power electrically driven internally mounted single / three phase power tool with manual operating handle shall be supplied for raising and lowering of lantern carriage for maintenance purpose. Speed power tool preferably be of slow speed.

In case of problems with electrically operated tool, a handle for the manual operation of the winches shall be provided and shall incorporate a torque limiting device.
There shall be separate torque limiting device to protect the wire ropes from over stretching. It shall be mechanical with suitable load adjusting device. The torque limitor shall trip the load when it exceeds adjusted limits. There shall be suitable provision for warning the operator once the load is tripped off. The torque limitor is a requirement as per the relevant standards in view of the overall safety of the system.

Stainless Steel Wire Ropes: All wire ropes shall be made form non - corrodible stainless steel of AISI 316 grade having a tensile strength of 165 kgf/ sq mm The rope shall have a construction of 7/19 . The overall diameter of the rope shall not be less than 6mm. The rope of 6mm diameter shall have a breaking load capacity of not less than 2350 Kg at a safety factor of 5: 1. The ropes shall confirm to AISI 316 marine grade. The test certificate for the wires rope shall be provided.

Any damage caused during execution of electrical works shall be responsibility of contractor. The damages so caused shall be made good to the satisfaction of President BSA. All material required to be used in the works shall be used in the works shall be got approved by President BSA IIT, Delhi before use at site.

Capacity for carrying fittings:

The carriage designed shall have capacity to accommodate maximum 08 Nos. of 1 X 2000 watts Metal Halide fitting and the control boxes.

Preferred makes of **(i) Fittings :** Philips, Bajaj, Crompton Greaves, Surya, Ventura or Dev Musco with (IP66 Protection)
(ii) Lamps : Philips, Bajaj, Crompton Greaves, Surya, Ventura or Dev Musco with (IP66 Protection)

Test & Guarantee Certificate :
Test certificate shall be furnished by the contractor, obtained from original equipment manufacturers (OEM) for each winch including wire rope, in support of the maximum load operated by the winch.

A separate guarantee certificate shall also be furnished by the contractor, obtained from OEM, for the quality and reliability of the total Mast system i/c the mast & accessories.

Bid Submission

i. Online Bid Submission :

The Online bids (complete in all respect) must be uploaded online in **Two** Envelops as explained below :-

Envelope – 1 (Following documents to be provided as single PDF file)			
Sl. No.	**Documents**	**Content**	**File Types**
1.	EMD	The scanned copy of Earnest money deposit instruments	.PDF
2.	Deviations	Scanned Copy of Deviations, if any, from N.I.Q. and specifications	.PDF
3.	SCHEDULE OF DEPARTURE FORM SPECIFICATIONS	SCHEDULE OF DEPARTURE FORM SPECIFICATIONS AS per Annexure-I	.PDF
4.	Annexure II	Complete technical particulars for high masts and luminaries as per Annexure II	.PDF
5.	Annexure III	Performa for sufficiency of existing space for installation of requirement's being offered As per Annexure III	.PDF
6.	Annexure IV	Scanned Copy of FORMAT FOR DEVIATIONSTO QUOTATION CONDITIONS as per Annexure IV	.PDF
7.	Annexure V	Scanned Copy of DECLARATION BY THE BIDDER(S) As per Annexure V	.PDF
8.	Annexure VI	Scanned copy of Performa for sufficiency of existing space for installation of requirement's being offered as per Annexure VI	.PDF
9.	Type test Certificate	Scanned copy of Type test certificate for high masts, luminaries and their accessories, lamps, ropes etc.	.PDF
Envelope – 2			
Sl. No.	**TYPES**	**Content**	
1.	Financial Bid	Price Bid To Be Uploaded in Excel sheet in given format BOQ_XXXX	.XLS
2.	AMC Value	AMC Value to be uploaded in .PDF Format	.PDF

ANNEXURE – I

SCHEDULE OF DEPARTURE FORM SPECIFICATIONS

• S.NO.	• REF. TO CLAUSE OF THE SPECIFICATION	• DESCRIPTION OF DEPARTURE	• REASONS FOR DEPARTURE

DEPARTURE FORM SPECIFICATION

Technical specification of High Mast

Additional conditions of contract

General

Certified that except for the departures mentioned above, the Quotation is in accordance with IIT Delhi general specifications for electrical works and in accordance with detailed requirements specified the Quotation specifications.

(SIGNATURE OF THE CONTRACTORS)

ANNEXURE – II
TECHNICAL PARTICULARS
(To be supplied along with Tech. Bid)

High Mast:
Make: -
Name and Address of the manufacturer:-
No. of Section:-
Length of each Section:-
Over lap lengths between sections:-
Type of joint:-
No. of sides:-
Wall thickness in mm. Top 4mm, Middle 4mm, Bottom 5.5mm
Material and design strength thereof:-
Process of galvanization in microns:-
Size of opening door at base:-
Base dia& top dia:-
Suitable of carrying no. of fittings:-
Size of base plates & thickness:-
Weight of hight mast (i/c base plate)
Dynamic loading
i) Max Wind Pressure:-
ii) Max. gust speed time considered (specified 3 second)
iii) Ht. Above ground level at which above two factors are measured:-
iv) Factor of safety for wind load:-
v) Factor of safety for other loads:-
vi) Factor of safety of tower
Hoist Ropes:-
Size of hoist ropes:-
Number of hoist rope:-
Manufacturer of rope:-
Breaking load capacity:-
Factor of safety:-
Cable:-
Type of cable:-
Material:-
Make:-
Current carrying capacity:-
Conductor size:-
Lantern Carriage:-
Material of constructions:-
Diameter of carriage ring:-
Type of constructions:-
No. of joints:-
Load carrying capacity:-

Annexure – III

Proforma for sufficiency of existing space for installation of requirement's being offered.

We hereby, confirm that existing space available is adequate for installation of equipment's being offered by us.

Signature of Bidder

TECHNICAL DATA FOR HIGH MAST SYSTEM

SCOPE

The scope of this specification covers the manufacture, transport, installation, testing and commissioning of the complete lighting system using raising and lowering type of High Mast Towers including the Civil Foundation Works. The department will only provide the supply point and the feeder cable of the required size upto bottom of the High Mast. However all items required for the safe and efficient operation and maintenance of the lighting system. Including the High Mast, whether explicitly stated in the following pages or not, shall be included by the Contractor.

APPLICABLE STANDARDS

The following shall be the applicable standards for the High Masts and accessories.

Code No. **Title**
I.S. 875 (Part – III) 1987 Code and practice for design loads for structures.
BSEN 10025/DIN 17100 Grades of MS Plants.
BS. 5135 / A WS Welding
BS. ISO 1461 Galvanizing
TR No. 7 1996 of ILE. UK Specifications for Masts & foundation
BS Code of Practice,
CP – III, Chapter – V Pt. II Gradient of wind related to height above ground.

HIGH MAST STRUCTURE

Nominal height of mast (mtr.) : 20 mtr. (after assembly)
Material of construction : As per IS 9731
Nominal Thickness (in mm) :
Bottom Section (minimum) 4 mm:Top Section (minimum) 3 mm
Cross section of mast : 20 sided polygon
Length of individual sections (approx.) : Base section- 11.00 mtr.
(Note:- No circumferential welded): Top section - 10.00 mtr.

Base and to dia.(approx.) : Base Dia. – 460 mm: Top Dia. – 150 mm
Type of joints : Telescopic stress fit – Only joint
Nominal length of overlap :0.60 mtr.
Size of base flange diameter : Diameter - 660 mm
And thickness (approx.) : Thickness - 25 mm
Meter protection treatment of mast section
Thickness of galvanization : As per IS – 1549
Size of door opening in the base section : 1200 mm x 250mm
Type of door construction and checking arrangement : As per Bidder's design
Details of termination board : Fixed on MS Bracket
Inside the base section
Size of anchor plate and its diameter – 1200mm
Thickness :Thickness – 6mm
Details of template : PCD – 590 MM
No. of foundation bolts : 8 Nos.
Size of bolts : M 30 /1200
Weight of mast & accessories : As per Bidder's design

Academic Loading

Max. design wind speed : 180 Km/hr.
Gust time considered : 3 sec
Height above ground level at : 10 mtrs at which wind velocity is measured

Intern Carriage

1. Material of construction : M.S. (Hot dip galvanized)
2. Diameter of carriage ring (mm) : 2800 mm (approx)
3. Construction : To suit lighting design
4. Number of joints : 2
5. Buffer arrangement between : Provided carriage and mast
6. Load carrying capacity : As per design
7. Total weight of assembly : As per design fittings
8. Number of luminaries : 8 (Twin Lamp)
9. Type of fittings / Fixtures : As per design

Winch

1. Number of winch / mast : One
2. Capacity : 750 Kg.
3. Method of operation : Manual / Electrical
4. Lubrication : Self lubricating in permanent oil bath
5. Geer ratio : 53:1 (minimum)

Stainless steel Wire Ropes

1. Code : AISI 316/304
2. Number of ropes : 2 for winch & 3 lantern carriage
3. Diameter : 4/6 mm
4. Thimble and terminals : Provided
5. Breaking load capacity : 275 Kg. for 6 mm
6. Minimum factor of safety : 5 or More

Cable

1. Type : Flexible copper.
2. Material : XLPE /PVC Insulated, PVC sheathed or Rubber sheathed.
3. Specification : 8 Core x 4 Sq.mm.

Lower Tools

1. Input supply ; 415 volt
2. Wattage : As per design
3. Reversible / Non-reversible : Reversible
4. Reversible operation : Reversing starter
5. Remote control switch :

i) Type : Reversing starter

ii) Length of control cable : 5 mtrsapprox

iii)Time for taking carriage Up/down : Raising – 20 min (approx)
: Lowering – 15 min (approx)

ANNEXURE –IV

FORMAT FOR DEVIATIONS TO QUOTATION CONDITIONS

S. No.	Ref of Page No.	Quotation Document		Subject	Deviation/Exception/ Clarification/Assumption
		Cl. No.	Para No.		
(1)	(2)	(3)	(4)	(5)	(6)

SEAL & SIGNATURE OF THE BIDDER

Any deviation appearing elsewhere in the Bidder's offer shall not be considered. Failure to clearly define Quotation exceptions may be cause for Bid rejection.

ANNEXURE –V

DECLARATION BY THE BIDDER(S)

We_____(Name of the Bidder's) hereby represent that we have gone through and understood the Bid Documents (including but not limited to), the Commercial, Technical Stipulations, Drawings, Schedule of rates etc. and that our Bid has been prepared accordingly in compliance with the requirements stipulated in the said documents.

We are submitting Bid Documents Part-A : Techno Commercial and Part-B : Price Bid, as part of our Bid duly signed and stamped on each page in token of our acceptance and shall form part of our bid. In the event of award of contract to us, all the parts including amendments and agreed variations shall be considered for constitution of Contract Agreement.

SIGNED FOR AND ON BEHALF OF BIDDER(S)

Name of Bidder(s)
Seal & Signature of Bidder
Date :_____
Place :

Not :- This declaration should be signed by the Bidder(s) authorized representative who is signing the Bid.

ANNEXURE –VI

Proforma for sufficiency of existing space for installation of requirement's being offered.

We hereby, confirm that existing space available is adequate for installation of equipment's being offered by us.

Signature of Bidder

QUOTATION
(PRICE BID)

Name of work :-

i). To be submitted by 16.30 hours on dated _____ to _____

ii) To be opened _____whose technical bid is accepted at _____hours on _____ in the office of _____ issued to : _____

Signature officer issuing the documents
_____

Designation _____

Date of issue _____

INDEX

1. **INSTRUCTIONS TO BIDDER**

2. **SCHEDULE OF QTY.**

1. INSTRUCTIONS TO BIDDER

This Financial Bid shall be part of contract along with Technical Bid, therefore rates should be quoted considering all the provisions of Technical bid.

Chairman
P.F.C.

INDIAN INSTITUTE OF TECHNOLOGY: DELHI
HAUZ KHAS, NEW DELHI – 110016

Name of Work : **Supply, Erection, Testing and Commissioning of 2 Nos.(two) High Mast Pole Lighting system of 20 m height for Cricket Practice Pitches in main stadium at IIT Delhi.**

Schedule of Quantity

S.N	Description	Qty.	Rate per unit	Amount
1. 1.1	**SH-I: High Mast Poles & Civil foundation work** Supply, installation, testing & commissioning of following mountings with20 Mt. height High Mast Pole, shaft in two sections or as per manufacture design suitable for wind speed as per IS-875/IS specification/BIS standards with motorized raising & lowering system comprising, head frame, luminaries carriage in asymmetrical arrangement, double drum winch, 6mm diameter SS wire rope, trailing cable, wiring for luminaries with all wiring materials like PVC insulated and PVC sheathed flexible cable of suitable size copper conductor core, lugs, connector, integral power tool motor, manual handle, junction box, LED type double dome aviation obstruction light, lighting finial. The pole shall comprises of control gear box for MH light fittings consisting 1 No. incoming 100A TPN MCCB of L&T Make and other accessories. Make :- Philips, Bajaj, Crompton Greaves, Surya, Ventura or Dev Musco with IP66 Protection 20 Mtrs. Height High Mast Pole suitable to install 08 Nos. luminaries.	2 Nos.	In figures In words	
2. 2.1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth. 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50m and lift up to 1.5m, disposed earth to be leveled and neatly dressed. All kinds of soil	27.50 Cu.Mt.	In figures In words	
2.2 2.2.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering –All work up to plinth level:- 1:4:8 (1 Cement : 4Coarse sand: 8 graded stone aggregate 40 mm nominal size)	0.94 Cu.Mt.	In figures In words	
	C/O			
S.N	**Description**	**Qty.**	**Rate per unit**	**Amount**

	B/F			
2.3	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement. Including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-25 grade reinforced cement concrete by using 380 Kg of cement per cum of concrete. All work up to plinth level.	6.66 Cu. Mt.	In figures In words	
2.4 2.4.1	Centering and shuttering including strutting, propping etc. and removal of form for: Columns. Pillars, Piers, Abutments, Posts and struts.	12.96 Sq.Mt.	In figures In words	
2.5 2.5.1	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete. Thermo-Mechanically Treated bars etc.	351.28 Kg	In figures In words	
3.	Supply, installation, testing & commissioning of 2KW Sports Light luminaries (IP-66) with one number 2 KW MH DET lamps and its control gear boxes, compact die cast aluminum housing, low weight high purity pre-anodised aluminum reflector system to be installed in 20 Mtrs. height High Mast Pole with the help of suitable tools and plants, wiring of luminaries with all wiring material like PVC insulated and PVC sheathed flexible cable of suitable size copper conductor cores, lugs complete as required. Make :- Philips, Bajaj, Crompton Greaves, Surya Ventura or Dev Musco with IP66 Protection.	14 Nos.	In figures In words	
4. 4.1	**SH-II: LT Cable, Panel &Earthing for High Mast Poles** Supplying of following size polyethelene (XLPE) insulated PVC outer sheathed cable with aluminum conductor for rated voltage of 1100 volts grade conforming to IS:7098 (part-I) /88 with amendment no. 1 armoured with galvanized steel strip (with ISI mark) Make ICL/ Havells / Grandlay / ICC / Nicco / Polycab /Gloster. 2 x 10 sq mm	250 Mt.	In figures In words	
	C/O			
S.N	**Description**	**Qty.**	**Rate per unit**	**Amount**
	B/F			
4.2	3 ½ x 50 sq. mm	70 Mt.	In figures	

			In words	
4.3	3 ½ x 70 sq. mm	250 Mt.	In figures In words	
4.4	3 ½ x 150 sq. mm	150 Mt.	In figures In words	
4.5	3 ½ x 300 sq. mm	270 Mt.	In figures In words	
5. 5.1	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required. Above 35 sq. mm. and Up to 95 Sqmm	300 Mt.	In figures In words	
5.2	Above 95 sq. mm. and Up to 185 Sqmm	140 Mt.	In figures In words	
5.3	Above 185 sq. mm. and Up to 400 Sqmm	260 Mt.	In figures In words	
6. 6.1	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing masonry open duct as required. Up to 35 sq mm	250 Mt.	In figures In words	
6.2	Above 35 sq. mm. and Up to 95 Sqmm	20 Mt.	In figures In words	
6.3	Above 95 sq. mm. and Up to 185 Sqmm	10 Mt.	In figures In words	
6.4	Above 185 sq. mm. and Up to 400 Sqmm	10 Mt.	In figures In words	
7.	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthling along with existing surface/ recessed conduit/ sub main wiring/ cable as required.	1480 Mt.	In figures In words	
8. 8.1	Supplying and making indoor end termination with brass compression gland and aluminum lugs for following sizes PVC insulated and PVC sheathed / XLPE aluminum conductor cable of 1.1 KV grade as required. 2 x10 sqmm (19mm)	4 set	In figures In words	
8.2	3 ½ x 50 sqmm (35mm)	2 set	In figures In words	
	C/O			
S.N	**Description**	**Qty.**	**Rate per unit**	**Amount**
	B/F			
8.3	3 ½ x 70 sqmm (38mm)	4 Set	In figures In words	

8.4	3 ½ x 150 sqmm (50mm)	2 Set	In figures In words	
8.5	3 ½ x 300 sqmm (70mm)	2 Set	In figures In words	
9. 9.1	Providing and fixing following rating and breaking capacity MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required. 400A, 35KA, 4 Pole of L&T Make type DH-400	1 No.	In figures In words	
10.	Supplying and fixing 63 A rating four pole 415volts, isolator of Legrand Make in the existing MCB DB complete with connections testing and commissioning etc. as required.	1 No.	In figures In words	
11.	Earthing with G.I. earth plate 600mm x 600 mm x 6 mm thick including accessories and providing masonry enclosure with cover plate having locking arrangements and watering pipe of 2.7 Mtr long etc. with charcoal / coke and salt as required.	06 Set	In figures In words	
12.	Providing and fixing 25mm x 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with GI nut, bolts, spring washers, excavation and refilling etc. as required.	50 Mt.	In figures In words	
13.	Providing and fixing 25mm x 5 mm G.I. strip in on surface or in recess for connections etc. as required.	20 Mt.	In figures In words	
14.	Providing laying and fixing of 100 mm dia GI pipe (medium class) in ground / surface along with pole complete with GI fittings including trenching (75mm deep) and refilling etc. as required.	18 Mt.	In figures In words	
	C/O			
S.N	**Description**	**Qty.**	**Rate per unit**	**Amount**
	B/F			
15.	Supplying, installation, testing & commissioning of cubical panel board of size 2 Mt x 1 Mt x 0.30Mt.(approx)with front opening door, totally enclosed type fabricated out of 14 SWG M.S CRCA sheet, free standing type, weather, dust & vermin proof by provision of gasket, beneath all			

	covers and doors suitable for operation on a 3 phase, 4 wire 415Volts, 50Hz, AC supply. The panel shall incorporate bus–bar chamber with aluminum bus bars extensible on either side in uniform rectangular section. The connections between bus bar and MCCBs / switches shall be fully insulated, supported on hygroscopic insulators and covered with heat shrinkable colour coded sleeves. The outgoing connections between MCCBs and cables shall be done through extended aluminum bus bars supported on hygroscopic insulators. The panel shall incorporate the following panel mounting including connections, inter- connections with proper copper wiring, earthing terminals, danger plate, painting & locking arrangement etc. complete as required. The panel drawings shall be got approved from Engineer-in-charge before fabrication. **INCOMING** (i) 400Amps TPN Switch Fuse UNIQ with HRC fuses Type FN-400 of Make L&T - 1 No. (ii) Digital type multimeter with C/Ts 250/5A for measuring current/voltage/power/powerfactor etc. Make : AE / L&T/ Legrand / Motwani -1 No. (iii) Pilot lamps (LED type) with control MCBs for three phase indication - 1 set **OUTGOING** (i) 100A TPN, 4 Pole MCCB type DH-100, 25KA, Make L&T = 4 Nos. (ii) Aluminium bus bar of size 400A for three phase and 200A for neutral -1 set. (iii) Electronic timer, contactor and other accessories for automatic operation of aviation lights – 1set	1 No.	In figures In words	

	Total		
	Discount if any	In figures In words	
	Grand Total		

AMC rate for five years after warranty period (this is not a part of financial evaluation)	**(inRs.)**	**(in Words)**

Signature of contractor