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PART-A

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INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR E-TENDERING FORMING PART OF BID DOCUMENT AND TO BE POSTED ON WEBSITE

(Applicable for inviting open bids)

The **Executive Engineer, Lucknow-II, C.P.W.D., Lucknow** for & on behalf of President of India invites online Percentage rate bids from approved and eligible contractors of CPWD for the following work(s):

S. No.	NIT NO.	Name of work and location	Estimated cost put to bid (Rs.)	Earnest Money	Stipulated Period of Completion of work (in months)	Last date of online submission of bid, copy of receipt of deposition of orginal EMD and other documents as specified in the bid document.	Time & date of opening of tender
1	2	3	4	5	6	7	8
1	**41/EE/Lucknow-II/2026-27**	**Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**	**Civil :- Rs. 3,88,51,432/-** **Electrical :Rs. 1,44,85,565/-** **Total Rs. 5,33,36,997/-**	**Rs. 10,66,740/-**	**12 Months**	**Upto 03:00 PM on 30.11.2026**	**At 03:30 PM on 30.11.2026**

1. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.
2. Information and Instructions for bidders posted on website shall form part of bid document.
3. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website https://etender.cpwd.gov.in or www.cpwd.gov.in free of cost.

*** To be filled by Executive Engineer.**

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4. But the bid can only be submitted after deposition of original EMD either in the office of Executive Engineer, inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission and uploading the mandatory scanned documents such as Insurance Surety Bonds, Account Payee Demand draft or Bankers Cheque or Fixed Deposit Receipts or/ and Bank Guarantee including e-Bank Guarantee (for balance amount as prescribed) from any of the Commercial Bank towards EMD in favour of Executive Engineer as mentioned in NIT, receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE/ AE), CPWD and other documents as specified.
5. Those contractors who are not registered or have not updated their profile on the website mentioned above, are required to get registered / update their profile beforehand. The necessary training materials including the videos with step to step process are available on download section of https://etender.cpwd.gov.in
6. The intending bidder must have valid Class-III digital signature certificate with encryption key (combo type) to perform any operations / transactions on the e-tendering portal / website and the bidder should download and install the eMsigner on their system as per instructions available on download section of https://etender.cpwd.gov.in
7. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
8. Contractor can upload documents in the form of JPG format and PDF format.
9. Contractor must ensure to quote rate in the prescribed column(s) meant for quoting rate in figures appears in yellow colour and the moment rate is entered, it turns sky blue.

   In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO).

   However, If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

List of Documents to be scanned and uploaded within the period of bid submission:

(i.) Insurance Surety Bond, Demand Draft/ Account Payee Banker's Cheque / FDR/ Bank Guarantee of any commercial Bank against EMD.

(ii.) Enlistment Order of the Contractor.

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(iii.) GST Registration Certificate if already obtained by the bidder.

If the bidder has not obtained GST registration as applicable, then he shall scan and upload following under taking along with bid documents.

"If work is awarded to me, I/we shall obtain GST registration certificate, as applicable, within one month from the date of receipt of award letter or before release of any payment by CPWD, whichever is earlier, failing which I/we shall be responsible for any delay in payments which will be due towards me/us on account of the work executed and/or for any action taken by CPWD or GST department in this regard".

(iv) Copy of receipt for deposition of original EMD issued from division office of any Executive Engineer (including NIT issuing EE/AE), CPWD.

(v) Undertaking on structural stability and soundness as per prescribed format Form 'F'

Note: Bidder should ensure himself that above documents are uploaded in correct format and at correct location on the website.

Executive Engineer
Lucknow-II
CPWD, Lucknow

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Annexure-I.

RECEIPT OF DEPOSITION OF ORIGINAL EMD

(Receipt No. ……#…… / date ……..…#……)

Name of Work: **Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**

1. NIT No. : **41/EE/Lucknow-II/2026-27**
2. Estimated Cost: **Rs. 5,33,36,997/-**
3. Amount of Earnest Money Deposit: **Rs. 10,66,740/-**

   (EMD shall be in Favour of Executive Engineer, Lucknow-II, CPWD.)
4. Last date & Time of submission of Bid : **15:00 Hrs. on 30-11-2026**

Name of Contractor : ……#…….....

1. Form of EMD ……#…….....
2. Amount of Earnest Money Deposit ……#…….....
3. Date of submission of EMD ……#……..……

…….

Signature, Name and Designation of EMD
receiving officer (EE/AE(P)/AAO) alongwith office stamp

* To be filled by EE inviting tender.
# To be filled by EMD receiving EE.

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Annexure-II

ON NON-JUDICIAL STAMP PAPER OF MINIMUM RS. 100

(Guarantee offered by Bank to CPWD in connection with the execution of contracts)

Form of Bank Guarantee for Earnest Money Deposit /Performance Guarantee/Security Deposit/Mobilization Advance

1. Whereas the Executive Engineer …… (name of division) ……., CPWD on behalf of the President of India (hereinafter called "The Government")has invited bids under ……(NIT number)……. dated …… for …… (name of work) …… The Government has further agreed to accept irrevocable Bank Guarantee for Rs. ……..…… (Rupees …… only) valid upto …… (date)*…… as Earnest Money Deposit from ……. (name and address of contractor) ……..(hereinafter called "the contractor") for compliance of his obligations in accordance with the terms and conditions of the said NIT.

OR**

Whereas the Executive Engineer …….. (name of division) ……., CPWD on behalf of the President of India (hereinafter called "The Government") has entered into an agreement bearing number ……..... with ……..... (name and address of the contractor) …….. (hereinafter called "the Contractor") for execution of work …… (Name of work) ……... The Government has further agreed to accept an irrevocable Bank Guarantee for Rs. ……..…… (Rupees …… only) valid upto …….. (date)..…… as Performance Guarantee/Security Deposit/Mobilization Advance from the said Contractor for compliance of his obligations in accordance with the terms and conditions of the agreement.

2. We, …… (indicate the name of the bank) ……. (herein after referred to as "the Bank"), hereby undertake to pay to the Government an amount not exceeding Rs. …….. (Rupees……. only) on demand by the Government within 10 days of the demand.

3. We, ……(indicate the name of the Bank) ……., do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. …….. (Rupees ……only)

4. We, …… (indicate the name of the Bank) ……., further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this

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Bank Guarantee shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

5. We, …… (indicate the name of the Bank) ……., further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. We, …… (indicate the name of the Bank) …….., further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

8. We, ……. (indicate the name of the Bank) ……., undertake not to revoke this guarantee except with the consent of the Government in writing.

9. This Bank Guarantee shall be valid up to ……. unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. …… (Rupees …….. only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date .....

Witnesses:

1. Signature……

   Name and address

Authorized signatory

Name

Designation

Staff code no.

2. Signature …….

   Name and address

Bank seal

* Date to be worked out on the basis of validity period of 90 days where only financial bids are invited and 180 days for two/three bid system from the date of submission of tender.

**In paragraph 1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee/security deposit/mobilization advance, as the case may be.

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Form 'F'

Undertaking on structural stability and soundness of already completed buildings and infrastructure projects.

I/we undertake and confirm that any building / infrastructure constructed by our firm /partnership firm/ company has not suffered any failure, making it unfit for intended use, either due to structural design and defects or due to use of sub-standard materials or execution of sub-standard work, poor workmanship or any other reason during the last 25 (twenty five) years.

I/we, further, undertake that if such information comes to the notice of CPWD, then Engineer-in-Charge shall be free to terminate the bid/agreement and to forfeit the entire amount of earnest money deposit, performance guarantee and security deposits.

I/we, also undertake that in addition to above, the Engineer-in-Charge shall be free to debar us forever from tendering in CPWD.

The decision of Engineer-in-Charge or any higher authority shall be final and binding.

Signature of notary with seal

Signature of bidder or an authorized person of the firm with stamp

Note: Affidavit to be furnished on a 'Non-judicial' stamp paper of Rs. 200/- (scanned copy of the notarized affidavit to be uploaded at the time of submission of bid).

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CPWD-6 FOR e-Tendering

1. Percentage rate bids are invited on behalf of President of India from approved and eligible contractors of CPWD for the work of **Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**

The enlistment of the contractors should be valid on the last date of submission of bids.

In case the last date of submission of bid is extended, the enlistment of contractor should be valid on the original date of submission of bids.

1.1 The work is estimated to cost **Rs. 5,33,36,997/-.** This estimate, however, is given merely as a rough guide.

1.1.1 The authority competent to approve NIT for the combined cost and belonging to the major discipline will consolidate NITs for calling the bids. He will also nominate Division which will deal with all matters relating to the invitation of bids. For composite bid, besides indicating the combined estimated cost put to bid, should clearly indicate the estimated cost of each component separately. The eligibility of bidders will correspond to the combined estimated cost of different components put to bid.

~~1.2 Intending bidders is eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:-~~

~~Criteria of eligibility for submission of bid documents~~

~~1.2.1 Conditions for Non-CPWD registered contractors only, if bids are also open to non-CPWD Contractors.~~

~~For works estimated cost upto tendering limit of class -I Buildings & Roads (erstwhile Composite/ Building/ infrastructure) category Contractor (However, for Horticulture category, it may be modified as per bidding limit of CPWD class I contractors of Horticulture category).~~

~~(i) Three similar works each of value not less than Rs..... or two similar works each of value not less than Rs..... or one similar work of value not less than Rs..... (all figures rounded to nearest convenient figure) during the last 7 years ending last day of the month previous to the one in which tenders are invited.~~

~~(ii) For EPC tender under Mode- I/II only (Applicable for CPWD enlisted contractors of appropriate class also).~~

~~One completed work costing not less than Rs. …. executed with the structural system technology as proposed by bidder in the letter of transmittal during the last 7 years ending last day of the month previous to the one in which tenders are invited. This work can be part of eligible work at 1.2.1 (i) above or as a separate work.~~

~~**Note:-**~~

~~For works costing above tendering limit of class -II Buildings & Roads(erstwhile Composite/ Building/ infrastructure)category contractors but upto tendering limit of Class-I Buildings & Roads(erstwhile Composite/ Building/ infrastructure) category~~

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Contractor (However, for Horticulture category, it may be modified as per bidding limit of CPWD class II and CPWD Class I contractors respectively of Horticulture Category) when bids are open to non-CPWD contractors also, then class II contractors of CPWD registered shall also be eligible if they satisfy the eligibility criteria specified in 1.2.1 above.

1.2.2 Criteria of eligibility for CPWD as well as non-CPWD contractors,

For works estimated to cost above the tendering limit of class -I (Super) Buildings & Roads (erstwhile Composite/ Building/ infrastructure) category Contractor (However for Horticulture category, it may be modified as per bidding limit of CPWD class I contractors of Horticulture Category).

(i) Three similar works each of value not less than Rs..... or two similar works each of value not less than Rs.....or one similar work of value not less than Rs.....(all figures rounded to nearest convenient figure) during the last 7 years ending last day of the month previous to the one in which tenders are invited.

(ii) For EPC tender under Mode- l/ll only (Applicable for CPWD enlisted contractors of appropriate class also).

One completed work costing not less than Rs ……..executed with the structural system technology as proposed by bidder in letter of transmittal during the last 7 years ending last day of the month previous to the one in which tenders are invited. This work can be part of eligible work at 1.2.2 (i) above or as a separate work.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum, calculated from the date of completion to the last date of submission of bid. This is applicable for 1.2.1 as well as 1.2.2 (Para 1.2.1(i) and Para 1.2.2(i) are not applicable for CPWD enlisted contractors of appropriate class. Para 1.2.1(ii) and Para 1.2.2(ii) are also applicable for CPWD enlisted contractors of appropriate class).

To become eligible for issue of bid, the bidders shall have to furnish an affidavit as under:-

I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in CPWD in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee. (Scanned copy to be uploaded at the time of submission of bid)

1.2.3 When bids are invited from non CPWD contractors and CPWD class II contractors as per provisions of clause 1.2.1 above, it will be mandatory for non CPWD contractors and CPWD class-II contractors to upload the work experience certificate(s) and the affidavit as per the provisions of clause 1.2.2.

But for such bids, Class-I contractors of CPWD are eligible to submit the bids without submission of work experience certificate and affidavit. Therefore, CPWD class-I contractors shall upload two separate letters for experience certificate and affidavit that these documents are not required to be submitted by them. Uploading of these two letters is mandatory otherwise system will not clear mandatory fields.

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2. Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD 7/8 (or other Standard Form as mentioned), which is available as a Govt. of India Publication and also available on website www.cpwd.gov.in. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.

3. The time allowed for carrying out the work will be **12 Months** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.

4. (i) The site for the work is available.

OR

~~The site for the work shall be made available in parts as specified below:-~~

……

(ii) The architectural and structural drawing for the work is available

OR

~~The architectural and structural drawings shall be made available in phased manner, as per requirement of the same as per approved programme of completion submitted by the contractor after award of work.~~

5. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website https://etender.cpwd.gov.in or www.cpwd.gov.in free of cost.

6. After submission of the bid, the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.

7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

8. When bids are invited in three stage system and, if it is desired to submit revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted then the bid submitted earlier shall become invalid.

9. Earnest Money in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee including e-Bank Guarantee (for balance amount as prescribed) from any of the Commercial Banks (drawn in favour of **Executive Engineer, Lucknow-II, CPWD)** shall be scanned and uploaded on the e-Tendering website within the period of bid submission. The original EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission. The EMD receiving Executive Engineer (including NIT issuing EE/AE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT.

   A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee including e-Bank Guarantee of any Commercial bank having validity for a period of 90 days for single bid

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works and 180 days for two bid system or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

The earnest money given by all the tenderers except the lowest tenderer shall be refunded immediately after the expiry of stipulated bid validity period or immediately after acceptance of the successful bidder, whichever is earlier. However, in case of two/ three bid system, earnest money deposit of bidders unsuccessful during technical bid evaluation etc. should be returned within 30 days of declaration of result of technical bid evaluation.

Copy of Enlistment Order and certificate of work experience and other documents as specified in the notice inviting e- tender shall be scanned and uploaded on the e-Tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in e- tender notice shall have to be submitted by the lowest bidder within a week physically in the office of tender opening authority. Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD deposited with any division of CPWD and other documents scanned and uploaded are found in order.

The bid submitted shall be opened at 03:30 PM on **30.11.2026**

10. The bid submitted shall become invalid and e-Tender processing fee shall not be refunded if:

(i) The bidder is found ineligible.

(ii) The bidder does not upload scanned copies of all the documents stipulated in the bid document.

(iii) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of bid opening authority.

(iv) If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

11. The contractor whose bid is accepted will be required to furnish performance guarantee in favour of **Executive Engineer, Lucknow-II, CPWD** at specified percentage of the tendered amount as mentioned in schedule E and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks in accordance with the prescribed form.. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses/ registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of aforesaid provisions by the subcontractors, if any engaged by the contractor for the said work within the period specified in Schedule F.

12. **The description of the work is as follows: Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External**

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Development work under ICMR at CHC Nagram, Lucknow (U.P.). (The Building to G + 1, Basic drawings are attached for references).

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances, which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site, whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost, all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise, specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The Competent Authority, for & on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.

15. The Competent Authority, for & on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.

16. The contractor shall not be permitted to bid for works in the CPWD Circle (Division in case of contractors of Horticulture/Nursery category) responsible for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Central Public Works Department or in the Ministry of Housing and Urban Affairs. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.

16. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.

17. The bids for the work shall remain open for acceptance for a period of 30 (thirty) days from the date of opening of bids in case of single bid system ~~and 75 (seventy five) days from the date of opening of technical bids in case bids are invited in 2 or 3 bid system~~.

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Further

(i) If any tenderer withdraws his tender within 7 days after last date and time (15:00 Hrs.) of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 50% of the earnest money absolutely, irrespective of letter of acceptance for the work is issued or not.

(ii) If any tenderer withdraws his tender after expiry of 7 days after last date and time (15:00 Hrs.) of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 100% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.

(iii) Withdrawal of the tender, by the tenderer, shall only be made through e-tender portal. Any other method i.e. through letter / e-mail etc. shall not be considered. The tender inviting authority gets intimation through SMS and e-mail in this regard.

(iv) In case of forfeiture of earnest money as prescribed in para (i) and (ii) above, the bidders shall not be allowed to participate in the re-bidding process of the same work.

18. This notice inviting Bid shall form a part of the contract document. The successful bidder/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-

(a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

(b) Standard C.P.W.D. Form 7/8 or other Standard C.P.W.D. Form as applicable.

19. **For Composite Bids**

19.1.1 The Executive Engineer in charge of the major component will call bids for the composite work. The cost of bid document and Earnest Money will be fixed with respect to the combined estimated cost put to tender for the composite bid.

19.1.2 The bid document will include following three components:

Part A:- CPWD-6, CPWD-7/8 including Schedule A to F for the major component of the work, Standard General Conditions of Contract 2023 Construction works as modified and corrected up to previous day of last date of submission of bids.

Part B:- General / specific conditions, specifications and schedule of quantities applicable to major component of the work.

Part C:- Schedule A to F for minor component of the work (competent authority under Clause 2 and Clause 5 shall be same authority as mentioned in Schedule A to F for major components), General/specific conditions, specifications and schedule of quantities applicable to minor component(s) of the work.

19.1.3 The bidders must associate himself, with agencies as per NIT conditions.

19.1.4 The eligible bidders shall quote rates for all items of major component as well as for all items of minor components of work.

19.1.5 After acceptance of the bid by competent authority, the EE in charge of major component of the work shall issue letter of award for & on behalf of the President of India. After the work is awarded, the main contractor will have to enter into one agreement with EE in-charge of major component and has also to sign two or more copies of agreement depending upon number of EE's/DDH in-charge of minor

components. One such signed set of agreement shall be handed over to EE/DDH in-charge of minor component(s).
EE of major component will operate Part A and Part B of the agreement.
EE/DDH in charge of minor component(s) shall operate Part- C alongwith Part A of the agreement.

19.1.6 Entire work under the scope of composite bid including major and all minor components shall be executed under one agreement.

19.1.7 Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works.

19.1.8 The main contractor has to associate agencies for specialized component(s) conforming to eligibility criteria as defined in the bid document and has to submit detail of such agency(s) to Engineer-in-Charge of relevant component(s) within prescribed time. Name of the agency(s) to be associated shall be approved by Engineer-in-Charge of relevant component(s).

19.1.9 In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in- Charge of relevant specialized component(s).

The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-Charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.

19.1.10 The main contractor has to enter into MoU with agency(s) associated by him. Copy of such MoU shall be submitted to EE/ DDH in charge of each relevant component as well as to EE-in-charge of major component. In case of change of associate contractor, the main agency(s) has to enter into MoU/agreement with the new contractor associated by him.

19.1.11 Running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor components shall be made by the Engineer- in-Charge of the discipline of minor component directly to the main contractor. The CMB shall be maintained independently by Engineer-in-Charge of major and minor components.

19.1.12A. The composite work shall be treated as complete when all the components of the work are complete. The completion certificate of the composite work shall be recorded

by Engineer-in-Charge of major component after record of completion certificate of all other components.

19.1.12B. Final bill of whole work shall be finalized and paid by the EE of major component. Engineer(s) in charge of minor component(s) will prepare and pass the final bill for their component of work and pass on the same to the EE of major component for including in the final bill for composite contract.

20. The intending bidders are required to update their profile in CPWD e- tender portal and to upload their bids well in advance of last date of submission of tender. Any issue related to updating profile/uploading tender can be resolved through the concerned Executive Engineer/ Assistant Engineer (Phone no 05224074129 e- mail Id:- **eelcd2cpwd.lu-up@gov.in**) or ERP helpline no. 18001803286 or e-mail ld cpwd.support@techmahindra.com. The e- tendering bidders are also advised not to wait to raise any issues till the last date of submission of bid in their own interest.

21. Price Preference to SC/ST individual contractor for item rate/percentage rate tender:

Price preference in quoted item rate/percentage rate tender shall be applicable to the individual enlisted/non-enlisted SC/ST contractor as under:-

(i) For work(s) upto and equal to an estimated cost of Rs. 2.70 lakh a price preference upto 5% (with reference to the lowest valid tender) may be allowed in favor of individual SC/ST enlisted/non-enlisted contractor. No earnest money is required in such case(s).

(ii) For work(s) beyond an estimated cost of Rs. 2.70 lakh and upto and equal to estimated cost of Rs. 6.20 lakh, the price preference upto 5% (with reference to the lowest valid tender) may be allowed in favour of individual enlisted SC/ST contractor. However, earnest money at a reduced rate of ½% may be accepted in such cases.

The price preference upto 5% (with reference to the lowest valid price bid) may be allowed in favour of individual SC/ST contractor only. The above concession shall be allowed only after verification of the individual contractor's claim of belonging to SC/ST community

Executive Engineer
Lucknow-II
CPWD, Lucknow

***To be filled in by Executive Engineer.**

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GOVERNMENT OF INDIA

CENTRAL PUBLIC WORKS DEPARTMENT

CPWD-7

PERCENTAGE RATE TENDER & CONTRACT FOR WORKS

(A) Tender for the work of: **Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**

(i) To be uploaded by **03:00 PM** on **30.11.2026** at https://etender.cpwd.gov.in or www.cpwd.gov.in

(ii) To be opened in presence of tenderers who may be present at **03:30** PM on **30.11.2026** in the office of **Executive Engineer, Lucknow-II, C.P.W.D., Lucknow.**

TENDER

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work "**Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**

I/We hereby tender for the execution of the work specified for the President of India with in the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for **Thirty (30)** days from the date of opening of technical bid and not to make any modification in its terms and conditions.

I/We have deposited EMD for the prescribed amount in the office of concerned Executive Engineer as per the bid document.

A copy of earnest money deposit **receipt of prescribed amount deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed)** issued by a **Commercial** Bank, is scanned and uploaded (strike out as the case may be). If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and

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conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tenderingprocess of the work.

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in CPWD in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee.

I/We hereby declare that I/We shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information/derived there from to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated

Signature of Contractor

Witness:

Postal Address

Address:

Occupation:

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ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on behalf of the President of India for a sum of ……..…….. (Rupees …… …… …… ……).

The letters referred to below shall form part of this contract agreement:

(a)

(b)

(c)

For & on behalf of President of India

Signature ……..

Dated: Designation …….

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PROFORMA OF SCHEDULES

(Separate Performa for Civil, Elect. ~~& Hort. Works~~ in case of Composite Tenders) (Operative Schedules to be supplied separately to each intending tenderer)

SCHEDULE 'A'

Schedule of quantities **(Attached Page No. 90 to 128)**

SCHEDULE 'D'

Extra schedule for specific requirements/document for the work, if any. **Nil**

SCHEDULE 'E'

Reference to General Conditions of contract – Applicable GCC is GCC for Construction works 2023, as modified and corrected up to previous day of last date of submission of bids.

Name of Work: Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).	
Estimated cost of the work:	
Civil Items of Work	**Rs. 3,88,51,432/-**
Electrical Items of Work	**Rs. 1,44,85,565/-**
Total	**Rs. 5,33,36,997/-**
Earnest money	**Rs. 10,66,740/- (to be returned after receiving Performance Guarantee)**
Performance Guarantee	a) 5% of the tendered value or Estimated Cost Put to Tender (ECPT) (whichever is higher) b) Where the tendered amount is less than eighty percent (80%) of the Estimated Cost Put to Tender (ECPT), the Performance Guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tender amount.
Security Deposit	2.5% of the tendered value

SCHEDULE 'F'

GENERAL RULES & DIRECTIONS:

Officer inviting tender	**Executive Engineer, Lucknow-II, CPWD, Lucknow**

Definitions:

2(vii) **Engineer-in-Charge**

For Civil items of work **Executive Engineer, Lucknow-II, CPWD, Lucknow.**

For Electrical items of work **Executive Engineer (Elect.), Lucknow, CPWD, Lucknow**

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	~~For horticulture items of work~~	~~**DD(Hort.), Lucknow Horticulture, CPWD, Lucknow**~~
2(viii)	Accepting Authority	**Chief Engineer (Lucknow), CPWD, Lucknow**
2(ix)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(x)	**Standard Schedule of Rates:**	
(a)	Civil Items of Work:	Delhi Schedule of Rates 2023 & Market rates.
(b)	Electrical Items of Work:	As mentioned in electrical part
	~~Horticulture Items of Work:~~	~~As mentioned in horticulture part.~~
2(xi)	Department:	Central Public Works Department
9(ii)	Standard CPWD contract Form:	GCC 2023 for Construction Works, CPWD Form-7/8 as modified and corrected up to previous day of last date of submission of bids.

Clause 1	i) Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance. ii) Maximum allowable extension **with late fee @ 0.1% per day of Performance Guarantee amount beyond the period as provided in (i) above**	07 Days 03 Days
Clause 2	Authority for fixing Compensation under Clause 2	**Chief Engineer (Lucknow), CPWD, Lucknow.**

Clause 5	**Applicable**	
	(i) Number of days from the date of issue of letter of acceptance for reckoning date of start	**10 Days or date of handing over of site which ever is later.**
	(ii) Time allowed for execution of work	**12 Months**
	(iii) Mile stones	**See on Page No. 89**

Clause 5.1 (iv) : Monthly time and progress chart containing upto date progress of work shall be for work done during previous month submitted by the agency on or before 5th day of every month failing which, a non refundable recovery @ Rs. 5000/- per week basis shall be made from running account bill without any notice in this regard.

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Clause 5.4

(i)	**Authority to convey the decision of shifting of mile stone and extension of time- Executive Engineer, Lucknow-II, CPWD, Lucknow.**
(ii)	**Authority to decide rescheduling of mile stone and extension of time- Chief Engineer (Lucknow), CPWD, Lucknow or successor thereof or Higher authority.**
(iii)	**Shifting of date of start in case of delay in handing over of site- Chief Engineer (Lucknow), CPWD, Lucknow or successor thereof or Higher authority.**

PROFORMA OF SCHEDULE clause 5 Schedule of handing over the site

Part	Portion of site	Description	Time period for handing over reckoned from date of issue of letter of intent
Part-A	Portion without any hindrance	Full site	10 (Ten) days
Part-B	Portion with encumbrances	NA	NA
Part-C	Portion dependent on work of other agencies	NA	NA

Clause 6 : Computerized Measurement Book/ Electronic Mode of Measurement : EMB through CPWD ERP Portal.

Clause 7 Gross work to be done together with net payment / Adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment — **Rs. 32.00 lakh**

Clause 7A Whether Clause 7A shall be applicable — **Yes**

(No Running Account Bill shall be paid for the work till the applicable labour licences, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-charge).

Clause 8 Competent Authorities to inspect and issue Part/ Final Completion Certificate — **Executive Engineer, CPWD, Lucknow-II or successor thereof or Higher authority**

Clause 8A Authority to decide compensation on account if contractor fails to submit completion plans. — **Chief Engineer (Lucknow), CPWD, Lucknow**

Clause 10A List of testing equipment to be provided by the contractor at site lab. — See as on Page 29 & 30

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Clause 10 B (ii) Whether clause 10-B (ii) shall be applicable. **Not Applicable**

Clause 10C **Applicable**

Component of Labour expressed as percent of total value of work	25%

Clause 10CC **Not Applicable**

Clause 10CC to be applicable in contracts with stipulated period of completion exceeding the period shown in next column. Schedule of component of other Materials, Labour, POL etc. for price escalation	**12 Months**
~~1. Cement component~~	~~**11%**~~
~~2. Labour component~~	~~**25%**~~
~~3. Civil component of other construction materials,~~	~~**28%**~~
~~4. E&M (Electrical and Mechanical) component of Construction Materials~~	~~**22%**~~
~~5. POL (Diesel) component.~~	~~**Nil**~~
~~6. Reinforcement steel based/TMT bars/structural steel (including strands and cables) component.~~	~~**14%**~~
~~7. Bitumen component~~	~~**Nil**~~
~~**Total**~~	~~**100%**~~

Clause 11	**Specification to be followed for execution of work:**
For Civil items of work	CPWD Specifications 2019 Vol. 1 and Vol. 2 with correction slips issued up to day previous to last date of submission of tender (Hereinafter called CPWD specifications also)
For Electrical items of work	As per electrical component
~~For Hort. items of work~~	~~As per Hort. Component~~

(i) Building Information Model (BIM) is applicable and

BIM professional to be deployed by contractor- : **Not Applicable**

Clause 12		
Type of work	**Construction Work**	
12.2	**Deviation limit beyond which Clause 12.2 shall apply**	**100%**

Clause 16	**Competent Authority for Deciding reduced rates:**	
	For Civil items of work	**Chief Engineer (Lucknow), CPWD, Lucknow or successor thereof or Higher authority.**

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	For Electrical items of work	**Chief Engineer (Lucknow), CPWD, Lucknow or successor thereof or Higher authority.**
	~~For Horticulture items of work~~	~~**Chief Engineer (Lucknow), CPWD, Lucknow or successor thereof or Higher authority.**~~

Clause 18	List of machinery, tools & plants to be deployed by the contractor at site as & when required	**As per Page No. 77**
Clause 19C	**Authority to decide penalty for each default**	**Chief Engineer (Lucknow), C.P.W.D., Lucknow or successor thereof.**
Clause 19D	**Authority to decide penalty for each default**	
Clause 19G	**Authority to decide penalty for each default**	
Clause 19K	**Employment of skilled / semi skilled workers.**	**Applicable**

Clause 25 Conciliator /Arbitrator

(i) Conciliator	**:**	**ADG(Lucknow), CPWD, Lucknow**
(ii) Arbitrator Appointing Authority	**:**	**Chief Engineer (Lucknow)**
(iii) Place of Arbitration	**:**	**Lucknow**

Clause 32	**Requirement of Technical Representative(s) and Recovery Rate**						
Sl. No.	**Minimum Qualification of Technical representative**	**Discipline**	**Designation (Principal Technical/Technical representative**	**Minimum experience (Years)**	**Number**	**Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of Clause 32**	
						Figures	Words
1	Graduate Engineer Or Diploma Engineer	Civil	Project Manager	5 (and having experience of one similar nature of work)	1	Rs. 25,000/- per month per person	Rs. Twenty five Thousand per month per person
2	Graduate Engineer Or Diploma Engineer	Civil	Project Planning /quality/billing Engineer	2 Or 5 respectively	1+1	Rs. 15,000/- per month per person	Rs. Fifteen Thousand per month per person

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers.

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Diploma holder with minimum 10 years relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Clause 38

i)	a)	Schedule/ statement for determining theoretical quantity of cement & bitumen on the basis of **Delhi Schedule of Rates 2023** printed by CPWD	**D.S.R. 2023 with** correction slips up to day previous to the last date of submission of bids
ii)		**Variations permissible on theoretical quantities**	
	a)	Cement for works with estimated cost put to tender not more than Rs. 25 lakhs.	**3% plus/minus**
		For works with estimated cost put to Tender is more than Rs. 25 lakhs	**2% plus/minus**
	b)	Bitumen all works	**2.5% plus & nil on minus side.**
	c)	Steel reinforcement and structural steel Sections for diameter, section and category.	**2% plus/minus.**
	d)	All other materials	**Nil**

C I O	}	**A. E. (P)**	**E. E. (Civil)**

GENERAL REQUIREMENTS FOR THE TENDER

Name of Work: **Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**

1 The tenderer is advised to read and examine the tender documents for the work and the set of drawings available with Engineer-in-charge. He should inspect and examine the site and its surroundings by himself before submitting his tender.

2 Separate schedule of quantity is included in this tender for civil and electrical items of work. If the tenderer wants to offer any unconditional rebates on their rates, the same should also be offered in the respective components of civil and electrical schedule separately. The contractor shall quote the percentage rates in figures and words accurately so that there is no discrepancy in rates written in figures and words.

3 Time allowed for the execution of work is **12 Months**.

4 The contractor(s) shall submit a detailed program of execution in accordance with the master programme/milestone within ten days from the date of issue of award letter.

5 Contractor has to arrange and install **Semi -Automatic batching plant** in case, concrete is prepared at site during the currency of work and nothing extra will be paid on this account.

6 Quality of the project is of utmost importance. This shall be adhered to in accordance with the provisions of CPWD specifications and guidelines given in the relevant paras.

7 The contractor (s) shall make his own arrangements for electricity and water required for the execution of work.

8 **Cement shall be arranged by the contractor himself.**

9 **Steel Reinforcement shall be arranged by the contractor himself.**

10 Contractor has to use specialized agencies for specialized items of works such as water proofing treatment work, sewage treatment plant, effluent treatment plant, BIM Services and other specialized items as mentioned in the tender documents. Only those specialized agencies/firms who have satisfactorily executed works as per following criteria during last seven years are eligible for the specialized works-

(a) Three similar works each costing not less than 40% of estimated cost for concerned sub head.

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Or

(b) Two similar works each costing not less than 60% of estimated cost for concerned sub head.

Or

(c) One similar work costing not less than 80% of estimated cost for concerned sub head.

Approval of the specialized agencies for each specialized work shall be obtained from the Engineer-in-Charge within one month of award of work. Even if, such specialized items of work shall be executed by the specialized agencies, the work shall be deemed to be executed by the tenderer for all purposes and the responsibility of the quality of items of works executed etc. shall continue to be that of the tenderer only.

11 Contractor has to deploy required Plant and machinery on the project. **Minimum number of plant and machinery to be deployed by him is indicated at Page No. 77**. In case the contractor fails to deploy the plant and machinery whenever required and as per the direction of the Engineer-in-charge, he (Engineer-in-charge) shall be at a liberty to get the same deployed at the risk and cost of the contractor.

12 The contractor shall submit the running bills in the shape of the computerised MB in pages of A-4 size as per the standard format of department and shall act as per modified clause 6 of CPWD-7

13 Contractor has to provide reinforcement cover blocks made of approved proprietary pre packed free flowing mortars (Conbe extra as manufactured by M/s Fosroc Chemical India Ltd. or approved equivalent) of high early strength.

14 The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time.

PART-B

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MATERIAL AND QUALITY ASSURANCE

1. The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted. He shall have to submit quality assurance programme within two weeks of the award of work. The quality assurance programme should include method statement for various items of work to be executed along with check lists to enforce quality control.

2. The contractor shall get the source of all other materials, not specified else where in the document, approved from the Engineer-in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/ make of various materials not specified in the agreement, to be used for the approval of the Engineer-in-Charge along with samples and once approved, he shall stick to it.

3. The contractor shall submit shop drawings of staging and shuttering arrangement, aluminum work, Steel truss work and other works as desired by Engineer In Charge for his approval before execution. The contractor shall also submit bar bending schedule for approval of Engineer –in – charge before execution.

4. Test Laboratories :

A) Laboratory at site : As per requirement and direction of Engineer-in-Charge.

The contractor shall at his on expense establish a testing lab at site and provide testing equipment and materials for the field tests mentioned in the list of mandatory tests given in CPWD Specifications 2019 Vol. 1 & 2. Nothing extra shall be payable to him on this account.

The representatives of the department shall be at liberty to inspect the testing facilities at site and conduct testing at random in consultation with Engineer in charge. The contractor shall provide all necessary facilities for the purpose. The laboratory shall be equipped, inter alia, with the following equipments:

a) **Balances:**

i) 7 kg to 10 kg capacity, semi-self indicating type – Accuracy 10 gm.

ii) 500 gm capacity, semi-self indicating type Accuracy 1 gm.

iii) Pan Balance- 5 kg Capacity- Accuracy 10 gm.

b) **Ovens-** Electrically operated, thermostatically controlled upto 1100C- Sensitivity 10C.

c) **Sieves:** as per IS: 460

i) IS Sieves – 450 mm internal dia of sizes 100 mm, 80 mm, 63 mm, 50 mm, 40 mm, 25 mm, 20 mm, 12.5 mm, 10 mm, 6.3 mm, 4.75 mm, complete with lid and pan.

ii) IS Sieves – 200 mm internal dia (brass frame) consisting of 2.36 mm, 1.18 mm, 500 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid and pan.

d) Sieve shaker capable of 200 mm and 300 mm dia sieves, manually operated with timing switch assembly.

e) Equipment for slump test- slump cone, steel plate, taping rod, steel scale, scoop.

f) Equipment for concrete testing

i)	Concrete cube moulds 15x15x15cm.	18 Nos.
ii)	Pruning Rods 2Kg weight length 40cm and ramming face 25mm	1 No.
iii)	Extra Bottom plates for 15cm cube mould	6 Nos.
iv)	Standard Vibration table for cubes	1 No
v)	Dial gauges 25 mm travel- 0.01 mm/division Least count-	1 No.
vi)	Fully automatic compression testing machine of 100 tonne capacity.	1 No.
vii)	Construction water testing kits	1 No.

Not less than 90% tests for material be performed at site lab with above stated equipment's, however at least 10% testing of materials shall be got done from external laboratories. However, for the tests to be carried out by the external laboratories, the contractor shall supply free of charge all the materials required for testing, including transportation. If the tests which were to be conducted in the site laboratory are conducted in other laboratories for any the reasons the cost of such tests shall be borne by the contractor.

B) Other Laboratories :

B1 The contractor shall arrange carrying out all tests required under the agreement through the laboratory as approved by the Engineer-in-Charge and shall bear all charges in connection therewith including charges for testing for all materials which shall be borne by the contractor.

C)* Sampling of Materials*:

C1 Sample of building materials fittings and other articles required for execution of work shall be got approved from the Engineer-in-Charge. Articles manufactured by companies of repute and approved by the Engineer-in-Charge shall only be used. Articles bearing BIS certification mark shall be used in case the above are not available, the quality of samples brought by the contractor shall be judged by standards laid down in the relevant BIS specifications. All

materials and articles brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-Charge which shall be preserved till the completion of the work.

C2 The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-Charge.

C3 BIS marked materials except otherwise specified shall be subjected to quality test at the discretion of the Engineer-in-Charge besides testing of other materials as per the specifications described for the item/materials. Wherever BIS marked materials are brought to the site of work, the contractor shall if required, by the Engineer-in-Charge furnish manufacturers test certificate to establish that the material produced by the contractor for incorporation in the work satisfies the provisions of BIS codes relevant to the material and/or the work done.

C4 The contractor shall procure all the materials in advance so that there is sufficient time to testing and approving of the materials and clearance of the same before use in work.

C5 All materials brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.

C6 The contractor shall be fully responsible for the safe custody of the materials issued to him even if the materials are in double lock and key system.

C7 The Stone aggregate/stone, sand shall be brought from any quarries subjected to the said materials confirm CPWD specifications.

5 The day to day receipt and issue accounts of different grade/brand of cement shall be maintained separately in the standard proforma by the Engineer-in-Charge of work and which shall be duly signed by the contractor or his authorised representative.

6 The contractor shall render all help and assistance in documenting the total sequence of this project by way of photography, slides, audio-video recording etc. Nothing extra shall be payable to the contractor on this account. However cost of photographs, slides, audio/videography etc shall be born by the department.

7 The contractor shall be fully responsible for the safe custody of materials brought by him issued to him even though the materials are under double lock key system.

8 Separate cement registers showing the receipt of the OPC and PPC shall be maintained at site. The contractor shall construct separate godowns for storage of OPC & PPC at site and nothing extra on this account shall be payable.

9 Cement issued shall be for consumption at site only. No cement for factory made items and those not manufactured at site shall be issued.

10 In case there is any discrepancy in frequency of testing as given in the list of mandatory test and that in the individual sub-head of work as per CPWD Specifications 2019 Vol. 1 & 2 the higher of the two frequencies of testing shall be adopted.

11 Maintenance of Works Register:

(i) All the register of tests to be carried out at construction site or in outside laboratories shall be maintained by the contractor which shall be issued to the contractor by Engineer-in-Charge in the same manner as being issued to CPWD field staff.

(ii) The test registers to be issued to the contractor are :

a) Materials at site account register.

b) Cement register.

c) Master test registers.

d) Cube test register.

e) Paint register.

f) Drawing register.

(iii) All the entries in the register will be made by the designated engineering staff of the contractor and same should be regularly reviewed by JE/AE/EE.

(iv) Contractor shall be responsible for safe custody of all the test registers.

(v) Submission of copy of all test registers, material at site register along with each alternate running account bill and final bill shall be mandatory. These registers should be duly checked by AE(P) in division office.

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ADDITIONAL CONDITIONS FOR CEMENT

1 The contractor shall procure PPC conforming to IS: 1489 (Part 1) as required in the work from reputed manufacturers of cement such as ACC, Ultratech, Shree Cement, JK Cement, Century Cement, Prism Cement, Ambuja or from any other reputed cement manufacturer having a production capacity not less than 1 million tons per annum as approved by Chief Engineer / ADG, CPWD, Lucknow.

2 The supply of cement shall be taken in 50 kg. bags bearing manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-charge and got tested in accordance with provisions of relevant BIS codes. In case the test results indicate that the cement arranged by the contractor does not conform to the relevant BIS codes, the same shall stand rejected, and it shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer- in-charge to do so.

3 The cement shall be brought at site in bulk supply of approximately 50 tonnes or as decided by the Engineer- in- charge. The cement godown of the capacity to store a minimum of 2000 bags of cement or decided by NIT approving authority in case less than 100 MT cement is required for work, shall be constructed by the contractor at site of work for which no extra payment shall be made.

4 Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the Engineer-in-Charge or his authorized representative and the keys of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of the cement godown. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge at any time.

5 The cement shall be got tested by the Engineer-in-charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. **All expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor.**

6 The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 38 of the contract and shall be governed by conditions laid therein. In case the cement consumption is less than theoretical

consumption including permissible variation, recovery at the rate so prescribed shall be made after ensuring structural soundness and stability on the basis of testing. In case of excess consumption, no adjustment shall be made.

7 The cement brought to the site and the cement remaining unused after completion of the work shall not be removed from site without the written permission of the Engineer-in-charge.

8 The damaged cement shall be removed from the site immediately by the agency on receipt of a notice in writing from the Engineer-in-charge. If he does not do so within 3 days of receipt of such notice, the Engineer-in-charge shall get it removed at the cost of the contractor.

SPECIAL CONDITION FOR STEEL REINFORCEMENT BARS

1. The contractor shall procure TMT bars /Low Alloy Steel of Fe 500 D (BAR SET-I) or more grade from steel producers such as **SAIL, Tata Steel Ltd, RINL, Jindal Steel & Power Ltd and JSW Steel Ltd** or their authorized dealers**.**

   1.1 TMT bars (BAR SET-I) shall meet the provisions of IS 1786 (latest version) (Indian Standard specifications for high strength deformed steel bars and wires for concrete reinforcement) pertaining to Fe 500 D (BAR SET-I) or more grade of steel. (DG, CPWD, New Delhi OM vide No. CSQ/SE(TAS)/Steel/2024/262-H dated 14-08-2024 may be referred copy attached)

2. The contractor shall have to obtain manufactures certificate stating the process of manufacture, chemical composition and test sheet giving results of each mechanical test applicable to the materials and submit and furnish to the Engineer-in-charge in respect of all supplies of steel brought by him to the site of work. Each test certificate shall indicate the number of cast to which it applies, corresponding to the number or identification mark to be found on the material.

3. Steel bars brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use. Samples of each confinement shall be taken and got tested by the Engineer-in-charge for chemical composition and physical properties (including bend and re-bend test) as per the provisions in this regard in the relevant BIS codes from any Govt. or approved laboratory. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications, the same shall stand rejected and it shall be removed from the site of work by the contractor at his cost within a week time of written orders from the Engineer-in-charge to do so.

4. The steel reinforcement shall be brought to the site in bulk supply of 30 tonnes or more or as directed by the Engineer-in-charge.

5. The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent distortion & corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

6. For checking nominal mass, tensile strength, bend test, re-bend test etc. specimens of sufficient length shall be cut from each size of the bar at random at frequency not less than that specified below:

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Size of bar	For consignment below 100 tonnes	For consignment over 100 tonnes
Under 10 mm dia bars	One sample for each 25 tonnes or part thereof	One sample for each 40 tonnes or part thereof
10 mm to 16 mm dia bars	One sample for each 35 tonnes or part thereof	One sample for each 45 tonnes or part thereof
Over 16 mm dia bars	One sample for each 45 tonnes or part thereof	One sample for each 50tonnes or part thereof

7. **All the expenditure to be incurred for testing of samples, e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor.**

8. If the quantity of steel actually used in the work is found to be more than the theoretical quantity of steel including authorised variation, nothing extra shall be payable to the contractor on this account. In the event of it being discovered that at any stage or after the completion of the work the quantity of steel used is less than the quantity ascertained as herein before provided (allowing variation on the minus side as stipulated in clause 38). The cost of quantity of steel so less used shall be recovered from the contractor at rate as specified in schedule 'F'. Decision of the Engineer-in-Charge in regard to theoretical quantity of steel which should have been actually used and recovery of the rate specified shall be final and binding on the contractor. In case the contractor brings surplus quantity of steel the same after completion of the work will be removed from the site by the contractor at his own cost after approval of the Engineer-in-Charge.

9. The standard sectional weights referred to as in Table 5.4 under para 5.3.4 in CPWD specifications for works 2019 Vol. 1 will be considered for conversion of length of various sizes of MS bars, Tor steel bars and TMT bars into standard weight.

10. Records of actual sectional weight shall also be kept dia-wise & lot-wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of

steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as derived actual weight.

11. If the derived weight as in para 10 above is lesser than the standard weight as in para 9 above, the derived actual weight shall be taken for payment.

If the derived actual weight is found more than the standard weight then the standard weight as worked out in para 9 above shall be taken for payment. In such case nothing extra shall be paid for the difference between the derived actual weight and the standard weight.

12. Mixing of different type of steel/different grades of steel shall not be allowed in the same structural members as main reinforcement to satisfy clause 26.1 of IS:456.

13. Tolerances on Nominal Mass (individual sample) shall be as under:-

Sl. No.	Nominal size mm	Tolerances on the Nominal Mass, percentage
1	Upto and including 10	-8%
2	Over 10 upto& including 16	-6%
3	Over 16	-4%

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तकनीकीअनुप्रयोग एवंमानक एकाई
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E-9156762

No. CSQ/SE(TAS)/Steel/2024/ 262-80 Dated: 14/08/2024

OFFICE MEMORANDUM

Subject:- Guidelines for use of TMT steel /Low Alloy Steel reinforcement Bars in CPWD worksand enlistment of the steel manufactures in respect of TMT steel /Low Alloy Steel reinforcement Bars in CPWD.

1. The Ministry of Steel, through notification dated 12.05.2016 and order dated 9.8.2016, abolished classification of steel producers as Integrated steel producers, primary steel producers, secondary steel producers, main producers, major producers or others as well as on the basis of process route of steel manufacturing in India.
2. The Ministry of Steel, vide Circular No. 4(13)/2016-SD(I) dated 14.12.2016, reiterated their Notification dated 12.05.2016. They further issued an order dated
09.08.2016, asking the users to ascertain the quality of the steel products, to be procured, as per relevant BIS standards.
3. Para 27.2 of Works Manual 2014 was modified through OM No. DG/MAN/382 dated 06.02.2019. In this OM, under the heading "Special Condition of Steel reinforcement bars", eligibility criteria and other technical parameters were set for steel manufactures. In the eligibility criteria, incorporation details of the company, various licences, certifications, in house testing facility at plant, and refining technologies used for manufacturing of steel and TMT bars (like BF-BOF route, COREX-BOF Route, DRI-EAF route) were cited. Those manufacturers, who met the aforesaid eligibility criteria, could be included in the preferred make list of Notice Inviting Tenders (NITs) of CPWD works.
4. However, CPWD Works Manual 2014 was replaced by CPWD Works Manual 2019 and came into force with effect from 07.03.2019. In CPWD Works manual 2019, para 4.10.1 deals with use of steel and cement in works and states that "*Special conditions shall be incorporated by the NIT approving authority keeping in view the guidelines issued by the Directorate from time to time in this regard which are available on CPWD website*".
5. Since no Criteria /guidelines were available for approval of TMT bars manufacturer after release of the CPWD works manual 2019, an Office Memorandum No. CE(CSQ /SE(TAS) /EE(TAD) /Steel/ 2019/ 497-H dated 27.12.2019 was issued. This OM specified that (i) only ISI marked TMT bars of various grades shall be procured for use in CPWD works, (ii) SDG/ADG shall approve the steel manufacturers based on eligibility criteria and other technical parameters as per OM No. DG/MAN/382 dated 06.02.2019
6. The OM 497-H dated 27.12.2019 was withdrawn and modified guidelines for use of reinforcement bars in structures was issued vide OM No. 50-H dated 17.02.2021. The use of corrosion resistant steel (CRS) reinforcement bars in structures was also mandated vide OM No. 50-H dated 17.02.2021. Further,

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clarification regarding corrosion resistant steel was issued vide OM No. 257-H dated 23.06.2022.

7. The single bench of Hon'ble High Court at Calcutta in the case of SRMB Srijan Private Limited & others V/s Union Of India & Others (W.P.A 9990 of 2020) SRMB Srijan Private Limited & others Vs. Union of India & others With (W.P.A 24267 of 2019) has quashed the modified Clause 27.2 of the CPWD Works Manual of 2014,para 4.10.1 of the CPWD Works Manual of 2019, and consequential Memorandums issued by the CPWD and directed to implement the Notification of the Ministry of Steel, Government of India dated May 12, 2016, the Order dated August 9, 2016 and the reminders of the said Ministry dated December 14, 2016 and February 7, 2017.
8. Subsequently an appeal was filed in Division Bench (DB) of Hon'ble High court at Calcutta by CPWD. In the said case, Hon'ble High court at Calcutta, passed the judgment dated 15.04.2024. The operative part of this judgement reads as "*Accordingly we find no grounds to interfere with the order passed by the Learned single bench except with regard to the direction issued in paragraph 53 of the impugned order whereby the modified clause 27.2 of the CPWD Works Manual has been quashed and instead of quashing the said modified clause 27.2 we direct the CPWD to appropriately amend their Works Manual to be in consonance with the notification issued by the Ministry of Steel, Govt. of India as done by the notifications referred to above.*"
9. In compliance of the above directions of the Hon'ble High Court at Calcutta, an Expert Committee was constituted by DG CPWD vide OM No. CSQ/SE(TAS)/EE(TAD)/Steel/2024/190-H dated 10.06.2024 for deciding the criteria for the selection of steel manufacturers for CPWD works. The expert committee has conveyed their final recommendation {enclosed as annexure I(d)} vide Minutes of Meeting dated 24th July 2024 and the same has been accepted by DG, CPWD. The brief of these recommendations are as follows:

Steel Bars shall be classified as:

a) Bar Set I, if it complies with the requirements given in the latest version of IS 1786, and additional requirement (e.g. Chemical Composition Requirement for Manganese and Copper, Tempered Martensite (TM) Ring Requirement, Marking Requirement and compliance of the provisions of ISO 9001:2015 and ISO 14001:2004) mentioned in the recommendations.

And

(b) Bar Set II, if it complies with the requirements given in the latest version of IS 1786.

The committee has also recommended use of above mentioned Steel Bar sets considering the importance of quality in construction of public structures in different projects of CPWD, on the basis of (a) earth quake zones, (b) environment conditions (coastline and exposure condition), (c) Structure category, and (d) heights of buildings and structures.

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10. Accordingly, it is decided that the reinforcement steel bars produced by plants of SAIL, RINL, TATA, JSW & JSPL which are in wider use in CPWD may be continued to be used as preferred make in the NIT in respect of Bar Set-I mentioned in para no. 9 above and Annexure-1(c). Further, it has also been decided that DG, CPWD may enlist more manufacturer plants for TMT steel/Low Alloy Steel reinforcement Bars on the basis of selection criteria recommended by the Expert Committee. These enlisted manufacturers plants for particular bar set may also be considered for stipulation as preferred make in the NIT depending upon their use.
11. The procedure for enlistment of the steel manufactures in respect of TMT steel /Low Alloy Steel reinforcement Bars in CPWD works is also enclosed herewith as Annexure-I and I (a) to I (f)

This issues with the approval of DG, CPWD.

Encl: As above

(Dinesh Kumar Ujjainia)
Superintending Engineer (TAS)

Copy to (Through CPWD Website):

The SDG (Chennai) / SDG (Chandigarh) / SDG (Kolkata) / SDG (Mumbai) for information please.

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Annexure-I

PROCEDURE FOR ENLISTMENT OF THE STEEL MANUFACTURES IN RESPECT OF TMT STEEL / LOW ALLOY STEEL REINFORCEMENT BARS IN CPWD WORKS.

1. The following procedure shall be adopted for enlistment of the manufacturers, in respect of TMT steel / Low Alloy steel reinforcement bars of different diameter and grades for use in CPWD works.

i. All manufacturers having their manufacturing plants in India are eligible for enlistment in CPWD subject to the condition that they are producing steel bars of different grades conforming to the latest version of IS 1786.

ii. The Thermo Mechanically Treated (TMT) steel / Low Alloy steel reinforcement bars conforming to IS:1786 must be manufactured using iron ore, virgin or processed with necessary refining facilities. The rolling / processing facilities, from iron making to finished steel reinforcement bar, may be owned by the same company or its subsidiary company (ies). In this regard the necessary proof may be submitted along with application.

iii. The eligible manufacturer shall apply **online** to CPWD website portal to **SDG (Chennai, Chandigarh, Kolkata, & Mumbai)** on their letter head along with requisite details in prescribed application **(as per Annexure-I(a)** along with documents **(as per Annexure-I (b).** The manufacturer shall mention name and location of plants to be enlisted for supply of steel reinforcement bar and shall pay enlistment fee of Rs. 1,00,000.00 (Rs. One Lac Only) per plant. The manufacturer is required to pay total enlistment fees to CPWD through e-payment in **Account Number 244189- AE(Cash), CSQ, NirmanBhawan, New Delhias per Annexure-I (f)** and receipts of payment shall be enclosed with the application form.

iv. The enlistment fee, once paid, is non-refundable due to any reason. Therefore, manufacturers are advised to ensure that they fulfil the eligibility requirements and possess all necessary documents for enlistment before payment.

v. The online application submitted along with documents will be scrutinized by the **CE (Works & TLQA) O/oSDG (Chennai,**

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Chandigarh, Kolkata, & Mumbai) and shortcoming (s) or deficiency (ies) in the submitted application, if any, will be communicated to the applicants through online portal. The applicants will be allowed to submit clarifications or information online within a period of one month from the date of intimation of shortcomings.

vi. If the manufacturer fails to submit the required clarifications or information within one month from the date of intimation of shortcomings, the application shall be summarily rejected and no further communication shall be entertained. The enlistment fees shall be forfeited.

vii. All the relevant clarifications and/or information received within the time period shall be considered and if found in order, such manufacturer shall be informed about the dates of plant (s) visit by the team of CPWD officers consisting of **one SE**, **one EE and one AE (to be nominated by respective SDG)**.

viii. On site verification of documents, submitted at the time of application, will be done by the CPWD team, during the plant(s) visit. Further, the testing of individual bars of particular grade (s), at each plant, shall be carried out in the lab available at plant in presence of CPWD team and representative of manufacturer **(as per Annexure-I(c))**. The entire testing process shall also be video recorded.

ix. CPWD team, at each plant, shall also collect the samples (i.e. one sample consist of three bars) of each diameter of different grades and sealed in presence of manufacturer's representative. The type testing of these samples shall be done in one of the designated lab of National Test House, IITs, NITs and NCCBM in presence of CPWD representatives. The dates of testing of samples in the designated laboratory shall be decided by the manufacturer in consultation with the lab authorities and CPWD team. The entire testing process, including opening of sealed samples, shall be video recorded.

x. After plant visit by the CPWD team, a report along with photographs / video of the plants and results of the tests conducted during visit shall be uploaded on the portal within 5 working days.

xi. The results of the type tests, conducted in the designated lab, shall be uploaded on the portal within 5 working days of receipt of the same.

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xii. After getting all the test reports, complete case along with documents and recommendation of respective SDG **(Chennai, Chandigarh, Kolkata, & Mumbai)** will be sent to CE, CSQ (Civil),CPWD, NirmanBhawan, New Delhi.

2. A committee comprising of following officers will evaluate the case received from SDG **(Chennai, Chandigarh, Kolkata, & Mumbai)** for the enlistment of steel manufactures' plant for reinforcement bar of different grades on the basis of criteria given in **annexure-I(d)** in CPWD Directorate, NirmanBhawan, New Delhi.

ADG (Tech)	-	Chairman
CE (Project)	-	Member (to be nominated by ADG (Tech)
CE, CSQ (Civil)	-	Member
SE(Design)	-	Member (to be nominated by ADG (Tech)
SE (TAS)	-	Member Secretary

The committee will recommend the steel manufacturers' plant for enlistment or otherwise to DG, CPWD for his approval.

3. The approval of the competent authority shall be intimated to the respective manufacturer in respect of a particular plant for each diameter of different grades of steel under category Bar Set I / Bar Set-II
4. If, no bar diameter of specific grade of steel of the particular plant of a manufacturer is found suitable, then he will be intimated accordingly. The manufacturer may apply afresh next time when applications are re-invited for enlistment. In case of rejection of application, the decision of the CPWD shall be final and binding on the applicants.
5. **Validity of Enlistment**: The enlistment of manufacturer's plant for particular bar diameter and grade of steel shall be valid for a period of 3 (three) years from the date of issue of enlistment order. The enlistment shall be open to review by the enlisting authority i.e. Director General, CPWD at any time. In case any adverse report is received against the manufacturer, the enlistment is liable to be suspended/cancelled/or manufacturer can be black listed for future enlistment in CPWD or any other action as deemed fit (as per **Annexure-I(e)**).

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Annexure-I(a)

Application for Enlistment OF THE STEEL MANUFACTURES IN RESPECT OF TMT STEEL / LOW ALLOY STEEL REINFORCEMENT BARS and re-enlistment (Supporting documents annexed with the application form should be uploaded as per Annexure-I(b))

1. (a)Name of the applicant ... .

(b)Status of entity (Limited Liability Partnership/Ltd. Company).....

2. Address

(a) Registered Office.....

(b) Head Office (if different from Registered office).....

3 Contact Details

(a) Name of contact person and Designation.....

(b) Telephone Number.....

(c) Mobile Number .....

(d) Email Id.....

(e) Website URL (If any) .....

4 Detail of Plant (s) for which Enlistment applied:

i. (a) Name of Plant.....

(b) Location.....

ii. (a) Name of Plant.....

(b) Location.....

5. Enlistment fee(s) detail (Fees Rs. 1,00,000.00 per Plant) :

(a) Transactions Reference Number .....

(b) Transaction Date.....

(c) Amount.....

6. Certificates (Strike out whichever is not applicable)

a. I/We (including all partners) certify that I/we have read the Rules for Enlistment of steel manufacturer in CPWD as amended upto date and shall abide by them.

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b. I/We certify that I/we are not enlisted and will not get myself / ourselves registered as steel manufacturer in the Department under more than one name.
c. I/We have neither employed nor shall we employ any person within one year of his retirement from the Government except with the prior permission of the Government.
d. I/We will not make changes in the owner ship of the company without prior intimation to department.
e. I/We have not declared or is in the process of being declared bankrupt, insolvent, wound up, dissolved or partitioned.
f. I/We have not been removed/suspended/blacklisted/debarred/restrained from the business by any central /state government department/PSUs.

I/We certify that the information given above is true to the best of my/our knowledge. I/We understand that if any information is found incorrect, our enlistment is liable to be cancelled and I may be blacklisted / suspended / debarred for future enlistment in CPWD.

Place :

Signature of applicant

Date:

(Authorized Signatory)

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Annexure-I (b)

A. Documents required to be submitted with application:

1. Documents regarding Ownership / Promoters of the manufacturing plant, its head office address, location and address of steel manufacturing facility.
2. If any subsidiary company(ies) exists, then documents regarding Ownership / Promoter ship of the subsidiary company, Subsidiary company's address and its relation with main company, location and address of manufacturing units of subsidiary company.
3. Copies of Certificate of Incorporation & Memorandum of Article of Association of Main Company.
4. Approval/ enlistment of manufacturer company by CPWD (in past), or any other Central/State Government departments/PSUs for use of steel reinforcement bars.
5. Document and Production process flow diagram / chart of steel making for production of TMT and Low alloy steel (Corrosion Resistant Steel) Reinforcement bars for Fe 415D, Fe 500D,and Fe 550D of bar sizes 8 mm to 45 mm dia.
6. Document related to Quality Assurance Plan adopted in manufacturing of steel and calibration record of measuring and testing equipments.
7. Authenticated copies of BIS certificate for billets (IS 2830 : 2012) & BIS certificate for TMT bars (IS 1786 :2008) (with up to date Amendment)
8. Copy of ISO-9001:2008 (Quality Management System), Quality Management System, ISO-14001:2004 (Environment Management System).
9. The CO2 emission per kg of steel production.
10. Whether manufacturer is blacklisted/suspended/debarred/restrained from business by any Central / State Government Department or PSU for poor quality of reinforcement steel bar (if any) supplied by the company.
11. Test results of bars as per Annexure-I(c).

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Annexure- I(c)

Testing requirement for individual reinforcement bar diameter of Particular Grade of steel:

Tests required for Fe 415D, Fe500D, Fe550D grade of steel and Low alloy steel reinforcement bars:

A. **FOR BAR SET- I**

1. Tests as per IS 1786 (latest version) and specified therein

1.1 Chemical Properties

Ladle analysis of steel for above grades for maximum percentage of constituents

i. Carbon (C), (ii) Sulphur (S) and (iii)Phosphorous (P) and (iv) Nitrogen and Carbon Equivalent

1.2 **Physical Properties**

(i) 0.2 percent proof stress / yield stress, minimum, N/mm2.

(ii) Ratio of Tensile Strength (Ts) to Actual Yield Strength (or 0.2 % of yield stress (Ys)) of the test piece N/mm2.

(iii) Elongation, percent, Minimum, on gauge length $5.65\sqrt{A}$, where *A* is the cross-sectional area of the test piece.

(iv) Total elongation at maximum force, percentage, minimum on gauge length $5.65\sqrt{A}$, where A is the cross-sectional area of the test piece.

(v) Bend test and re-bend test.

(vi) The mean area of ribs (in mm2) per unit length (in mm) above the coreof the bar, projected on a plane normal to the axisof the bar.

(vii) Pull-out testing in accordance with IS 2770 (Part 1)

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2. **Additional requirement**

2.1 Permissible limit for Manganese and Copper as follows:

Constituent	Permissible Limit (% of cast metal quantity)		
	Fe 415 D	Fe 500 D	Fe 550 D
Manganese (Mn)			
Maximum	1.60	1.60	1.60
Copper (Cu)			
Maximum	0.80	0.80	0.80
Minimum	0.20	0.20	0.20

Notes:

The above composition shall be obtained as per latest version of IS 228

1. Manganese using Periodate Spectrophotometric Method **(Part 12),** and
2. Copper using Thiosulphate Iodide Method (**Part 15)** or Spectrophotometric (Diethyl Dithiocarbonate) Method **(Part 21)**

2.2 Tempered Martensite Ring Test as per Annexure-I (d).

2.3 The process of manufacturing steel shall comply with the provisions of ISO9001: 2015 and ISO14001: 2004.

(B)FOR BAR SET-II

1. The test requirements given in para 1.1 and 1.2 above.

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Annexure-I(d)

1. CRITERIA FOR CLASSIFICATION OF BARS

The steel bars manufactured in India shall be classified as specified hereunder for the purposes of their use in works of CPWD.

1.1 Process of Classification

Steel Bars shall be classified as *Bar Set I* and *Bar Set II*. The bars shall be placed under one of these categories based on *Type Test* (the test performed to select the bars) performed as specified hereunder. These tests to be performed are those specified in the latest version of **IS 1786** published by the Bureau of Indian Standards, and the additional tests mentioned in Para **2** of this document.

The *Type Test* shall be performed at any one of the National Test Houses, IITs, NITs, and NCCBM, subject to:

(a)The test samples being collected from the manufacturing facility by the representative engineer of CPWD,

(b) The availability of the required test facility at the said laboratory, and

(c) The test being witnessed by representative engineer of CPWD.

1.2 Classification of Steel Bars

The bar shall be classified as:

(1) *Bar Set I*, if it complies with the requirements given in the latest version of **IS: 1786**, and those given in Para **2** of this document, and

(2) *Bar Set II*, if it complies with the requirements given in the latest version of **IS 1786**.

2. ADDITIONAL REQUIREMENTS

Four additional requirements as specified hereunder.

2.1 Chemical Composition Requirement

The permissible limits of additional elements shall be as per **Table 1**.

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Table 1: Permissible limits of additional elements

Constituent	Permissible Limit (% of cast metal quantity)		
	Fe 415 D	Fe 500 D	Fe 550 D
Manganese (Mn)			
Maximum	1.60	1.60	1.60
Copper (Cu)			
Maximum	0.80	0.80	0.80
Minimum	0.20	0.20	0.20

Notes:

The above composition shall be obtained as per latest version of **IS 228**:

(1) Manganese using Periodate Spectrophotometric Method (**Part 12**), and

(2) Copper using Thiosulphate Iodide Method (**Part 15**) or Spectrophotometric (Diethyl Dithiocarbonate) Method (**Part 21**).

2.2 TM Ring Requirement

The following two requirements shall be met with:

(1) Does the *Tempered Martensite(TM) Ring* satisfy the visual analysis as per **Step 1** of **Table 2**; and

(2) The thickness of the TM Ring obtained as per **Step 2** of **Table 2** shall be between 0.07f and 0.15f, where f is the *original nominal diameter* of the bar.

(a) Test Procedure

The following is the procedure:

(1) The test setup to capture the *Cross-Sectional Phase Distribution (CSPD)* of the TMT bars shall be as shown in **Figure 1**.

(2) Steel bars may be cut using handsaw or an abrasive cutter with continuous supply of coolant to limit the temperature of steel, and thereby avoid any transition or changes in *Tempered Martensite(TM)* and *Ferrite-Pearlite (FP)* phases (**Figure 2**). The sharp edges of cut bars should be smoothened using

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silicon carbide abrasive sheets. A metal polishing machine can be used to achieve effective smoothening.

(3) The smoothened steel specimen shall be moulded in cold setting epoxy with good surface finish. Setting time of epoxy is about 10-15 minutes.

(4) The moulded specimen surface shall be course polished using abrasive sheets of 80, 150, 220, 320, and 600 grit sizes in sequence. Specimens shall be micro-etched using Nital (5% Nitric acid in alcohol) to capture the CSPD.

(b) Measurements

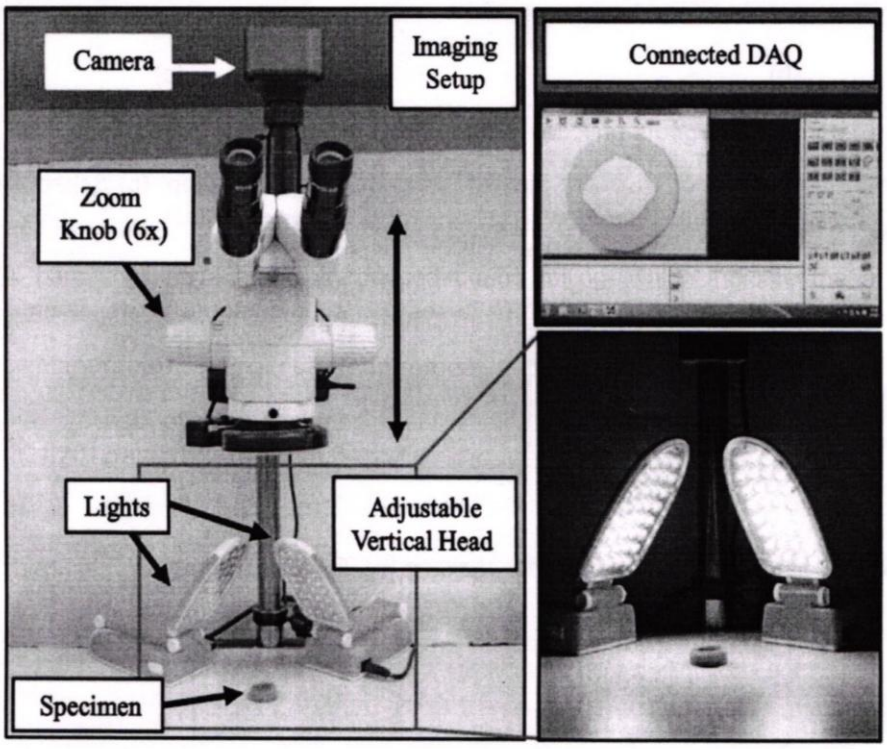
The procedure for obtaining the *CSPD* of the TM Ring along the perimeter shall be as per **Table 2**.

2.3 Marking Requirement

All bars shall have marks introduced during rolling, which indicate the *name of manufacturer* or *brand name*, and *grade of steel*.

2.4 Manufacturing Process Requirement

The process of manufacturing steel shall comply with the provisions of ISO 9001:2015 and ISO 14001:2004.



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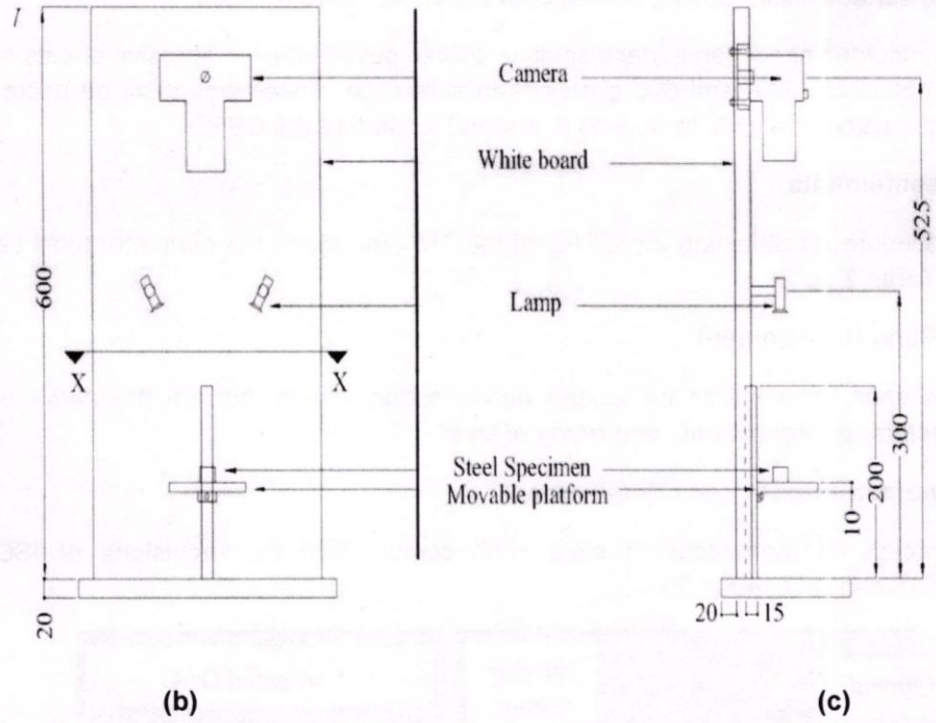


Figure 1: Test setup for CSPD of the TMT bars: (a) Imaging Setup, (b) Schematic Front View (c) Schematic Side View

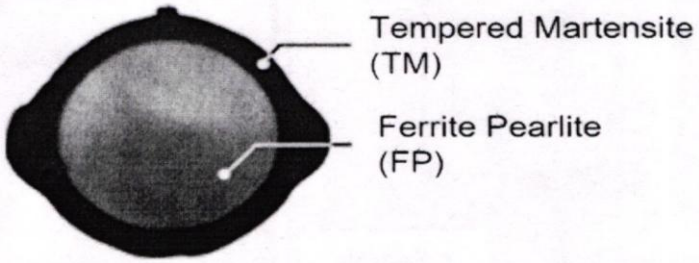


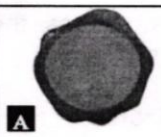
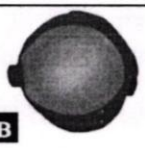
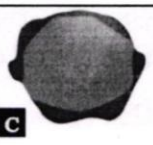
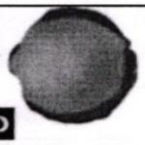
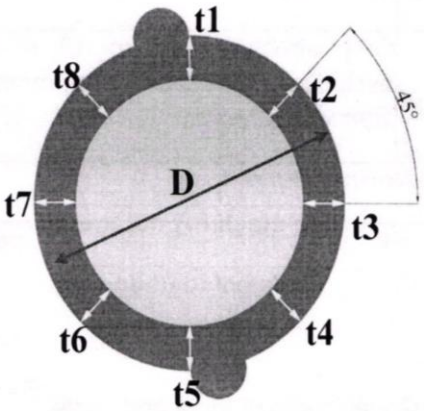
Figure 2: Cross-section of the steel bar showing the TM and FP areas

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Table 2: Method of obtaining CSPD of TM Ring

Step 1: Visual Analysis of etched Cross-Section				
	 A	 B	 C	 D
	Acceptable	*Not acceptable*	*Not acceptable*	*Not acceptable*
1.	Is a dark grey peripheral region and light grey core seen as in Case A?			Yes/No
2.	Does the dark grey peripheral region form a continuous outer ring?			Yes/No
Step 2: Dimension Analysis of TM-Ring thickness				
3.	Diameter D *(mm)* of the steel bar			
4.	**Geometry**		t_1	
			t_2	
			t_3	
			t_4	
			t_5	
			t_6	
			t_7	
			t_8	
			Measured t_{min} *(mm)*	
			Measured t_{max} *(mm)*	
5.	Is the measured $t_{min} \geq 0.07$ f ?		Yes / No	
	Is the measured $t_{max} < 0.15$ f ?		Yes / No	

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3. GUIDELINES FOR USE OF STEEL BARS IN DIFFERENT PROJECTS

Considering the importance of quality in construction of public structures, the basis for use of bars in different projects of CPWD shall be as given in **Table 3**.

Table 3: Use of *Bar Sets I* and *II* in CPWD Projects

S.No.	*Consideration*	*Bar Set I*	*Bar Set II*
1.	**Earthquake Zones**	All zones	Only *Earthquake Zone II*
2.	**Environment Conditions**		
	(a) Coastline	All conditions	Beyond *10 km* from the coastline of India
	(b) Exposure Conditions	All exposure conditions as per **IS 456** (latest version)	Only *Mild* and *Moderate* Exposure Conditions as per **IS 456** (latest version)
3.	**Structure Category**	All categories	*OnlyNormal Buildings* as per **Table 4** and standalone *Normal Structures* as per **Table** 5.
4.	**Heights of Buildings and Structures**	All heights	Only structures up to 12 m height excluding *staircase headroom* and *liftmachine rooms*

Table 4: List of *Normal Buildings*

Residential or Non-Residential Buildings with occupancy less than 100 persons, *excluding*:

(1) Educational buildings,
(2) Buildings of strategic importance,
(3) Buildings and structures identified by Government of India and State Governments to be critical for governance or Disaster Management,
(4) Hospital buildings,
(5) Buildings that house the control or operations of utilities (for example, water, power, and sewage disposal), and lifeline (for example, communication and transportation facilities) structures,
(6) Buildings related to defense and space applications,
(7) Buildings identified by Government of India, State Governments and UT Administrations to be of *Special Importance*, and
(8) Any other building identified with the approval of DG, CPWD.

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Table:5 List of Standalone Normal Structures

Water Tanks and Water Sumps up to 50,000 liters, and Pump Rooms of area less than 20 m2
Septic Tanks, Sewage Treatment Plants, and Effluent Treatment Plants up to 10,000 liters/day
Bridges and Culverts of spans up to 6 m
Earth Retaining Structures up to 4 m
Compound Walls, Entry Gates, and Small Reception Rooms
Storm Water Drains
Cable Trenches
Parking Structures of single storey
Security Cabins and Sentry Post
Any other structure identified with the approval of Technical Sanctioning Authority of CPWD

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Annexure-I(e)

Grounds for Removal/ Suspension/ Blacklisting/ Debarring of manufacturer from CPWD

1. The manufacturer may be removed/suspended/blacklisted/debarred, if any of the following is established:

i. If found to have given false particulars at the time of Application; or
ii. Has indulged in any type of forgery or falsification of records; or
iii. Changes in the owner ship of the company without prior intimation to department.
iv. Declared or is in the process of being declared bankrupt, insolvent, wound up, dissolved or partitioned or
v. Violates the labour rules and regulations or
vi. Is involved in complaints of serious nature received from any source which have been proved; or
vii. Ceases to fulfil eligibility criteria based on which manufacturer's name was approved; or
viii. Is considered as not required to be in list of CPWD enlisted manufacturer for any other reason considered fit by the enlisting authority; or
ix. Received reports from field units of CPWD for supply of sub-standard quality of steel in more than one occasion; or
x. Has been removed/suspended/blacklisted/debarred/restrained from the business by any central /state government department/PSUs.

2. Whenever, any type of complaint mentioned above at serial number (i) to x), is received against a manufacturer. The manufacturer will be served with suitable show cause notice to give reply within a period of 15 days. After considering the reply/non-reply of the Show cause notice and other facts on records, further action will be taken as deemed fit. In case of Removal/ Suspension/ Blacklisting/ Debarring of the manufacturer, the minimum period will not be less than three years from the date of issue of the order. The re-application/application already under consideration for fresh enlistment of such manufacturer shall not be processed till the period of Removal/ Suspension/ Blacklisting/ Debarring is over. The manufacturer has to apply afresh for enlistment after period of Removal/ Suspension/ Blacklisting/ Debarring is over.

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Annexure-I (f)

Procedure for online payment of enlistment fee

1. Log on to home page of NTR portal on https://bharatkosh.gov.in.
2. Go to "Quick Payment" link on the home page.
3. Select the Ministry/Department "030-Housing and Urban Affairs" from the drop-down menu.
4. Select the purpose as "Enlistment fee from contractor" from the drop-down menu.
5. Click NEXT and Select the DDO as" 244189-AE(CASH),CSQ, NIRMAN BHAWAN, NEW DELHI" from the drop-down menu.
6. Enter the amount of enlistment fee(s) in the amount window.
7. Under Remarks write "enlistment fee for enlistment of steel manufacturer for the plants (i)…., (ii)… ,(iii)…., ".
8. After filling all the mandatory fields in "Depositor's detail", click" Next".
9. Confirm the information entered in the preview and click the "Confirm" button.
10. After confirmation, the portal will open the Payment Gateway.
11. Make payment using the Payment Gateway and download the system generated electronic receipt.

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GENERAL TERMS AND CONDITIONS

1 The order of preference in case of any discrepancy may be read as the following:

i) Nomenclature of items as per schedule of quantities.

ii) Particular specification and special condition, if any.

iii) CPWD specifications.

iv) Architectural Drawings

v) Indian standard specifications of B.I.S.

vi) Sound Engineering Practice

A reference made to any Indian Standard specification in these documents, shall imply to the latest version of that standard. Including such revision/amendments as issued by the bureau of Indian standard upto last date of receipt of tenders. The contractor shall keep at his own cost all such publications of relevant Indian standard applicable to the work at site.

2 Except for the items, for which particular specifications are given or where it is specifically mentioned otherwise in the description of items in the schedule of quantities the work shall generally be carried out in accordance with the "CPWD Specifications 2019 Vol. 1 and Vol. 2 (with upto date corrections slips). (Hereinafter to be referred to as CPWD specifications) and instructions of Engineer-in-Charge. Wherever CPWD specifications are silent the latest IS codes/specification shall be followed.

3 Unless otherwise provided in the Schedule of Quantities/Specifications, the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the work and nothing extra shall be payable to him on account of the same. Extra payment for centering/shuttering, if required to be done for heights greater than 3.5 m shall however be admissible at the rates arrived at in accordance with clause 12 of the agreement, if not already specified.

4 The proposed building is a prestigious project and quality of work is paramount importance. Contractor shall have to engage well experienced skilled labour and deploy modern T&P and other equipment to execute the work. Many items like stone masonry & stone cladding works, stone flooring, structural glazing, PVDF coating aluminium composite panel and other specialised flooring work, Wood work will specially require engagement of skilled workers having experience particularly in execution of such items.

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5 a) The contractor (s) shall inspect the site of work before tendering and acquaint himself with the site conditions and no claim on this account shall be entertained by the department.

b) The contractor (s) shall get himself acquainted with nature and extent of the work and satisfy himself about the availability of materials from kiln or approved quarries for collection and conveyance of materials required for construction.

6 The contractor (s) shall study the soil investigation report for the site, available in the office of the Engineer-in-Charge and satisfy himself about complete characteristics of soil and other parameters of site. However, no claim on the alleged inadequacy or incorrectness of the soil data shall be entertained.

7 The tenderer shall see the approaches to the site. In case any approach from main road is required by the contractor, the same shall be made good, improved and maintained by the contractor at his own cost. No payment shall be made on this account.

8 The contractor (s) shall give to the Municipality, Police and other authorities all necessary notices etc. that may be required by law and obtain all requisite Licenses for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be leviable on account of these operations in executing the contract. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain light and other illumination on for cautioning the public at night.

9 The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night speed limit boards red flags, red lights and providing barriers. He shall be responsible for all dangers and incidents caused to existing / new work due to negligence on his part. No hindrances shall be caused to traffic during the execution of the work.

10 Contractor shall provide permanent bench marks and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural and plumbing drawings

11 The contractor shall make his own arrangement for obtaining electric connection(s) if required and make necessary payments directly to the department concerned.

12 Other agencies doing works related with this project may also simultaneously execute their works and the contractor shall afford necessary facilities for the same. The contractor shall

leave such necessary holes, openings etc. for laying/burying in the work, pipes cables, conduits, clamps, boxes and hooks for fan clamps etc. as may be required for the other agencies. Nothing extra over the Agreement rates shall be paid for doing these.

13 Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The contractor shall be bound to follow all such restrictions/instructions and nothing extra shall be payable on account of the same.

14 The contractor shall fully comply with all legal orders and directions of the Public or local authorities or municipality and adhere by their rules and regulations and pay all fees and charges for which he may be liable in this regard. Nothing extra shall be paid/reimbursed for the same.

15 The building work shall be carried out in the manner complying in all respects with the requirements of the relevant bylaws and regulations of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-charge and nothing extra shall be paid on this account.

16 The contractor shall give a performance test of the entire installation(s) as per standing specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc. and nothing extra whatsoever shall be payable for the same.

17 It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.

18 The structural and architectural drawings shall at all times be properly co-related before executing any work. However, in case of any discrepancy in the item given in the schedule of quantities appended with the tender and Architectural drawings relating to the relevant item, the former shall prevail unless otherwise given in writing by the Engineer-in-charge.

19 The contractor shall maintain in perfect condition, all portions executed till completion of the entire work allotted to him. Where however phased delivery of work is contemplated these provisions shall apply separately to each phase.

20 The entire royalty at the prevalent rates shall have to be paid by the contractor on all the boulders, metals, shingle sand etc. collected by him for execution of the work, directly to the Revenue authority or authorized agents of the State Government concerned or the Central Government, as the case may be.

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21 PROGRAMME CHART

i) The contractor shall prepare an integrated programme chart for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the programme within the stipulated period or earlier as indicated in the mile stones under clause 5 of the contract and submit the same for approval to the Engineer-in-Charge within ten days of the award of the contract.

ii) The programmes chart should include the following:-

a) Descriptive note explaining sequence of various activities.
b) Net work (PERT/CPM/BAR CHART)
c) Programme for procurement of materials by the contractor
d) Programme of procurement of machinery/equipment's having adequate capacity commensurate with the quantum of work to be done within the stipulated period by the contractor.
e) Programme for engagement of labourers (skilled /unskilled) in number.

22 If it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above the contractor shall produce a revised programme showing the modifications to the approved programme to ensure completion of the work within the stipulated time for completion.

23 The submission for approval by the Engineer-in-Charge of such programme or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of Engineer-in-Charge to take action against the contractor as per terms and conditions of the agreement.

24 If the work is carried out in more than one shift or during night no claim on this accounts shall be entertained.

25 Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. The contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.

26 The contractor shall be responsible for the watch and ward/guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.

27 The contractor shall bear all incidental charges for cartage, storage and safe custody of materials issued by department.

28 Any cement slurry added over base surface for continuation of concreting for better bond is deemed to have been built in the items and nothing extra shall be payable for extra cement considered in consumption on this account.

29 The contractor shall take instructions from the Engineer-in-charge for stacking of materials. No excavated earth or building materials etc. shall be stacked/collected in areas where other buildings, roads, services, compound walls etc. are to be constructed.

30 Any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.

31 The contractor shall submit for the approval of Engineer-in-Charge names of specialized agencies of repute along with their technical capacity proposed to be engaged by him, who must have executed satisfactorily works of value as specified in mandatory conditions.

32 The works shall be carried out in accordance with the Architectural drawings and structural drawings, to be issued from time to time by the Engineer-in-Charge. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work and satisfy himself that the information available there of is complete and unambiguous. The discrepancy, if any shall be brought to the notice of the Engineer-in-Charge before execution of the work. The contractor alone shall be responsible for any loss or damage executing by the commencement of work on the basis of any erroneous and or incomplete information.

33 The contractor shall take all precautions to avoid accidents by, exhibiting caution boards day and night, speed limit boards, red flags, red light and providing necessary barriers and other measures required from time to time. The contractor shall be responsible for all damages and accidents due to negligence on his part.

C I O	}	**A. E. (P)** **E. E. (Civil)**

34 Other agencies will also simultaneously execute and install the works of electrification, air conditioning, lifts, fire-fighting etc. for this work and the contractor shall provide necessary facilities for the same. The contractor shall leave such recesses, holes openings etc. as may be required for the electric, air-conditioning and other related works (for which inserts, sleeves, brackets, conduits base pinion, clamps etc. shall be supplied free of cost by the department unless otherwise specifically mentioned) and the contractor shall fix the same at time of casting of concrete, stone work & brick work, if required and nothing extra shall be payable on this account.

35 The contractor shall conduct work so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.

36 All Architectural drawings given in the tender other than those indicated in nomenclature of items are only indicative of the nature of the work and materials/fixings involved unless and otherwise specifically mentioned. However, the work shall be executed in accordance with the drawings duly approved by the Engineer-in-Charge.

37 Samples of all materials and fittings to be used in the work in respect of brand manufacturer and quality shall be got approved from the Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work. Articles bearing BIS certifications mark shall only be used unless no manufacturer has got BIS mark for the particular material. Any material/fitting whose sample has not been approved in advance and any other unapproved material brought by the contractor shall be immediately removed as soon as directed.

38 Unless otherwise specified in the schedule of quantities the rates for all items shall be considered as inclusive of pumping/baling out water, if necessary, for which no extra payment shall be made. Those conditions shall be considered to include water from any source such as inflow of flood, surface and sub-soil water etc. and shall apply to the execution in any season.

39 On completion of work, the contractor shall submit at his own cost four prints of "as built" drawings to the Engineer-in-Charge within 30 days of completion of work. These drawings shall have the following information:

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a) Route of all piping and their diameters including soil waste pipes & vertical stacks.

b) Ground and invert levels of all drainage pipes together with locations of all manholes and connections upto outfall.

c) Route of all water supply lines with diameters, location of control valves, access panels etc.

40 The contractor shall provide site office of 02 rooms having minimum size of 15x10 ft. and 20x10 ft. including required furniture's A/C & attached toilet at location as specified by Employer" including but not limited to following :-

(i) The site office accommodation shall be provided with all necessary furniture, fitted with all electrical items like light, fans, Air conditioners, all office utilities, and complete wiring, water supply, sewerage and drainage etc. along with services of one MTS (multi-tasking services) employee. The contractor shall provide the office accommodation within 01 (One) month from the date of commencement of work failing which the compensation @ Rs. 30,000/- per month shall be recovered from the contractor.

(ii) The contractor shall arrange to maintain the site offices which includes watch and ward, day to day up keeping of the office and surroundings, periodic whitewashing/ color washing of the building including utilities, payment of telephone/electrical/water supply bills etc.

(iii) The cost of construction, cost of all furniture, fittings/fixtures /electrical fittings etc. and cost of maintenance and the related service charges of the building, payment of telephone bills/electricity bills/water charges etc. (till completion of project) is deemed to be included in the quoted rates of work and nothing extra shall be payable. Six months after completion of work, the site office accommodation shall be dismantled and removed from the site after due approval of Engineer-in-Charge and nothing extra shall be paid to the agency on account of this. This site office accommodation shall be maintained properly till completion of work and no claim what so ever shall be entertained on the ground whether the delay in completion of work has been attributable to the Department or to the contractor.

41 No extra payment will be made for operation/activity mentioned at Sl. No. 1 to 40 above unless specifically mentioned otherwise.

42 Condition regarding secured advance :-

Secured advance shall be admissible only on those bonafide materials which are likely to be used in the work in a period not exceeding six months from the date of secured advance payment. If agency fails to use the material (in respect of which secured advance have been paid) in the work in this specified period of six month, the said component of secured advance shall be recovered from next running account bill paid to the agency. Secured advance on the same material shall not be paid again.

C I O	}	**A. E. (P)** **E. E. (Civil)**

PARTICULAR SPECIFICATION

1. EARTH WORK

Any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.

2. *RCC WORK*

The work shall be done as per CPWD specifications.

2.1 If the quantity of cement actually used in the work is found to be more than the theoretical quantity of cement including authorised variation, nothing extra shall be payable to the contractor on this account. In the event of it being discovered that after the completion of the work, the quantity of cement used is less than the quantity ascertained as herein before provided (allowing variation on the minus side as stipulated in clause 38) the cost of quantity of cement so less used shall be recovered from the contractor at the rate as specified in schedule 'F'. Decision of the Engineer-in-Charge in regard to the quantity of cement which should have been actually used as per the schedule and recovery at the rate specified shall be final and binding on the contractor.

2.2 For non-scheduled items, the decision of the Superintending/Chief Engineer regarding theoretical quantity of the cement which should have been actually used shall be final and binding on the contractor.

2.3 Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-Charge.

2.4 In case the contractor brings surplus quantity of cement the same after completion of the work will be removed from the site by the contractor at his own cost after approval of the Engineer-in-Charge.

2.5 Cement register for the cement shall be maintained at site.

Cement bags shall be stored in separate godowns to be constructed by the contractor at his own cost as per sketch (which is only indicative and actual size will depend on the site requirements) given in CPWD specifications with weather proof roofs and walls. Each godown shall be provided with a single shutter door with two locks. The key of one lock shall remain with Engineer-in-charge or his authorized representative and that of the other lock with the authorized agent of the contractor at the site of work so that the cement is issued from the godown according to the daily requirements with the knowledge of both parties and proper account for the same is maintained in the standard proforma.

PROFORMA FOR THE CEMENT REGISTER

PARTICULARS OF RECEIPT

Date of receipt	Quantity received	Progressive total	Date of issue	Quantity issued	Items of work for which issued
1	2	3	4	5	6

PARTICULARS OF ISSUE

Qty. returned at the end of the day	Total issued	Daily balance in hand	Contractor's initial	JE's initial	Remarks (AE/EE's periodical check)
7	8	9	10	11	12

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2.6 DESIGN MIX CONCRETE:

The contractor shall be required to submit two separate design mix of concrete with and without using plasticizers, separately. The decision of the engineer-in-charge to specify the design mix of concrete based on above shall be final.

2.6.1 Coarse aggregate: As per CPWD Specifications

2.6.2 Fine Aggregate: As per CPWD Specifications.

2.6.3 Water: It shall conform to requirements laid down in IS:456 : 2000 and CPWD specifications.

2.6.4 Cement: Cement arranged by the contractor will be PPC (in bags) conforming to IS: 1489-Part-I. If for any reasons, cement other than that specified in this para for example OPC of grade 43 or higher grade is brought to site by contractor, the issue, payments rate as well as the quantity to be used in the design mix concrete will remain unchanged.

2.6.5 Slump: Design slump should be clearly specified in the mix design.

2.6.6 Admixtures shall not be used without approval of Engineer-in-charge. Wherever required, admixtures of approved quality shall be mixed with concrete as specified. The admixtures shall conform to IS: 9103. The contractor shall not be paid anything extra for admixture required for achieving desired workability without any change in specified water cement ratio for RCC/CC work.

2.6.7 The concrete mix design/laboratory tests with and without admixture shall be got done by contractor at his own cost and will be carried out by the contractor through one of the following laboratory/Test houses:

(i) IIT- BHU, Roorkee

(ii) IET- Lucknow

(iii) HBTI- Kanpur

(iv) MNNIT- Allahabad

(v) KNIT- Sultanpur

(vi) Approved Lab/ Govt. Engineering Institutions as directed by the Engineer-in-charge.

(vii) MMM Engineering College, Gorakhpur (UP)

The various ingredients for mix design / laboratory tests shall be sent to the test houses through the Engineer-in-Charge and the samples of such aggregate & cement shall be preserved at site by the department

2.6.8 The contractor shall submit the mix design report from any of above approved laboratory for approval of Engineer-in-Charge with in 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the mix design is approved by the Engineer-in-charge. In case of white cement and the likely use of admixtures in concrete with PPC/white cement the contractor shall design and test the concrete mix by using trial mixes with white cement and/or admixtures also for which nothing extra shall be payable.

2.6.9 In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted at laboratory established at site shall be submitted by the contractor as per the direction of the Engineer-in-Charge.

2.7 APPROVAL OF DESIGN MIX

The mix design for a specified grade of concrete shall be done for a target mean compressive strength Tck=Fck+1.65 s.

Where Fck = Characteristic compressive strength of 28 days

s = Standard deviation which depends on degree of quality control

The degree of quality control for this work is "good" for which the standard deviation (s) obtained for different grades of concrete shall be as below:

Grade of Concrete	For "Good" quality of control
M 25	4.00
M 30	5.00
M 35	5.00
M 40	5.00

Of the six specimen of each set three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28 days

2.8 All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the contractor.

2.9 The batching plant shall conform to IS:4925. It shall have the facilities of presetting the quantity to be weighed with automatic cutoff when the same is achieved. Concreting at places may have to be resorted to through concrete pump for which nothing extra shall be paid.

2.10 All other operations in concreting work like Mixing, Slump, Laying Placing of concrete, compaction curing etc. not mentioned in this particular specification for Design Mix of concrete shall be as per CPWD specification.

2.11 WORK STRENGTH TEST

TEST SPECIMEN

Work strength test shall be conducted in accordance with IS: 456 on random sampling. Each test shall be conducted on six specimens, three of which shall be tested at 7 days and remaining three at 28 days.

TEST RESULTS OF SAMPLE

The test result of the sample shall be the average of the strength of three specimen. The individual variation shall not be more than 15 percent of the average. If more, the test results of the sample are invalid. 90% of the total test shall be done at the laboratory established at site by contractor and remaining 10% in the laboratory of CPWD or in any other laboratory as directed by the Engineer-in-Charge.

Lot size

The minimum frequency of sampling of concrete of each grade shall be according to the following:-

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Quantity of concrete in the work cubic metre per day	Number of samples.
1-10	1
11-30	2
31-60	3
61-100	4
101 & above	4 + one additional sample for additional 50 cubic metre or part thereof.

Note: At least one sample shall be taken from each shift.

2.12 STANDARDS OF ACCEPTANCE- As per CPWD specifications/IS 456 Code

2.13 In case of rejection of concrete on account of unacceptable compressive strength governed by para "Standard of Acceptance" as above the work for which samples have failed shall be redone at the cost of contractors. However the Engineer-in-Charge may order for additional test (like cutting cores, ultrasonic pulse velocity test, load tests on structure or part of structure etc.) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The contractor shall take remedial measures necessary to retain the structure as approved by the Engineer-in-Charge without any extra cost. However for payment the basis of rate payable to contractor shall be governed by the 28 days cube test results.

2.14 Only MS centering/shuttering and scaffolding material unless & otherwise specified shall be used for all RCC. Work to give an even finish of concrete surface. However marine ply shuttering in exceptional cases as per site requirement may be used on specific request from contractor on approval by the Engineer-in-Charge.

2.15 Necessary arrangements shall be made for field tests and all required equipment's shall be arrange by establishing field lab by the Agency for mandatory tests of the materials as specified in CPWD specifications or as per direction of Engineer-in-Charge. No extra payment shall be paid on this account.

3. **READY MIX CONCRETE (RMC)/BATCH MIX CONCRETE FROM RMC PRODUCER**

The contractor shall arrange Ready Mix Concrete (RMC) from the approved RMC producing plants as given in the list of preferred make.

The contractor shall, within a period of 15 days of award of the work, submit text of MOU proposed to be entered between purchaser (the contractor) and supplier (RMC producer) to the Engineer-in-Charge for his approval. The contractor shall draw the MOU with approved RMC producer and submit to the Engineer-in-Charge within a week of such approval. The contractor will not be allowed to use ready mix concrete without completion of above stated formalities.

Notwithstanding the approval granted by the Engineer-in-Charge in aforesaid manner

or provisions in CPWD Specifications 2019, the contractor shall be fully responsible for quality of concrete including input control, transportation and placement etc.

The Engineer-in-Charge will reserve right to inspect at any stage and reject the concrete if he is not satisfied about quality of product at the user's end.

The Engineer-in-Charge reserves the right to exercise control over the:-

(i) Ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting of tests for checking quality of materials, recording of test result and declaring the materials fit or unfit for use in production of mix.

(ii) Calibration check of the RMC plant.

(iii) Weight and quantity check on the ingredients, water and admixture added for batch mixing.

(iv) Time of mixing of concrete.

(v) Testing of fresh concrete, recording of results and declaring the mix fit or unfit for use. This will include continuous control on the workability during production and taking corrective action, if required.

(vi) For exercising such control, the Engineer-in-Charge shall periodically depute his authorized representative at the RMC plant. It shall be responsibility of the contractor to ensure that all necessary equipment, manpower & facilities are made available to the Engineer-in-Charge and/or his authorized representative at RMC plant.

(vii) The contractor shall arrange for sending an SMS on the mobile No. of authorised representative of Engineer-in-Charge as soon as the RMC is despatched from the plant, giving details such as time of despatched, grade of concrete, tipper registration number etc.

The contractor should therefore draw MOU/agreement with RMC producer very carefully keeping in view all terms and conditions/specifications forming part of this document.

All required relevant records of RMC shall be made available to the Engineer-in-Charge or his authorized representative. The Engineer-in-Charge shall as required, specify guidelines & additional procedures for quality control & other parameters in respect of materials, production & transportation of concrete mix which shall be binding on the contractor & the RMC plant. Only concrete as approved in design mix by the Engineer-in-Charge shall be produced in RMC plant and transported to the site.

3.1 QUALITY CONTROL OF READY MIXED CONCRETE

It shall be the responsibility of the contractor to ensure that RMC producer provides all necessary testing equipments and takes all necessary measures to ensure quality control of ready mixed concrete. In general the required measures shall be:-

(i) Control of purchased material quality

RMC producer shall ensure that all the materials purchased and used in the production of concrete confirm to the stipulation of the relevant standards and the requirements of the concrete mix design and quality control procedures. This shall be accomplished by visual checks, sampling and testing, certification from material supplier and

information/date from materials supplier. Necessary equipment for the testing of all materials shall be provided and maintained in calibrated condition at the plant by the RMC producer.

(ii) Control of material storage

Adequate and effective storage arrangement shall be provided by RMC producer at RMC plant for reliable transfer and feed systems, drainage of aggregate, prevention of freezing or excessive solar heating of aggregate, prevention from contamination etc.

(iii) Record of mix design and mix design modification

RMC producer shall ensure that record of mix design and mix design modification is readily available in his computer at RMC plant for inspection of Engineer-in-Charge or his authorized representative at any time. Any modification in mix design shall be done only after the approval of the Engineer-in-Charge.

(iv) Transfer and weighing equipment

RMC producer shall ensure that a documented calibration procedure is in place. Proper calibration records shall be made available indicating date of next calibration due & corrective action taken. RMC producer shall ensure additional calibration checks whenever required by the Engineer-in-Charge in writing to contractor. RMC producer shall also maintain a daily production record including details of customers to whom RMC was supplied including details of mixes supplied. Record shall also be maintained of materials used for each day's production including water and admixtures.

The accuracy of measuring equipment shall be within + 2% of quantity of cement & + 3% of quantity of aggregate, admixture and water being measured.

(v) Maintenance of Plant, Truck Mixers and Pumps

Plant, Truck Mixers and Pumps should be well maintained so as to not hamper any operation of production, transportation and placement of concrete.

(vi) Production of concrete at RMC producing plant

(a) Weighing (correct reading of batch date and accurate weighing):-For each load, printed or graphical records shall be made of the weights of the materials batched, the estimated slumps, the total amount of water added to the load, the delivery ticket numbers for that load and the time of loading the concrete into the truck.

(b) Adequate testing equipments at the plant including equipment for measuring surface moisture content of aggregates shall be provided by the RMC producer.

(c) Making corresponding adjustments at the plant automatically to batched quantities to allow for observed measured or reported changes in materials or concrete qualities.

(d) Sampling of concrete, testing, monitoring of results.

(e) Diagnosis and correction of faults identified from observation/complaints.

(f) Control of designed and the prescribed mixes: a quality control system shall be operated to control the strength of designed mixes to the required levels. The system shall include continuous analysis of results from cube tests.

(vii) Ready mix concrete shall be arranged in quantity as required at site of work. The ready mix concrete shall be supplied as per the pre-agreed schedule approved by Engineer-in-Charge. Noting extra shall be payable on this account.

(viii) The Engineer-in-Charge reserves the right to approve RMC producing plants not mentioned in the list of approved RMC plants if they fulfil all the necessary conditions.

(ix) In case of rejection of concrete for which cubes have failed to achieve the requirement of acceptance criteria as per the CPWD specification, the work done using that RMC shall be rejected and the work shall be redone at the cost of the contractor, however, the Engineer-in-Charge may order for additional tests (like ultrasonic pulse velocity and rebound hammer test etc.) to be carried out at the cost of contractor to ascertain, if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The contractor shall take remedial measures necessary to retain the structure as approved by the Engineer-in-Charge without any extra cost. However, for payment, the basis of rate payable to contractor shall be governed by the 28 days cube test result and reduced rates shall be regulated in accordance with para 5.4.10.5 D (D-3) of CPWD Specifications 2019.

Laying of RMC concrete-All ready mixed designed concrete shall be laid with the help of concrete pump of adequate capacity.

3.2 Transportation, placing and Compaction of Concrete

Mixed concrete from the RMC shall be transported to the point of placement by transit mixers and placed in position through concrete pumps and/or steel closed bottom buckets capable of carrying minimum 0.6 cum concrete is proposed to be transported by transit mixer, the mixing speed shall not be less than 4 rev/min. of the drum nor greater than a speed resulting in a peripheral velocity of the drum 70 m/minutes at its largest diameter. The agitating speed for the agitator shall neither be less than 2 rev/min nor more than 6rev/min of the drum. The numbers of revolution for a uniform mix, after all ingredients, have been charged into the drum unless tempering water is added, all rotation after 100 revolutions shall be at agitating speed of 2 to 6 rev/min and the number of such rotations shall not exceed 250. The general construction of transit mixer and other requirement shall conform to IS: 5892.

4 PRE-CAST RCC WORK

4.1 Pre-cast reinforced concrete units shall be of grade or mix as specified. Provision shall be made in the mould to accommodate fixing devices such as hooks, flats etc. and forming of notches and holes. Each unit shall be cast in one operation. A sample of the unit shall be got approved from Engineer-in-Charge before taking up the work.

4.2 Pre-cast units shall be clearly marked to indicate the top of member and its locations.

4.3 Pre-cast units shall be stored, transported and placed in position in such a manner that these are not damaged.

5 SANITARY INSTALLATIONS, WATER SUPPLY AND DRAINAGE

The work of water supply and sanitary installations shall be got executed by the agency as approved by Engineer-in-Charge.

(i) The entire plumbing drawing and sanitary installation drawing/ details shall be submitted by the contractor and got approved by the Engineer-in-Charge before the execution.

(ii) The entire responsibility for the quality of work will however rest with the building contractor only.

The work of water supply, internal sanitary installations and drainage etc. shall be carried out as per the bylaws of the Municipal Corporation or any other local body and the contractor shall produce necessary completion certificates from such authority after completion of work.

All water tanks, taps, sanitary, water supply and drainage pipes fittings and accessories etc. shall conform to the bylaws and specifications of the Municipal Body/Corporation where CPWD specifications are not available.

The contractor shall engage licensed plumbers for the work and the materials (fixtures/fittings) tested by the local Municipal Body/Corporation wherever required at his own cost. Nothing extra shall be paid/reimbursed for the same.

The contractor shall give a performance test of the entire installation(s) as per standing specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc. and nothing extra whatsoever shall be payable for the same.

The work in general shall be carried out as per CPWD specifications. Rate includes all materials, labour and all the operations mentioned in the respective items unless and otherwise specifically mentioned.

The contractor shall give a satisfactory performance test of the entire installation (s) before the work is finally accepted and nothing extra shall be payable to the contractor on this account.

The contractor shall be responsible for all the protection of sanitary, water supply fittings and fixtures against pilferage and breakage during the period of installation until the completion / handing over of the work.

The contractor shall submit completion plans for water supply internal sanitary installations and building drainage work within thirty days of the date of completion. These plans are to be submitted on drawings prepared preferably through computers (1 original copy + 3 photocopies) on suitable scales to show the general arrangement and desired details.

6. WATER PROOFING TREATMENT

The contractor shall associate himself with the specialized firm, to be approved by the Engineer-in-charge in writing, for water proofing treatment for basement/lower ground floor, underground tank and on roofs. A Noterizied Guarantee Bond on stamp paper of Rs. 100/- should be submitted in the prescribed proforma attached with tender document shall be given by the specialized firm, for a period of 10 years from the date after the maintenance period prescribed in the contract, which shall be counter signed by the contractor as token of overall responsibility. In addition 10% (ten percent) of the cost of water proofing items shall be

retained as guarantee to watch the performance of the work done. However half of this retained amount will be released after five years, if the performance of the work done is found satisfactory. If however any defect is noticed during the guarantee period, it shall be rectified by the contractor within seven days of intimation. In case it is not attended to, the same will be got done by another agency at the risk and cost of the contractor. This guarantee deposit can however be released in full if a bank guarantee of equivalent amount for 10 years is produced and deposited with the department by the contractor.

7. Water Supply & Sanitary Installation:

A Notarized Guarantee Bond on stamp paper of Rs. 100/- should be submitted by the contractor in the prescribed proforma attached with tender document for performance of water supply & sanitary installation work. In addition 5% (Five percent) of the cost of water supply & sanitary installation items shall be retained as guarantee to watch the performance of the work done. Which shall be released after 02 (Two) year to be reckoned from the date after the expiry of maintenance period prescribed in the contract, if the performance of the work done is found satisfactory.

SPECIAL CONDITIONS

1. The contractor shall not store/dump construction material or debris on metalled road.
2. The contractor shall get prior approval from Engineer-in-Charge for the area where the construction material or debris can be stored beyond the metalled road. This area shall not cause any obstruction to the free flow of traffic/inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.
3. The contractor shall take appropriate protection measures like raising wind breakers of appropriate height on all sides of the plot/area using CGI sheets or plastic and/or other similar material to ensure that no construction material dust fly outside the plot area.
4. The contractor shall ensure that all the trucks or vehicles of any kind which are used for construction purposes/or are carrying construction material like cement, sand and other allied material are fully covered. The contractor shall take every necessary precautions that the vehicle are properly cleaned and dust free to ensure that enroute their destination, the dust, sand or any other particles are not released in air/contaminate air.
5. The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.
6. The contractor shall provide all medical help, investigation and treatment to the workers involved in the construction of building and carry of construction material and debris relatable to dust emission.
7. The contractor shall ensure that C&D waste is transported to the C&D waste site only and due record shall be maintained by the contractor.
8. The contractor shall compulsory use water jet in grinding and stone cutting.
9. The contractor shall comply all the preventive and protective environmental steps as stated in the MoEF guidelines, 2010.
10. The contractor shall carry out on-Road-Inspection for black smoke generating machinery. The contractor shall use cleaner fuel.
11. The contractor shall ensure that the DG sets comply emission norms notified by MoEF.
12. The contractor shall use vehicles having pollution under control certificate. The emissions can be reduced by a large extent by reducing the speed of a vehicle to 20 kmph. Speed bumps shall be used to ensure speed reduction. In cases where speed reduction cannot effectively reduce fugitive dust, the contractor shall divert traffic to nearby paved areas.

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13. The contractor shall ensure that the construction material is covered by tarpaulin. The contractor shall take all other precaution to ensure that no dust particles are permitted to pollute air quality as a result of such storage.
14. No extra payment shall be done for leveling course, if required any, to match finishied level of floorings of different materials and thickness as per direction of Engineer-in-Charge.
15. During the execution of work, the finished items i/c tile works, granite work, marble work, kota stone and all other items shall be protected from damages/scratches/broken/discolour etc. by using suitable materials as per direction of Engineer-in-Charge till the completion/handing over of building to user department.

~~**16. Contractor shall have to establish huts for labours and storage of materials out side MRHRU, ICMR at CHC Nagram, Lucknow (UP). The contractor shall have to arrange space for the same as is acceptable to the local body and nothing extra shall be paid on this account.**~~

17. The contractor shall submit the MEP (Mechanical, Electrical, and Plumbing) drawings and drawings for external services well in advance for approval of Engineer-in-Charge.

~~**18. 5-Star GRIHA Compliance:-**~~

~~a) The scope of work includes achieving a 5-star GRIHA rating. The agency shall execute the work in accordance with the requirements.~~

~~b) The agency shall provide necessary assistance to the GRIHA consultant and GRIHA officials to achieve 5-Star GRIHA.~~

~~c) **The following conditions to be ensured with respect to achieving the GRIHA – 5 star rating in the work:**~~

~~(i) Soil should be stored within the site and covered with trauplin sheet in a suitabble method as recommended by GRIHA. Ensure that topsoil from the excavated area is preserved, stabilized within the site, and its fertility is maintained throughout the construction period.~~

~~**(ii) Documentation and Verification**~~

~~a) The contractor shall submit mix designs, material test certificates, supplier declarations, and quantity records demonstrating compliance with requirements for GRIHA~~

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~~documentation. All materials shall conform to the relevant Indian Standards (IS) and be approved by the Engineer/Consultant before use.~~

~~(iii) Door Shutters must be Urea-formaldehyde free/ From GRIHA product catalogue (As recommended by GRIHA)~~

~~**Any other condition (s) apart from the above which is required to achieve GRIHA 5 star rating in the work shall be ensured by the bidder during the execution of the work as per direction of Engineer-in-Charge.**~~

19. The contractor should provide a helpdesk along with services of 1 carpenter, 1 plumber, 2 Beldar & 1 electrician for a period of 45 days after the date of handing over of the building to the user department for rectifying the issues pointed out by CPWD & user department during taking over process.
20. No extra payment will be made for operation/activity mentioned at Sl. No. 1 to 19 above.

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LIST OF MACHINERY, TOOLS & PLANTS TO BE DEPLOYED BY THE CONTRACTOR AT SITE AS & WHEN REQUIRED

Sl. No.	Name of Equipment	Numbers
1	Excavators (various sizes)	As per requirement of work and direction of Engineer-in-Charge.
	Equipment for hoisting & lifting	
1	Tower Crane	
	Equipment for Concrete work	
1	Semi Automatic batching plant capacity of 20 cum per hours or as per direction of Engineer-in-Charge	
2	Concrete pump (Desirable)	
3	Concrete Transit Mixer	
4	Concrete mixer (diesel)	
5	Concrete mixer (electrical)	
6	Needle vibrator (electrical)	
7	Needle vibrator (petrol)	
8	Surface vibrator	
	Equipment for Building work	
1	Bar bending Machine	
2	Bar cutting machine	
3	Drilling machine	
4	Wall grooving machine for chase cutting	
5	Welding machine i/c transformer	
6	Rig machine	
7	Cube testing machines	
8	M.S. pipes — As per requirement or as directed by Engineer-in- Charge	
9	Steel shuttering	
10	Steel scaffolding	
11	Grinding/polishing machines	
	Equipment for transportation	
1	Tippers	
2	Trucks	
	Pneumatic equipment	
1	Air compressors (diesel)	
	Dewatering equipment	
1	Pump (diesel)	
2	Pump (electric) (Desirable)	
	Power equipment	
1	Diesel Generator (minimum 200 KVA)	

Note: 1. The above list is only indicative and not exhaustive. The Bidder may be required to deploy more T&P as per requirement of work.

2. All the above plants & equipments are to be deployed as and when required or directed by Engineer-in-Charge.

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LIST OF PREFERRED MAKES FOR CIVIL WORKS

Approved makes of materials to be used in the work are as under. In case of non-availability of these makes, the Engineer-in-charge may allow use of alternative BIS makes of materials in the work. Non BIS marked materials may be permitted by the Engineer-in-charge.

Sl. No.	Material description	Proposed make list
1	Acoustic Wall Paneling	
	i) Wooden Slats Panels	Armstrong, Gyptech, Anutone, BSR Calsi Ceilings, Bollard, Tranquil
	ii) Puffed Fabric Finish Panel	Armstrong, Gyptech, Anutone, Bollard, Tranquil
2	Aluminium section	Hindalco, Jindal, Indian Aluminium Co.
3	Aluminium shuttering	Knest, S-form, Durand forms (India) Pvt. Ltd, Mivan, Pabors
4	Aluminium Composite Panel 4 mm thick 'B1' Fire rated (external grade)	Viva, Alstone, Eurobond, Wonder Alu Board, Alutuff, Alex, Aldeko
5	Anodized aluminium hardware	Alualpha, Global, Classic, EBCO
6	AAC Block	MAX Blocks, Biltech ACE, Don Construction Chemicals, UltraTech, Garvit, HIL
7	Adhesive -AAC block Adhesive	UltraTech, Ferrous Crete, Aneeb, JK Cement (JK Tylo), Saint Gobain Weber, Ardex Endura, VURA, Berger, Astral
8	Adhesive -Tile Adhesive Grouts	STP Ltd, Kajaria, BASF, Don Building Chemicals (India) Pvt. Ltd., Ardex Endura, Aneeb, Garware, JK White (JK Tylo), Don Construction Chemicals India Pvt. Ltd., JK Cement, Vura, Berger, Astral, Trimurti
9	CPVC Pipe & fitting	Superme, Raksha, Ashirvad, Prayag Polymers, Birla HIL, AKG, Kothari, Astral, Vigor,
10	Cement (PPC/OPC)	ACC, Ultratech, Shree Cement, JK Cement, Century Cement, Prism Cement, Ambuja
11	Cement (White)	Birla White, JK White or equivalent
12	Centrifugally Cast (Spun) Iron Pipes & Fittings /Hubless pipes & fittings	NECO, Kapilansh, RPMF, SKF, RIF
13	a) CP brass bath fittings (Standard)	Jaquar (Essco), CERA, Johnson, Parryware, Euronics, Polyplast, Asian Paints (EssEss), Kerovit (Kajaria), Essel, RAK, Hindware Limited (Italian), Somany, Prayag, Astral,
	b) CP brass bath fittings (Premium)	Jaquar, Grohe, Kholer, Essel, Roka. Hindware Limited (Queo), Asian Paints (Bathsense),
14	DGU Glass	Gold Plus, Olumpus Toughened, Shankar Fenestration Glasses
15	Distemper- 1st quality acrylic distemper (washable/ ready mix / Low VOC)	Asian Paints (Tractor Aqua Lock Paint), Garware, Berger: Bison lite ICI-Dulux, JK MaxX (Jumbo)], Birla Opus Prime (D-20)
16	Dash fasteners / Clamps/ Anchors	Hilti, Bosch, AFT, Fischer, Wuerth
17	DI Pipes & fittings	Jindal, Electro steel, Tata Ductura, Kapilansh
18	Elastomeric Liquid W.P. membrane with acrylic polymer	Tikidan (Tiki Aquoseal ARR), Don Construction Chemicals, Pidilite, MYK Arment, Berger, Astral, Technonicol
19	Extruded polystyrene insulation board	Dowcorning, Supreme, Analco, Tikidan (DANOPREN Range), Technonicol
20	**False Ceiling System**	
	i) GI Sections for frame work of Gypsum/ Calcium Silicate board	Saint Gobain, Hi-Steel, USG Boral, Western, Anutone, BSR Calsi Ceilings

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	ii) T-grid of GI powder coated for Mineral / perforated Gypsum / Calcium Silicate / Metal/ Glass tiles /GRG ceiling	Saint Gobain, Hi-Steel, USG Boral, Armstrong, Anutone, Western, Bollard, Royal Kraft, BSR Calsi Ceilings
21	**False Ceiling Tiles**	
	i) Perforated GRG tiles	Saint Gobain, USG Boral, Armstrong, Gyptech, Anutone, BSR Calsi Ceilings
	ii) Mineral Fiber tiles	Saint Gobain, Hi-Steel, USG Boral, Armstrong, Anutone
	iii) Glass Fiber Reinforced Gypsum tiles	Saint Gobain, Anutone, BSR Calsi Ceilings
	iv) Metal tiles	Saint Gobain, Hi-Steel, USG Boral, Armstrong, Western, Gyptech, Bollard, Royal Kraft, Anutone, BSR Calsi Ceilings, Tranquil
	v) Calcium silicate tiles	Aerolite, Ramco Hilux or equivalent
22	Fire rated doors	Signum fire protection, Shakti Metdoor, Navair, Promat, Bhawani Fire, Asahi, Supreme Metwood
23	Fire rated stainless steel fittings	Geze, Dorma, Ozone, Dorset, KICH & KICH PR
24	Fire rated glass	AIS, Hero Fire S, Schott, Sanit Gobain, Asahi
25	Floor hardener	Ironite, Perma, STP Ltd., MYK Arment, Berger, Astral
26	Floor spring & door closer	Godrej, Dorset, Ozone, Hardwyn, EBCO, Dormakaba, Geze, KICH & KICH PR
27	Flooring (Epoxy, PU Flooring, Anti-Static, Terrazzo, Car Park Deck, Self-levelling compound)	Beger, Don Construction Chemicals or equivalent.
28	Flush door shutters	Century, Durian, Greenply, Jayna (Jain wood Industries), Airolam, Archidply, Black Cobra
29	FRP doors shutters & frame	Jayna, Fiberways, Jain doors Pvt. Ltd.
30	FRP Drain cover & frame	Fibreways, Dudhi or equivalent
31	FRP Chajja	Fibreways, Dudhi, NECO
32	FRP Manhole Covers	Fibreways, Dudhi, NECO, Astral
33	GI Sections for Dry Wall Cladding / Partition	Western, Saint Gobain,/ Everest/ Trimurti
34	Gypsum plaster	Ferrous Crete, Gyproc, Saint Gobain, Ultra Tech, JK Cement 'Gypso MaxX', Western, Aneeb, Trimurti,
35	Glass (Clear/ Float/ Frosted/ Refractive Glass/ Tinted/ Lacquered)	Saint Gobain, AIS, Modiguard, Gold Plus, Shankar Fenestration Glasses,
36	Glass -Mirror glass	Atul, Modi Guard, Golden Fish, Gold Plus
37	Glass Wool	Dow Corning, UP Twiga, Isover
38	Hand dryer	Euronics, Dolphy, Jaquar
39	HDPE Pipes	Reliance, Jain Pipes, Raksha, Supreme, Kothari, Prayag, Astral
40	HDPE /PVC Membranes for water Proofing	Asian Paints, Berger, Pidilite, MYK Arment, Technonicol
41	HDHMR Board	Black Cobra, Action Tesa, Century Ply, Greenply
42	Hessain Based Bituminous Felt	MAK Felt 46 Kg, STP Ltd. or equivalent
43	Laminates	Action TESA, Greenlam, Century Ply, Airolam, Archidply, Durian, Black Cobra
44	Laminated Glass	Gold Plus, Olumpus Toughened, Shankar Fenestration Glasses
45	Matting's (Trapper, carpet, Aluminium Dust – Buster)	Euronics, Dolphy, Eurotech
46	MS Tubular windows	Navair, Sukriti, Jangid Engineering Works

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47	Melamine polish	Asian Paints melamine gold, Garware, Wudfin of Pidilite, Timbertone of ICI Dulux. Birla Opus Allwood
48	Manhole covers – (CI Manhole covers, frames and Gratings)	NECO, SKF, RPMF, Kapilansh
49	Manhole covers – (SFRC Manhole covers, frames and Gratings)	KK, JAIN, Pargati
50	Modular Kitchen	Godrej, Evok by Hindware, Glanz
51	Modular Expansion Joint	Herculus, MNR, Sanfield India Ltd, DECG (FRANO), Vexcolt, Pinnacle Solutions, V.R. Engineer
52	Pressed Steel door frames	Navair, Sukriti, Jangid Engineering Works
53	Plywood / Veneer	Greenply, Durian, Century, Airolam, Archidply, Black Cobra
54	Multicell Polycarbonate Sheet	GE Plastic, LEXAN, MG Polyplast, Danpal, Fibreways
55	Profile steel sheet	Ezydeck of TATA, Lloyd Superdeck, JSW, Jindal, Fibreways
56	Particle board	Action TESA, Merino, Archidply, Greenlam
57	Paver block & Kerb stone	Pavcon, Mayur, KK, Power, Navya
58	Paint -Acrylic emulsion	Asian Paints: (Premium Interior Emulsion Paint), Garware, Nerolac: Beauty Gold, Berger: Rangoli Total Care, ICI Dulux: Super Cover, JK MaxX (Trendz), Birla Opus Prime (I-50/Calista Everclear),
59	Paint-Premium acrylic	Asian Paints: (Royale Luxury Emulsion), Nerolac: Impression, Berger: Silk, ICI Dulux: Velvet Touch, JK MaxX (Majesta), Birla Opus Prime (One Pure Elegance
60	Paint-Plastic emulsion	Asian Paints (Apcolite), Garware, Nerolac: Impression, Berger (easy clean), ICI Dulux 3in 1, Birla Opus Prime (I-50/Calista Everclear),
61	Paint -Textured Exterior Paint	Luxture, Asian Paints, Nerolac, Garware, Berger Paints, JK MaxX Paints, Birla Opus Prime, UTTPL,
62	Paint -Acrylic smooth exterior paint	Asian Paints: (Apex), Nerolac: Excel Super, Berger: Weather Coat, ICI Dulux: Weather Shield, JK Armour, Birla Opus Prime (E-30/E-50/ Calista Neo Star),
63	Paint -Premium acrylic smooth exterior paint with silicon additive	Asian Paints: Apex Ultima, Nerolac: Excel Total Super, Garware, Berger: Long life7, ICI Dulux : Weather Shield Max, JK MaxX (Maximo), Birla Opus Prime (E-70/One True Look),
64	Paint -Synthetic Enamel Paint	Asian Paints: Apcolite Premium Gloss Enamel, Nerolac: Synthetic Hi gloss, Berger: Luxol Hi gloss, ICI Dulux: Gloss Synthtic enamel, JK MaxX (JK Enamlo), Birla Opus Prime (N-52/N-53/ Sparkle Gloss/ Style Cover Max),
65	Primer-Cement Primer	Nerolac, Berger (BP white), Garware, Asian (Decoprime WT), ICI (White primer), JK MaxX (JK Primera), Birla Opus Prime (I-10/Calista Pro Hide),
66	Primer -Steel primer (Red Oxide Zinc Chromate Primer)	Asian Paints, Nerolac, Garware, Berger, ICI, JK MaxX, Birla Opus – (Red Oxide Primer / CMP RO Primer/ SGE RO Primer),
67	Primer -Wood primer	Asian Paints, Nerolac, Garware, Berger, ICI, JK MaxX, Birla Opus,
68	Paint- Epoxy paint	Asian Paints, Nerolac, Berger, ICI, JK MaxX, Birla Opus
69	Paint- Fire retardant paint	Asian Paints, Akzo Nobel, Wuerth Promat, JK MaxX, Birla Opus
70	PVC Water Tank	Syntex, JS Polyplast, Prayag, Astral, Vectus

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71	PVC/WPC Jali	Black Cobra, Alstone, Rajshree, Jamex
72	PVC Flushing Cistern	Sparsh Pearl, Prima, Cera, Hindware
73	PVC Seat Cover	Sparsh Pearl. Jaquar, Hindware, Kohler
74	PTMT fittings	Shakti, Polyplast, Prima, Raksha, Prayag Polymer, Vectus,
75	Pipe-GI/MS Pipe	Tata, Jindal (Hisar), Prakash Surya
76	Pipe Fittings -GI	Unik, AVR, Zoloto
77	PVC door shutter and frame	Rajshri, Sintex, Jain Door Pvt. Ltd., Black Cobra
78	Polyurea coating for Water Proofing	Asian Paints, Berger, Pidilite, MYK Arment, Technonicol
79	Polyurethane over deck insulation foam	Berger, Technonicol or equivalent
80	Puf Sandwich Panel	Fibreways, Tata, EPACK, Alphapeb
81	Ready Mix Concrete (RMC Plant)	RMC India, Ultratech Concrete, ACC Ready Mix, AVRM India Pvt. Ltd., J.P. Group, Shree Cement Ltd. (Bangur Concrete), JK Cement (JK Super RMC)
82	Reinforcement- (Steel TMT bars)	SAIL, Tata Steel, Rashtriya Ispat Nigam Ltd. (RINL), JSW Steel Ltd, Jindal Steel & Power Ltd
83	Stainless steel railing, Accessories etc.	Jindal, Dormakaba, Ozone, Godrej, KICH & KICH PR
84	SS fittings for doors & window	Jindal, Dormakaba, Global, Dorset, EBCO, Hardwyn, Godrej, Ozone, Geze, Prayag, KICH & KICH PR
85	Sealant – (Silicon based water repellant / weather sealant)	Dow Corning, Waker, BASF, Pidilite (Dr. Fixit / Roff). STP Ltd., Makphalt, Don Construction Chemicals, Tikidan (Tiki Siliseal / Tikiseal PU Range), MYK Arment, Berger
86	Sealant (Poly-Sulphide)	Fosroc, Pidilite (Dr. Fixit/Roff), CAC, BASF, Sika, Don Construction Chemicals, Makphalt, Tikidan (Tiki Polyseal Range), MYK Arment, Berger
87	SW Pipes (BIS approved)	Anand, Parry, Perfect
88	a) Sanitary ware, fittings & accessories (Standard)	Jaquar (Essco), CERA, Johnson. Parryware, Euronics, Asian Paints (EssEss), Kerovit (Kajaria), Essel, RAK, Hindware Limited (Italian), Somany
	b) Sanitary ware, fittings & accessories (Premium)	Jaquar, Grohe, Kholer, Essel, Roka. Hindware Limited (Queo), Asian Paints (Bathsense),
89	Soap & Paper dispenser	Euronics, Jaquar, Essel, Kholer, KICH & KICH PR,
90	Stainless steel Grab Bars & Rails	Euronics, Jaquar, Essel, Dormakaba, KICH & KICH PR
91	Stainless Steel grating	Neer, Asian Paint, Essel, Euronics,
92	Stainless steel sink	Neelkanth, Niralli, Essel, Jayna, Plato, Prima, Prayag
93	SCI S&S Pipes & fittings	RIF, NECO, Kapilansh, RPMF, SKF
94	Tiles- Mosaic tiles/ Chequered Tiles	Ultra Tiles, Nitco, Pavcon
95	Tiles- Glazed Ceramic	Kajaria, Johnson, Somany, RAK, Nitco, Aparna Vitero, Italica, AGL, Orient Bell
96	Tiles- Vitrified Tiles (Antiskid / Matt / Glazed)	Kajaria, Johnson, Somany, RAK, Nitco, Aparna Vitero, Italica, AGL, Orient Bell
97	Tile Grouts	Aneeb, Astral, Don Construction Chemicals, MYK Arment
98	Toilet Cubicles	Merino (Titan Series), Greenlam (Sturdo Classic) or equivalent
99	Toughened Glass	Gold Plus, Olumpus Toughened, Shankar Fenestration Glasses
100	uPVC door/ window / ventilator	Fenesta, Veka, Duroplast, Aluplast, Prominance, Koemmerling, AdvikaFenster, Okotech [IS:17953:2023], Eumax [IS 17953: 2023], Yashpoly (IS 17953:2023], Pabros, Rajshri, Simta Astrix
101	uPVC doors and window hardware	Roto, EBCO, Dorset, GEZE
102	uPVC pipe and fittings	Astral, Supreme, Raksha, Ashirvad, Prayag Polymers, Birla

		HIL, AKG, Kothari, Vigor,
103	Water proofing compounds, (admixtures, plasticizer, super plasticizer, curing compounds)	Fosroc, ROFF/Dr. Aneeb, Fixit (Pidilite Industries), CAC, Perma, Sika, BASF, STP Ltd., Garware, Tikidan (Danomix Range), Birla Opus Prime, Penetron, Don Construction Chemicals, MYK Arment, Berger, Technonicol
104	Water proofing compound (Integral) (with cement for plaster & mortar)	Fosroc: Conplast 421, CAC, Aneeb, Perma, Dr. Fixit : LW+, Sika: Sikacim, STP Ltd., Garware, Tikidan (Danomix LW Range), Birla Opus Prime, Penetron, Don Construction Chemicals, MYK Arment, Berger, Technonicol
105	Water proofing compound (for bathroom/ toilet /balcony & other wet areas)	Fosroc: Bush Bond, Aneeb, Dr. Fixit : Pidifine 2K, Asian Paints: Damp Block 2K, Garware, Perma, CICO: Tapecrete, STP Ltd., Tikidan (Danocrte Range), Birla Opus Prime (C2K, C2K+), Don Construction Chemicals, MYK Arment, Berger, Technonicol
106	Water proofing compound (Crystalline)	Fosroc: Bushbond TGP, CAC, Dr. Fixit : Dr. Fixit Krystalline, Sika: Sika 101h, Aneeb, Perma, Garware, STP Ltd., Tikidan (Tikicryst-BC Range), Penetron, Don Construction Chemicals, MYK Arment, Berger, Technonicol
107	Water Proofing Coatings (Polyurethane, Polyurea, Acrylic Cementitious, SRI Coating, Food grade epoxy coating, Coal tar epoxy, Silicone water repellent coating)	Aneeb, Berger, Technonicol or equivalent
108	WTP -MBBR Reactor, Multigrade Filter and Activated carbon Filter	Degremont, OSDPL, Thermax & Ion Exchange
109	WTP- MBBR Media	Cooldeck, MM Aqua, Eco Aqua & Ion Exchange
110	WPC door shutter and frame	Alstone, Jamex, Rajshri, Plasto Green, Black Cobra
111	Wall putty (cement based)	Asian Paints, Birla Wall Care, Trimurti, Garware, JK White, JK Cement (JK wall MaxX),
112	WPC Board	Jamex, Alstone, Rajshri, Black Cobra

Note : Contractor shall provide applicable warranty of the products/materials being used in the work to the Engineer-in-Charge at time of approved of the product/material & contractor shall finally submit warranty taken from the manufacturer to Engineer-in-Charge for record.

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Annexure-IV

GUARANTEE TO BE EXECUTED BY CONTRACTORS FOR REMOVAL OF DEFECT AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS

The Agreement made this …….day of ……two thousand and …… between …….son of …….of …….(hereinafter called the **Guarantor** of the one part) and the PRESIDENT OF INDIA (hereinafter called Government of the other part).

WHEREAS this agreement is supplementary to a contract (hereinafter called the Contract) dated …….. and made between the **GUARANTOR** of the one part and the Government of the other part, whereby the Contractor, inter alia, undertook to render the buildings and structures in the said contract recited completely water and leak – proof.

AND WHEREAS **GUARANTOR** agreed to give a guarantee to the effect that the said structures will remain water and leak-proof for ten years from the date of giving of water proofing treatment.

NOW THE **GUARANTOR** hereby guarantees that water proofing treatment given by him will render the structures completely leak-proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date after the maintenance period prescribed in the contract.

Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose;

(a) Misuse of roof shall mean any operation which will damage water proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof;
(b) Alteration shall mean construction of an additional storey or a part of the roof or construction adjoining to existing roof whereby proofing treatment is removed in parts;
(c) The decision of the Engineer-in-charge with regard to cause of leakage shall be final.

During this period of guarantee the **guarantor** shall make good all defects and in case of any defect being found, render the building water –proof to the satisfaction of the Engineer-in-Charge at his cost, and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-Charge calling upon him to rectify the defects, failing which the work shall be got done by the Department by some other contractor at the **GUARANTOR'S** cost and risk. The decision of the Engineer-in-Charge as to the cost, payable by the **Guarantor** shall be final and binding.

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That if **GUARANTOR** fails to execute the water proofing or commits breach thereunder then the **GUARANTOR** will indemnify the Principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by him by reason of any default on the part of the **GUARANTOR** in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and / or cost incurred by the Government the decision of the Engineer – in – Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligor ……. and by …….. and for and on behalf of the PRESIDENT OF INDIA on the day, month and year above written.

Signed, sealed and delivered by OBLIGOR in the presence of –

1. …….
2. …….

Signed for and on behalf of THE PRESIDENT OF INDIA by ……..in the presence of –

1. …….
2. …….

C I O	}	**A. E. (P)** **E. E. (Civil)**

Annexure-V

TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF EPOXY/PU FLOORING

The agreement made this _____ day of _____ Two Thousand and _____ between _____ son of _____ (hereinafter called the GURANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part.)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated _____ and made between the GUARANTOR OF THE ONE PART AND the Government of the other part, whereby the contractor inter alia, undertook to render the work in the said contract recited structurally stable, sound material and workmanship.

AND WHEREAS THE GURANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable and guaranteed against faulty material and workmanship, finishing for 2 (Two) years to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable and guaranteed against faulty material and workmanship, finishing for two years to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer-in-charge with regard to nature and cause of defects shall be final.

During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the Guarantor's risk and cost. The decision of the Engineer-in-Charge as to the cost, payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all the defects or commits breach thereunder, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or

damage and/or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents, have been executed by the obligator _____ and _____ by _____ for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGATOR in the presence of:

1. _____
2. _____

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY _____ in the presence of :

1. _____
2. _____

Annexure-VI

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF SANITARY INSTALLATIONS / WATER SUPPLY / DRAINAGE WORK.

The agreement made this..... day of ..... (Two Thousand …… only)..... between .....S/o .....(hereinafter called the GUARANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part)

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated ..... and made between the GUARANTOR OF THE ONE PART

AND the Government of the other part, whereby the contractor inter alia, undertook to render the work in the said contract recited structurally stable, leak proof and sound material, workmanship, anodizing, colouring, sealing.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable, leak proof and guaranteed against faulty material and workmanship, and finishing for five years from the date of completion of work.

NOW THE GUARANTOR hereby guarantee that work executed by him will be free from any leakage, seepage, cracks in pipes, fittings, floor traps and guaranteed against faulty material and workmanship, defective galvanizing for five years to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer-In-Charge with regard to nature and cause of defect shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect to satisfaction of Engineer-in-charge at his cost and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be got done by the Department by some other contractor at the guarantor's cost and risk. The decision of the Engineer-in-Charge as to the cost payable by the Guarantor shall be final and binding.

That if the guarantor fails to make good all defects or commits breach thereunder, then the guarantor will indemnify the principal and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in

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performance and observance of this supplementary agreement. As to the amount of loss and/or damage and or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligator ……. and by …….. and for and on behalf of the PRESIDENT OF INDIA on the day, month and year above written.

Signed, sealed and delivered by OBLIGOR in the presence of –

1. …….
2. …….

Signed for and on behalf of THE PRESIDENT OF INDIA by ……..in the presence of –

1. …….
2. …….

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Milestones of the Contract

Sl. No.	Description of mile stone	Period for completion from date of start in months	Withheld amount for non achievement of mile stone.
1	25% of tendered amount.	03 Month	1.25% of the accepted tendered value.
2	50% of tendered amount.	06 Months	1.25% of the accepted tendered value.
3	75% of tendered amount.	09 Months	1.25% of the accepted tendered value.
4	100% of tendered amount.	12 Months	1.25% of the accepted tendered value.

Recovery for Non Achievement of completion of sample toilet

Sample item	Period for completion from day of start	Recovery amount (Rs.)
Completion of sample toilet in all respect including electrical work.	75 Days after casting of first floor slab.	Recovery of Rs. 15,000/- per fortnight (Non-refundable) till completion of sample toilet.

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Schedule of Quantity					
Name of work : Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).					
Sl.No	**Description**	**Quantity**	**Unit**	**Rate**	**Amount**
1.0	**SH : EARTH WORK**				
1.1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and for all lift, as directed by Engineer-in-charge.				
1.1.1	All kinds of soil	1016.00	cum	177.50	180340.00
1.2	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, for all lift, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
1.2.1	All kinds of soil.	44.00	cum	260.30	11453.00
1.3	Excavating trenches by mechinical / manual means of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, for all depth, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
1.3.1	All kinds of soil				
1.3.1.1	Pipes, cables etc, not exceeding 80 mm dia.	80.00	metre	215.60	17248.00
1.3.1.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia	47.00	metre	352.15	16551.00
1.4	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	1060.00	cum	196.00	207760.00

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1.5	Excavating, supplying, stacking and filling of local earth (including royalty) by mechanical transport upto a lead of 5km also including ramming and watering of the earth in layers not exceeding 20 cm in foundation trenches, plinth, sides of foundation etc. complete for all lift.	506.00	cum	700.50	354453.00
1.6	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	30.00	cum	2123.75	63713.00
2.0	**SH : CONCRETE WORK**				
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 :				
2.1.1	1:5:10 (1 cement : 5 coarse sand (zone-III): 10 graded stone aggregate 40 mm nominal size).	110.00	cum	6518.60	717046.00
2.2	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor etc., up to floor five level, excluding the cost of centering, shuttering and finishing:				
2.2.1	1:1½:3 (1 cement : 1½ coarse sand (zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources).	3.70	cum	10357.55	38323.00
2.3	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	85.00	sqm	749.30	63691.00
3.0	**SH : REINFORCED CEMENT CONCRETE**				
3.1	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases above plinth level up	47.00	cum	11505.50	540759.00

	to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size).				
3.2	Centering and shuttering including strutting, propping etc. and removal of form for:				
3.2.1	Foundations, footings, bases of columns, etc. for mass concrete	120.00	sqm	392.15	47058.00
3.2.2	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	24.00	sqm	842.50	20220.00
3.2.3	Suspended floors, roofs, landings, balconies and access platform	658.00	sqm	927.25	610131.00
3.2.4	Lintels, beams, plinth beams, girders, bressumers and cantilevers	1166.00	sqm	736.40	858642.00
3.2.5	Columns, Pillars, Piers, Abutments, Posts and Struts	708.00	sqm	961.30	680600.00
3.2.6	Stairs, (excluding landings) except spiral-staircases	48.00	sqm	764.95	36718.00
3.2.7	Edges of slabs and breaks in floors and walls				
3.2.7.1	Under 20 cm wide	350.00	metre	208.55	72993.00
3.2.8	Weather shade, Chajjas, corbels etc., including edges	32.00	sqm	951.10	30435.00
3.3	Extra for additional height in centering, shuttering where ever required with adequate bracing, propping etc., including cost of de-shuttering and decentering at all levels, over a height of 3.5 m, for every additional height of 1 metre or part thereof (Plan area to be measured).				
3.3.1	Suspended floors, roofs, landing, beams and balconies (Plan area to be measured)	685.00	sqm	384.30	263246.00
3.4	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.				
3.4.1	Thermo-Mechanically Treated bars of grade Fe-500D or more. **Confirming to BAR Set-I as per additional condition for Steel reinforcement in Tender document.**	48400.00	Kg	107.85	5219940.00
3.5	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete				

	above plinth level.				
3.5.1	Thermo-Mechanically Treated bars of grade Fe-500D or more. **Confirming to BAR Set-I as per additional condition for Steel reinforcement in Tender document.**	31110.00	Kg	107.85	3355214.00
3.6	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 1.10 times of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
3.6.1	All works upto plinth level				
3.6.1.1	Concrete of M25 grade with minimum cement content of 330 kg /cum	360.00	cum	9504.75	3421710.00
3.6.2	All works above plinth level upto floor V level				
3.6.2.1	Concrete of M25 grade with minimum cement content of 330 kg /cum	214.00	cum	9860.40	2110126.00
3.6	Add for using extra cement in the items of design mix over and above the specified cement content therein.	189.00	quintal	733.50	138632.00
4.0	**SH : BRICK WORK**				
4.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in:				
4.1.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	94.00	cum	7132.25	670432.00

4.2	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in :				
4.2.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	91.00	cum	9105.95	828641.00
4.3	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level.				
4.3.1	Cement mortar 1:4 (1 cement :4 coarse sand)	62.00	sqm	1123.80	69676.00
4.4	Brick edging 7cm wide 11.4 cm deep to plinth protection with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 including grouting with cement mortar 1:4 (1 cement : 4 fine sand).	84.00	metre	60.85	5111.00
4.5	Providing and laying Autoclaved Aerated concrete blocks (AAC) masonry with 150mm/ 230mm/ 300mm thick AAC with Grade-I blocks of density 551 to 650 kg/ cum conforming to IS: 2185 (Part 3) in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. (The payment of RCC band and reinforcement shall be made for seperately).	289.00	cum	8333.65	2408425.00
5.0	**SH : CLADDING WORK**				
5.1	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.				
5.1.1	Granite of any colour and shade				
5.1.1.1	Area of slab upto 0.50 sqm	14.00	sqm	5413.50	75789.00
5.1.1.2	Area of slab over 0.50 sqm	146.00	sqm	5136.30	749900.00

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5.2	Providing edge moulding to 18 mm thick marble stone counters, Vanities etc., including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.				
5.2.1	Granite work	139.00	metre	510.95	71022.00
5.3	Extra for fixing marble /granite stone, over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based adhesive, including cleaning etc. complete.	62.00	metre	568.55	35250.00
5.4	Providing and fixing stone slab with table rubbed, edges rounded and polished, of size 75x50 cm deep and 1.8 cm thick, fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the chase with epoxy grout or with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm nominal size) as per direction of Engineer-in-charge and finished smooth.				
5.4.1	Granite Stone of approved shade	2.00	sqm	4051.85	8104.00
5.5	Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of minimum size 300x600 mm as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	378.00	sqm	1267.95	479285.00
6.0	**SH : WOOD AND P.V.C. WORK**				
6.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately).				
6.1.1	Second class teak wood	1.20	cum	142949.70	171540.00

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6.2	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:				
6.2.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	35.00	sqm	2392.65	83743.00
6.3	Extra for providing vision panel not exceeding 0.1 sqm in all type of flush doors (cost of glass excluded) (overall area of door shutter to be measured):				
6.3.1	Rectangular or square	35.00	sqm	199.15	6970.00
6.4	Providing and fixing wooden moulded beading to door and window frames with iron screws, plugs and priming coat on unexposed surface etc. complete :				
6.4.1	2nd class teak wood				
6.4.1.1	50x12 mm	126.00	metre	221.10	27859.00
6.5	Providing and fixing M.S. grills of required pattern in window opening with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete.				
6.5.1	Fixed to window openings with rawl plugs screws and necessary drilling holes in masonry work / CC / RCC and making goods etc all complete.	1904.00	kg	238.35	453818.00
6.6	Providing and fixing IS : 12817 marked stainless steel butt hinges with stainless steel screws etc. complete :				
6.6.1	100X58X1.90 mm	68.00	each	107.10	7283.00
6.7	Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with ISi, IS : 3564, embossed on the body, door weight upto 36 kg to 80 kg and door width from 701 mm to 1000 mm), with double speed adjustment with necessary accessories and screws etc. complete.	17.00	each	983.15	16714.00
6.8	Providing and fixing special quality chromium plated brass cupboard locks with six levers of approved quality including necessary screws etc. complete.				

6.8.1	Size 50 mm	10.00	each	333.95	3340.00
6.9	Providing and fixing aluminium hanging floor door stopper, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade, with necessary screws etc. complete.				
6.9.1	Twin rubber stopper	23.00	each	72.35	1664.00
6.10.	Providing and fixing magnetic catcher of approved quality in cupboard / ward robe shutters, including fixing with necessary screws etc. complete.				
6.10.1	Double strip (horizontal type)	10.00	each	39.70	397.00
6.11	Providing & Fixing decorative high pressure laminated sheet of plain /wood grain in gloss / matt/ suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS : 2046 Type S, including cost of adhesive of approved quality.				
6.11.1	1.0 mm thick	70.00	sqm	897.30	62811.00
6.12	Providing and fixing factory made uPVC glazed/ wire mesh windows/ doors comprising of lead free uPVC multichambered frame, sash and mullion/ coupler (wherever required) extruded profiles having minimum wall thickness of 1.70 mm for Series R1 and R2 profiles and 2.10 mm for Series R3 and R4 profiles conforming to EN: 12608 in any shape, colour and design duly reinforced with galvanized mild steel section made of required shape & size as per CPWD Specification, uPVC extruded glazing beads, interlocks and Inline sash adaptor (whereever required) of appropriate dimension, EPDM gasket, hardware, SS 304 grade fasteners of minimum 8 mm dia. with countersunk head, comprising of matching polyamide PA6 grade sleeve for fixing frame to finished wall as per IS 1367 : Part 1 to 14, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame, sash & mullion (if required) shall be mitred cut and fusion welded/mechanically jointed duly sealed at all corners, including drilling of holes for fixing hardware and drainage of water etc.				

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	After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of approved size and quality, all complete as per approved drawing conforming to CPWD specification & direction of Engineer-in-Charge. Section of steel reinforcement and cross sections of uPVC profiles to be as per design approved by Engineer-in-Charge. Wire mesh/ Glazing of plain/ toughened/ laminated/ double glass unit with/ without high performance coatings as per design requirements and conforming to IS: 3548 & IS: 16231 shall be paid separately.				
	Note:- Structural design proof checked from a Government Engineering Institute, to be provided by the manufacturer for :				
	(i) Sites with basic wind speed > 45 m/sec as per IS 875 – Part 3				
	(ii) Sites with structure height more than 20m for all wind speeds.				
6.12.1	Three track three panels sliding window with two glazed & one wire mesh panels with Aluminium channel for roller track, wool pile, nylon rollers with SS 304 body.				
6.12.1.1	Using R2 series with frame (70 mm & above) x (40 mm & above) & both glazed and fly screen sash (25 mm & above) x (50 mm & above) with zinc alloy (zamak) powder coated touch locks with hook. (Height upto 1.2 metre).	79.00	sqm	10993.55	868490.00
6.12.2	Fixed window / ventilator without mullion / transom.				
6.12.2.1	Using R1 series with frame (33 mm & above) x (35 mm & above). (Height upto 0.90 metre)	5.00	sqm	8247.25	41236.00
6.12.3	Fixed window/ ventilator with mullion/ transom.				
6.12.3.1	Using R1 series with frame (33 mm & above) x (35 mm & above) & mullion (33 mm & above) x (50 mm & above). (Height upto 0.90 metre)	36.00	sqm	9155.20	329587.00
6.13	Providing and fixing frame work for partitions/ wall lining etc. made of 50x50x1.6 mm hollow MS tube, placed along the walls, ceiling and floor in a grid	516.00	kg	166.80	86069.00

	pattern with spacing @ 60 cm centre to centre both ways (vertically & horizontally) or at required spacing near opening, with necessary welding at junctions and fixing the frame to wall/ ceiling/ floors with steel dash fasteners of 8 mm dia, 75 mm long bolt, including making provision for opening for doors, windows, electrical conduits, switch boards etc., including providing with two coats of approved steel primer etc. complete, all as per direction of Engineer-in-charge.				
7.0	**SH : STEEL WORK**				
7.1	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	826.00	kg	133.70	110436.00
7.2	Providing and fixing in position collapsible steel shutters with vertical channels 20x10x2 mm and braced with flat iron diagonals 20x5 mm size, with top and bottom rail of T-iron 40x40x6 mm, with 40 mm dia steel pulleys, complete with bolts, nuts, locking arrangement, stoppers, handles, including applying a priming coat of approved steel primer.	6.00	sqm	11439.60	68638.00
7.3	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer.				
7.3.1	Using flats 30x6mm for diagonal braces and central cross piece	4.00	sqm	5563.75	22255.00
7.4	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
7.4.1	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	1000.00	kg	172.60	172600.00
7.5	Providing and fixing carbon steel galvanised (minimum coating 5 micron) dash fastener of 10 mm dia double threaded 6.8 grade (yield strength 480 N/mm2), counter sunk head, comprising of 10 mm				

	dia polyamide PA 6 grade sleeve, including drilling of hole in frame, concrete/ masonry, etc. as per direction of Engineer-in-charge.				
7.5.1	10 x 120 mm	138.00	each	170.95	23591.00
7.6	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in- charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	420.00	kg	772.40	324408.00
8.0	**SH : FLOORING**				
8.1	52 mm thick cement concrete flooring with concrete hardener topping, under layer 40 mm thick cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and top layer 12 mm thick cement hardener consisting of mix 1:2 (1 cement hardener mix : 2 graded stone aggregate 6 mm nominal size) by volume, hardening compound mixed @ 2 litre per 50 kg of cement or as per manufacturer's specifications. This includes cost of cement slurry, but excluding the cost of nosing of steps etc. complete.	50.00	sqm	978.45	48923.00
8.2	Providing and fixing glass strips in joints of terrazo/ cement concrete floors.				
8.2.1	40 mm wide and 4 mm thick	80.00	metre	91.75	7340.00
8.3	Providing and laying Vitrified tiles in floor in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm including grouting the joints with white cement and				

	matching pigments etc. The tiles must be cut with the zero chipping diamond cutter only . Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily.				
8.3.1	Double charge vitrified tile polished finish of size				
8.3.1.1	Size of Tile 600 x 600 mm	185.00	sqm	1453.65	268925.00
8.3.1.2	Size of Tile 800 x 800 mm	125.00	sqm	1534.85	191856.00
8.3.2	Glazed Vitrified tiles Matt/Antiskid finish of size				
8.3.2.1	Size of Tile 600 x 600 mm	69.00	sqm	1464.85	101075.00
8.4	Grouting the joints of flooring tiles having joints of 3 mm width, using epoxy grout mix of 0.70 kg of organic coated filler of desired shade (0.10 kg of hardener and 0.20 kg of resin per kg), including filling /grouting and finishing complete as per direction of Engineer-in-charge.				
8.4.1	Size of Tile 600x600 mm	273.00	sqm	309.05	84371.00
8.4.2	Size of Tile 800x800 mm	138.00	sqm	244.75	33776.00
8.5	Deduct for not grouting the joints with white cement and matching pigment in the items of fixing of vitrified tiles.	411.00	sqm	-13.30	-5466.00
8.6	Providing and laying Polished Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge.				
8.6.1	Polished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent	38.00	sqm	4481.30	170289.00
9.0	**SH : ROOFING**				
9.1	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS :				

	5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes.				
9.1.1	110 mm diameter	101.00	metre	377.40	38117.00
9.2	Providing and fixing on wall face unplasticised - PVC moulded fittings/accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.				
9.2.1	Coupler				
9.2.1.1	110 mm	45.00	each	136.15	6127.00
9.2.3	Bend 87.5°				
9.2.3.1	110 mm bend	27.00	each	150.35	4059.00
9.2.4	Shoe (Plain)				
9.2.4.1	110 mm Shoe	18.00	each	131.85	2373.00
9.3	Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.				
9.3.1	110 mm	45.00	each	371.30	16709.00
9.4	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	15.00	each	54.70	821.00
9.5	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of				

	1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :				
9.5.1	12.5 mm thick tapered edge gypsum moisture resistant board	192.00	sqm	1529.10	293587.00
9.6	Providing and fixing Gl Clip in Metal Ceiling System of 600x600 mm module which includes providing and fixing 'C' wall angle of size 20x30x20 mm made of 0.5 mm thick pre painted steel along the perimeter of the room with help of nylon sleeves and wooden screws at 300 mm center to centre, suspending the main C carrier of size 10x38x10 mm made of G.I steel 0.7 mm thick from the soffit with help of soffit cleat 37x27x25x1.6 mm, rawl plugs of size 38x12 mm and C carrier suspension clip and main carrier bracket at				

	1000 mm c/c. Inverted triangle shaped Spring Tee having height of 24 mm and width of 34 mm made of Gl steel 0.45 mm thick is then fixed to the main C carrier and in direction perpendicular to it at 600 mm centers with help of suspension brackets. Wherever the main C carrier and spring T have to join, C carrier and spring T connectors have to be used. All sections to be galvanized @ 120 gms/sqm (both side inclusive), fixing with clip in tiles into spring T with :				
9.6.1	GI Metal Ceiling Clip in plain Beveled edge global white color tiles of size 600x600 and 0.5 mm thick with 25 mm height, made of G I sheet having galvanizing of 100 gms/ sqm (both sides inclusive) and electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending.	56.00	sqm	2221.70	124415.00
10.0	**SH: FINISHING**				
10.1	12 mm cement plaster of mix				
10.1.1	1:6 (1 cement: 6 coarse sand)	1456.00	sqm	343.65	500354.00
10.2	15 mm cement plaster on rough side of single or half brick wall of mix				
10.2.1	1:6 (1 cement: 6 coarse sand)	2411.00	sqm	395.35	953189.00
10.3	Cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.				
10.3.1	12 mm cement plaster	151.20	sqm	449.55	67972.00
10.4	Extra for plastering exterior walls of height more than 10 m from ground level for every additional height of 3 m or part thereof.	277.00	sqm	87.10	24127.00
10.5	White washing with lime to give an even shade :				
10.5.1	New work (three or more coats)	658.00	sqm	39.05	25695.00
10.6	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade				
10.6.1	Two or more coats on new work	187.00	sqm	155.90	29153.00
10.7	French spirit polishing :				
10.7.1	Two or more coats on new works including a coat of wood filler	60.00	sqm	446.25	26775.00

10.8	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	2338.00	sqm	156.05	364845.00
10.9	Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour.				
10.9.1	Two coats	2338.00	sqm	137.45	321358.00
11.0	**DEMOLISHING OF EXISTING STRUCTURE**				
11.1	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer - in- charge.	15.00	cum	3551.25	53269.00
11.2	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge.				
11.2.1	In cement mortar	98.00	cum	2060.20	201900.00
11.3	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete and stacking within 50 metres lead :	20.00	each	367.20	7344.00
12.0	**SH : Road Work**				
12.1	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres.	270.00	sqm	218.90	59103.00
12.2	Providing and laying C.C. pavement of mix M-25 with ready mixed concrete from batching plant. The ready mixed concrete shall be laid and finished with screed board vibrator , vacuum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-	32.00	cum	9823.80	314362.00

	in-charge. (The panel shuttering work shall be paid for separately). (Note:- Cement content considered in this item is @ 330 kg/cum. Excess/ less cement used as per design mix is payable/ recoverable separately).				
12.3	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	2.00	cum	10117.60	20235.00
12.4	Providing and laying tactile tile (for vision impaired persons as per standards) of size 300x300x9.8mm having with water absorption less than 0.5% and conforming to IS:15622 of approved make in all colours and shades in for outdoor floors such as footpath, court yard, multi modals location etc., laid on 20mm thick base of cement mortar 1:4 (1 cement : 4 coarse sand) in all shapes & patterns including grouting the joints with white cement mixed with matching pigments etc. complete as per direction of Engineer-in-Charge.	11.00	sqm	2017.60	22194.00
12.5	Providing and laying factory made chamfered edge Cement Concrete paver blocks in footpath, parks, lawns, drive ways or light traffic parking etc, of required strength, thickness & size/ shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50 mm thick compacted bed of sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand. complete all as per				

	direction of Engineer-in-Charge.				
12.6	80 mm thick C.C. paver block of M-35 grade with approved colour design and pattern.	50.00	sqm	1091.50	54575.00
13.0	**SH : SANITARY INSTALLATIONS**				
13.1	Providing and fixing 8 mm dia C.P. / S.S. Jet with flexible tube upto 1 metre long with S.S. triangular plate to Eureopean type W.C. of quality and make as approved by Engineer - in - charge.	2.00	each	349.15	698.00
13.2	Providing and fixing CP Brass 32mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge.	14.00	each	1034.80	14487.00
13.3	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	4.00	each	1607.95	6432.00
13.4	Providing and fixing 600x120x5 mm glass shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	4.00	each	1083.50	4334.00
13.5	Providing and fixing toilet paper holder :				
13.5.1	C.P. brass	6.00	each	803.70	4822.00
13.6	Providing and fixing soil, waste and vent pipes :				
13.6.1	100 mm dia				
13.6.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	91.00	metre	1169.30	106406.00
13.7	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
13.7.1	100 mm dia				
13.7.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	10.00	each	567.20	5672.00
13.8	Providing and fixing plain bend of required degree.				
13.8.1	100 mm dia				
13.8.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	12.00	each	368.00	4416.00

13.9	Providing and fixing single equal plain junction of required degree :				
13.9.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
13.9.1.1	100x100x100 mm	8.00	each	581.45	4652.00
13.10.	Providing and fixing terminal guard				
13.10.1	100 mm				
13.10.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	6.00	each	427.80	2567.00
13.11	Providing and fixing shielded coupling for Hubless centrifugally cast iron pipe				
13.11.1	100 mm dia				
13.11.1.1	SS 304 grade coupling with EPDM rubber gasket	100.00	each	432.05	43205.00
13.12	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors:				
13.12.1	100 mm inlet and 100 mm outlet				
13.12.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	12.00	each	854.55	10255.00
14.0	**SH : WATER SUPPLY**				
14.1	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply and all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall				
14.1.1	32 mm nominal dia Pipes	50.00	metre	518.75	25938.00
14.1.2	50 mm nominal dia Pipes	50.00	metre	934.15	46708.00
14.2	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings and fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of				

	Engineer in Charge. Concealed work, including cutting chases and making good the walls etc.				
14.2.1	20 mm nominal dia Pipes	98.00	metre	537.60	52685.00
14.2.2	25 mm nominal dia Pipes	60.00	metre	627.25	37635.00
14.3	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge.External work.				
14.3.1	50 mm nominal dia Pipes	50.00	metre	794.25	39713.00
14.4	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
14.4.1	32 mm nominal bore	5.00	each	689.60	3448.00
14.4.2	50 mm nominal bore	5.00	each	1026.65	5133.00
14.5	Providing and fixing gun metal non- return valve of approved quality (screwed end) :				
14.5.1	50 mm nominal bore				
14.5.1.1	Vertical	5.00	each	1445.15	7226.00
14.6	Providing and fixing uplasticised PVC connection pipe with brass unions :				
14.6.1	45 cm length				
14.6.1.1	15 mm nominal bore	14.00	each	97.75	1369.00
14.7	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931				
14.7.1	15mm nominal bore	28.00	each	574.30	16080.00
15.0	**SH : DRAINAGE**				
15.1	Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete :				
15.1.1	150 mm diameter	36.00	metre	695.80	25049.00
15.2	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) all-round S.W. pipes including bed concrete as per standard design :				
15.2.1	150 mm diameter S.W. pipe	36.00	metre	1179.85	42475.00

15.3	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design:				
15.3.1	180x150 mm size P type				
15.3.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	12.00	each	2802.15	33626.00
15.4	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
15.4.1	300 mm dia. R.C.C. pipe	45.00	metre	994.30	44744.00
15.5	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design :				
15.5.1	Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) :				
15.5.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	3.00	each	12770.55	38312.00
15.6	Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) :				

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15.6.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1.00	each	26405.50	26406.00
15.7	Extra for depth for manholes :				
15.7.1	Size 90x80 cm				
15.7.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	4.00	metre	8825.40	35302.00
15.7.2	Size 120x90 cm				
15.7.2.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1.00	metre	10585.50	10586.00
16.0	**SH : ALUMINIUM WORK**				
16.1	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) :				
16.1.1	For fixed portion				
16.1.1.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	66.00	kg	530.90	35039.00
16.1.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately)				
16.1.2.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	39.00	kg	634.45	24744.00
16.3	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and				

	door weight upto 125 kg, for doors, including cost of cutting floors, embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge.				
16.3.1	With stainless steel cover plate minimum 1.25 mm thickness	2.00	each	2823.85	5648.00
16.4	Providing and fixing aluminium round shape handle of outer dia 100 mm with SS screws etc. complete as per direction of Engineer-in-charge				
16.4.1	Powder coated minimum thickness 50 micron aluminium	6.00	each	109.30	656.00
16.5	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivt & double action hydraulic floor spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc. to be paid separately).	6.00	sqm	5325.90	31955.00
17.0	**SH : WATER PROOFING**				
17.1	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for under ground structures as directed by Engineer-in-Charge and consisting of :(i) Ist layer of 22 mm to 25 mm thick approved and specified rough stone slab over a 25 mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) mixed with water proofing compoundconforming to IS:2645 in the recommended proportion over the leveling course (leveling course to be paid separately). Joints sealed and grouted with cement slurry mixed with water proofing compound.(ii) 2nd layer of 25 mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportions.(iii) Finishing top with stone aggregate of 10 mm to 12 mm nominal size spreading @ 8 cudm/sqm				

	thoroughly embedded in the 2nd layer.				
17.1.1	Using rough kota stone.	13.00	sqm	1515.60	19703.00
17.2	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25 mm thick with cement slurry mixed with water proofing compound conforming to IS:2645 in recommended proportions with a gap of 20 mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry.				
17.2.1	Using rough kota stone.	32.00	sqm	2024.70	64790.00
17.3	Providing and laying water proofing treatment in sunken portion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying : (a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/ sqm. This layer will be allowed to air cure for 4 hours. (b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.	37.00	sqm	617.05	22831.00
17.4	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations: (a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300 mm height including cleaning the surface before treatment.				
	(b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water				

	proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs.(c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/ sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by Engineer- in-charge.				
	(d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer- in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3 mm deep. (e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge :				
17.4.1	With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	439.00	sqm	1684.60	739539.00
18	**SH : RAIN WATER HARVESTING & TUBEWELLS**				
18.1	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, upto 90 metre depth below ground level.				
18.1.1	All types of soil				
18.1.1.1	300 mm dia,	150.00	metre	707.75	106163.00

18.2	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer -in-charge, beyond 90 metre & upto 150 metre depth below ground level.				
18.2.1	All types of soil				
18.2.1.1	300 mm dia,	50.00	metre	825.70	41285.00
18.3	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
18.3.1	150 mm nominal size dia	50.00	metre	793.25	39663.00
18.4	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
18.4.1	150 mm nominal size dia	40.00	metre	807.45	32298.00
18.5	Supplying, filling, spreading & leveling stone boulders of size range 5 cm to 20 cm, in recharge pit, in the required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge.	1.30	cum	1509.80	1963.00
18.6	Supplying, filling, spreading & leveling gravels of size range 5 mm to 10 mm, in the recharge pit, over the existing layer of boulders, in required thickness, for all leads & lifts, all complete as per direction of Engineer-in- charge.	1.50	cum	1538.25	2307.00
18.7	Supplying, filling, spreading & leveling coarse sand of size range 1.5 mm to 2 mm in recharge pit, in required thickness over gravel layer, for all leads & lifts, all complete as per direction of Engineer -in-charge.	2.30	cum	1538.25	3538.00

18.8	Gravel packing in tubewell construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.	12.00	cum	2024.50	24294.00
18.9	Providing and fixing factory made precast RCC perforated drain covers, having concrete of strength not less than M-25, of size 1000 x 450x50 mm, reinforced with 8 mm dia four nos longitudinal & 9 nos cross sectional T.M.T. hoop bars, including providing 50 mm dia perforations @ 100 to 125 mm c/c, including providing edge binding with M.S. flats of size 50 mm x 1.6 mm complete, all as per direction of Engineer-in-charge.	1.00	cum	1399.95	1400.00
18.10.	Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 mild steel screwed and socketed/ plain ended casing pipes of required dia, conforming to IS: 4270, of reputed & approved make, including painted with outside surface with two coats of anticorrosive paint of approved brand and manufacture, including required hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge.				
18.10.1	150 mm nominal size dia having minimum wall thickness 5.00 mm	90.00	metre	1972.25	177503.00
18.11	Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 plain slotted (having slot of size 1.6/3.2 mm) mild steel threaded and socketed/ plain bevel ended pipe (type A) of required dia, conforming to IS: 8110, of reputed and approved make, having wall thickness not less than 5.40 mm, including painted with outside surface with two coats of anticorrosive bitumestic paint of approved brand and manufacture, including hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer -in-charge.				
18.11.1	150 mm nominal size dia	50.00	metre	2102.25	105113.00

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18.12	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method, collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.	50.00	hour	1085.05	54253.00
18.13	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of:				
18.13.1	150 mm dia	2.00	each	246.45	493.00
18.14	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts of required size complete.				
18.14.1	150 mm clamp	2.00	each	2019.05	4038.00
18.15	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I).				
18.15.1	150 mm dia	2.00	each	322.00	644.00
19.0	**SH : NEW TECHNOLOGIES AND MATERIALS**				
19.1	Providing and fixing false ceiling at all heights with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595mm of approved texture, design and patterns having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Non combustible as per BS:476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal				

	conductivity < 0.043 W/m K as per ASTM 518:1991, in true horizontal level suspended on inter locking metal powder coated T-Grid of hot dipped galvanised iron section of 0.40 mm thick on Silhouette profile, rotary stiched double webbed white with 6mm reveal profile (white/black), comprising of main-T runners of size 15x42mm of length 3000 mm, cross - T of size 15x42 mm of length 1200 mm and secondary intermediate cross-T of size 15x42 mm of length 600mm to form grid module of size 600 x 600 mm, suspended from ceiling using galvanised mild steel items (galvanizing @ 80 grams per sqm) i.e. 50 mmlong, 8 mm outer diameter M-6 dash fasteners, 6 mm dia fully threaded hanger rod upto 1000 mm length and L-shape level adjuster of size 85x25x2 mm. Galvanised iron perimeter wall angle of size 22x19x0.40 mm of length 3000 mm to be fixed on periphery wall / partition with the help of plastic rawl plugs at 450 mm center to center and 40mm long dry wall S.S screws. The work shall be carried out as per specifications, drawing and as per directions of the Engineer-in-Charge.				
19.1.1	With Micro look edged Calcium silicate false ceiling tiles 15mm thick all around on edge resting portion and 10mm thick in the centre.	410.00	sqm	2559.50	1049395.00
19.2	Providing and fixing factory made single extruded WPC (Wood Polymer Composite) solid door/window/clerestory windows & desertory other Frames/Chowkhat comprising of virgin PVC polymer of K value 58-60 (Suspension Grade), calcium carbonate and natural fibers (wood powder/ rice husk/wheat husk) and non toxic additives (maximum toxicity index of 12 for 100 gms) fabricated with miter joints after applying PVC solvent cement and screwed with full body threaded star headed SS screws having minimum frame density of 750 kg/cum, screw withdrawal strength of 2200 N (Face) & 1100 N (Edge), minimum compressive strength of 58 N/mm2, modulus of elasticity 900 N/mm2				

	and resistance to spread of flame of Class A category with property of being termite/borer proof, water/moisture proof and fire retardant and fixed in position with M.S hold fast/lugs/SS dash fasteners of required dia and length complete as per direction of Engineer-In- Charge. (M.S hold fast/lugs or SS dash fasteners shall be paid for separately). Note: For WPC solid door/window frames, minus 5mm tolerance in dimensions i.e depth and width of profile shall be acceptable. Variation in profile dimensions on plus side shall be acceptable but no extra payment on this account shall be made.				
19.2.1	Frame size 45 x 85 mm	31.00	metre	926.35	28717.00
19.3	Providing and fixing factory made single extruded WPC (Wood Polymer Composite) solid decorative type flush door shutter of required size comprising of virgin polymer of K value 58-60 (Suspension Grade), calcium carbonate and natural fibers (wood powder/ rice husk/wheat husk) and non toxic additives (maximum toxicity index of 12 for 100 gms) having minimum density of 650 kg/cum and screw withdrawal strength of 1800 N (Face) & 900 N (Edge), minimum compressive strength 50 N/mm2, modulus of elasticity 850 N/mm2 and resistance to spread of flame of Class A category with property of being termite/borer proof, water/moisture proof and fire retardant. WPC to be laminated with PVC foil of minimum 14 microns thick of approved design pasted with hot melt adhesive on both faces of shutter and fixing with stainless steel butt hinges of required size with necessary full body threaded star headed counter sunk S.S screws, all as per direction of Engineer-In-Charge. (Note: stainless steel butt hinges and necessary S.S screws shall be paid separately)				
19.3.1	30 mm thick	9.00	sqm	4764.20	42878.00

19.4	Providing and fixing factory made 18 mm thick single extruded WPC (Wood Polymer Composite) solid plain white colour board Jali, CNC (Computer numeric control) routed of approved design by Engineer-in - charge which are machine cut for duct/shaft covering, partitions and facades comprising of virgin polymer of K value 58-60 (Suspension Grade), calcium corbonate and natural fibers (wood powder/ rice husk/wheat husk) and non toxic additives(maximum toxicity index of 12 for 100 gms) having minimum density of 650 kg/cum and screw withdrawal strength of 1800 N (Face) minimum compressive strength 50 N/mm2, modulus of elasticity 850 N/mm2 and resistance to spread of flame of Class A category with properties of being termite/borer proof, water/moisture proof and fire retardant and fixing on M.S (mild steel) frame made of 25 x 25 x 1.5 mm square hollow box section including applying a priming coat of approved steel primer, placed at grid made at 1.0 x 1.0 m or as per requirement at site with necessary stainless steel fasteners and SS screws etc., all complete as per direction of Engineer-In- Charge. (Note: M.S (mild steel) framework with priming coat and necessary SS fasteners and SS screws shall be paid separately).	59.00	sqm	3437.15	202792.00
				Total	**35359856.00**
	Modified Estimated Cost after using Correction factor on DSR 2023 items on account of GST @ 0.973				34405140.00
				Add Cost Index @ 5%	1720257.00
				Total	**36125397.00**
20.0	**Market Rate Item**				
20.1	Providing and fixing Stainless steel pipe curtain rods with stainless steel bracket :				
20.1.1	25 mm dia	74.00	metre	454.20	33611.00
20.2.	Providing and fixing stainless steel tower bolt of approved quality and make with stainless steel screws etc. all complete as per sample approved by the Engineer-in-Charge.				
20.2.1	150x10mm	6.00	each	224.45	1347.00
20.2.2	300x10mm	24.00	each	389.25	9342.00

20.3	Providing and fixing stainless steel sliding door bolts with stainless steel nuts & bolts and stainless steel screws etc. complete as per sample approved by the Engineer-in-Charge.				
20.3.1	250x16mm	6.00	each	583.75	3503.00
20.3.2	300x16 mm	18.00	each	711.10	12800.00
20.4	Providing & fixing of Stainless steel, D Type Pull Handle set of two of size 150x19 mm all complete and as per directions of Engineer-in-charge	46.00	pair	1194.60	54952.00
20.5	Providing & fixing of Stainless steel, D Type Pull Handle set of two of size 400x25.4 mm all complete and as per directions of Engineer-in-charge	4.00	each	1256.25	5025.00
20.6	Providing and Fixing Channeled Wood works perforated panels of width 192mm, thickness of 15mm and length 2400 mm or as required, made of a Moisture Resistant fibre board with minimum 595 Kg/M3 density substrate with a laminated facing as per the approved shade & finish and a melamine balancing layer on the reverse side. The boards shall have a special perforation pattern where the visible surface has a "Helmholtz" fluted perforation of 3mm width and 13mm of visible panel each. The edges of the panels shall be "tongue-and-grooved" to receive special clips for installation. The back of the perforated panel shall have sound absorbing non-woven acoustical fleece having NRC of 0.60. The panels shall be mounted on special aluminium splines (keel) using clips etc. all complete as per direction of Engineer-in-Charge.	73.00	sqm	8333.35	608335.00
20.7.	Providing fly proof stainless steel grade 304 wire gauge, to windows and clerestory windows using wire gauge with average width of aperture 1.4 mm in both directions with wire of dia. 0.50 mm all complete.	52.00	sqm	676.00	35152.00
20.8	Providing and laying Vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, riser of steps, over 12 mm thick				

	bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joint with white cement & matching pigments etc. complete.				
20.8.1	Double charge vitrified tile polished finish of size				
20.8.1.1	Size of tile 600 x 600 mm	19.00	sqm	1349.40	25639.00
20.8.1.2	Size of tile 800 x 800 mm	13.00	sqm	1431.70	18612.00
20.9.	Providing and laying Endura Industrial plain series tiles size 300x300x20mm in floor in different sizes of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) jointing with grey cement slurry @ 3.3 kg/ sqm including pointing the joints with white cement and matching pigments etc. all complete as per direction of Engineer-in-charge.	16.00	sqm	1711.40	27382.00
20.10.	Providing and laying Polished Garnite Stone slabs 18 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.				
20.10.1	Polished Granite stone slab jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent.	5.00	sqm	2532.45	12662.00
20.11	Providing and fixing machine cut, mirror polished, stone work for wall lining/wall clading (veneer work) in required design and pattern on 12 mm (average) thick cement mortar 1:3 (1 cement : 3 coarse sand) laid and jointed with white cement slurry @ 3.3 kg/sqm including pointing with white cement slurry admixed with pigment of matching shade, including rubbing, curing, polishing etc. all complete as per Architectural drawings, and as directed by the Engineer-in-Charge.				
20.11.1	18 mm thick Granite stone slab all colour except cherry/ruby red.	24.00	sqm	6089.10	146138.00

20.12	Providing and fixing of 10 mm thick Laminated wooden flooring Classification of Use 23/32 (Heavy Domestic/General Commercial) with a Surface Abrasion Resistance of class AC4 (average 4500 cycles), Impact Resistance of IC2 (EN13329), Resistance to Cigarette Burn with a rating of 5 (EN 438-2:15), Swelling after 24 hrs in water of 15% (EN13329), Modulus of Rupture of 53.3 newton/mm2, Internal Bond 1.78 newton/mm2, Surface Soundness of 1.3 newton/mm2 (EN 13329:2000) with a 0.2mm thick wear layer on top of a High Density Fiber substrate core (density > 850 Kg/M3) of plank size 1291 mm X 135 mm having Uni fit locking arrangement (lock strength > 1000 lbs/ft) with an under layment made of natural colour foam , with accessories like End profile, Transition profile, reducer, etc. complete. The rate includes cost of all materials, accessories, labour, HOM, etc., complete at all levels. (The Shade, pattern etc., to be approved by Engineer in charge)Make-Floor Master /Egger/ Haro/ Armstrong. (Only finished floor area shall be measured for the purpose of payment).	40.00	sqm	2907.00	116280.00
20.13	Providing GI slotted bracket size 300 mm length 75 mm width and thickness 5 mm and fixing the bracket with anchor fastener of size 10 mm dia x 120 mm long in RCC/CC at all heights i/c fastening of the CI/GI pipes of required dia with GI U bolt of 10 mm dia etc. complete as specified and as directed by Engineer-in-charge.	60.00	each	643.05	38583.00
20.14	Providing & applying copolymer emulsion based spray applied texture to give desired finish by applying an intermediate texture layer @ 16.60 kg / 10 sqm to form a film of 1.5 – 2.0 mm thickness with Hopper / Texture Spray Gun over an under coat of exterior primer @ 0.90 litre / 10 sqm and top coating with premium acrylic smooth exterior emulsion paint with silicon additives two or more coats of required shade @ 1.43 litres / 10 sqm complete including preparation of surface and as per direction of Engineer – in – charge and	1528.00	sqm	374.15	571701.00

	manufacturers specifications.				
20.15	Providing and Fixing of Glass fibre cloth on Junction of block work and RCC work at corner / wall surface and other location including cutting to required size with side laps of 100mm if required & fixing with nails / cement paste etc. all complete as per direction of Engineer-in-charge.	334.00	sqm	88.15	29442.00
20.16	6 mm cement plaster of mix :				
20.16.1	1:3 (1 cement : 3 coarse sand)	441.00	sqm	246.15	108552.00
20.17	Providing and fixing [white vitreous china table top wash basin of size 420 x420 x135mm (Jaquar make Cat No. ARS-WHT-39901 or equivalent premium model of Grohe, Kholer, Hindware limited (queo) etc. as per prefered make list) with C.P. brass single lever tall boy with 155mm extension body, fixed spout without popup waste system with 600mm long braided hoses (Jaquar make Cat No. KUP-35005BPM or equivalent premium model of Grohe, Kholer, Hindware limited (queo) etc. as per prefered make list) and 32mm C.P. brass waste (Jaquar make Cat No. ALD-709L130 or equivalent premium model of Grohe, Kholer, Hindware limited (queo) etc. as per prefered make list)] of standard pattern including making holes in counter wherever required all complete as per direction of Engineer-in-charge	8.00	each	10592.90	84743.00
20.18	Providing and fixing white vitreous china flat back half stall urinal of size 580x380x350 mm with standard size C.P. brass flush pipe, waste fittings, spreaders with union and clamps (all in C.P. brass) complete including painting of fittings and brackets, cutting and making good the walls and floors wherever required as per direction of Engineer in charge				
20.18.1	Single half stall urinal	4.00	each	8141.45	32566.00
20.19	Providing and fixing stainless steel grade-304 grating of approved quality and Make. Circular type flat cut floor drain type				
20.19.1	100 mm nominal dia	14.00	each	194.20	2719.00
20.20.	Providing & fixing CP brass Towel Ring square with round flange (Jaquar make Cat No. CAN-1121N) or equivalent standard &	8.00	each	1330.70	10646.00

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	design all complete as per direction of Engineer-in-Charge.				
20.21	Providing & fixing Liquid soap dispenser with glass bottle of Jaquar make Cat No.-ACN-1135N or equivalent all complete as per direction of Engineer-in-charge.	8.00	each	1280.45	10244.00
20.22	Providing & fixing high quality nylon grip wall mounted 'U' shaped rail (with hinge) of size 600x100mm of approved quality and make etc. all complete and as per direction of Engineer-in-charge.	2.00	each	10362.15	20724.00
20.23	Providing & fixing high quality nylon grip wall mounted inverted 'L' shaped Grab Bar with 500 & 700mm long bars of approved quality and make etc. all complete as per direction of Engineer-in-charge.	2.00	each	6305.50	12611.00
20.24	Providing & fixing high quality nylon grip wall mounted 40mm dia, 600 mm long Grab Bar of approved quality and make etc. all complete as per direction of Engineer-in-charge.	2.00	each	3316.40	6633.00
20.25	Providing and fixing 15mm C.P. brass URINALS wall auto closing system with built-in control cock and wall flange of of Jaquar make Cat No.-PRS-CHR-077 or equivalent all complete as per direction of Engineer-in-charge.	4.00	each	2129.55	8518.00
20.26	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing :	5.00	sqm	2763.65	13818.00
20.27	Providing and fixing single equal plain junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
20.27.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905				
20.27.1.1	100x100x100 mm	8.00	each	863.10	6905.00
20.28	Core cutting in RCC slab of different size of dia & depth in toilets and balcony areas.				
20.28.1	Core size of 127 mm dia upto 150 mm depth.	12.00	each	622.95	7475.00

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20.29	Providing, filling and sealing the gap of core cut in RCC after laying the CI/PVC pipes with non-shrinkable grout GP-2 of FOSROC or equivalent in SIKA, CICO, PIDILITE and Asian Paints at all floors i/c preparation of surface etc. all complete as per manufacturer specification and as directed by engineer-in-charge.				
20.29.1	Upto 100mm dia pipe	12.00	each	224.80	2698.00
20.30.	Providing and fixing S.S. clamps & tie rod for hanging cast iron pipes from ceiling with nut-bolt arrangment to adjust required slope in pipe line all complete as per directions of Engineer-in-charge.				
20.30.1	For 100 mm dia hubles C.I. pipe line	114.00	each	296.05	33750.00
20.31	Providing & fixing Health Faucet with 1 meter long easy flex tube in chrome finish and wall hook of Jaquar make Cat No. - ALD-CHR-573 all complete as per direction of Engineer-in-charge	6.00	each	1828.90	10973.00
20.32	Providing and fixing [white vitreous china extended wall mounting water closet of size 375x520x400 mm of jaquar (Cat. No. SLS-WHM-6953BIUSM or equivalent premium model of Grohe, Kholer, Hindware limited (queo) etc. as per prefered make list) with UF Soft close slim seat cover, hinges, accessories set concealed cistern for wall hung WC of Jaquar (Cat no. JCS-WHT-2400 or equivalent premium model of Grohe, Kholer, Hindware limited (queo) etc. as per prefered make listwith control plate of Jaquar (Cat no. JCP-CHR-2415 or equivalent premium model of Grohe, Kholer, Hindware limited (queo) etc. as per prefered make list)] including all fittings and fixtures, nuts, bolts and gasket etc including making connection with the existing P/S trap, complete in all respect as per directions of Engineer-in-Charge.	6.00	each	27706.00	166236.00
20.33	Providing and fixing C.P brass 2-Way bib cock with wall flange of Jaguar make (CAT No. COP-041PM) or equivalent and as per direction of Engineer-in-charge				
20.33.1	15 mm nominal bore	6.00	each	1796.00	10776.00

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20.34	Cutting grooves of size 10 mm wide and 50 mm deep in existing cement concrete pavement by using mechanical cutting machine & filling Polysulphide sealant compound for sealing of expansion joints in roads / pavements all complete as per direction of the Engineer-in-Charge (including royalty):	300.00	per cm depth per cm width per metre length	38.60	11580.00
20.35	Providing, hoisting and fixing (ISI marked) hot compression moulded S.M.C (sheet moulding compound) panel tank of required size on steel staging (which shall be paid separately),the tank shall be provided 600mm dia manhole with lockable cover. The panel of size 1000x2000 /1000x1000/ 1000x500/ 500x500mm should countered to withstand by hydraulic head of at least four time the marked load i/c HDG bolts and nuts HDG flang support c-channel, rubber gasket SS washers cleats ,HDG rectangular vertical steel support for each wall panel & jointing with stainless steel tie rod to support each panel i/c PVC support for roof panel, ladder of approved material, design and height of inside & outside the tank HDG/ SMC corner angels for support all fittings and providing and fixing 300mm long pipe pieces for inlet , outlet, overflow and scour pipes of required dia., air vent pipes in each tank , water level indicator of approved deisgn (Mechanical type) complete with guage and assembly.	20000.00	litre	15.65	313000.00
	The tank after erection and assembly as per manufacturer specification shall be filled with water up to the over flow level which will be placed near the roof of the tank tested for leakage found during the testing should be rectified to make to 100% leak proof, complete as per direction of Engineer-in-charge.				
20.36	Providing and fixing Centre Patch Lock with Cylinder for glass door of approved brand and manufacture, including providing and fixing and making necessary holes etc. for fixing required fittings, all complete as per direction of Engineer-in-charge.	2.00	each	1792.30	3585.00

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20.37	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge . (Cost of aluminium snap beading shall be paid in basic item):				
20.37.1	With float glass panes of 5 mm thickness (weight not less than 12.50 kg/sqm)	117.00	sqm	827.15	96777.00
	Total				**38851432.00**

PART- C

(Electrical Work)

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PROFORMA OF SCHEDULES

(Separated Performa for Civil, Elect. ~~& Hort.~~ Works in case of composite tenders)

Name of Work:- **Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**

SCHEDULE 'A'

Schedule of Quantities (as per PWD-3) **Attached page No. 209 to 258**

SCHEDULE 'D'

Extra schedule for specific requirements/document for the work, if any: **Nil**

SCHEDULE 'E'

Reference to General Conditions of contract – Applicable GCC is GCC for Construction works 2023, as modified and corrected up to previous day of last date of submission of bids.

Name of Work: **Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).**

Estimated cost of work: Electrical Work **Rs. 1,44,85,565/-**

i) Earnest money: **Included in schedules of Civil component**

ii) Performance Guarantee: **Included in schedules of Civil component**

iii) Security deposit: 2.5% of Tendered value of work.

SCHEDULE 'F'
General rules and direction

Officer inviting tender **Executive Engineer, Lucknow-II, CPWD, Lucknow.**

Definitions:

2(vii)	**Engineer-in-Charge**	
	Electrical items of work	**Executive Engineer (E), Lucknow Electrical, CPWD, Lucknow.**
	Civil items of work	**Executive Engineer, Lucknow-II, CPWD, Lucknow.**
2(viii)	Accepting Authority	**Chief Engineer (Lucknow), CPWD, Lucknow**
2(ix)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(x)	**Standard Schedule of Rates:**	
	Electrical items of Work:	DSR 2025 & M/R
2(xi)	Department:	Central Public Works Department
9(ii)	Standard CPWD contract Form:	GCC 2023 for Construction Works, CPWD Form-7/8 as amended/modified up to previous day of last date of submission of the

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bids.

Clause 1	i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance	As prescribed in Civil component.
	ii) Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period as provided in (i) above	As prescribed in Civil component.
Clause 2	Authority for fixing Compensation under Clause 2	**Chief Engineer (Lucknow), CPWD, Lucknow**
Clause 5	i) Number of days from the date of issue of letter of acceptance for reckoning date of start	**As prescribed in Civil component.**
	ii) Time allowed for execution of work	**As prescribed in Civil component.**

Authority to decide:-

(i) Authority to convey the decision of shifting of mile stone and extension of time- As prescribed in civil component**.**

(ii) Authority to decide rescheduling of mile stone and extension of time- As prescribed in civil component**.**

(iii) Shifting of date of start in case of delay in handing over of site- As prescribed in civil component**.**

PROFORMA OF SCHEDULE Clause 5 schedule of handing over of site:

Part	Portion of site	Description	Time period for handing over reckoned from date of issue of letter of intent
Part-A	Portion without any hindrance	Full site	As per civil component
Part-B	Portion with encumbrances	NA	As per civil component
Part-C	Portion dependent on work of other agencies	NA	As per civil component

Clause 6 :	Computerized Measurement Book/ Electronic Mode of Measurement : EMB through CPWD ERP Portal.	
Clause 7	Gross work to be done together with net payment/Adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment	**Rs. 12.00 Lacs**
Clause7A	Whether clause 7A shall be applicable.	***As per Civil Component***
Clause 8	Competent Authorities to inspect and issue Part/Final Completion Certificate	*As per Civil Component*
Clause 8A	Authority to decide compensation on account if contractor fails to submit completion plans.	***As prescribed in Civil Component***
Clause 10A	List of testing equipment to be provided by the contractor at site lab.	**Refer page No. 134**

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Clause 10 B (ii) Whether clause 10-B shall be applicable. **As per Civil Component**

Clause 10 C : **Applicable**

Component of labour expressed as percentage of value of work **25%**

Clause 10 CC **As per Civil Component**

Clause11 **Specification to be followed for execution of work:**

CPWD General Specifications for Electrical Works Part I Internal - 2023, General specification for external electrical work Part II -2023, Part III- Lift & Escalators-2003, Part IV- Sub-station- 2013, Part-V- Wet riser & Sprinkler systems-2020, Part-VI – Fire Detection & Alarm system-2018, Part VII- DG sets-2013, Part VIII- Gas Based Fire Extinguishing system-2013, Heating, Ventilation & Air- Conditioning (HVAC)- 2024 as amended last date previous to date of submission of tender.

Clause 12

Type of work	**Construction Work**
12.2	**Deviation limit beyond which Clause 12.2 shall apply for building work:**
	100%

Clause 16	**Competent Authority for Deciding reduced rates:**	
	For Electrical items of work	**Chief Engineer (Lucknow), CPWD, Lucknow**
Clause 18	List of mandatory machinery, tools & plants to be deployed by the contractor at site.	**As per list enclosed and as required.**
Clause 19 C	**Authority to decide penalty for each default**	As prescribed in civil component
Clause 19 D	**Authority to decide penalty for each default**	As prescribed in civil component
Clause 19 G	**Authority to decide penalty for each default**	As prescribed in civil component
Clause 19 K	**Employment of skilled / semi-skilled workers.**	As prescribed in civil component

Clause 25 Conciliator /Arbitrator

(i) Conciliator	**:**	As per Civil Component
(ii) Arbitrator Appointing Authority	**:**	
(iii) Place of Arbitration	**:**	

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More Than Rs. 5 to 10 (For Electrical)

Clause 32		**Requirement of Technical Representative(s) and Recovery Rate**					
Sl. No.	**Minimum Qualification of Technical representative**	**Discipline**	**Designation (Principal Technical/ Technical representative**	**Minimum experience (Years)**	**Number**	**Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of Clause 32**	
						Figures	Words
1	Graduate Engineer Or Diploma Engineer	Electrical	Project Planning /quality/billing Engineer	2 Or 5 respectively	1	Rs. 15,000/- per month per person	Rs. Fifteen Thousand per month per person

Note.

(i) Nothing extra need to be added while preparing M/R justified amount of the work if stipulation is made as per above recommended scale of requirement of technical staff.

(ii) Requirement of technical staff and their experience can be varied depending upon nature of work and contract period determined.

(iii) In event requirement of technical staff is varied and estimated expenditure on technical staff worked out on the basis of 75% of the rate of recovery exceed 1% of the cost of work ,excess may be added while preparing M/R justified amount of the work .

Assistant Engineers retired from Government services that are holding Diploma will be treated at par with Graduate Engineers. Diploma holder with minimum 10year relevant experience with a reputed construction co. can be treated at par with Graduate Engineers for the purpose of such deployment subject to the condition that such diploma holders should not exceed 50% of requirement of degree engineers.

Clause 38

i)	a)	Schedule/ statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2025 printed by CPWD	**As per Civil Component**
ii)		**Variations permissible on theoretical quantities**	
	a)	Cement for works with estimated cost put to tender not more than Rs. 25 lakhs.	
		For works with estimated cost put to Tender is more than Rs. 25 lakhs	
	b)	Bitumen all works	
	c)	Steel reinforcement and structural steel Sections for diameter, section and category.	
	d)	All other materials	

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ANNEXURE

Clause- 10 –A & 18

List of mandatory machinery, tools and plants & testing Equipment to be deployed by the contractor at site, these equipment shall be available in the test room at site.

1.	**Steel/Aluminium Ladder 1.5 m to 8 m.**	**2 Nos.**
2.	**Chase cutting machines.**	**4 Nos.**
3.	**Electrical wire drawing equipment.**	**3 Set.**
4.	**Torque wrench for nut/bolt/screws.**	**5 Nos.**
5.	**Conduit die set.**	**3 Set.**
6.	**Pipe vice.**	**2 Nos.**
7.	**Bench vice.**	**2 Nos.**
8.	**L.T.Meggar 500/1000 volts.**	**2 Nos.**
9.	**Tong Tester.**	**2 Nos.**
10.	**Multimeter.**	**2 Nos.**
11.	**Hydraulically operated & hand operated crimping machine.**	**1+1 No.**
12.	**Earth tester.**	**2 Nos.**
13.	**Portable Ordinary drilling machine.**	**4 Nos.**
14.	**Portable Hammer drilling machine.**	**2 Nos.**
15.	**Overhead conduit puller.**	**1 No.**
16.	**Vernier caliper**	**2 Nos.**
17.	**Screw gauge**	**2 Nos.**

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Annexure-II

ON NON-JUDICIAL STAMP PAPER OF MINIMUM RS. 100

(Guarantee offered by Bank to CPWD in connection with the execution of contracts)

Form of Bank Guarantee for Earnest Money Deposit /Performance Guarantee/Security Deposit/Mobilization Advance

1. Whereas the Executive Engineer …… (name of division) ……..., CPWD on behalf of the President of India (hereinafter called "The Government")has invited bids under ……(NIT number)……. dated …… for …… (name of work) …… The Government has further agreed to accept irrevocable Bank Guarantee for Rs. ……..……. (Rupees …… only) valid upto …… (date)*…… as Earnest Money Deposit from ……. (name and address of contractor) ……..(hereinafter called "the contractor") for compliance of his obligations in accordance with the terms and conditions of the said NIT.

   OR**

   Whereas the Executive Engineer …….. (name of division) ……., CPWD on behalf of the President of India (hereinafter called "The Government") has entered into an agreement bearing number ……..... with ……..... (name and address of the contractor) …….. (hereinafter called "the Contractor") for execution of work …… (Name of work) ……... The Government has further agreed to accept an irrevocable Bank Guarantee for Rs. ……..……. (Rupees …… only) valid upto …….. (date)..…… as Performance Guarantee/Security Deposit/Mobilization Advance from the said Contractor for compliance of his obligations in accordance with the terms and conditions of the agreement.

2. We, …… (indicate the name of the bank) ……. (herein after referred to as "the Bank"), hereby undertake to pay to the Government an amount not exceeding Rs. …….. (Rupees……. only) on demand by the Government within 10 days of the demand.

3. We, ……(indicate the name of the Bank) ……, do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. …….. (Rupees …….only)

4. We, …… (indicate the name of the Bank) ……, further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

5. We, …… (indicate the name of the Bank) ……, further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said

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AE(E)(P)

agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. We, …… (indicate the name of the Bank) …….., further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

8. We, ……. (indicate the name of the Bank) ……., undertake not to revoke this guarantee except with the consent of the Government in writing.

9. This Bank Guarantee shall be valid up to ……. unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. …… (Rupees …….. only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date .....

Witnesses:

1. Signature……

Name and address

Authorized signatory

Name

Designation

Staff code no.

2. Signature …….

Name and address

Bank seal

* Date to be worked out on the basis of validity period of 90 days where only financial bids are invited and 180 days for two/three bid system from the date of submission of tender.

**In paragraph 1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee/security deposit/mobilization advance, as the case may be.

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AE(E)(P)

Name of Work: Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).

Eligibility condition for Associate agency for execution of Pdg. E.I. & Fans, compound light & cable work

The associate agency shall be registered/enlisted in CPWD in composite category in appropriate class and should have a valid electrical license. The Registration/enlistment shall be valid on the date of MOU entered between main agency and associate agency.

The main contractor/agency has to submit detail of such agency to be associated to the Engineer-in-charge (of E.I. & Fans) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (of E.I. & Fans work). In case the main contractor intends to change associated agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (of E.I.. & Fans Work). The new agency/agencies shall also have to satisfy the laid down eligibility criteria mentioned above. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor. Main agency/associate agency has to under go tripartite agreement between for each material supplied by him.

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AE(E)(P)

Eligibility condition for associate agency for Lift [SH -5]

1. The Lift Manufacturer shall comply with BIS standards; duly certified by designated labs/ certifying agencies.
2. The manufacturer shall be PPP MII Order 2017 (as amended) complaint.
3. The manufacturer shall furnish an undertaking regarding availability of spares for the entire life of the lift i.e. 15 to 20 years
4. The complete lift installation including its components, safety devices, various types of controls etc., testing, inspection, operation and maintenance shall conform to relevant Codes/Standards, as amended upto date.
5. Quality Standards shall conform to IS/ISO-9001:2015 as amended.
6. The down time of installed lifts, which are being maintained by the manufacturer, shall not be more than 8 hours (average) in case of minor faults and 7 days (average) in case of major faults in last one year. The data to be considered shall be for last financial year.
7. The experience of successful completion of Similar works shall be as per CPWD Work Manual/SoP as follows:-

The main agency has to associate the specialized agency for execution of Lift work.

The associate specialized agency should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than 40% of estimated cost of Lift work.

OR

(ii) Two similar works each of value not less than 60% of estimated cost of Lift work.

OR

(iii) One similar works each of value not less than 80% of estimated cost of Lift work.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "SITC of Lift".

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (SITC of Lift) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (SITC of Lift). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (SITC of Lift). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

The firm has to ensure that lift equipment manufacturer comes under definition of local manufacturers as per Govt. of India, Policy of Public Procurement (Preference to make in India) Order, 2017 (PPP-MII Order 2017) issued by Department of Industrial Policy and Promotion.

However, the composite category contractor shall also be carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

OR

b) He directly procures the equipment of approved make from manufacturer and gets it installed from authorized agency/ service provider of the manufacturer or specialized agency as per criteria mentioned in the NIT.

A undertaking from make in India manufacturer lift and authorization certificate from manufacturer of lift for un-conditional technical support to agency associated.

C *I* *O*	*NIL*

AE(E)(P)

Eligibility condition for Associate agency for execution of SITC of Fire Alarm System [SH: 7]

The main agency has to associate the specialized agency of Fire Alarm System.

The associate specialized agency should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than 40% of estimated cost of Fire Alarm work.

OR

(ii) Two similar works each of value not less than 60% of estimated cost of Fire Alarm work.

OR

(iii) One similar works each of value not less than 80% of estimated cost of Fire Alarm work.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "SITC Fire Alarm System".

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (SITC of Fire Alarm System) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (SITC of Fire Alarm System). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (SITC of Fire Alarm System). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

However, the composite category contractor shall also carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

C *I* *O*	*NIL*

AE(E)(P)

Eligibility condition for Associate agency for execution of SITC of Fire Fighting System [SH-8]

The main agency has to associate the specialized agency of Fire Fighting System.

The associate specialized agency should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than 40% of estimated cost of Fire Fighting work.

OR

(ii) Two similar works each of value not less than 60% of estimated cost of Fire Fighting work.

OR

(iii) One similar works each of value not less than 80% of estimated cost of Fire Fighting work.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "SITC Fire Fighting System".

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (SITC of Fire Fighting System) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (SITC of Fire Fighting System). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (SITC of Fire Fighting System). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

However, the composite category contractor shall also carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

C *I* *O*	*NIL*

AE(E)(P)

Eligibility condition for Associate agency for execution of SITC of CCTV, LAN & EPABX System [SH-9]

The main agency has to associate the OEM/specialized agency of CCTV, LAN & EPABX system

The associate specialized agency should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than 40% of estimated cost of *CCTV, LAN & EPABX* System.

OR

(ii) Two similar works each of value not less than 60% of estimated cost of *CCTV, LAN & EPABX* System.

OR

(iii) One similar works each of value not less than 80% of estimated cost of *CCTV, LAN & EPABX* System.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7 % per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "SITC of CCTV, LAN & EPABX **System".**

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (**SITC of** CCTV, LAN & EPABX **System**) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (**SITC of** CCTV, LAN & EPABX **System**). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (**SITC of** CCTV, LAN & EPABX **System**). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

However, the composite category contractor shall also carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

C *I* *O*	*NIL*

AE(E)(P)

Eligibility condition for Associate agency for execution of DG set [SH-10]

The main agency has to associate specialized agency of DG set.

The associate agency shall be specialized to carryout the DG set work as criteria laid down below:- The associate specialized agency having valid electrical license should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than 40% of estimated cost of DG work with capacity of individual DG Set being 50 KVA

OR

(ii) Two similar works each of value not less than 60% of estimated cost of DG work with capacity of individual DG Set being 50 KVA

OR

(iii) One similar work each of value not less than 80% of estimated cost of DG work with capacity of individual DG Set being 50 KVA

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "DG Set".

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (**DG Set**) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (**DG Set**). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (**DG Set**). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

However, the composite category contractor shall also carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

OR

b) He directly procures the equipment of approved make from manufacturer and get it installed from authorized agency/ service provider of the manufacturer or specialized agency as per criteria mentioned in the NIT PQ.

C *I* *O*	*NIL*

AE(E)(P)

Eligibility condition for Associate agency for execution of UPS System [SH: 11]

The main agency has to associate the specialized agency of UPS System.

The associate specialized agency should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than 40% of estimated cost of UPS system.

OR

(ii) Two similar works each of value not less than 60% of estimated cost of UPS system.

OR

(iii) One similar works each of value not less than 80% of estimated cost of UPS system.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "UPS system".

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (UPS system) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (UPS system). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (UPS system). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

However, the composite category contractor shall also carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

C *I* *O*	*NIL*

AE(E)(P)

Eligibility condition for Associate agency for execution of SOLAR PHOTO VOLTAIC POWER PLANT [SH-12]

The main agency has to associate the specialized agency of Solar Photo Voltaic Power Plant .

The associate specialized agency should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than *40% of estimated cost of* SPVP Plant work

OR

(ii) Two similar works each of value not less than 6*0% of estimated cost of SPVP Plant work*

OR

(iii) One similar works each of value not less than *80% of estimated cost of SPVP Plant work*

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "SITC OF SOLAR PHOTO VOLTAIC POWER PLANT".

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (SITC OF SOLAR PHOTO VOLTAIC POWER PLANT) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (SITC OF SOLAR PHOTO VOLTAIC POWER PLANT). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (SITC OF SOLAR PHOTO VOLTAIC POWER PLANT). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

However, the composite category contractor shall also be carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

C *I* *O*	*NIL*

AE(E)(P)

Eligibility condition for Associate agency for execution of SITC of Sub-station equipments [SH-13]

The main agency has to associate the OEM/specialized agency of Sub-station

The associate specialized agency should have successfully completed works, as mentioned under during last 7 years ending previous day of last date of submission of tender.

(i) Three similar works each of value not less than 40% of estimated cost of Sub-station work with capacity of individual Sub-station being 100 KVA.

OR

(ii) Two similar works each of value not less than 60% of estimated cost of Sub-station work with capacity of individual Sub-station being 100 KVA.

OR

(iii) One similar works each of value not less than 80% of estimated cost of Sub-station work with capacity of individual Sub-station being 100 KVA.

The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7 % per annum; calculated from the date of completion to previous day of last date of submission of tender.

Similar work shall mean works of "SITC of Sub-station equipments".

The main contractor/agency has to submit detail of such associate agency to Engineer-in-charge (**SITC of** Sub-station equipments) with in fifteen days from date of start of work. The associate agency shall be approved by Engineer-in-charge (**SITC of** Sub-station equipments). In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge (**SITC of** Sub-station equipments). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

However, the composite category contractor shall also carry out himself work without associating any specialized agency provided: -

a) He fulfils the prescribed eligibility criteria respectively for these work(s).

OR

b) He directly procures the equipment of approved make from manufacturer and get it installed from authorized agency/ service provider of the manufacturer or specialized agency as per criteria mentioned in the NIT PQ.

C *I* *O*	*NIL*

AE(E)(P)

SH:- 5, 7, 8, 9, 10, 11, 12 & 13

MEMORANDUM OF UNDERSTANDING [M.O.U] BETWEEN

1] M/S [Name of the firm with full address]
Enlistment Status
Valid Upto:
[Henceforth called the main contractor]

And

2] M/S [Name of the firm with full address]

Enlistment Status

Valid Upto:

[Henceforth, called Associated Contractor]

Name of Work:- Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).

[Electrical Component only] as per schedule, specifications, terms and conditions of the tender.

We state that M.O.U. between us will be treated as an agreement and has legality as per Indian Contract Act (amended up to date) and the department (CPWD) can enforce all the terms and conditions of the agreement for execution of the above work. Both of us shall be responsible for the execution of work as per the agreement to the extent of this MOU allows. Both the parties shall be paid consequent to the execution as per agreement to the extent this MOU permits.

We have agreed as under :

1- The associated contractor shall be liable for disciplinary action if he failed to discharge the action(s) and other legal action as per agreement besides forfeiture of the security deposit.

2- All the material, machinery and equipments, tools and tackles required for execution of the electrical works as per agreement shall be the responsibility of the associated contractor.

3- The site staff required for the electrical work shall be arranged by the associated contractor as per terms and conditions of the agreement.

SIGNATURE OF MAIN CONTRACTOR

SIGNATURE OF ASSOCIATED CONTRACTOR

Date
Place

Date
Place

COUNTERSIGNED
EXECUTIVE ENGINEER (E)

C *I* *O*	*NIL*

AE(E)(P)

SH:- 5, 7, 8, 9, 10, 11, 12 & 13
WILLINGNESS CERTIFICATE

Name of Work: Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).

I hereby give my willingness to work as associated contractor for the above mentioned work.

I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-charge. Also I will employee full time technically qualified supervisor for the works. I will attend inspection of officers of the department as and when required.

Date : **Signature of Contractor**

C *I* *O*	*NIL*

AE(E)(P)

Additional Conditions for E.I. & Fans work.

1- The work shall be carried out strictly in accordance with CPWD General Specifications for Internal Electrical Works Part I Internal - 2023, General specification for External Electrical work Part II -2023, Part III- Lift & Escalators-2003, Part IV- Sub-station- 2013, Part-V- Wet riser & Sprinkler systems-2020, Part-VI – Fire Detection & Alarm system-2018, Part VII- DG sets-2013, Part VIII- Gas Based Fire Extinguishing system-2013, as amended last date previous to date of submission of tender. as amended upto date and as per instructions of the Engineer-in-Charge including as below and nothing will be paid extra.

(a) All material shall be got approved from Engineer-in-Charge before use. One sample flat/Bay /Room shall be made for approval of final location of switch boards/ fittings etc. and then only work shall be executed in other flats/bays/Room.

All damages done to the building during execution of Electrical work shall be the responsibility of the contractor and the same will be made good immediately at his own cost to the satisfaction of the Engineer-in-Charge. Any expenditure incurred by the department in this condition shall be recovered from the contractor and decision of the Engineer-in-Charge about recovery shall be final.

(b) All hardware items such as screws, thimbles, G.I. wires etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned. All hardware materials such as nuts/bolts/screws/ washers etc. to be used in the work shall be zinc/cadmium plated iron.

(c) CONDUIT LAYOUT shall be prepared by contractor and got approved before execution of work. Minimum No. of Junctions to be kept, & if required junctions to be kept underneath the fitting locations in corridor/rooms so that junctions are not visible after fittings are fixed/in position. Drop of conduit shall be well planned w.r.t. location of fitting/D.B. and criss crossing to be avoided. All chases in walls shall be cut using wall grooving machine. For this purpose electricity shall be arranged by contractor.

(d) Any conduit which is not to be wired by the contractor shall be provided with GI fish wire for wiring by some other agency subsequently. Nothing extra shall be paid for the same.

Termination of multi-stranded conductors shall be done using crimping type thimbles at both the ends. Nothing extra shall be paid for the same.

(e) For Submain Wiring, Colour Code for different phases and Neutral (R.Y.B. black) to be maintained. While circuit wiring, wiring for fan point, wiring for light point shall be done with different colours for easy identification. Wiring for neutral shall be done with black colour and all connections to fans & fittings wherever visible shall be made with white PVC insulated copper wire or wherever cover sleeve may be provided. At Switch board, Switch shall be fixed in a logical manner w.r.t. fittings layout.

(f) Unless specifically approved by Executive Engineer (E.), loose wire box, above DB shall not be provided however DB's shall have loose wire box of same make.

All connections to MCB's shall be made using thimble/lugs.

(g) All DB's i/c incoming & outgoing MCB's shall be suitably numbered for location/circuits. DB shall be fixed in recess suitably (30 mm. approx. projected from unplastered wall) to ease opening of door. Top of DB to match with door frame height as per site conditions.

C *I* *O*	*NIL*

AE(E)(P)

(h) Phenolic laminated sheet shall be of Egg white colour, and shall be filed/rounded at edges and of minimum 3mm thick wherever required.

(i) All fittings and fans should be properly earthed through the protective conductor.

Provision of earth bars in main boards, earth terminal block in DB's & earth studs in all metal boxes shall be made, connection to this stud shall be crimped.

A clamp type termination should be made in the termination of earth strips (where provided) to pipe electrodes to provide surface type contact.

(j) The earthing shall be carried out in the presence of the Engineer-in-charge or his authorized representative.

(k) The size at switch box for providing Modular Plate type Switch/Sockets shall be properly settled to take care of all necessary switches/screws/fan regulators. Blanking plate if required shall also be provided at no extra cost.

(l) For point wiring in steel conduit all piano type switch or all modular type switches/sockets/telephone outlets/T.V. outlets shall be of only one make.

(m) The contractor shall make his own arrangement at his own cost for electrical/ general tools and plants required for the work.

(n) All LED light fittings should have minimum 5 years warranty, warranty certificate to be submitted by agency on OEM letter head regarding this.

2- The work shall be carried out according to approved drawings/details which shall be subsequently issued to the successful tenderer for execution of work and as per instructions of the Engineer-in-Charge who will have the right to change the layout as per requirement at site and the contractor shall not have any claim due to change in layout.

The work shall be carried out in engineering like manner. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost to the satisfaction of the Engineer-in-Charge. The programme of electrical works are to be co-ordinated in accordance with the building work and no claim for idle labour will stipulated in the tender, electrical work shall have to be completed alongwith completion of civil work.

All the debris of the electrical works should be removed and the site should be cleared by the contractor immediately after the accruing of debris. Similarly any rejected material should be immediately cleared off from the site by the contractor.

Watch and ward of the material/equipment shall be the responsibility of the contractor till handing over of installation to the department.

The contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-Charge and to comply with the remarks therein.

3- The entire installation shall be at the risk and responsibility of the contractor until these are tested and handed over to the department. However, if there is any delay in construction from the department side, the installation may be taken over in parts, but the decision on the same shall rest with Engineer-in-Charge which shall be a binding on the contractor.

4- Issue of material to the contractor wherever stipulated, shall be according to the requirement at site from time to time depending upon the program of work.

5- The contractor shall have to return the surplus/unused material supplied by the department for use on work at the place of original supply failing which the recovery shall be made at the recovery rate as given the list stipulated materials, if applicable.

C *I* *O*	*NIL*

AE(E)(P)

6- Cement for this bonafied work is to be arranged and used by the contractor himself and nothing extra will be paid on this account.

7- The contractor shall make his own arrangement at his own cost for electrical / general tools and plants required for the work.

8- The rates of all items of work shall unless clearly specified otherwise, includes the cost of all labour, materials and other input involved in the execution of work.

9- Central / State Sales Tax / Contract Tax / GST etc. should be included in the rates tendered. Statutory deductions of contract tax at source shall be made while releasing payment through running/final bills. A certificate specifying the rate and amount of deduction shall however be issued. No Form 31/32 (road permit) shall be issued by the department. The road permit shall be arranged by the tenderer at his own.

10- All U.G. Cable work shall be got inspected and measurements lest checked by the Assistant Engineer in charge of work and his authorized representative before filling up the trenches, failing which work remain subject to 100% recheck at the risk and cost of the contractor.

11- All U.G. Cables before laying shall be got tested for continuity in presence of the authorized representative of the Engineer-in-Charge.

12- Route of the U.G. Cables shall be got approved from the Engineer-in-Charge or his authorized representative.

13- Earthing shall invariably be done in the presence of the Engineer-in-Charge pr his authorized representative.

14- Contractor shall preserve the copies of invoices, test certificates; gate passes etc. to prove the genuineness of material / purchases which are used at site as per agreement

15- Notwithstanding the schedule of quantities, all items of interrelated works consider necessary to make the installation complete and operative are deemed to be included shall be provided by the contractor at no extra cost.

16- The secured advance as applicable shall be allowed.

17- **Completion Plan & Test Certificate:** Contractor shall submit completion plan for Internal and External electrical services **(in triplicate)** failing which a recovery 0.1% of tendered amount shall be made from final bill. Contractor has to submit SLDs & layout plan in triplicate in Dwd. pdf & A0 size hard copies in triplicate duly signed and checked by the concerned JE/AE.

Test certificate for the work carried out shall also be submitted failing which recovery @3% of tender amount subject to maximum of Rs.500000/- shall be made from final bill.

18- Panels: Drawing of panel shall be submitted for approval within 30 days from award of work and fabrication to be taken up only after approval of such drawing.

19- Quantities indicated in Schedule of work are only tentative, contractor shall consult AE-in-Charge before procurement. Payment shall be made only for the quantities actually executed and measured.

20- Time Period: Contractor has to plan his activities, so that electrical work is to be carried out in close co-ordination with CIVIL work and in no case CIVIL work be delayed because of delay in electrical work and the work has to be completed accordingly.

C *I* *O*	*NIL*

AE(E)(P)

21- The makes for items shall be as per list attached.

22- **Storage :-** Responsibility for storage space for execution of work shall be of main contractor.

23- **Power & Water Supply:-** Responsibility for supply of power & water for execution of work shall be of main contractor.

C *I* *O*	*NIL*

AE(E)(P)

ADDITIONAL CONDITIONS FOR FIRE FIGHTING SYSTEM.

1- **Specification**-: The work shall be executed as per CPWD's general specification for Electrical Works part-I (Internal)-2023, Part-II (External)-2023, Part-V (Wet Riser System for Fire Fighting Installation)- 2020, amended upto date and as per direction of Engineer-in-Charge. The additional specifications are to be read with above and in case of any variations; specifications given along with the tender shall apply.

2- **Location**-: The work is to be executed at **MRHRU, ICMR at CHC Nagram, Lucknow (UP).** The Contractor is advised to visit the site before submission of their tender.

3- **Approval from CFO**-: The Contractor shall be required to obtain Pre NOC and final NOC from Chief Fire Officer and work shall be deemed to be completed only after receiving NOC from CFO & rectification if any. Statutory fee if any shall be paid by department. However, all liasoning work / arranging inspection of CFO shall be the responsibility of contractor.

4- **Storage**: - Responsibility for storage space for execution of work shall be of main contractor.

5- **Power & Water Supply: -** Responsibility for supply of power & water for execution of work shall be of main contractor.

6. The material in required quantity to be used in the work shall be got approved from the Engineer-in-charge before its use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.

7. Contractor shall preserve the copies of invoices, test certificates; gate passes etc. to prove the genuineness of material/purchases. The responsibility of procurement, genuine material of specialized works shall rest with the contractor.

8. **No inspection outside the country is permissible if required so the same will be deemed to be waived off and necessary test reports shall be submitted before the dispatch of equipment.**

9. **Payment Terms: -** The Following percentage of contract rates shall be payable against the stages of work shown herein:

S.no.	Stage of work	Panels, Fire fighting pumps	All other items
i	After initial inspection (wherever specified) and delivery at site in good condition on pro-rata basis.	75 %	70 %
ii	On completion of pro-rata installation	15 %	20 %
iii	On testing, Commissioning and handing over.	10 %	10 %

C *I* *O*	*NIL*

AE(E)(P)

ADDITIONAL CONDITIONS FOR FIRE ALARM SYSTEM

1- **Specification:-** The work shall be executed as per CPWD's general specification for Electrical Works Part – I (Internal), Part-VI Fire Detection and Alarm System – 2018. The additional specifications are to be read with above and in case of any discrepancy; technical specifications given along with the tender shall apply.

2- **Location:-** The work is to be executed at **MRHRU, ICMR at CHC Nagram, Lucknow (UP).** The contractor is advised to visit the site before submission of their tender and ensure that equipment being offered by them shall be accommodated in the spaces available.

3- **Acceptance of Tender: -** The department reserve the right to reject any or all the tenders without assigning any reason.

4- **Rates:-** The rates shall be inclusive of all taxes, levies, packing, transportation, handling etc. Nothing extra shall be paid.

5- **Storage:-** Responsibility for storage space for execution of work shall be of main contractor.

6- **Power & Water Supply:-** Responsibility for supply of power & water for execution of work shall be of main contractor.

7- **T&P:-** The department will not issue any T&P for execution of the work.

8- **Pre-commissioning test**:- Before commissioning of the installation, all tests as per CPWD's specifications and or respective manufacturer's recommendations shall be carried out and result submitted.

9- **Acceptable make: -** The acceptable make of various equipment are indicated in the list attached. Alternative or equivalent make will not be accepted.

10- **Care of Building**: - The contractor will have to ensure that no damage is caused to the building during execution of the work. The contractor will have to repair any damage caused during execution of the work, failure of which the department will repair the same at the risk & cost of the contractor.

11- **Approval of Drawings**: After award of the work, the contractor will have to submit following drawings: - (i) Single Line Diagram of Fire Alarm System. (ii) Drawings of Fire Alarm System. (iii) Any other drawing considered necessary by Engineer-in-Charge.

Work will be started after getting the above drawings approved by the Engineer-in-charge.

12- **Payment Terms: -** The Following percentage of contract rates shall be payable against the stages of work shown herein:

S.no.	Stage of work	Panels, Detectors & Devices	All other items
i	After initial inspection (wherever specified) and delivery at site in good condition on pro-rata basis.	75 %	70 %
ii	On completion of pro-rata installation	15 %	20 %

C *I* *O*	*NIL*

AE(E)(P)

iii	On testing, Commissioning and handing over.	10 %	10 %

13- **Final inspection**:- After completion of the work, the contractor will demonstrate trouble free operation of the system to the Engineer-in-Charge. In case any deficiencies are noticed during the demonstration, the same will be attended by the contractor promptly.

14- **Completeness of Tender**: All sundry materials such as Foundation Bolts, Hardware Items, Junction Boxes, Sleeves, Flexible conduit etc. which are not specifically mentioned in the tender but are required for completion of the work, will be deemed to be included and the contractor will be bound to provide the same without any extra cost.

15- **Minor Building Work**: Minor building work such as Foundation, making opening in Walls/Slab for passage of pipe, making chases, fixing suspenders in Slab/Walls and furnishing the damages to the building to the satisfaction of Engineer-in-Charge etc. are to be executed by the contractor as a part of the work and nothing extra shall be paid for the same.

16- **Indemnity**: The contractor will be fully responsible for any accident taking place during execution of the work. The department will not take any responsibility for the same.

17- **Completion Plan/Drawings**: After completion of the work the contractor will submit completion plans, wiring drawings of equipment, catalogue etc. which are required for maintenance of the system.

18- Payment shall be released only after submission of PAN No. and valid GST TIN No. of the state where work is to be executed. If payment is delayed due to non- submission of PAN No. and valid GST TIN No. then, responsibility for the same will lie on the part of the contractor and no claim/interest etc. will be paid by the department on this account.

19- The contractor shall make payment to the worker through Cheque/RTGS/D.D. and a proof of making payment through Cheque/RTGS/D.D. may be submitted along with running account bill of contractor.

20- **Approval from CFO:-** The Contractor shall be required to obtain Pre NOC and final NOC from Chief Fire Officer, and work shall be deemed to be completed only after receiving NOC from CFO & rectification if any. Statutory fee if any shall be paid by department. However all liasoning work / arranging inspection of CFO shall be the responsibility of contractor.

21- The material in required quantity to be used in the work shall be got approved from the Engineer-in-charge before its use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.

22. Contractor shall preserve the copies of invoices, test certificates, gate passes etc. to prove the genuineness of material/purchases. The responsibility of procurement, genuine material of specialized works shall rest with the contractor.

23. **No inspection out side the country is permissible if required so the same will be deemed to be waived off and necessary test reports shall be submitted before the dispatch of equipment.**

TECHNICAL SPECIFICATION FOR FIRE ALARM SYSTEM

1.0 ANALOGUE ADDRESSABLE FIRE ALARM SYSTEM

1.1 SCOPE OF WORK

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1.1.1 The scope of work under this heading shall include designing supplying and installing, Testing and commissioning of Analogue Addressable Fire Detection and Alarm System. The work under this system shall consist of furnishing all materials, equipment, appliances and labour necessary to install the complete Fire Detection and Alarm System, complete with Main Fire Alarm Control Panel, Sensors, Sounders, Strobes, Manual Call Stations, Relays etc. for interfacing with other systems.

1.1.2 It shall include laying of cabling/wiring/conduiting and power supply etc., necessary for installation of the system with supply of sensors and devices as appropriate and as indicated in the Specification and Bill of Quantities. Any openings/chasing in the wall/ceiling required for the installation shall be made good in appropriate manner.

1.1.3 The Bidder shall also undertake to control and monitor the ventilation and other systems from the Fire Alarm Panel through the use of Addressable Output / Input Modules.

1.1.4 The Building should be designated as multiple fire zones with each area forming one or more software programmed zones. All wiring shall be done using 2 x 1.5 mm2 twisted pair shielded PVC insulated copper cable while exposed and in PVC/MS Conduits in concealed in concrete.

1.2.1 GLOSSARY OF TERMS

1.2.1.1 **FIRE ALARM CONTROL PANEL (FACP)** This refers to the microprocessor-based panel that shall be connected to the various sensors/devices by means of 2 wire loops. The FACP shall be able to supervise individual detectors for proper performance as well as to give pinpoint location of Fire or Fault Alarm and initiate Alarms as well as facility for cutting off of AHU‟s and Electrical Power is also to be included. The panel shall also have the provision of through volt-free contact to activate an Auto-Dialer to dial selected phone numbers in case of fire.

1.2.1.2 **LOOP** A loop shall mean a 2-wire circuit which is capable of monitoring and controlling detector/devices. The loop card shall have built-in short circuit isolators to accommodate Class A wiring.

1.2.1.3 **ADDRESSABLE DEVICES** This term indicates the complete group of addressable devices such as Sensors or Detectors, Manual Call Stations, Addressable Output / Input Modules etc.

1.2.1.4 **SENSORS OR DETECTORS** The Sensors or Detectors shall be Analogue Addressable type. The chamber should be easily removable for the purpose of easy maintenance. The address programming shall be done through the decade switch in the Detector. The Detectors shall have a common base to allow easy interchange of various types of Detectors.

1.2.1.5 **MANUAL CALL STATION** The Manual Call Station shall be addressable type with Input Modules to define the address for each station. The function shall be similar to that of conventional Manual Call Point and should be reset table without replacing the glass.

1.2.1.6 **OUTPUT MODULE** Output module shall mean Addressable points from the FACP with potential free contacts for tripping of AHUs, power supply etc. as required. Any module shall operate two relay outputs powered from the loop and preferably consuming single address on the loop. The system shall also be able to handle separate modules to interface the speakers of the Public Address System.

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1.2.1.7 **INPUT MODULE** The input modules shall be of dual/single channel type. The dual channel module shall be selectable for Normally Open or Normally Close by a 2 bit DIL switch.

1.2.1.8 **FAULT ISOLATOR** This unit shall be placed on the loop preferably after every 20 devices and shall be able to isolate electrical short circuit in the wiring. All the other detectors shall remain functional because of the Class A wiring of the loop. The isolator shall not utilize an address and shall be built into the detector base wherever required.

1.2.1.9 **SOUNDERS/HOOTERS** Each sounder shall be of addressable type. It shall be capable of being directly mounted on the wall/ceiling or along with the detector. The sounder shall be programmed to activate in event of an alarm from a single detector/device or a group of detectors/ devices.

1.3 SPECIFICATION

1.3.1 A general line diagram showing the circuit and spacing of detectors is to be enclosed. The quantity mentioned in the Price Schedule shall be quoted for. Unit rates shall apply in the event of any variance.

1.4 FIRE ALARM SYSTEM

1.4.1 The Fire Alarm System shall confirm to EN54, BS: 5839-1:2013 in respect of design and installation, and it shall give Audio/Visual Alarm Signals when there is rise in temperature in case of Heat Detector or while measuring Smoke Density in case of Smoke Detector, while it exceeds the pre-set limit. The system shall give pinpoint location of fire with warning system and voice communication for commands and instruction if required.

1.4.2 Annunciation facility shall also be inbuilt into the FACP, the panel being able to initiate alarm signal for any particular zone.

1.4.3 The system shall be fully supervised for all fault conditions with distinctive alarm operated for fault and fire conditions. Test buttons and software features shall be provided to test the electronic circuits and Detector health.

1.4.4 The FACP shall have facility to connect addressable Input / Output Devices in the peripheral RS 485 bus.

1.4.5 The system shall be based on an "Open Protocol" to ensure flexibility of using Sensors / Detectors of an alternate manufacturer, in case the user requires such an option at a later date.

1.5 FIRE ALARM CONTROL PANEL (FACP)

1.5.1 The Fire Alarm Control Panel shall be micro processor based fully Analogue Addressable, Analogue Control Unit which shall control all Analogue Addressable Detectors, Manual Call Stations and Switching Systems (for disconnecting AHU and power supply) connected to it.

1.5.2 All addressable units shall be connected to the FACP through the Loop Cards and shall be addressed through individual numbers. The FACP shall be able to obtain analogue value for all detectors in the circuit through a pulsed digitalized current data. The FACP shall be able to analyze all analogue inputs from all addressable units, and through its own software and ambient level screening the FACP shall be able to identify fire, possible fire or fault conditions. The unit supervision shall be dynamic and continuous.

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1.5.3 The FACP shall itself have one loop card built in. The loop shall be able to address Detector/Devices as per BOQ .All the networked panels shall display all the events occurring anywhere in the system. Each FACP on the network shall effectively function as a repeater panel as well.

1.5.4 The FACP shall also give adequate warning signal whenever there is dust accumulation in detectors, and up to the point of its replacement it should be possible to change the level of ambient alarm calibration condition either by the use of software program operable by the owner or by resetting the detector.

1.5.5 Short / Open circuit units shall also be reported at the FACP In such cases, the system through the use of fault isolators shall be able to isolate that segment between the two fault isolators. The missing Detectors/Devices shall also be reported at the FACP with identification of the location.

1.5.6 The FACP shall have the facility to set sensitivity of each smoke sensor remotely.

1.5.7 When an alarm condition is sensed at the FACP from a smoke or heat detector, a delay time/alarm verification period shall be stated. If the sensor is still in alarm after the delay time expires, an alarm condition is reported. The delay time shall be adjustable from 0 to 990 sec's.

1.5.8 The FACP shall have the facility to perform walk test such that an operation can be periodically checked out for all initiating devices. As each device is placed into alarm the FACP shall print the condition and automatically rest the device. Audible devices shall be initiated, if required at a preprogrammed time. If a zone is inadvertently left in walk test mode, it shall automatically reset to normal after the idle time is exceeded. During the walk test the zones other than the programmed zones shall be under continues supervision (normal mode). In case of any alarm initiated by detector/devices the walk test shall get terminated automatically.

1.5.9 Programming functions shall include alarm/trouble type assignment, point descriptor assignment, alarm message assignment, etc.

1.5.10 Programming may be carried out from the FACP keyboard or utilizing the approved PC setup software via laptop/desktop computer.

1.5.11 The FACP shall have a Liquid Crystal Display of Alphanumeric type to indicate immediately all conditions. The display should be high resolution, backlit 80 character. In case of testing of the system from the FACP the Display shall be able to give readouts of analogue value of all detectors being tested. The FACP shall also be able to carry out continuous self-monitoring when in normal condition.

1.5.12 The FACP shall have facility for in-built or external printer coupled to the FACP, which shall log all events with time. The printout shall clearly indicate the event - Fire/Pre Alarm/Fault etc. With the unit address and time.

1.5.13 The FACP shall also be able to discriminate between false alarms and fire conditions, as well as priority selection of alarm in case alarm activate in two or more remotely located units simultaneously. In such cases, the Manual Call stations shall have the highest priority.

1.5.14 The FACP also is able to actuate switches automatically in case of Fire condition that of AHU"s and power supply or other systems such as Gas Extinguishing Systems.

C *I* *O*	*NIL*

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1.5.15 In this respect the bidder is required to take note of clause relating to cutting off of AHU"s given above. The bidder shall note that the Client shall provide no additional facilities for completion of this mechanism other than that specified in clause 1.4.6.

1.5.16 The System shall be fail safe and adequate safe guards should be under taken that in the event of a failure of a part of the System it shall not handicap the complete System. The Loop Cards shall be of Modular Construction.

1.5.17 The Bidder shall undertake the responsibility of the complete installation, commissioning, user trials, training and maintenance of the System as required. The Bidder shall take all responsibility for preparation and installation of System Software into the FACP. The Software shall be such so as to be easily operated by the Client's Personnel and secured against Software errors, ability to be upgraded so as to incorporate more features at a later date.

1.5.18 The FACP shall have its own Battery Backup of a minimum of 48 hours in normal condition and then half an hour in alarm condition. The back up time calculation shall be done as per IS 2189 standards.

1.5.19 It shall be able to withstand temperature variations from 00 centigrade to 550 centigrade. Further, Relative Humidity (non-condensing type) up to 95% shall not hamper its performance. The voltage rating shall be from 15V DC to 32V DC, though the voltage may be change depending upon the working voltages of a proprietary FACP.

1.5.20 The logic circuitry shall be based on high noise immunity solid state hardware employing modular construction. Logic cards shall be of epoxy fiber glass construction.

1.5.21 The FACP shall be capable of being networked (future expansion) with other similar FACPs located at different part of the premises through a single RS485 bus.

1.5.22 The FACP shall have provision for interfacing with the Public Address System.

1.5.23 The panel should have the facility to interface with an automatic two-channel programmable speech dialer for verbal reporting of fire. It shall be able to call four telephone numbers per channel. The programmable speech dialer shall have two alarm inputs and shall provide listen-in capabilities through the built-in microphone. The dialer shall have a built-in keypad for easy operation, programming and voice recording.

1.6 ADDRESSABLE DETECTORS

A. SMOKE DETECTOR

1.6.1. All detectors are fitted with plug-in system type connections, from the maintenance and compatibility point of views. An alarm release will not effect a detector's good functioning. After resetting the alarm, the detector will resume operations without readjustment of any kind.

1.6.2. The detector shall be high performance optical type. Detectors using radioactive elements shall have BARC approval.

1.6.3 The detector shall be able to sense incipient fire by detecting the presence of visible and invisible products of combustion. The detector shall be suitable for low voltage (15 to 32 V DC) two wires supply. The detector shall be provided with Twin LED indication and the sensitivity of the detector shall not vary with change in ambient temperature, humidity, pressure or voltage variation.

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1.6.4 Neither its performance shall be affected by air current up to 1.52mtr per second. The detector shall be suitably protected against dust accumulation/ ingress and it shall be free from maintenance and functionally tested at intervals. All detectors shall be identical in construction design and characteristic to facilitate easy replacement.

1.6.5 The coverage per smoke detector shall strictly follow IS 2189 standards. It shall be possible to connect Smoke Detector with Heat Detector or Manual Push Button in the same circuit. The sensitivity of detector shall be set from the FACP to suit the site requirement.

1.6.6 It shall have in-built locking mechanism to check the removal and pilferage of the detector.

1.6.7 The Photoelectric type Smoke Detector shall be Analogue Addressable type and be able to send analogue output to the FACP regarding its condition. It shall be able to communicate with the FACP by the pulses emitted from the FACP. The detector should be programmed using a decade or rotary switch.

1.6.8 The base of the Detector shall be electronics free and interchangeable with other smoke or heat detectors.

1.6.9 It shall be able to withstand temperature variations from - 10 degree centigrade to 50 degree centigrade. Further, Relative Humidity (non-condensing type) up to 80% shall not hamper its performance. The voltage rating shall be from 15V -32V DC though the voltage may be changed depending upon the working voltages of a proprietary FACP.

1.6.10 It shall be possible to test the Detectors working both from the FACP as well as locally by means of a magnet to simulate a Functional Test Condition.

1.6.11 It shall be possible to mount the detectors in Duct Casting Unit for sampling of Supplying Air from the AHUs. Secondary response indicators shall be provided for all the Above False Ceiling Detectors.

1.6.12 The detector shall have twin LED's for 360 degree viewing angle. LED on the detector shall blink each time the sensor is scanned by the FACP. If the FACP determines that the sensor is in alarm, the FACP will command the sensor LED to remain on to indicate the same. Each sensor will be capable of being tested for alarm via command from the FACP. Each sensor shall respond to FACP scan with the information about its type for identification.

1.6.13 It shall be possible to connect loop powered base sounders on the detector loop. The sounder shall not require a separate cable for power supply.

B. HEAT DETECTOR

1.6.14 Heat detector shall provide temperature measurement when it reaches pre-alarm in normal course. However the operator shall have the option of calling up the temperature measured by the specific detector as and when required.

1.6.15 It shall have in-built locking mechanism to check the removal and pilferage of the detector.

1.6.16 The heat detector shall be Analogue Addressable type and be able to send analogue output to the FACP regarding its condition. It shall be able to communicate with the FACP by the pulses emitted from the FACP. The detector should be programmed using a decade or rotary switch.

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1.6.17 The base of the Detector shall be electronics free and interchangeable with other smoke or heat detectors

1.6.18 It shall be able to withstand temperature variations from - 10 degree centigrade to 50 degree centigrade. Further, Relative Humidity (non-condensing type) up to 80% shall not hamper its performance. The voltage rating shall be from 15V -32V DC though the voltage may be changed depending upon the working voltages of a proprietary FACP.

1.6.19 It shall be possible to test the Detectors working both from the FACP as well as locally by means of magnet to do a Functional Test.

1.6.20 The detector shall have twin LED's for 360 degree viewing angle. LED on the detector shall blink each time the sensor is scanned by the FACP. If the FACP determines that the sensor is in alarm, the FACP will command the sensor LED to remain on to indicate the same. Each sensor will be capable of being tested for alarm via command from the FACP. Each sensor shall respond to FACP scan with the information about its type for identification.

1.6.21 It shall be possible to connect loop powered base sounders on the detector loop.

1.7 MANUAL CALL STATIONS

1.7.1 The manual station shall be a press to break type. The device shall be red in color and suitable for surface or flush mounting. Manual stations shall be inter faceable to an addressable input module that can be accommodated within the device. The manual station shall have normally open fire alarm and annaunciator contacts and these contacts shall close on activate. Contacts shall remain closed until station is manually reset.

1.7.2 The Manual Call Station shall be fully addressable with its own addressable module and operated by digitized signals from the FACP. The voltage range shall be from 15V to 32V. It shall have protection as per IP33. The operating temperature range shall be from -10 degree C to 50 degree C. Relative Humidity (non condensing) range of performance parameters shall be between 10 to 93%.

1.8 FIRE ALARM REPEATER / ANNUNCIATOR PANEL

1.8.1. The Alarm Repeater/Annunciator Panel shall display fire/fault messages simultaneously with the FACP. It shall be capable of interfacing with the FACP on a single RS 485 Bus.

1.8.2. The panel shall have a 80 character backlit alphanumeric LCD display, which shall display date, time & description of alarm/trouble events that are displayed in the FACP with an inbuilt buzzer to indicate fault/fire alarm.

1.8.3. The panel shall be powered from the FACP.

1.8.4. It shall have control keys for Sound, Silence, Mute and to reset the FACP from the repeater station.

1.8.5. The repeater panel shall have the following LED,,s indications a. Supply b. Fault c. Mute d. Silent e. Disabled f. Fire

1.9 SOUNDER/HOOTERS CUM STROBES

1.9.1 The sounder shall be electronic type and shall give discontinuous/ intermittent audible alarm whenever any detector or MCP operates.

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1.9.2 The sound output from the Hooter should be as per IS 2189.

1.9.3 The sounder/Hooter shall be powered from either 2 wire detector loop.

1.9.4 The horn/strobe shall be listed to UL 1971/ UL 464/LPCB and shall be Approved for fire protective service. The horn/strobe shall be wired as a primary-signaling notification appliance and comply with the Americans with Disabilities Act requirements for visible signaling appliances, flashing at 1 Hz over the strobess entire operating voltage range. The strobe light shall consist of a xenon flash tube and associated lens/reflector system. The horn shall have three audibility options and an option to switch between a Temporal 3 pattern and a Non-Temporal (continuous) pattern. These options are set by a multiple position switch. On four-wire products, the strobe shall be powered independently of the sounder. The horn on horn/strobe models shall operate on a coded or non-coded power supply.

1.10 DUCT CASTING UNIT The Duct Casting Units are to be directly installed in the return Air conditioning ducts for detecting any hazardous quantity of products of combustion be carried through the ducts. The complete unit shall consist of Polycarbonate housing to accommodate Photo Electric Detector with plug - in facility and sampling tubes, one for Air inlet and other as the air outlet. The Inlet tube shall extend into and across the duct width (from 0.5 meter to 3.0 meter); the outlet tube shall be of fixed length of 7.5-cm length. When the AHU blower fans shall operate a continuous cross sectional Sampling of air from the duct shall flow through the housing containing the Detector. The outlet tube shall return the sampled air into the duct. The functional requirements of the Duct Casting Unit shall be: i) Uniform Sensitivity - irrespective of air velocity - up to 1200 meters per minute. ii) It shall function on the Venturi principle, with Aluminum Venturi tubes. iii) The Duct Casting Unit shall be compact, easy to install and with the facility to dismantle the cover or Detector for maintenance purposes. iv) The housing shall be mounted outside the duct; the probe tubes shall be inserted through the duct by cutting precision sized holes into the duct and sealed with rubber gaskets. v) The Duct Casting Unit shall be LPCB/UL Approved.

1.11 ADDRESSABLE MONITOR MODULE

1.11.1 The monitor module shall provide an addressable input for N.O. or N.C. Contact devices such as manual stations, Water flow switches, sprinkler Supervisory devices, etc.

1.11.2 It shall provide a supervised initiating circuit. An open-circuit fault shall be Annunciated at the Fire Alarm panel (Subsequent alarm shall be reported.)

1.11.3 The device shall contain an LED, which blinks upon being scanned by the Fire alarm panel. Upon determination of an alarm condition of an alarm condition, the LED shall be latched on.

1.11.4 The device shall have a selectable inbuilt fault isolator.

1.12 ADDRESSABLE CONTROL MODULE

1.12.1 Addressable Control Module shall be provided to operate dry contacts for switching ON OFF pressurization fans, AHU‟ s etc. in case of fire etc.

1.12.3 It shall have a built in type identification to automatically identify this Device to the control panel.

1.12.4 It shall have internal circuitry & relay powered directly by two-wire loop.

C *I* *O*	*NIL*

1.12.5 It shall have a selectable inbuilt fault isolator.

1.13 FAULT ISOLATOR MODULE

1.13.1 The Fault Isolator Device shall detect and isolate a short-circuited segment of a Fault-tolerant loop.

1.13.2 The device shall automatically determine a return to normal condition of the Loop and restore the isolated segment.

1.13.3 The fault isolator device shall be placed 20-30 devices as per IS 2189 to limit the Number lost in the event of a short-circuit/wiring fault.

1.14 GRAPHIC MONITORING SOFTWARE

1.14.1 The Graphic Software shall provide both Alarm Management and system maintenance tool.

1.14.2 All the information is available on a single screen allowing quick Assessment, whilst any actions can be taken by accessing the Built-in menus. Building Evacuation, Alarm Silencing and Reset are available to any users with suitable security clearance.

1.14.3 System maintenance can be performed on any device or zone whether the workstation is connected to a single panel or a series of networked panels. From a single location simple checks can be performed to assess the status of individual devices, whilst devices and zones can easily be temporarily isolated for on-site works to be performed. Advanced functionality is available to users with level 3 access permitting the maintenance of PC software security passwords, Time & Date setting and control of the workstation functionality.

1.14.4 The schematic view offers users the site plan. It can be configured to provide a number of levels representing the overall site, individual floor plans, small sections of the floor plans or even individual rooms. Each plan is independently named and can be configured to show all devices as installed on the site.

1.14.5 The event log details a complete history of the activity of the fire system. All major control actions are recorded with date, time, user and an Optional comment field. Entries are colour coded to help easy Identification of specific types of events.

1.15 FIRE ALARM SYSTEM TESTING

1.15.1. FACP

a. The FACP shall be checked for basic tests such as visually checking input voltage and amperage. All zones one by one shall be de wired to check for fault signal indication in the FACP.

b. The Power Source shall be cut off and checked for stand by Supply from the Batteries. After six hours the FACP Source shall be switched on to check for auto switch over to the Mains mode.

c. Tests shall be conducted for AC fail, charger fail, DC fail, Battery Disconnect or Battery fail. In all such cases the relevant L E D should glow and the piezo sound shall also give sound output.

1.15.2 SMOKE DETECTOR

C *I* *O*	*NIL*

a. The testing shall be carried out for each loop / zone, initially one detector in a zone and subsequently 2 or more disassociated detectors in each zone with time lapse between the detectors to test for Alarm Priority, Alarm Queuing and Call Logging.

b. An identified detector will be subjected to smoke aspiration from burning paper/cigarette puffs, rubber and other materials which give dense smoke held at 0.3 M distance from the detector. The FACP should indicate increased analogue output for that address and after the programmed delay time, a fire alarm signal shall be indicated. This delay shall be utilised for alarm verification.

c. The same test shall be carried out for two detectors in the same Loop but in different rooms. The FACP shall indicate Pre Alarm higher analogue levels for both detectors in its display with separate identification for both fires. One of the detectors in question is subjected too higher and longer levels of smoke aspiration. The FACP should give priority alarm for this address. The printout shall indicate individual addresses of the detectors with achieved analogue values and the time of event.

d. This test shall be carried out for different Loops as well as for 2 Loops simultaneously.

1.15.3 HEAT DETECTOR

a. The same tests in the same sequence shall be carried out for this Detector but with the application of hot air from a hair dryer held at approximately 60 cm distance.

1.15.4 COMBINED TEST

a. The next test will be in combination of Photoelectric / Heat Detectors simultaneously with time lapse between application of smoke or heat or as required by the Client.

1.15.5 ADDITIONAL TEST

a. One detector of each type will be disconnected and subjected to slow dust build - up by means as desired by the Bidder and again connected in the circuit.

b. The FACP shall indicate the changed ambient levels and automatically adjust the analogue values for the same. These Detectors are to be replaced by new Detectors of identical type and the FACP shall then be programmed accordingly and checked. The Bidder will take custody of the removed detectors without additional cost to the Owner.

c. Any part of the Loop shall be short-circuited. The FACP shall indicate the communication failure of all the devices connected in the short-circuited segment. After the short circuit is corrected, the Fault Isolator shall return to its normal status automatically, this being reflected in the FACP. The Loop shall then be in normal operation again. Any part of the Loop shall be de wired and tested as given above.

1.15.6 All other tests as required by the client at the time of handing over.

FIRE ALARM CONTROL PANEL

Type	:	Analog Addressable
Type of display	:	LCD
Display of	:	ALL EVENTS
Addressable capability	:	As per BOQ
Intelligent capability	:	Yes
Fault-isolation capability	:	Yes
Alarm delay capability	:	Yes
Sensor-self-test capability	:	Yes
LCD display type	:	Minimum 80 character on each line
BAS integration capability	:	Yes through Modbus
Stand-by battery with charger	:	Yes
Voltage requirement	:	230 V 50 HZ – Ac

MULTICRITERIA/MULTISENSOR DETECTOR

Type	:	Analog Addressable
Twin LED indication	:	Yes

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Blinking LED facility	:	Yes
Addressable capability	:	Yes
Intelligent capability	:	Yes
Remote / Local test capability	:	Yes
Sensor Coverage	:	Spot Detection
Programming of detector	:	By Decade or Rotary Switch
Operating Temperature Deg C	:	-10° C to 50° C
Operating RH at 40° C	:	10% - 93% RH
Operating Voltage	:	15 - 32 V DC
Sensors	:	Optical and thermal type
Sensitivity settings	:	minimum 2 Nos.
Photo thermal sensitivity settings	:	minimum 3 Nos.
Detection Mode	:	Combines or Thermal Only.

LAZER SMOKE DETECTOR

Type	:	Analog Addressable
Twin LED indication	:	Yes
Blinking LED facility	:	Yes
Addressable capability	:	Yes
Intelligent capability	:	Yes
Remote / Local test capability	:	Yes
Sensor Coverage	:	Spot Detection
Programming of detector	:	By Decade or Rotary Switch
Operating Temperature Deg C	:	-10° C to 50° C
Operating RH at 40° C	:	10% - 93% RH
Operating Voltage	:	15 - 32 V DC

OPTICAL SMOKE DETECTOR

Type	:	Analog Addressable
Twin LED indication	:	Yes
Blinking LED facility	:	Yes
Addressable capability	:	Yes
Intelligent capability	:	Yes
Remote / Local test capability	:	Yes
Sensor Coverage	:	Spot Detection
Programming of detector	:	By Decade or Rotary Switch
Operating Temperature Deg C	:	-10° C to 50° C
Operating RH at 40° C	:	10% - 93% RH
Operating Voltage	:	15 - 32 V DC

FIXED/ ROR TYPE HEAT DETECTOR

Type	:	Analog Addressable
Dual Thermistor	:	Yes
Twin LED indication	:	Yes
Blinking LED facility	:	Yes
Addressable capability	:	Yes
Intelligent capability	:	Yes
Remote / Local test capability	:	Yes
Sensor Coverage	:	Spot Detection
Programming of detector	:	By Decade or Rotary Switch
Operating Temperature Deg C	:	-10° C to 50° C
Operating RH at 40° C	:	10% - 93% RH
Operating Voltage	:	15 - 32 V DC

MANUAL CALL POINT

C *I* *O*	*NIL*

AE(E)(P)

Type	:	Analog Addressable, Resettable type
LED indication	:	Yes
Operating Voltage	:	15V - 32 V
Dimensions	:	Semi-flush mounting: 89 x 93 x 27.5 (WxHxD)/
Surface mounting	:	89 x 93 x 59.5 (WxHxD)
Weight : Semi Flush	:	110g/Surface: 160g
IP Rating	:	IP24D
Operating Temperature:		-10°C to +50°C
Relative Humidity	:	0% - 95% non-condensing
Operating Voltage	:	15V to 30Vdc max

REPEATER ALARM PENAL

Type	:	Active Type
Controls	:	System Reset, Accept, Mute, Silence & Self Test
LCD Display	:	80 Characters
Power Supply	:	External Type 24 VDC
Operating Current	:	90MA

ADDRESSABLE MONITOR MODULE

Mounting Option	:	DIN Rail or Surface Mount
Status Indication	:	Tri Colour LED
Address Setting	:	Through Selector Switch
Operating Temperature :		-10 deg c- +50 deg c
Humidity	:	0 – 95 % Maximum Non Condensing
Operating Voltage	:	15-30 VDC
Type	:	Single Channel

ADDRESSABLE CONTROL/OUTPUT MODULE

Mounting Option	:	DIN Rail or Surface Mount
Status Indication	:	Tri Colour LED
Address Setting	:	Through Selector Switch
Operating Temperature :		-10 deg c- +50 deg c
Humidity	:	0 – 95 % Maximum Non Condensing
Operating Voltage	:	15-30 VDC
Type	:	Single Channel
Relay Type	:	Form C

FAULT ISOLATOR MODULE

Mounting Option	:	DIN Rail or Surface Mount
Status Indication	:	Tri Colour LED
Address Setting	:	Through Selector Switch
Operating Temperature :		-10 deg c- +50 deg c
Humidity	:	0 – 95 % Maximum Non Condensing
Operating Voltage	:	15-30 VDC
Fault detection Delay :		100 to 400 ms

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ADDITIONAL CONDITIONS FOR DG SET WORK.

1. **Specification**-: The work shall be executed as per CPWD's general specification for Electrical Works Part-I (2023) & Part-II (2023) and Part-VII (2013) for DG Set Work, IE Rules, Indian Standards amended upto date and as per direction of Engineer-in-Charge. The additional specifications are to be read with above and in case of any variations, specifications given along with the tender shall apply.

2. **Location**-: The DG sets are to be installed at **MRHUR, ICMR at CHC Nagram, Lucknow (UP)** and the contractor is advised to visit the site before submission of their tender and ensure that equipment being offered by them shall be accommodated in the spaces available.

3. **Inspection by CEA/State Govt. Electrical Safety Department -:** After completion of the work, the contractor will offer the same for inspection of Central Electricity Authority/State Govt. Electrical Safety Department if required. The contractor will extend all help including test facilities to the representative of Central Electricity Authority State Govt. Electrical Safety Department. In case the contractor fails to make desired facilities available during inspection, the department reserves the right to provide the same at the risk & cost of the contractor. The observation of Central Electricity Authority/State Govt. Electrical Safety Department which are a part of agreement will be attended by the contractor promptly. The installation will be commissioned only after receiving clearance from Central Electricity Authority. Inspection fees of Central Electricity Authority will be borne by the department.

4. **Storage**:- Responsibility for storage space for execution of work shall be of main contractor.

5. **Power & Water Supply:-** Responsibility for supply of power & water for execution of work shall be of main contractor.

6. The material in required quantity to be used in the work shall be got approved from the Engineer-in-charge before its use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.

7. Contractor shall preserve the copies of invoices, test certificates; gate passes etc. to prove the genuineness of material/purchases. The responsibility of procurement, genuine material of specialized works shall rest with the contractor.

8. **No inspection outside the country is permissible if required so the same will be deemed to be waived off and necessary test reports shall be submitted before the dispatch of equipment.**

9. **If, NIT departs from standard practice of manufacture then standard practice of manufacture shall be prevail.**

10. **Terms of payment:-** The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.
 i) 70% after initial inspection (wherever specified) & delivery at site in good condition on pro-rata basis.
 ii) 20% after completion of installation in all respects.
 iii) Balance 10% will be paid after testing, commissioning and handing over to the department for beneficial use.

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11. **Guarantee:-** All equipments shall be guaranteed for a period of minimum 12 months, from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. 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 doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in- charge in this regard shall be final.

12. The successful tenderer should furnish well in advance three copies of detailed instructions and manuals of manufacturer's for all items of equipments regarding installation, adjustments, operation and maintenance including preventive maintenance & trouble shooting together with all the relevant data sheets, spare parts catalogue etc. all in triplicate.

13. All the equipments and fabricated items etc. shall be offered for initial inspection at manufacturer's works. The contractor will intimate the date of testing of equipments at the manufacturers works before dispatch .The successful tenderer shall give advance notice of minimum two weeks regarding the dates proposed for such tests to the Engineer in charge to facilitate his presence during testing. The Engineer in Charge may witness such testing. The cost of Engineers visit to the manufacturer's works will be borne by the Department.

    All routine tests conforming to relevant IS shall be carried out in the presence of Engineer-in- Charge or his authorized representative. The department reserves the right to inspect or not to inspect the equipment at the works of the manufacturer. In the later case confirmation in writing will be issued by the department. However, nothing extra shall be paid for conducting routine test in the presence of department's representative.

    Copies of all manufacturer's routine and type test certificates of the equipments carried out at the manufacturers premises shall be furnished to the inspecting officer and consignee. After completion of work in all respect, the contractor shall offer the installation for testing and operation.

14. All consignments are to be duly insured up to the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

15. **Technical specifications for DG set work:-**

    (i) The tenderer shall submit detailed schematic diagram for the approval of the Engineer-in-charge. Tenderer / Contractor will make sure that the equipment offered shall fulfil the design conditions. All the equipments and their installation shall be suitable for the environmental conditions encountered at the location as indicated in specifications. If any deviations from the Tender specification are contemplated, these shall be clearly brought out in the tender along with the reasons for the same. If the tenderer fails to bring out specific deviations, it will be presumed that the work shall be carried out as per tender specifications.

    (ii) The tenderer shall submit the de-rating calculations for engine along with supporting manufacture catalogues & model no of Engine & Alternator, offered.

    (iii) **CPCB Norms**- The DG Sets shall be meet the latest requirements of environmental (protection) rules 1986 as laid down by Ministry of Environment & Forests read with GSR 771 (E) dated 11-12-2013 with respect to emission norms of the diesel engine for supplies made on or after 01-07-14 and with respect to noise level GSR 371 (E) dated 17/05/2002 for the DG sets supplies made on or after 01-01-05. The

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firm need to furnish the certificate of Type approval and certificate of conformity of production issued by the Central Pollution Control Board (CPCB) or any authorized agency as prescribed by MoEF / CPCB in the above law.

(iv) **Scope of work**:- The detailed scope of supply, installation, testing and commissioning includes the following:-

(a) DG Set, prime continuous power rating, capacity at 0.8 power factor developing 415 volts 3 phase 4 wire output with the engine and alternator mounted on common base frame to both DG Set complete and all accessories required. The DG Sets shall be capable of delivering desired KVA at 0.8 P.F for the external load after meeting its own requirement for auxiliaries etc. and after accounting for de-rating due to various factors, site conditions.

(b) Necessary acoustic enclosure.

(c) Necessary piping required for Fuel system, Lubricating oil system and exhaust.

(d) Necessary batteries for starting including its cables.

(e) Necessary control Panel as per detailed specification.

(f) Necessary set of suitable vibration isolation mountings.

(g) Minor building work including cutting and making good of openings in wall and floors, grouting etc. as required.

(h) All clamps support etc. for all components of the installation as required.

(i) Control wiring from D.G. Set up to control panels and MV distribution panels having AMF facilities.

(j) Providing & Fixing/ Laying of power cable of various sizes XLPE insulated PVC sheathed 1.1 KV grade armoured cable for connection between generator and panel.

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ADDITIONAL CONDITION FOR LIFT WORK.

1. General

(i) This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning putting into operation of lifts.

(ii) LOCATION: The lifts will be installed in **MRHRU, ICMR at CHC Nagram, Lucknow (UP).** The work shall be executed as per CPWD General Specifications for Electrical works (Part III Lifts & Escalators-2003) and NBC-2016 as wall as per relevant IS and as per directions of Engineer-in-charge.

(iii) These additional specification are to be read in conjunction with above and in case of variations, specifications given in these additional conditions shall apply. However, nothing extra shall be paid on account of these additional specifications & conditions as the same are to be read along with schedule of quantities for the work.

(iv) The tenderer should in his own interest visit the site and familiarize himself with the site conditions before e-tendering

(v) No T & P shall be issued by the department and nothing extra shall be paid on account of this.

(vi) The contractors have provident fund code number and all the workers employed by them has activated Universal Account Number (UAN).

(vii) Payment to contractor shall be made after obtaining the certificate from the contractor that all the workers employed by him directly or indirectly are enrolled as member of PF and due contribution have been made into their account.

2. Terms of payments

The following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.

(i) 70% after initial inspection and delivery at site in good condition of pro-rata basis

(ii) 20% after completion of installation in all respect.

(iii) Balance 10% will be paid after testing, commissioning trial run & handing over to the department for beneficial use.

3. Rates

The rates quoted by the tenderer/firm shall be inclusive of GST and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site i/c temporary constructional storage, risks, over head charges general liabilities/obligations and clearance form local authorities.

The contractor has to carry comprehensive maintenance for 24 months from the date of handing over. Nothing extra shall be paid for this.

Octroi duty shall not be paid separately but octroi exemption certificate can be furnished by the department on demand. However, the department is not liable to re-imburse the octroi duty in case exemption certificate are not honoured by the concerned authorities.

The rates quoted by the firm should be inclusive of all related minor civil works and nothing extra shall be paid on this account.

4. Completeness of tender

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All sundry equipment, fittings, unit assemblies, accessories, hardware items foundation bolts, termination lugs for electrical connections, and other items which are useful and necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

5. For item/equipment requiring initial inspection at manufacturer's works the contractor will intimate the date of testing of equipments at the manufacturer's works before dispatch. The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make the arrangement for the same. The successful tenderer shall give sufficient advance notice regarding the dates proposed for such tests /inspection to the department's representative (s) to facilitate his presence during testing/fabrication. The Engineer-in-charge at his discretion may witness such testing/fabrication. The cost of the Engineer's visit to the factory will be borne by the Agency. Also equipment may be inspected at the manufacturer's premises before dispatch to the site by the contractor.

6. Storage and custody of materials

The lift machine room maybe used for storage of sundry materials and erection equipments if available or else the agency has to make his own arrangement. No separate storage accommodation shall be provided by the department. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the installation by the department.

7. Care of building

Care shall be taken by the contractor while handling and installation the various equipments and components of the work to avoid damage to the building. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

Guarantee

All equipments shall be guaranteed for a period of 24 months from the date of taking over the installation by the department against unsatisfactory performance and /or break down due to defective design, workmanship of material. 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 faulty the department that undue delay in being caused by the contractor in doing this, the same will be done by the department at the risk and cost of the contractor. The decision of the engineer-in-charge in this regard shall be final.

8. Power supply

Responsibility for supply of power for execution of work shall be of main contractor.

9. Water supply

Responsibility for supply of water for execution of work shall be of main contractor.

10. After award of work

The successful tenderer would be required to submit the following drawing within 15 days of award of work for approval before commencement of installation.

a) All general arrangement drawings.

b) Details of foundations for the equipments, load data, location etc. of various assembled equipment as may be needed generally by other agencies for purpose of their work. The data will include breaking load on guides, reaction of buffers on lift pits

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reaction on support points in machine room, lift well etc.

c) Any other drawing /information not specifically mentioned above but deemed to be necessary for the job by the contractor.

d) Any other drawing/information not specifically mentioned above but deemed to be necessary for the job by the contractor.

11. The successful tenderer should furnish well in advance three copies of detailed instruction and manual of manufacturer for all items of equipments regarding installation, adjustment, operation and maintenance i/c preventive maintenance & trouble shooting together with all the relevant data sheets, spare parts catalogue and workshop procedure for repairs, assembly and adjustment etc all in triplicate.

12. Extent of work

The work shall comprise of entire labour i/c supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning as may be required by the department. The term complete installation shall not only mean major items of the plant and equipments covered by specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout charts whether or not those have been mentioned in details in the tender document in connection with this contract.

Minor building work necessary for installation of equipment, foundation, making of opening in wall or in floors and restoring to their condition, finish and necessary grouting etc as required.

The work is turnkey project. Any item required for completion of the project but left inadvertently shall be executed with in the quoted rates.

13. Inspection and testing

Copies of all documents of routine and type test certificated of the equipment, carried out at the manufacturers premises shall be furnished to the engineer –in – charge and consignee. The agency shall intimate in writing to Engineer-in-charge for factory inspection well in advance before dispatch.

After completion of the work in all respect the contractor shall offer the installation for testing and operation.

Dummy load for testing of lift after installation at site shall be arranged by the contract. Nothing extra shall be payable on this account.

14. Compliance with Regulations and Indian standards

All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by these specifications. In particular, the equipment and installation will comply with the following:

I. Factories Act.

II. Indian Electricity Rules

III. I.S & BS Standards as applicable

IV. Workmen's compensation Act

V. Statutory norms prescribed by local bodies like CEA, DFO etc.

Nothing in this specification shall be construed to relieve the successful tenderer of his

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responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

Successful tenderer shall arrange for compliance with statutory provision of safety regulation and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirement would make the tenderer liable for penalty of Rs. 50/- for each default. In addition, the department will be at liberty to make arrangement for the safety requirements at the cost of tenderer and recover the cost thereof from him.

15. Indemnity

The successful tenderer shall at all times indemnify the department, consequent on this works contract. The successful tenderer shall be liable, in accordance with the Indian law & Regulations for any accident occurring due to any cause and the department shall not be responsible for any accident or damage incurred or claims arising therefrom during the period of erection, construction and putting in to operation the equipments and ancillary equipment under the supervision of the successful tenderer in so far as the later is responsible. The successful tenderer shall also provide all insurance i/c third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer due to the above.

16. Erection tools

No tools and tackles either for unloading or for shifting the equipments for erection purpose would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

17. Co-operation with other agencies

The successful tenderer shall co-ordinate with other contractors and agencies engaged in the construction of building, if any, and exchange freely all technical information so as to make the execution of this works contract smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the successful tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specification of the dismantled portion of the was not undertaken by the successful tenderer himself.

18. Mobilization advance

No. mobilization advance shall be paid for this work.

19. Insurance and storage

All consignments are to be duly insured upto the destination from warehouse to warehouse at the cost of the supplier. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

20. Verification of correctness of Equipment at destination

The contractor shall have to produce all the relevant record to certify that the genuine equipment from the manufacturers has been supplied and erected.

21. Painting

This shall include cost of painting of entire exposed iron work complete in the installation. All equipments works shall be painted at the works before dispatch to the site.

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22. Training

The scope of works includes on technical training of two persons at site. Nothing extra shall be payment on this account.

23. Maintenance

Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of two years from the date of completion or handling over of the installation to the deptt whichever is later.

The routine as well as preventive maintenance for two years by manufacturer shall be carried out from the date of taking over the installation by deptt. i/c attending all call back of break down round the clock, for two years which shall be within the scope of work.

24. Interpreting specifications

In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:

a) Schedule of quantities

b) Technical Specifications

c) Drawing (if any)

d) General Specifications

e) Relevant IS or other international code in case IS code is not available.

25. Technical specification for Lift

i) Door safety: Temper proof Infra Red curtain covering the entire height of Lift door will be provided in the lifts.

ii) Audio/Visual overload alarm with load plate indicating the rated load and permissible number of passengers/load will be provided in the lifts.

iii) Intercom system will be provided at suitable locations.

iv) BARRIER FREE REQUIREMENTS

a) All the 13 Passenger and above lifts shall be made suitable for wheel chair users with suitable dimensions.

b) A hand rail not less than 600mm long at 900mm above floor level shall be fixed adjacent to the control panel to 3 sides of car body.

c) The time of an automatic closing door should be minimum 5 seconds and the closing speed should not exceed 0.25 mtrs. per second.

d) The interior of the lift shall be provided with a device that audibly indicate the floor the cage has reached and indicate that the door of the cage for entrance/exit is either open or closed.

e) Brail operating buttons as required in car an all levels.

v) All the required test certificate and safety certificates has to be submitted by agency.

vi) If any discrepancies in Schedule of Work and detailed specification than detailed specification will be valid.

26. Technical requirement for Lift

S. No.		
1	Name of Manufacturer	
2	Country of Manufacturer	
3	Capacities (Persons/Weight)	13 Passengers (884 Kg.) (MRL)

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4	Service	Passenger lift
5	Speed of Travel	1 MPS
6	Nos. of floors served	2 (G+1)
7	Nos. of openings/Stops	2 Nos./ 2 Nos.
8	Position of counter weight	As per OEM
B.	**Machine**	
1	Position of Machine	Above lift shaft
2	Motor	Permanent magnet synchronous motor
3	Electric supply particulars for which it is suitable for operation	415 volt 3 phase 50 Hz. (± 10%)
C.	**Brake**	
1	Type	Electro mechanical
D.	**Car and Doors:**	
1	Outside dimension of car	Suitable for 13 passenger lift as per IS
2	Inside clear dimensions	Suitable for 13 passenger lift as per IS
3	Construction of car	Stainless Steel 304 Grade with minimum 1.5 mm thick.
4	Design/type of enclosure of car	Moon rock/Hairline finish Stainless Steel.
5	Details of flooring	Granite flooring
6	Attachment & fitting inside the car	As per OEM
a)	Car Size:	Suitable for 13 passenger lift as per IS
b)	Operation:	Central opening
c)	Construction, design & finish:	Moon rock/Hairline finish Stainless Steel.
7	Landing doors	Stainless Steel SS 304 with minimum 1.5 mm thick.
a)	Door clear opening	Minimum 900mm
b)	Operation:	Centre opening power doors with permanent magnet synchronous motor
c)	Construction & Finish:	Moon rock/Hairline finish Stainless Steel
E.	**Safety Devices:**	
1	Car safety – Type	Over speed governor
2	Counter weight safety – Type	Spring buffer/As per OEM
3	Door interlocks in car – Type	Electro mechanical
4	Door locks in landing – Type	Electro mechanical
5	Direction and position indicator in car	Dot matrix (Red LED) / As per OEM
6	Emergency alarm	Battery operated high intensity DB level
7	Facia plate	Stainless Steel
8	Fireman drive	Required
9	3 Way Hands free press & speak intercom	Required
10	Full height infra red safety curtains	Required
11	Pit Ladder	Required
12	Signal fixtures in stainless steel finish	Required
13	Emergency light with rechargeable battery	Required
14	Adjustable guide shoes	Required
15	Micro movement LED based buttons	Required
16	+10% to -10% volt fluct. Withstand capacity	Required
17	Automatic phase reversal	Required
18	Automatic voltage regulator	Required
F.	**Other safeties included in the offer**	**ARD suitable for 13 passenger lift as per IS specification**

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Additional Condition for CCTV System

1. The work shall be carried out as per CPWD general specifications of electrical works amended upto date and as per direction of Engineer-in-charge.
2. No. T&P shall be issued to the contractor.
3. The material shall be got approved before use at site of work from Engineer-in-charge.
4. Any damage done to the building / equipment shall be made good by the contractor at his own risk and cost.
5. The site shall be cleared properly after completion of work.
6. The contractor has to engaged his labour as per site condition. The department shall be not entertain any claim for the idle labour whatsoever.
7. The contractor shall make all safety arrangement during execution of work, if any accident occurs due to the negligence it will be the entire responsibility of the contractor.
8. All the equipments shall be guaranteed for one Year from the date of completion and hand over of the installation of CPWD, against unsatisfactory performance and /or beark down of the equipment or component or any other parts of installation so found defective in the guarantee period shall be replaced/repaired by the contractor free of charges to the satisfaction of Engineer-in-charge.
9. The contractor shall provide all operating manual complete drawings and shall provide one months training to the personnel's of the department free of cost.
11. The successful supplier/firm shall give three years warranty and five years service support for the items from the manufacturer in written.
12. The successful firm shall support and will provide all necessary technical support in installation and successful commission of the entire system and nothing extra shall be paid on this account.
13. There will be not deviation regarding makes and specifications of the CCTV Camera etc taken in the tender. However department may consider higher specifications if it meets our requirement nothing extra will be paid on this account.
14. All equipments shall be delivered with technical catalogues, instructions manual, wiring diagram etc.
15. The contractor shall provide the STQC compliance certificate for CCTV camera and other allied equipments.

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16. Guarantee / Warranty

16.1 The equipment supplied by the contractor shall be guaranteed against failure due to quality of material, workmanship, circuit design of any other failure, for a period of at least. One year from the date of commissioning and acceptance of the equipment.

16.2 Contractor shall give warranty that all the equipment and material to be supplied under the contract are now and free any defects and faults in material, workmanship and manufactured and are of highest grade and consistent with the established and generally excepted standards for the same type of equipments and material and shall performing full conformity with the specifications and drawing. The contractor shall be responsible for any defect that may develop under the contract conditions and under proper use, arising from faulty material, design or workmanship such as corrosion, in adequate quantity of material to meet equipment requirement, in adequate contact protection, deficiency in circuit design and/or otherwise and shall remedy such defects at its own cost when called upon to do so by the purchaser. The contractor shall warrant that if system deficiency are notices in operation of the system for which software function are involved then the software update for correcting the deficiency shall be supplied free of cost for the purchaser. The warranty shall survive inspection or payment of complaints notified prior to such date 01 year after tile stores have been taken over after successful commissioning of the entire equipments.

16.3 Replacement under warranty shall be made by the contractor free of all charges at site including freight, insurance incidental charges.

16.4 With respect to parts needed to troubleshot and maintain installation after the warranty period the contractor shall warranty the delivery of spares for at least 1 year. After this period the contractor shall inform CPWD where the parts can be procured in case contractor is able to provide.

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Additional Conditions for Solar Photovoltaic Power Plant

1. The work shall be carried out as per CPWD general specifications of electrical works amended upto date and as per direction of Engineer-in-charge.
2. No. T&P shall be issued to the contractor.
3. The material shall be got approved before use at site of work from Engineer-in-charge.
4. Any damage done to the building / equipment shall be made good by the contractor at his own risk and cost.
5. The site shall be cleared properly after completion of work.
6. The contractor has to engage his labour as per site condition. The department shall be not entertain any claim for the idle labour whatsoever.
7. The contractor shall make all safety arrangement during execution of work, if any accident occurs due to the negligence it will be the entire responsibility of the contractor.
8. All the equipments shall be guaranteed for one Year from the date of completion and hand over of the installation of CPWD, against unsatisfactory performance and /or beark down of the equipment or component or any other parts of installation so found defective in the guarantee period shall be replaced/repaired by the contractor free of charges to the satisfaction of Engineer-in-charge.
9. The contractor shall provide all operating manual complete drawings and shall provide one months training to the personnel's of the department free of cost.
10. The successful firm shall support and will provide all necessary technical support in installation and successful commission of the entire system and nothing extra shall be paid on this account.
11. All equipments shall be delivered with technical catalogues, instructions manual, wiring diagram etc.
12. **Terms of payments**

    Following payment terms shall be applicable.

    i) No advance payment shall be made.

    ii) Following percentage of contract rates shall be payable against the stage of work shown herein:

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Sl. No.	Stage of Work	
1.	After initial inspection (wherever specified) and delivery at site in good condition on pro-rata basis.	70%
2.	On completion of installation in all respect on pro-rata basis.	20%
3.	On successful Commissioning and taking over by the department.	10%

13 DRAWINGS & MANUALS: Two sets of Engineering, electrical drawings and Installation and O&M manuals are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes along with basic design of the power plant and power evacuation, synchronization along with protection equipment. Approved ISI and reputed makes for equipment be used.

14 The following Statutory Clearances shall be obtained by the/Bidder(s) wherever applicable:

(a) Building and Architectural Drawings approvals from relevant authorities/Primary Beneficiary Organisation.

(b) Electrical Safety approval for system more than 10 KW (Chief Electrical Inspector)

i) All equipment, accessories, materials, civil construction & erection works should comply with statutory requirements, IS and required and highlighted IEC standards

ii) All statutory requirements for working at the Site like labour registration, workman compensation policy, ESIC etc. to be complied with by the vendor before deployment of resources at the Site.

15 Test Certificates and Reports to be Furnished

Test Certificates / Reports from IECQ / NABL accredited laboratory for relevant IEC / equivalent BIS standard for quoted components shall be furnished. Type Test Certificates / reports shall be provided for the solar modules and solar grid tied inverters up to 20kW to provide evidence of compliance with standards. For solar grid tied inverters above 20kW, self-certification by the manufacturer of the said inverter is acceptable.

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General Instructions

A Water and power supply for the construction shall be the responsibility of the Contractor/Bidder

B Security, safety, watch, and ward of all materials at sites shall be the responsibility of the Contractor/Bidder

C Liaison with the concerned distribution licensees, Uttar Pradesh New and Renewable Energy Development Agency, the Chief Electrical Inspector and any other statutory authorities as applicable for all the Project approvals

D Expenses for any other works, supply of material, and providing services required for the successful commissioning and operation of the plant, but not specifically mentioned in this document.

E Safety management to be strictly complied with by the Contractor/Bidder throughout implementation activity.

F First-aid medical facilities at the Site during construction to be provided by the Contractor/ Bidder(s)

G All local labour, employment, and other issues shall be handled independently by the Contractor/ Bidder(s)

H The entire responsibility and risk relating towards the workforce working at the Site, and compliance of different statutory regulations like Workman Compensation Act, Employees" State Insurance Corporation (ESIC), Factory Act 1948, Contract Labour Regulation, and Abolition Act 1970, Shop and Establishment Act 1948, and other Statutory regulatory bodies shall solely lie with the Contractor.

16 Technical specifications

A Grid Tied Solar Rooftop Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables, Junction boxes, Distribution boxes and switches. PV Array is mounted on a suitable structure. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable. Solar PV rooftop system shall consist of following major equipment/components.

 Solar PV modules consisting of required number of Crystalline PV cells.

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- Grid interactive Power Conditioning Unit with Remote Monitoring System
- Mounting structures
- Junction Boxes.
- Earthling and lightening protections.
- IR/UV protected PVC Cables, pipes and accessories

SOLAR PHOTOVOLTAIC MODULES: Solar PV modules should be of the crystalline silicon type, manufactured in India. Detailed specifications of the solar PV modules are given below Type Crystalline silicon Origin Manufactured in India
Efficiency >= 16.5%
Fill factor >= 70%
warranty Panel output (Wp) capacity to be >=90% at the end of 10 years and >=80% of at the end of 25 years. Module frame Non-corrosive and electrically compatible with the mounting structure material Termination box Thermo-plastic, IP 65, UV resistant Blocking diodes Schottky type Module minimum rated power The nominal power of a single PV module shall not be less than 330Wp. Identification tag for each solar module Shall be provided inside the module and must be able to withstand environmental conditions and last the lifetime of the solar module. Identification tag data a) Name of the manufacturer with logo Month and year of manufacture Model No (Should consists of the voltage and rate wattage) b) Module serial number c) Made in India Power output rating To be given for standard test conditions (STC). I- V curve of the each module shall be submitted. Compliance with standards and codes IEC 61215 / IS 14286 IEC 61730 Part 1 and 2 Salt Mist Corrosion Testing As per IEC 61701 The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. The rated output power of any supplied module shall have tolerance of +/- 3%. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

WARRANTIES :

a) Material Warranty:

i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (5) years from the date of sale to the original customer .

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ii. Defects and/or failures due to manufacturing iii. Defects and/or failures due to quality of materials i. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will replace the solar module(s), at the Owners sole option. ii. The performance warrant shall be as mentioned above.

17. **Solar PV Mounting Structure:** The PV modules shall be mounted on fixed metallic structures having adequate strength and as per specifications given below which can withstand the load of the modules and high wind velocities. The array structure will be made of pre galvanized sheet steel of size not less than 50mm x 50mm x 6mm size/Aluminium (L-angle – 50mm x 50mm x 5mm, U-channel – 33mm x 30mm x 33mm x 3mm). The support structure shall be hot dip galvanized steel or aluminium. The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.

17.1 Detailed specifications for the mounting structure are given below: Wind velocity withstanding capacity 150 km / hour The designs have been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to users if they desire so. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.

Structure material Pre galvanized sheet steel with a minimum galvanization thickness of 80 microns and the structural patterns shall be made before galvanizing

Bolts, nuts, panel mounting clamps, fasteners (with spring washers)
Stainless steel SS 304

Mounting arrangement

RCC-flat roofs Installation

The structures shall be designed for simple mechanical on-site installation. There shall be no requirement of welding or complex machinery at the installation site. Minimum distance between roof edge and mounting structure 0.5m Access for panel cleaning and maintenance All solar panels must be accessible from the top for cleaning and from the bottom for access to the module-junction box. Panel tilt angle North – south orientation with a fixed tilt angle of 27-30

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degrees(depending on location), south facing. However to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.

Regarding civil structures the bfirm need to take care of the load bearing capacity of the roof and need arrange suitable structures based on the quality of roof. The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m2. The array structure shall be grounded properly using maintenance free earthing kit suitable for mounting over building terrace

Solar Array Fuse

The cables from the array strings to the solar grid inverters shall be provided with DC fuse protection. Fuses shall have a voltage rating and current rating as required. The fuse shall have DIN rail mountable fuse holders and shall be housed in thermoplastic IP 65 enclosures with transparent covers.

18. Solar Grid Inverter

As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels to match the grid voltage. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the "Power Conditioning Unit (PCU)". In addition, the PCU shall also house MPPT (Maximum Power Point Tracker). Inverter output should be compatible with the grid frequency. Typical technical features of the inverter shall be as follows:

1. Total output power (AC To match solar PV plant capacity while achieving optimum system efficiency
2. Input DC voltage range As required for the solar grid inverter DC input
3. Maximum power point (MPPT) Shall be incorporated
4. Number of independent MPPT inputs 1 or more
5. Operation AC voltage –Three phase 415V four wire Above 50 KW-11KV or as per availability of the main grid supply
6. Operating Frequency range 47.5 – 52.5 Hz
7. Nominal frequency 50 Hz
8. Power factor of the inverter >0.98 at nominal power
9. Total harmonic distortion Less than 3%

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10. Built-in Protection AC high / low voltage; AC high /low frequency
11. Anti-islanding protection As per VDE 0126-1-1 / IEC 60255.5/ IEC 60255.27 / IEC 62116
12. Operating ambient temperature range -0 oC to +50 oC
13. Humidity 0 – 95% Rh
14. Inverter efficiency >=97%
15. Inverter weighted efficiency >=95%
16. Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting
17. Communication interface RS 485 / RS 232 / RJ45
18. Safety compliance IEC 62109-1, IEC 62109-2
19. Environmental Testing IEC 60068-2 (1, 2, 14, 30)
20. Efficiency Measurement Procedure IS/IEC 61683
21. Cooling Convection
22. Display type LCD for data display. LCD /LED for status display
23. Display parameters to include Output power(W), cumulative energy (Wh), DC voltage (V), DC current (A), AC voltage (V), AC frequency (Hz), AC current (A), cumulative hours of operation (h).

The combined wattage of all inverters should not be less than rated capacity of power plant under STC.

PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown. The output of power factor of PCU inverter is suitable for all voltage ranges or sink of reactive power, inverter should have internal protection arrangement against any sustainable fault in feeder line and against the lightning on feeder. Built-in meter and data logger to monitor plant performance shall be provided. The PCU/ inverters should be tested from the MNRE approved test centres /NABL /BIS /IEC accredited testing- calibration laboratories

GRID ISLANDING: In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as “islands.” Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Rooftop PV system shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding

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protection) disconnection due to under and over voltage conditions shall also be provided. A manual disconnect 4pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel The AC output of the solar grid inverter shall be connected to the building"s electrical system after the Discom service connection meter and main switch on the load side. The solar grid inverter output shall be connected to a dedicated module in the Main Distribution Board (MDB) of the building. It shall not be connected to a nearby load.

19. DATA ACQUISITION SYSTEM / PLANT MONITORING

Data Logging Provision for plant control and monitoring, time and date stamped system data logs for analysis with the high quality, suitable PC, Metering and Instrumentation for display of systems parameters and status indication to be provided. Solar Irradiance: An integrating Pyranometer / Solar cell based irradiation sensor (along with calibration certificate) provided, with the sensor mounted in the plane of the array. Readout integrated with data logging system.

Temperature: Temperature probes for recording the Solar panel temperature and/or ambient temperature to be provided complete with readouts integrated with the data logging system The following parameters are accessible via the operating interface display in real time separately for solar power plant: □ AC Voltage. □ AC Output current. □ Output Power □ Power factor. □ DC Input Voltage. □ DC Input Current. □ Time Active. □ Time disabled. □ Time Idle. □ Power produced Protective function limits (Viz-AC Over voltage, AC Under voltage, Over frequency, Under frequency ground fault, PV starting voltage, PV stopping voltage.

All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous values for up to a month and the average values) should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel. PV array energy production: Digital Energy Meters to log the actual value of AC/ DC voltage, Current & Energy generated by the PV system provided. Energy meter along with CT/PT should be of 0.5 accuracy class. Computerized DC String/Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately. String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored. Computerized AC energy

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monitoring shall be in addition to the digital AC energy meter. The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form. All instantaneous data shall be shown on the computer screen. Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant. Provision for Internet monitoring and download of data shall be also incorporated. Remote Server and Software for centralized Internet monitoring system shall be also provided for download and analysis of cumulative data of all the plants and the data of the solar radiation and temperature monitoring system. Ambient / Solar PV module back surface temperature shall be also monitored on continuous basis. Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant for correlation with solar and environment data shall be provided. Remote Monitoring and data acquisition through Remote Monitoring System software at the owner/ with latest software/hardware configuration and service connectivity for online / real time data monitoring/control complete to be supplied and operation and maintenance/control to be ensured by the supplier. Provision for interfacing these data on client server and portal in future shall be kept.

PROTECTIONS The system should be provided with all necessary protections like earthing, Lightning, and grid islanding as follows:

LIGHTNING PROTECTION

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IEC 62305 /IS 2309 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

SURGE PROTECTION Surge protection shall be provided on both the DC and the AC side of the solar system. The DC surge protection devices (SPDs) shall be installed in the DC distribution box adjacent to the solar grid inverter.

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The AC SPDs shall be installed in the AC distribution box adjacent to the solar grid inverter. The SPDs earthing terminal shall be connected to earth through the above mentioned dedicated earthing system. The SPDs shall be of type 2 as per IEC 60364-5-53

EARTHING PROTECTION

(i) Each array structure of the PV yard should be grounded/ earthed properly as per IS:30431987. In addition the lighting arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of Discom /UPNEDA as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly. (j) Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.

CABLES : Cables of appropriate size to be used in the system shall have the following characteristics:

a) Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards Temp. Range: –10oC to +80oC. Voltage rating 660/1000V

b) For the DC cabling, Solar cables with multi stranded copper conductors XLPE or XLPO insulated and sheathed with the voltage rating of 1000 V DC or higher UV stabilised single core flexible copper cables shall be used. Multi-core cables shall not be used.

c) For the AC cabling, PVC or XLPE insulated and PVC sheathed single or multi-core flexible copper cables shall be used. Outdoor AC cables shall have a UV-stabilised outer sheath

d) The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 1.0%.

e) The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%

f) The DC cables from the SPV module array shall run through a UV-stabilised PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm or through a High Density Poly Ethylene (HDPE) conduit. The conduits shall not run across the path way of the terrace. Flexible corrugated PVC conduits shall not be used.

g) Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers.

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h) All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50 cm. The minimum DC cable size shall be 4.0 mm2 copper. The minimum AC cable size shall be 4.0 mm2 copper for up to 10kWp and 16.0mm2 for above 10kWp / required standard size. In three phase systems, the size of the neutral wire shall be equal to the size of the phase wires. The following colour coding shall be used for cable wires:

i) DC positive: red (the outer PVC sheath can be black with a red line marking)

j) DC negative: black

k) AC single phase: Phase: red; neutral: black

l) AC three phase: Phases: red, yellow, blue; neutral: black Earth wires: green

m) Cables and conduits that have to pass through walls or ceilings shall be taken through a PVC pipe sleeve.

n) Cable conductors shall be terminated with tinned copper end-ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Solar Grid Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.

o) Cable lugs and end –ferrules for all cable conductor and wire terminations shall be crimped with crimping pliers and end-ferrule pliers

p) All cable ties shall be UV resistant.

q) The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years

r) The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.

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Additional Conditions for EPABX System

1- The work shall be carried out strictly in accordance with CPWD General Specifications for Internal Electrical Works 2023 General Specification for External Electrical works-2023 as amended last date previous to date of submission of tender as amended upto date and as per instructions of the Engineer-in-Charge including as below and nothing will be paid extra.

(a) All material shall be got approved from Engineer-in-Charge before use.
All damages done to the building during execution of work shall be the responsibility of the contractor and the same will be made good immediately at his own cost to the satisfaction of the Engineer-in-Charge. Any expenditure incurred by the department in this condition shall be recovered from the contractor and decision of the Engineer-in-Charge about recovery shall be final.

(b) All hardware items such as screws, thimbles, G.I. wires etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned. All hardware materials such as nuts/bolts/screws/ washers etc. to be used in the work shall be zinc/cadmium plated iron.

(c) Phenolic laminated sheet shall be of Egg white colour, and shall be filed/rounded at edges and of minimum 3mm thick wherever required.

(d) The contractor shall make his own arrangement at his own cost for electrical/ general tools and plants required for the work.

2- The work shall be carried out according to approved drawings/details which shall be subsequently issued to the successful tenderer for execution of work and as per instructions of the Engineer-in-Charge who will have the right to change the layout as per requirement at site and the contractor shall not have any claim due to change in layout.

The work shall be carried out in engineering like manner. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost to the satisfaction of the

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Engineer-in-Charge. The programme of electrical works are to be co-ordinated in accordance with the building work and no claim for idle labour will stipulated in the tender, electrical work shall have to be completed alongwith completion of civil work.

All the debris of the E&M works should be removed and the site should be cleared by the contractor immediately after the accruing of debris. Similarly any rejected material should be immediately cleared off from the site by the contractor.

Watch and ward of the material/equipment shall be the responsibility of the contractor till handing over of installation to the department.

The contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-Charge and to comply with the remarks therein.

3.0 Terms of payment

The following terms of payment shall be applicable for these works.

(i) No advance payment shall be made.

(ii) **70% after** initial inspection and delivery at site in good condition on pro-rata basis.

(iii) **20% after** completion of installation in all respect.

(iv) **Balance 10% will** be paid after Testing, Commissioning & Handing Over to the department for beneficial use.

4. Storage :- Responsibility for storage space for execution of work shall be of main contractor.

5. Power & Water Supply:-Responsibility for supply of power & water for execution of work shall be of main contractor.

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ADDITIONAL CONDITION FOR UPS SYSTEM

1.0 SCOPE

This specification covers manufacture, assembly at factory, testing as may be necessary before dispatch, delivery at site, installation, testing and commissioning of UPS at **MRHRU, ICMR at CHC Nagram, Lucknow (UP).** This also covers the commercial conditions of contract, applicable for the work. These shall be read, in conjunction with conditions indicated in the standard form PWD-8. In the event of any discrepancy between these forms and the conditions hereunder, the later shall prevail.

1.1. The tenderers are advised not to deviate from the technical specification/items commercial terms and conditions of NIT like terms of payment, guarantee, arbitration clause, escalation etc.

2.0 Terms of payment

The following terms of payment shall be applicable for U.P.S covered in this work.

(v) No advance payment shall be made.

(vi) **70% after** initial inspection and delivery at site in good condition on pro-rata basis.

(vii) **20% after** completion of installation in all respect.

(viii) **Balance 10% will** be paid after Testing, Commissioning & Handing Over to the department for beneficial use.

3. Storage :- Responsibility for storage space for execution of work shall be of main contractor.

4. Power & Water Supply:-Responsibility for supply of power & water for execution of work shall be of main contractor.

5 Works to be done by the contractor

In addition to supply, installation, testing and commissioning of all the equipments, as per schedule of work, and CPWD specifications, the following works shall be deemed to be included within the scope of work to be executed by the contractor.

i) Any minor building work for the installation such as cutting and making good the damages.

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ii) Provision of all accessories required for the installation.

iii) Tools and tackles required for handling and installation of equipments.

iv) Protection required for the equipments from rain, dust storm etc. during transportation.

v) Necessary equipments for commissioning the system at site and testing etc.

vi) No Form 31/Road permit will be issued to the contractor by the department.

6 After award of work

The successful tenderer shall submit the detailed working in respect of UPS. Work will be started after getting the drawing approved by the Engineer-in-Charge.

7 Inspection

7.1 Copies of all manufacturer's routine and type test certificates of the equipments shall be furnished to the Engineer-in-Charge.

7.2 UPS and battery bank shall be offered for initial inspection & testing in the work of the manufacturer before delivery. Contractor will give sufficient notice for the same. The department reserves the right to inspect or not to inspect the equipment in the work of the manufacturer. In the later case confirmation in writing will be issued by the department. The department will bear the to & fro expenses of the officer deputed for carrying out inspection. However nothing extra shall be paid for conducting routine test in the presence of department's representative.

7.3 After installation, the equipment shall be tested by the contractor, for which all consumables shall be provided by him.

The inspection at site includes operation checks and any other test as necessary to check the performance of the equipments, so as to check conformity to tender specifications.

8 Warranty

All equipments supplied and installed shall be covered by warranty for one year against defective workmanship and material. If any equipment is found to be defective due to faulty materials, faulty design, or inferior quality of materials it shall be repaired or replaced at site free of charge by the successful tenderer at his own cost during the warranty period. The warranty shall cover consequential damages to the equipment supplied and installed by the tenderer due to poor workmanship or defective materials. All repairs shall be done promptly

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within a reasonable period. The warranty period will commence from the date of handing over of the installations to the department duly commissioned.

9 Painting

The tendered cost shall include cost of painting of entire installation complete in all respect.

10 Rates

10.1 The department will not issue Octroi exemption certificate.

11 Extent of work

11.1 The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning as may be required by the department.

11.2 The scope of works include on job technical training of two persons at site nothing extra shall be payable on this account.

12. The material in required quantity to be used in the work shall be got approved from the Engineer-in-charge before its use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.

13. Contractor shall preserve the copies of invoices, test certificates, gate passes etc. to prove the genuineness of material/purchases. The responsibility of procurement, genuine material of specialized works shall rest with the contractor.

14. No inspection out side the country is permissible if required so the same will be deemed to be waived off and necessary test reports shall be submitted before the dispatch of equipment.

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ADDITIONAL CONDITIONS FOR SUB-STATION

1- Specification-: The work shall be executed as per CPWD's general specification for Electrical Works, Part-I-2023, Part-II-2023 (External) & Part-IV-2013 for Sub-Station. Indian Standards amended upto date and as per direction of Engineer-in-Charge. The additional specifications are to be read with above and in case of any variations, specifications given along with the tender shall apply.

2- Location-: The **MRHRU, ICMR at CHC Nagram, Lucknow (UP)** and the contractor is advised to visit the site before submission of their tender and ensure that equipment being offered by them shall be accommodated in the spaces available.

3. Terms of Payments:
Following percentage of contract rates for the various items included in the contract shall be payable against the stage of work shown herein.

(i) No advance payment shall be made.
(ii) **70% after** initial inspection and delivery at site in good condition on pro-rata basis.
(iii) **20% after** completion of installation in all respect.
(iv) **Balance 10% will** be paid after Testing, Commissioning & Handing Over to the department for beneficial use.

4- Rates-:
The department will not issue Octroi exemption certificate.

5- Completion Period-:
The Completion period indicated in the tender documents is for the entire work of planning, designing, approval of drawings etc., arrangement of materials &equipments, delivery at site including transportation, installation, testing, commissioning and handing over of the entire system to the satisfaction of the Engineer-in-charge.

6- Storage :- Responsibility for storage space for execution of work shall be of main contractor.

7- Power & Water Supply:-Responsibility for supply of power & water for execution of work shall be of main contractor.

8- Indemnity-:
The successful tenderer shall at all times indemnify the department, consequent on this works contract. The successful tenderer shall be liable, in accordance with the Indian Law and Regulations for any accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising three from during the period of erection, construction and putting into operation the equipments and ancillary equipment under the supervision of the successful tenderer in so far as the latter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer on account of the above.

9- Insurance and Storage-:

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All consignments are to be duly insured upto the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

10- Inspection by CEA-: After completion of the work, the contractor will offer the same for inspection of Central Electricity Authority/Local electricity safety of Government department . The contractor will extend all help including test facilities to the representative of Central Electricity Authority. In case the contractor fails to make desired facilities available during inspection, the department reserve the right to provide the same at the risk & cost of the contractor. The observation of Central Electricity Authority which are a part of agreement will be attended by the contractor promptly. The installation will be commissioned only after receiving clearance from Central Electricity Authority. Inspection fees of Central Electricity Authority will be borne by the department.

11. Losses of the transformers shall be in accordance with IS 1180-Part1 for Level-II.
12. The material in required quantity to be used in the work shall be got approved from the Engineer-in-charge before its use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.
13. Contractor shall preserve the copies of invoices, test certificates, gate passes etc. to prove the genuineness of material/purchases. The responsibility of procurement, genuine material of specialized works shall rest with the contractor.
14. Agency has to provide all related diagram and calculation sheet for protection system.

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Additional Conditions for LAN System

1- The work shall be carried out strictly in accordance with CPWD General Specifications for Internal Electrical Works 2023 General Specification for External Electrical works-2023 as amended last date previous to date of submission of tender as amended upto date and as per instructions of the Engineer-in-Charge including as below and nothing will be paid extra.

(a) All material shall be got approved from Engineer-in-Charge before use.
All damages done to the building during execution of work shall be the responsibility of the contractor and the same will be made good immediately at his own cost to the satisfaction of the Engineer-in-Charge. Any expenditure incurred by the department in this condition shall be recovered from the contractor and decision of the Engineer-in-Charge about recovery shall be final.

(b) All hardware items such as screws, thimbles, G.I. wires etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned. All hardware materials such as nuts/bolts/screws/ washers etc. to be used in the work shall be zinc/cadmium plated iron.

(c) Phenolic laminated sheet shall be of Egg white colour, and shall be filed/rounded at edges and of minimum 3mm thick wherever required.

(d) The contractor shall make his own arrangement at his own cost for electrical/ general tools and plants required for the work.

2- The work shall be carried out according to approved drawings/details which shall be subsequently issued to the successful tenderer for execution of work and as per instructions of the Engineer-in-Charge who will have the right to change the layout as per requirement at site and the contractor shall not have any claim due to change in layout.

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The work shall be carried out in engineering like manner. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost to the satisfaction of the Engineer-in-Charge. The programme of electrical works are to be co-ordinated in accordance with the building work and no claim for idle labour will stipulated in the tender, electrical work shall have to be completed alongwith completion of civil work.

All the debris of the E&M works should be removed and the site should be cleared by the contractor immediately after the accruing of debris. Similarly any rejected material should be immediately cleared off from the site by the contractor.

Watch and ward of the material/equipment shall be the responsibility of the contractor till handing over of installation to the department.

The contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-Charge and to comply with the remarks therein.

3.0 Terms of payment

The following terms of payment shall be applicable for these works.

1. No advance payment shall be made.
2. 70% after initial inspection and delivery at site in good condition on pro-rata basis.
3. 20% after completion of installation in all respect.
4. Balance 10% will be paid after Testing, Commissioning & Handing Over to the department for beneficial use.

4. **Storage :-** Responsibility for storage space for execution of work shall be of main contractor.

5. **Power & Water Supply:-**Responsibility for supply of power & water for execution of work shall be of main contractor.

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Acceptable Makes for E&M works

Preferred makes of materials to be used in the work areas under. In case of non availability of these makes, the Engineer-in-Charge may allow use of alternative BIS makes of materials in the work. Non BIS marked materials may be permitted by the Engineer-in-charge.

Sl.	Details of Materials/Equipment	Manufacturer's Name
	I.E.I, MCBDB & MCB, Cables and Wires	
1	FRLS PVC insulated copper conduct or single core cable for wiring. (ISI marked)	Finolex/ RR Kabel/ KEI/ Havells/ Polycab/ Grandlay/ Plaza Cables/ Anchor/ Bonton/ Paramount cables/ AKG/ Gloster/ Rallison/ Agilon
2	Modular switches, socket/ telephone socket/ cable TV socket/ data outlet socket/ fan regulator /GI boxes etc (Wiring accessories) /regulators etc.	Legrand (Arteor)/ Schneider electric (Zencelo)/ Wipro (Artisa) /Hager (Insysta) /M.K (Honeywell)/ Havells (Murano) / ABB (Millenium)/ Anchor by Panasonic (Vision) / or equivalent model in Indoasian
3	MS Conduit (ISI marked) with heavy duty MS conduit pipe accessories	BEC / AKG / RMCON (Note: The make of accessories shall be same that of conduit pipe and will comply to IS/4768 part 22003)
4	MCB, Isolator, Industrial plug Socket, RCCB, RCBO's, ELCB(ISI Marked/ IEC Compliant)	Schneider Electric/ Legrand/ Hager/ L&T (LAURITZ KNUDSEN)/ ABB /Seimens/ IndoAsian/ C&S/ Anchor by Panasonic /Havells
5	MCBDB & Loose Wire Box	Schneider Electric/ Legrand/ Hager /L&T (LAURITZ KNUDSEN)/ ABB/ Siemens/ IndoAsian/ C&S/ Havells
6	Change Over Switch	L&T (LAURITZ KNUDSEN)/ Havells/Hager/C&S
7	Automatic Transfer Switch(ATS)	Asco/ Russel/ Socomac/ Hager/ ABB/L&T (LAURITZ KNUDSEN)
8	Armoured/ Unarmoured Telephone cable, Coaxial Cable	Delton/ Finolex/ RRKabel/ Havells/ Grandlay/ Plaza Cables/ Anchor/ Bonton/ Paramount cables/ JMW Kable/ AKG/ Rallison/ Agilon
9	PVC conduit (ISI marked) with heavy duty PVC conduit pipe accessories	AKG/ Norpack/ BEC/ Polypack/ Precision/ Anchor/ Polycab/ Pressfit
10	Selector Switch & Toggle Switch	Salzer/(L&T (LAURITZ KNUDSEN)/ Siemens/ Kaycee/ Rishabh/ ABB
11	PVC Trunking	MK (Honeywell) /Schneider Electric/ Legrand/ Pressfit
12	GI Pipe	Tata/Jindal(Hissar)/Prakash Surya
13	Paints	ICI/ Asian/ Berger
14	Terminal Blocks & Connectors	Elmax/ Wago/ Hensel/ Connect well
15	Phenolic Laminated Sheet/Bakelite sheet	Hylam/ Formica (P-IGrade)/ Mylam/ Greenlam
16	Cat-6/ 6A Cable, Co-Axial cables, Telephone Wires & cable	Amp, Avaya /Beldon/ Legrand/ Molex/ Schneider/ Anchor / Plaza Cables/ Bonton/ AKG/ Rallison/ Agilon
	Fans & Fittings	
1	LED Fittings(ISI Marked/BEE	Wipro/ Phillips/ Crompton Greaves/Havells/ Bajaj/

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AE(E)(P)

	Certified)	Trilux/ Lighting Technology/ Orient Electric/ Jaquar/ Regent
2	Exhaust fan/Fresh Air Fan/ Inline Fan	Havells/ Crompton/ CG Power/ USHA/ Almonard/ Halonix/ Bajaj/ Polycab/ Orient Electric/Kruger/ Nicotra/ Humidien / GreenHeck/ Flantwood
3	BLDC Ceiling Fan/Wall Fan (ISI Marked /BEE Certified)	Havells /Crompton /CG Power/ USHA/ Anchorby Panasonic/ Halonix /Bajaj/ Polycab/ Orient Electric
4	Wall Bracket Fitting	Havells/ Crompton Greaves / Decon / Phillips/ Lighting Technology/ Luster/ Jaquar/ Anchor Panasonic/ Orient Electric/ Halonix/ Regent
5	LED lamp	Wipro/ Phillips/ Crompton Greaves/Havells/ Osram /Jaquar / Bajaj/ Polycab/ Orient Electric
6	Mirror Light	Jaquar / Philips/ Havells/ Crompton Greaves / Decon/ Wipro/ Regent
7	Geysers(BEE Certified)	Racold/ CG/ Havells/ Usha/ Venus/ AOSmith/ Jaquar/ Anchor by Panasonic/Bajaj
	Street Lighting	
1	LED post Top fitting	Wipro/ Phillips/ Crompton Greaves / Havells/ Keselec Schreder/ Lighting Technology /Bajaj/ Polycab/ Orient Electric/ Regent
2	LED Street light fitting	Wipro/ Phillips/ Crompton Greaves / Havells/ Keselec Schreder/ Lighting Technology/ Bajaj/ Polycab/ Orient Electric
3	LED street lights with inbuilt Solar panel and controller	Wipro/ Phillips/ Crompton greaves/ Havells/ Lighting Technology/ Bajaj/ Jaquar /Insta Power
4	Ornamental MS & G.I pole (factory finish)	Keselec Schreder- Ecopole3m ATG in GI with base plate/ Valmont/ Wipro/ Phillips/ Crompton greaves/ Bajaj/ Paruthi Engineers Pvt. Ltd./Luster/ Twinkle
5	Hot Dipped Galvanized Octagonal Pole (Factory finish)	Valmont/ Wipro/ Phillips/ Crompton Greaves /Bajaj/ Paruthi Engineers Pvt. Ltd./ Consoul /VSTP.
6	Polycarbonate Junction Box/ Enclosure	Hensel/ Spelsberg/ Naptune-Bals
7	XLPE Insulated PVC Sheathed Alum./Copper Conductor Armored Cable of 1.1 KV Grade	Finloex/ RR Kabel /KEI/ Havells/ Polycab/ Nicco/ Grandlay/ Paramount cables/ Gloster/ Plaza Cables/AKG/ Bonton/ Rallison/ Agilon
	Sub Station Equipment's	
1	LT panel/ Meter Panel Board/ Outdoor Feeder Pillar/APFC panels /Bus ducts	Tricolite Electrical Industries/ C&S/Application/ Sterling & Wilson/ MILESTONE/ Adlec Control System Pvt. Ltd./ Advance Panels & Switchgears Pvt. Ltd./ Indo Asian /Associated Switchgears & Projects Ltd/ Allied Engineers/ Shalabh/ Engineers & Engineers/ Pristine/ Excel Control System/ Expert Engineers/ R.P. Controls/ Coronet Engineers Pvt. Ltd./ Havells/ NEC/ SPC Electrotech Pvt Ltd/ ASES /MAK E-Products Pvt. Ltd./ Prestige Switchgears Pvt. Ltd./ Modern Switchgears (India)/ Asian Switchgear Pvt. Ltd./ Precision System Control
2	TTA Panels (LT distribution) **(OEM or their system integrator)**	Legrand, Schneider, Siemens, ABB, L&T (LAURITZ KNUDSEN)

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AE(E)(P)

3	Air insulated Rising Main/Bus Trunking	C&S/L&T (LAURITZ KNUDSEN)/ Schneider /Legrand /ABB/Siemens
4	Sandwich type bus Trunking/ Rising Main	C&S/L&T (LAURITZ KNUDSEN)/ Schneider /Legrand /ABB/Siemens
5	Moulded Case Circuit Breaker (MCCB) Thermal Release/ Microprocessor Based (Ics = Icu =100%)	Schneider electric/ Legrand/ L&T (LAURITZ KNUDSEN) /ABB/ Siemens/ C&S / Havells /Indoasian
6	Power/Aux.Contactor3/4Pole	Schneider Electric/ Legrand/ Hager/ L&T (LAURITZ KNUDSEN)/ ABB/ Siemens /C&S/ BCH
7	Potential transformers /Current Transformers	Automatic Electric/ Gilbert & Maxwell/ Matrix/ Precise/ L&T (LAURITZ KNUDSEN)/ Kappa/ ESENNAR
8	LED Type Indicating Lamps/Push button	Schneider electric/ L&T (LAURITZ KNUDSEN)/ Siemens/ C&S /Vaishno/ Syska
9	Overload relays	Schneider Electric/ L&T (LAURITZ KNUDSEN)/ Siemens/ C&S /ABB
10	Conventional/ Electronic Digital Meters (A/V/PF/Hz/KW/KWH)	Conzerv/ L&T (LAURITZ KNUDSEN)/ Secure/ AE/ C&S
11	Timer	Schneider Electric/ Legrand/ Hager/ L&T(LAURITZ KNUDSEN) / ABB / Siemens/ C&S
12	Fasteners/GI Clamps	Hilti/ AFT/ Fisher/ Chilli/ GMGR
13	D.W. Corrugated HDPE Pipe(ISI Marked)	REX/ Triputi/ Duraline/ Gemini/ Durton/ Kisan/ Jain Irrigation/ Raksha
14	Transformer (Oil/Dry pipe)	Crompton /ABB/ Schneider/ Siemens/ VOLTAMP/ ESENNAR
15	HT Panel/ Ring main Unit	Compton/ Siemens/ ABB/ L&T (LAURITZ KNUDSEN) / Schneider
16	H.T. Cable (ISI marked)	KEI/ Havells/ Polycab/ Gloster/ Nicco/ Grandlay/ Finolex/ RR KABEL/ Rallison
17	HT End Termination/Cable Joining Kit	Reychem/ Denson/ CabSeal/ Safekei/ 3M
18	ACBs with Display	Schneider Elecric (MVS)/ Legrand (DMX3MP4) /L&T (LAURITZ KNUDSEN) (U-Power-OMEGA)/ ABB (Emax) PR122/ Seimens /C&S (WinMaster)
19	Rubber mat	Jyoti/ Deep Jyoti/ Premier (Duly ISI Marked)
20	Ammeter	Rishabh/ L&T (LAURITZ KNUDSEN)/ AE/ C&S
21	Voltmeter	Rishabh/ L&T (LAURITZ KNUDSEN)/ AE/ C&S
22	All Type Fire Extinguishers (ISI Marked)	Atasee/ Kalpex/ Lifeguard/ Ceasefire/ Minimax/ Safex/ GETECH
23	Capacitor and Reactors/APFC Relay	EPCOS/ L&T (LAURITZ KNUDSEN) /DUCATI/ ABB/ Siemens/ Schneider
24	XLPE Insulated PVC Sheathed Alum./Copper Conductor Armored/ Unarmored Cable of 1.1KV Grade	Finloex/ RR Kabel /KEI/ Havells/ Polycab/ Paragon (Electron)/ Universal /Nicco/ Grandlay/ Paramount cables/ V-marc/ JMW Kable/ Gloster/ Plaza Cables/ AKG/ Bonton/ Rallison
25	Cable Glands Double Compression with Earthing Links	Baliga Lighting/Comet/Cosmos /Dowells/ Gripwell
26	Bimetallic Cable Lug	Comet/ Dowells (Biller India)/ HexBrass (Copper Alloy India)/ Jainson/ Action

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AE(E)(P)

27	MS/GI Cable Tray	Pilco/ Slotco/ Pasco/ MEM/ BEC/ Steelways /Legrand/ RMCON/ Trueleader/ R.P. Controls/ Prestige Switchgears Pvt. Ltd.
28	Programmable Logic Controller (PLC)	Siemens/ Allen Bradley/ L&T (LAURITZ KNUDSEN) /ABB
29	Compact type sub station close along with Transformer, HT/LT switchgears, all functional & control/ Indicating equipments/ assemblies /Sub assemblies	ABB/ SIEMENS/ SCHNEIDER/ CROMPTON/ L&T (LAURITZ KNUDSEN) /VOLTAMP
	Fire Fighting Equipments	
1	MS pipe	Tata/ Jindal (Hisar)/ Parkash Surya
2	GI Pipe	Tata/ Jinda l(Hisar)/ Parkash Surya
3	Forged Steel Fittings/flanges	Johnsons Industries/VS Forge/JK Forging/ Trueforge
4	Forged Steel Fittings and flanges (for welding joints)	VS Forge/ Rohini/ Kanwalforge/ Jhonson/ Trueforge
5	Pipe hangers	Chilli/ Hilti/ GMGR
6	Gun metal/ Brass Valve (ISI marked)/(Full way Globe valve/ Non return valve)	Sant/ Leader/ Advance/ Zoloto/ Kirloskar/ GETECH / Kartar
7	Butterfly/Sluice Valve (ISI marked)	Audco / Sant/ Leader/ Advance/ Zoloto/ Kirloskar/ GETECH/ Kartar
8	Check Valve (ISI marked)	Audco/ Sant/ Leader/ Advance/ Zoloto/ Kirloskar/ GETECH/ Kartar
9	Foot Valve (Cast Iron/Gun Metal)	Audco/Sant/ Leader/ Advance/ Zoloto/ Kirloskar/ GETECH/ Kartar
10	Y-Type Strainer	Audco/ Sant/ Leader /Zoloto/ Kirloskar/ GETECH/ Kartar
11	Fire/Sprinkler Pump/Terrace Fire Pump	Kirloskar/ KSB/ Grundfos/ WiloMather & Platt
12	Electrical Motor	ABB/ Siemens /Kirloskar/ Grundfos/ Crompton/ NGEF
13	Diesel Engine for fire pump	Cummins India/ Ashok Leyland/ KOEL/ Greaves
14	Couplings(Type-Type)	Lovejoy/ Fenner/ Dunlop
15	Anti Vibration Mounting	Kanwal Industrial Corporation/ Dunlop/ GERB/ Resistoflex
16	Pressure Switch (ISI marked)	SystemSensor/ Infoss/Danfoss/ Switzer/ Honeywell & Siemens
17	Pressure Guage (ISI marked)	HGuru/Fiebig/Dwyer
18	Double/Single Headed Landing Value (ISI marked)	Minimax/ NewAge/ Safeguard/ Lifeguard/ Padmini/ Omex/ Andex/ KalpEX/ Atasee/ GETECH/ Armorfire/ Kartar
19	Male Female Fire Hose Coupling (SS304)(ISI marked)	Minimax/ NewAge/ Safeguard/ Lifeguard/ Padmini/ Omex/ Andex/ KalpEX/ Atasee/ GETECH/ Kartar
20	First Aid Drum/ Fire Hose reels/Shutoff Nozzle (Gunmetal/ ABS)(ISI marked)	Minimax/ NewAge/ Safeguard/ Lifeguard/ Eversafe/ Padmini/ Omex/ Andex/ KalpEX/ Atasee/ GETECH/ Kartar
21	SS 304/ Gun metal Branch Pipe & Nozzle (ISI marked)	Minimax/ New Age/ Safeguard/ Lifeguard/ Padmini/ Omex /Andex/ Atasee/ GETECH/ Armorfire/ Kartar
22	Fireman Axe	Minimax/ New Age/ Safeguard/ GETECH
23	Water Flow Switch (FM/UL listed)	System Sensor/ Rapid Control/ Potter/ Switzer

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AE(E)(P)

24	Rust preventive polymeric 4mm thick tape for pipes directly buried in ground pipe protection pypkoat (AW4) wrapping (ISI marked)	Pypcoat/ Marphalt/ Rustech /Safex
25	Level controller & indicator (water) (ISI marked)	Auto Pump/ Cirrus Engineering/ Techtrol
26	Fire brigade inlet connection (ISI marked)	Minimax/ New Age / Safeguard / Lifeguard/ Padmini/ Omex/ Eversafe/ KalpEX/ Atasee/ GETECH/ Armorfire
27	Thermoplastic pipe for first aid hose reel (ISI marked)	New Age / Safeguard/ Lifeguard/ Padmini/ Omex / Eversafe/ KalpEX/ Atasee/ GETECH/ Kartar
28	Fire Sealent	Promat/ Birla 3M/ Hilti
29	Overload relays	Schneider Electric / Larsen & Toubro/ Siemens/ C&S / ABB
30	Power/ Aux. Contractor 3 /4 pole	Schneider Electric / Legrand /Hager/ L&T (LAURITZ KNUDSEN)/ABB/ Seimens/ C&S/ BCH
31	LED Type Indicating lamps/ Push Button	Schneider Electric / L&T (LAURITZ KNUDSEN)/ Siemens/ C&S/ ABB
32	LT jointing Kit/Termination	Raychem/ Denson/ Cap Seal/ Safekei/ 3M
33	RRL hose pipe (ISI Marked)	New Age/ Safeguard /Lifeguard/ Padmini/ Omex/ KalpEX/ Atasee/ GETECH/ Armorfire/ Kartar
34	Dry Battery	Exide/ Amar Raja/ HBL/ Pulse/Amco
35	Battery Charger	Statcon /Amar raja/ CDC/ AE/ Expofyn/ Thycon India
36	Epoxy Paint	ICI/ Asian/ Berger/ Nerolac
37	Air release Valve	Rb/ Tbs/ Cimbrio/ Zoloto
38	Analogue/digital Measuring Instruments (Voltmeter/Ammeter/ Energy meter/KW /PF/Multi-Function Meter)	AE/ Rishab/ L&T (LAURITZ KNUDSEN)/ C&S/ Conzerve
39	Aluminum/Copper power Cable/ Control cable (Armored /Unarmored)	Finloex/ RR Kabel /KEI/ Havells/ Polycab/ Nicco/ Grandlay/ Paramount cables/ Gloster/ Plaza Cables/ AKG/ Bonton/ Rallison
40	Cable gland and Lugs	Comet/ Dowells /Hax brass (Copper Alloy India) /Jainson/ Action
41	Solenoid Valve/Spray nozzle	Perker / HD / Tyco/ Emersion/ Kartar
42	Sprinkler	HD/Tyco/ Reliable/ Wormald/ Viking/ Atasee/ GETECH/ Kartar
43	Sprinkler head/Water Curtain Nozzle	Tyco/Viking/ Omex/ Newage/ Lifeguard/ GETECH/ Kartar
44	Steel Flexible Extension	Omex/ Newage/ Tyco / Lifeguard/ GETECH/ Kartar
45	Vibration Eliminator	Resistoflex/D waren/ Kanwal
46	Welding Electrodes	Advani/ ESAB/ L&T (LAURITZ KNUDSEN)
47	Deluge Valve	Tyco/ Viking/ HD
48	Cast Iron Valve	Kirloskar/ Kartar/ Kalpana/ Joloto /Audco/ Advance/ GETECH
	Fire Alarm System	
1	Addressable Manual call box	Notifier/ Johnson Control/ Honeywell /Siemens/ Bosch/ EST/ASES (Agni Suraksha) / Notofire
2	Addressable Type fault isolator	Johnson Control/ Honeywell/ Siemen/ Bosch/ EST (Edwards) /ASES (Agni Suraksha)/ Notofire
3	Strobe lights cum hooter	Notifier/ Johnson Control/ Honeywell/ Siemens/

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		Bosch /EST/ASES (Agni Suraksha)/ Notofire
4	Addressable control modules for hooter	Notifier/ Johnson Control/ Honeywell/ Siemens/ Bosch / EST /ASES (Agni Suraksha)/ Notofire
5	Addressable monitor module for flow switch	Notifier/ Johnson Control/ Honeywell/ Siemens/ Bosch / EST/ASES (Agni Suraksha)/ Notofire
6	Addressable type fire alarm control panel	Notifier/ Johnson Control/ Honeywell/ Siemens/ Bosch / EST /ASES (Agni Suraksha)/ Notofire
7	Network repeater panel	Notifier/ Johnson Control/ Honeywell/ Siemens/ Bosch / EST/ ASES (Agni Suraksha)/ Notofire
8	Addressable multi sensing fire detector (combination of optical type smoke detector & ROR type heat Detector)	Notifier/ Johnson Control /Honeywell/ Siemens/ Bosch /EST /ASES (Agni Suraksha)/ Notofire
9	Fire Alarm / Fire Survival Cable	AKG/ Grandlay/ plaza/ Bonton/ Notofire/ Finolex RR Cable/ KEI/ Havells/ Rallison
10	Response Indicator	Notifier/ Johnson Control/ Honeywell/ Siemens /Bosch /EST/ASES (Agni Suraksha)
	Water Supply Pump Sets	
1	Mono Submersible Pump Set	KSB/ CG/ Kirloskar/ Grundfoss
2	Submersible Pump Set	KSB/ CG/ Kirloskar/ Grundfoss
3	GI pipe	Tata/ Jindal Hisar/Prakash Surya
4	Sluice Valve/ Check Valve/ Butterfly valve/Non Return Valve	Kirloskar/ Sant/ Leader/ Joloto/ Audco/ Advance
5	Submersible Cable	Fionlex/ RR Kable /KEI/ Havells/ Polycab/ AKG/ Grandlay/ Plaza/ Rallison
	VRV/VRF, Air Conditioner & Water Purifier	
1	Split/Window type Air Conditioner	Mitshubshi/ Toshiba /O General/ Daikin/ Hitachi/ Voltas/ Carrier/ Bluestar / LG/ Panasonic
2	VRV/VRF	Mitshubshi Electric/ Mitshubshi Heavy Industries/ Toshiba/ Bluestar / O General/ Daikin / Hitachi/ Voltas/ Carrier/ LG
3	Voltage stabilizer	Vguard/ Bluebird/ Voltas/ Servokon/ Logicstate
4	RO/water purifier	Kent/ IonExchange/ Aquaguard/ Venza
5	Drinking water cooler	Voltas/ Blue Star/ Usha
6	Refrigerant Copper Tube/pipes	Met-Tube/ Hindustan/ Rajco/ Totalline/ Mandav tubes /Jindal Refrigeration
7	UPVC Drain pipe	Polypack/ Supreme/ AKG/ BEC/ Ashirwad/ Astral/ Finolex
8	AHU (Dy. Coil Based)	Zeco / System Air/ Edgetech / Daikin/ Waves
	Insulation	
1	Nitrile Rubber	Armaflex/ Vidoflex/ Superflex/ K-flex/ ALP Aeroflex
2	Crossed linked polyethylene	Torcellene/ Thermo Break/ Armaflex / ALP Aeroflex
	Ducting & Grills	
1	Factory Fabricated Duct	Zeco/ Techno Fabri Duct/ Rolastar/ Ductofab/ ETA
2	G.I. Sheet Metal Duct	SAIL/ Tata/ Jindal
3	Grilles/Diffusers	Air Master/ Airflow/ Dynamic/ Ruskintitus/ Carryaire / Revistar

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AE(E)(P)

	Uninterrupted Power Supply (UPS)	
1	Online/Offline UPS	Numeric/ Eaton/ APC/ Vertiv/ Mitsubshi/ Toshiba/ Alliance Autometer/ Microtek/ Delta
	Audio Video System	
1	Projector	Panasonic / Christie / Barco / Sony/NEC /EPSON
2	LED Display	Panasonic / LG / Samsung / Sony
3	SITC of Floor Cart for one 55" Display	Custom Designed
4	Digital Podium	AHA/ILS/ TECOM /EAPL/ ELKO/ Liberty/ UNI
5	Motorised Projection Screen	Draper /Dalite/ Milan Lliberty/ Logic /Chief /Visico/ Teck/ Focus
6	Wall Plate	Atlona / Extron / Lightware/ Aurora/ Creston
7	Matrix Switcher	Atlona / Extron / Lightware / Aurora/ Creston
8	Matrix switcher with USB interface	Atlona / Extron / Lightware/ Aurora/ Creston
9	HD Base T receiver for HDMI with USB	Atlona / Extron / Lightware/ Aurora/ Creston
10	Transmitter and Receivers	Atlona / Extron / Lightware/ Aurora/ Creston
11	Wireless Presentation system	Atlona / Extron / Barco/ Creston/ Cramer/AMX
12	Goose neck microphone etc. complete as reqd. (on podium)	Audio Technica / Shure / Bayerdynamic /AKG/ Electrovoice /Senheiser/ JBL
13	wireless Lapel microphone etc. complete as reqd.	Audio Technica / Shure / Bayerdynamic /AKG/ Electrovoice /Senheiser/ JBL
14	Handheld wireless microphone with table stand etc. complete as reqd.	Audio Technica / Shure / Bayerdynamic /AKG /Electro voice / Senheiser/JBL
15	Antenna distribution system etc complete as per tender specification	Audio Technica / Shure / Bayerdynamic/ AKG/ Electro voice / Senheiser /JBL
16	Pair of UHF wide-band directional antennas etc complete as per tender specification	Audio Technica / Shure / Bayerdynamic/ AKG/ Electro voice /Senheiser /JBL
17	Speakers	L Acoustics / Community Audio/ Bose/ Martin Audio/ JBL/ Electrovoice/ Renkus Heinz / Sony /D&B Audiotechnik
18	Amplifier	Labgruppen / Powersoft / Martin Audio/Bose/ Lab Gruppen/ Ashly Audio /Bose/Sony/JBL
19	Digital Signal Processor	Klark Teknik / Biamp / Clearone/ Ashly Audio /Bose
20	Control System	Atlona / Extron / AMX/ Aurora/ Creston
21	Touch Control Panel	APPLE/ SAMSUNG/ AMX
22	Docking station for wireless touch panel	Launch Port / AMX / Vidda Box/ SAMSUNG
23	Wi fi access point	Linksys / Netgear / D-Link /CISCO/ Allied Tellies /HP / Aruba/ Juniper
24	POE Switch	Linksys / Netgear / D-Link /CISCO/ Allied Tellies/ HP/ Aruba/ Juniper
25	Cables	Sommer/ Gotham/ Belden/ Panduit/ Commscope /Simon /Atlona/ Sommer /Klotz/ Systimax/ Schneider/ Molex /Legrand/ Extreme/ Derwiser/ Systimax (Commscope) / Agilon
26	Connectors	Amphenol, Neutrik, Switchcraft
27	Rack	Valrack/MIDDLE ATLANTIC /WQ/ Netrack/ Panduit/ Rittal/ Emerson/ Schneider (APC)/ Derwiser
28	Multi Input Recorder	Lumens/ Mediapointe /Media site/ Vbrick

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AE(E)(P)

29	PTZ Camera	Honey Well/ Bosch/Sony/ Pelco/ Tyco/ Samsung
30	Camera Control Joystick	Lumens/ Sony/ Vaddio/ Honeywell
31	Document Camera	Lumens / Elmo / Wolf Vision
32	Video conference Codec	Panasonic /Cisco /Polycom
	SIGNAGE	
1	Signage	Autoglo / Prolite / Ceasefire
	HVAC System	
1	Chilled Water Machine (Screw/ centrifugal water cooled)	Johnson Control/ Daikin/ Carrier/ Bluestar/ Trane/ Voltas/ Dunhum- Bush 1
2	Brine Chilled Water Machine (Scroll water cooled)	Brine Chilled Water Machine (Scroll water cooled)
3	Pump	Grundfos / Kirloskar / Xylem / Armstrong/ Wilo
4	Variable Frequency Drive (VFD)	Danfoss/ Siemens / ABB / Carrier
5	Cooling Tower	Bell / Paharpur / Mihir / Advance / Belden
6	Air Handling Unit (AHU)	Zeco Aircon/ System Air/ Edgetech /Bluestar / Voltas / Carrier / VTS/ Waves
7	Cooling Coil	Zeco Aircon/ System. Air/ Edgetech/ Bluestar/ Voltas/ Carrier/ Waves
8	Plug Fan	Kruger/ Nicotra / Greenheck/ Camtree
9	Centrifugal Fan	Kruger / System Air / Nicotra / Greenheck/ Camtree
10	Wet Scrubber	Zeco Aircon/ System Air / Edgetch/ Waves
11	Servo Voltage Stablizer	Servocon/ Servomax / Recons / NEEL / APLAB
12	Air Filter	Mechmaark / Pyramid / Thermodyne
13	Propeller fan	Marathon/ Sphere / Kruger
14	GSS Sheet	Sail/Tata/ Jindal / National
15	Factory Fabricated Duct(MS/GSS)	Dustech/ Ductofeb/ Zeco / Rolasta / Atco
16	EPS Thermal Insulation	Beardcell/ Styrene/SHI/ Lloyd/ Armaflex/ U.P. Twiga/ ALP Aeroflex
17	Fibre glass Wool	Owns Canning /Lloyd/ Armaflex/ U.P. Twiga /ALP Aeroflex
18	Flexible pipe connection	Resitoflex / Dunlop / Easyflex / Cori
19	Butterfly Valve	Advance / Audco / Honeywell / Belimo
20	Y-Strainer	Rapid cool/ Emerald / Honeywell / SM
21	POT Strainer	Rapid cool/ Emerald / Honeywell / SM
22	Non Return Valve	Audco / Advance / Honeywell
23	Balancing Valve	Audco / Advance / Honeywell
24	Two way Control Valve with Acturator, Motor and Thermostat	Honeywell / Siemens / Belimo / Danfoss
25	Ball Valve	Sant/ Rapid cool / Danfoss / Belimo
26	Auto Air / Purge Valve	Anergy/ Rapidcool / AIP / Flamco
27	Thermometer / Pressure Gauge	Fiebig/ H-Guru / Emerald / Libra
28	Water Flow Switch	Siemens/ Anergy / Omiron / Danfoss/ Honeywell
29	Temp & RH Sensor	Honeywell / Siemens/ Omiron / Schineider
30	Air Differential Pressure Switch	Honeywell / Siemens/ Omiron / Schineider
31	Air Differential Sensor	Honeywell / Siemens/ Omiron
32	Fire Damper with Actuator	Trox/ Greenheck / Conaire / Sgsjemair
33	Grilles & Dampers	Pineair/ Conaire/ Caryaire/ Greenair/ System Air/ Sevea/ Tristar
34	Under deck Insulation	Beardsell/ Styrene/ Lloyd/ Modifoam/ Armaflex/ ALP Aeroflex

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35	Motor for Centrifugal Fan	Crompton Greaves / Siemens / L&T (LAURITZ KNUDSEN)
36	VFD Enclosure (Flameproof)	Siemens/ Schneider / L&T (LAURITZ KNUDSEN) / Crompton Greaves / Sudhir/ Balliga/ Flexpro/ FCGI
37	Single Phase Preventor	Minilec / L&T (LAURITZ KNUDSEN)/ Ellsco
38	Current Transformer (Cast Resin)	AE/ Kappa
39	Switch / Fuse Unit / HRC Fuse	L&T (LAURITZ KNUDSEN) / Siemens / ABB / C&S
40	Ammeter / Voltmeter (Digital Type)	AE /L&T (LAURITZ KNUDSEN) / Crompton Greaves / Siemens / Conserve
41	LED indicating Lamp / Push Button	Siemens/ GE Power / ABB / L&T (LAURITZ KNUDSEN)/ Schneider Electric
42	Selector Switch	AE/ L&T (LAURITZ KNUDSEN)/ Kaycee
43	Relay Timer / Contactor / Starte/ Push Button	Siemens / L&T (LAURITZ KNUDSEN) / Schneider Electric / ABB / BIL
44	Paint	Nerolac / Asian / Berger
45	Power / Control Cable	Worldcab / Skytone / Polycab
46	Fire Survival Power / Control Cable	Belden / Fusion Polymers / Tyco / RR Kabel /Finolex/ Gloster/ Plaza/ Grandlay/ Rallison
47	Termination Kit	Raychem / Densons / Xicon / ABB
48	Perforated Cable Tray	B.E.C./Apex/ Aditya Steel
49	Fastener	Hilti / AFT / Wurth/ Fisher
50	ACB, Change Over Switch	L&T (LAURITZ KNUDSEN)/ Legrand / Schneider / Siemens
51	Copper Tube/pipes	Met-Tube/ Hindustan/ Rajco /Total line/ Mandav tubes/ Jindal Refrigeration
	CCTV System	
1	Bullet Camera	Honey Well/ Bosch/ Sony/ Pelco/ Tyco/ Samsung /PRAMA
2	Dome Camera	Honey Well/ Bosch /Sony/ Pelco/ Tyco/ Samsung /PRAMA
3	NETWORK SWITCH	Cisco/ Avaya/ Juniper/ Extreme/ Hp /PRAMA
4	WIRELESS CONTROLER	Cisco/ Avaya/ Juniper/ Extreme/ Hp /PRAMA
5	ACCESS POINT POE	Cisco/ Avaya/ Juniper/ Extreme/ Hp /PRAMA
6	NVR / KEYBOARD	Honey Well/ Bosch/ Sony/ Pelco/ Samsung /PRAMA
7	LED TV	Sony/ LG/ Panasonic/ Samsung /PRAMA
8	CAT 6A CABLE (23 AWG)	Panduit - Pannet/ Siemon/ Belden/ Systimax/ Kei /PRAMA
9	PATCH PANEL / PATCH CORD/RJ45 WITH FACE PLATE	Panduit Pannet/ Siemon/ Belden/ Systimax / PRAMA
10	Communication Cables/ Signal Cable/ Control/ Power Cable	Finolex, Havells, Polycab, Techno flex, Lapp Cable, Beldon, Legrand, Molex, Comm Scope, Schneider /PRAMA
11	Optic Fiber Cable	Systemax, Panduit, Siemon, Belkin, Beldon, Comm Scope, Legrand, Molex, Schneider /PRAMA/ Agilon
12	FACE PLATE / ADAPTOR PLATE	Panduit - Pannet/ Siemon/ Belden /PRAMA
13	WALL MOUNTING CABINETS / CABLE MANAGE	Emerson/ Panduit /Rittal /Valrack /PRAMA
14	SFP MODULE	Cisco/ Avaya/ Huawei/ Juniper/ Extreme/HP /PRAMA
15	IPPBX	Panasonic/ Cisco/ Mitel/ Alcatel/ Progility/ Avaya /NEC / Coral /PRAMA

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16	CCTV STORAGE HDD	Samsung /WD / Seagate /PRAMA
17	TELEPHONE (ANALOG)	Panasonic/ Cisco/ Mitel/ Alcatel /Progility/ Avaya /NEC
18	TELEPHONE (DIGITAL)	Panasonic/ Cisco/ Mitel/ Alcatel /Progility/ Avaya /NEC
19	DIGITAL KEY TELEPHONE WITH LCD DISPLAY	Panasonic/ Cisco/ Mitel/ Alcatel /Progility/ Avaya /NEC
20	MDF	Panasonic/ Cisco /Mitel/ Alcatel/ Progility/ Avaya/ NEC / PRAMA
21	PVC Conduits	Recision/ BEC/ AKG Polycab/ Pressfit
22	Net work able LaserJet Color printer	Cannon/ Epson/ Hewlett Packard
23	DIGITAL WATER LEAK DETECTION SYSTEM	TTK/ Tyco (Tracetek)/ Elsa/ C- Systems
24	Digital Rodent Repellent System	Maser Electronics/ C-System/ RSCAT
	Boom Barriers	
1	Boom Barriers	Motwane, Godrej, Faac, Gunnebo
	LAN and Data Networking	
1	STP Cat6a Cable and Its Components Such as Patch Cords, Patch Panels, Face Plates and All Their Accessories	Comm Scope- SYSTIMAX/ Siemon/ Panduit-Pannet/ Belden/ Legrand/ Molex
2	Single Mode Fiber& Multi Mode Optic Cables of Various Core Capacities and Their Accessories — Wall Mounted or Rack Mounted Lius, Patch Cords and Pigtails and Other Accessories	COMMSCOPE- SYSTIMAX/ SIEMON/ PANDUIT-PANNET/ BELDEN/ MOLEX
3	NETWORKING ENCLOSURES, RACKS OF VARIOUS SIZES — 15U UP TO 42U	APW-VERO PRESIDENT/ RITTAL/ PANDUIT—PANNET/ VALRACK/ NETRECK
4	0.5 MM DIA FRLS PVC INSULATED ANNEALED Cable	Finolex/ RR Kable/ Havells/ Molex/ Bonton/ Delton/ Legrand/ Beldon/ Avaya/ Gloster/ Plaza/ AKG
5	COPPER CONDUCTOR CABLE — 4 PAIRS Cat-6 cable, fiber optic	Finolex/ RR Kable/ Havells/ Molex/ Bonton/ Delton/ Legrand/ Beldon/Avaya/ Gloster /Plaza/ AKG
6	Networking Switches — Access Switches, Distribution Switches, Core Switches, Server Farm Switches and their components such as 1Gbps SFP, 10Gbps SFP+, 40Gbps QSFP+ & 100Gbps QSFP28 transceivers and modules and other accessories such as power supplies, fans, stacking cables.	Cisco/ Extreme Networks/ HPE (Aruba)/ Juniper Networks/ Allied Telesis
7	Wireless Controllers, Wireless Access Points and their accessories	Cisco/ Extreme Networks/ HPE (Aruba)/ Juniper Networks/ Allied Telesis
8	Internet Router, Intranet Router and their accessories and Optic	Cisco/ Juniper Networks/ Extreme Networks/ HPE (Aruba)
9	Network Management System	Cisco/ Extreme Networks/ HPE (Aruba)/ Juniper Networks/ Allied Telesis
10	AAA Solution for Campus LAN	Cisco/ HPE (Aruba)/ Juniper/ Extreme Networks
11	Next Generation Firewall and its accessories	Check Point/ Cisco/ PaloAlto/ Annexegate/ Fortinet; F5/ HPE(Aruba)
12	IP based PBX Communication	Avaya/ Cisco/ NEC/ Alcatel/ Matrix

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	Solution, IP Phones, Soft phones, Voice Gateway, Communications Software and Mobility Client, Desktop Client Software	
13	Industry Standard Intel Platform Server Hardware	Dell/ HP/ Lenovo or as per IP-PBX communication system platform OEM
14	Chrone box	Topaz/ Coral /Crown
15	HARD DISK DRIVE	Seagate/ Hitachi/ WD
16	NETWORK RACK	Valrack/ Dynamic /Rittal/ Comrack /Netrack
17	Rack	Valrack/ Middle Atlantic /WQ/ Netrack/ Panduit/ Rittal/ Emerson/ Schneider (APC)/ Derwiser
	ACCESS CONTROL SYSTEM	
1	Access control system & allied accessories	HID/ Lenen/ Genetec /Idcube
	DG Set	
1	Diesel Operated Generating Engine	Cummins India/ Caterpillar / Ashok Leyland/ KOEL / Greaves / Perkins
2	Alternator	Stamford/ Lerroy Sommer / Kirloskar Electric / Caterpillar / Crompton Greaves / KOEL
3	DG Set Canopy / Enclosure	As Per OEM / OEA Of Respective DG Set Manufacturer.
4	MCB, MCBDB, RCBO'S/ RCCB'S	Schneider Electric /Hager/ L&T (LAURITZ KNUDSEN)/ Siemens/ ABB
5	MCCB 3 & 4 Pole	Schneider Electric/ Siemens/ Larsen & Toubro/ ABB
6	Ammeter/Voltmeter/ Selector Switch, Indicating Lamp/Relays	AE/IMP/ MECO/ L&T (LAURITZ KNUDSEN) (Only Digital Type To Be Used)
7	Contractors, Timer	L&T (LAURITZ KNUDSEN)/ Siemens/ Schneider Electric
8	HT Cable	KEI/ Havells /Polycab/ Gloster/ Nicco/ Grandlay/ Finolex /RR KABEL/ Rallison
9	LT Cable	Finolex/ RR Kabel/ KEI/ Havells/ Polycab/ Grandlay/ Plaza Cables/ Panasonic/ Anchor/ Bonton/ Paramount cables/ V-marc/ JMW Kable /AKG/ Gloster/ Rallison
10	Bus Trunking Make	GE/ C&S/ Schneider /L&T (LAURITZ KNUDSEN)/ ABB/ Legrand
11	HT Cable End Termination	M Seal/Denson/Raychem/Cab Seal
12	Battery	Panasonic/ Exide/ Amaron/ luminous/ SF
13	G.I. Pipe	Jindal (Hissar)/Tata. (ISI Marked)
14	ACB	L&T (LAURITZKNUDSEN) /ABB/ Siemens/ Schneider /Legrand
15	Vibration Isolators	Resistoflex/ Flenonics (USA)/ Gerv
16	Noise Control Silencer / Muffler	Intertec/ Sound Control India, As Per OEM
17	Fiberglass	UP Twiga, Kimmco/ Owing Corning
18	Alarm Annunciator	Advani Oralikon/ Larsen & Toubro Minilec
19	Motors	Kirloskar/ Bharat Bijlee/ Siemens
20	MS Pipes Upto 200 Mm Dia	Tata Steel/ Jindal (Hissar)
21	G.I. Pipe Fitting	Unik/ Zoloto M
22	Flexible Pipe Connections	Resisto flex/ Flexionics (USA)
23	Welding Rod	Advani/ ESAB
24	Indicating Lamps, Selector Switch	Siemens/ L&T (LAURITZ KNUDSEN)/ Kaycee/ BCH
25	AMF/Synchronized Panel(DG Set)	As Per OEM of DG Set
26	Cable Glands Double Compression With	Baliga Lighting / Comet / Cosmos / Dowell's

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AE(E)(P)

	Earthing Links	
	Solar System Solar Power Generation System	
1	Solar Power Generation System	REIL/ BEL/ CEL/ REC/ SOLON/ TATA POWER /ADANI /INA/ WAAREE / VIKRAM/ ABB/ MOSER BEAR/ WIPRO
2	Junction Box	VNT/ SUN GARNER/ OEM of SPV Modules
3	SPV Inverter	Sungrow/ Delta/ SMA/ ABB
4	Module Mounting Structure	As per MNRE/ Manufacturer's standard
5	XLPE Alumunium / Copper cable	Finolex/ RR Kabel/ KEI/ Havells/ Polycab/ Paragon (Electron)/ Universal/Nicco/RPG Cables/ Grandlay/ Bonton/ Plaza cables/ Panasonic/ Anchor/ Paramount Cables/ V-marc/ JMW Kable /AKG/ Gloster/ Rallison
6	Solar cable XLPO Insulated (DC)	RR Kable / Polycab/ Havells/ Finolex/ Lapp/ Paragon (Electron)/ Bonton/ Svarn/ NEC/ KVVS/ HPL Finolex/ KEI/ Grandlay/ Plaza Cables/ Panasonic/ Anchor/ Paramount cables/ V-marc/ JMW Kable /AKG/ Gloster/ Rallison
	EARTHING	
1	Earthing	Avon Earthing, Ashlok Safe Earthing, VRH Lightning Protection
	FACADE LIGHTING	
1	**Facade light**	Trilux, Philips, LT, Ligman, Griven, Traxon, Unilamp

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AE(E)(P)

Schedule of Quantity					
Name of work : Construction of Model Rural Health Research Unit (MRHRU) Building including E&M works and External Development work under ICMR at CHC Nagram, Lucknow (U.P.).					
S1. No.	**Description of Items**	**Qty.**	**Unit**	**Rate**	**Amount**
	Sub Head - 1 (Internal EI Work)				
1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS/HFFR PVC insulated copper conductor single core cable etc as required.				
a)	Group C	142.00	Point	2101.00	298342.00
2	Wiring for twin control light point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface / recessed steel conduit, 2 way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS / HFFR PVC insulated copper conductor single core cable etc as required.	4.00	Point	2242.00	8968.00
3	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
a)	Group C	14.00	Point	1246.00	17444.00
4	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.				
a)	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	200.00	Metre	370.00	74000.00
b)	4 X 1.5 sq. mm + 2 X 1.5 sq. mm earth wire	100.00	Metre	488.00	48800.00
c)	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	500.00	Metre	476.00	238000.00
d)	4 X 4 sq. mm + 2 X 4 sq. mm earth wire	250.00	Metre	744.00	186000.00
e)	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	200.00	Metre	652.00	130400.00
f)	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	100.00	Metre	1001.00	100100.00

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g)	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	60.00	Metre	1253.00	75180.00
h)	4 X 16 sq. mm + 2 X 6 sq. mm earth wire	60.00	Metre	1760.00	105600.00
5	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
(a)	20 mm	200.00	Metre	254.00	50800.00
(b)	25 mm	400.00	Metre	289.00	115600.00
(c)	32 mm	100.00	Metre	360.00	36000.00
6	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a)	TV antenna socket outlet	3.00	Each	168.00	504.00
7	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	50.00	Metre	54.00	2700.00
8	Supplying and fixing two module stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	24.00	Each	402.00	9648.00
9	Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess etc as required.				
a)	1 or 2 Module (75mmX75mm)	43.00	Each	354.00	15222.00
10	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 amps modular socket outlet and 5/6 amps modular switch, connection etc. as required.	14.00	Each	545.00	7630.00
11	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 amps modular socket outlet and 15/16 amps modular switch, connection etc. as required.	47.00	Each	659.00	30973.00
12	Supplying and fixing call bell/ buzzer suitable for single phase, 230V, complete as required.	8.00	Each	112.00	896.00

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AE(E)(P)

13	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providng and fixing 2 Nos. 3 pin 5/6 A modular socket outlet and 2 Nos. 5/6 A modular switch, connections etc. as required.	29.00	Each	757.00	21953.00
14	Supplying & fixing suitable size GI box wih modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc. as required.	32.00	Each	807.00	25824.00
15	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	50.00	Each	47.00	2350.00
16	Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal(Aluminium alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, suitable for operation with regulator for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as req.				
a)	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	2.00	Each	2695.00	5390.00
b)	1400mm, service value ≥ 6.0 CM/Min/Watt, air delivery 245 CM/Min (Minimum)	22.00	Each	2737.00	60214.00
17	Supplying, installation, testing and commissioning of 250 mm sweep 1250 RPM, suitable for 230 volts 50 Hz fresh Air Fan i/c making good the damage, connections with 1.5 sqmm FRLS PVC insulated copper wire i/c supplying & fixing the louvers/shutters complete with frame for fresh air fan testing, commissioning etc. as required.	6.00	Each	2018.00	12108.00

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AE(E)(P)

18	Supplying, Installation, Testing and Commissioning of single phase 300mm Sweep, min. 900/1400 RPM heavy duty propeller type exhaust fan for operation on 220-240 V, 50Hz, AC electricity, in the existing opening including making good the damages and connection with 1.5 sqmm FRLS PVC insulated copper wire including providing & fixing of louver shutter complete as required.	6.00	Each	3633.00	21798.00
19	Supplying, installation, testing and commissioning of 400 mm sweep Wall fan with all accessories suitable for use on 230 volts, 50 Hz single phase AC supply with 1.5 sqmm FRLS PVC insulated copper conductor single core cable, earthing etc as required.	10.00	Each	3730.00	37300.00
20	Supplying, installation, Testing & Commissioning of LED Recessed/ surface Down lighter (Round/ square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS: 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 50/60 hz, Operating temp range -5 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F.≥0.95, IP20, CRI ≥80 , UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5%), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K / 6500°K (As per ANSI Bin), SDCM (Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be confirming to relevant BIS standards and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing Complete in all respect i/c external connections with 1.5 sq. mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output. LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and				

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	CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				
	Powder coated die cast/ Extruded aluminium Body including trim				
a)	12 -15 watt	45.00	Each	715.00	32175.00
21	Supplying, installation, Testing & Commissioning of Panel light 2x2 ft., of following body material and construction as per IS: 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -5 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F.≥0.95, IP20, CRI ≥80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K/ 5700°K /6500°K (As per ANSI Bin), SDCM (Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c external connections with 1.5 sq. mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output. LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				
	Powder coated die cast /Extruded aluminium Body (Thickness ≥ 1.20 mm)				
a)	36 watt	46.00	Each	2508.00	115368.00

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AE(E)(P)

22	Supplying, installation, Testing & Commissioning of Flood Light, powder coated pressure die cast aluminium body with built in or separate driver as per the requirement with Driver efficiency >85%, Input voltage: Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -5 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000-4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2, P. F.≥0.95, IP-66, IK-10, CRI ≥70, under voltage and over voltage protection, EMI-EMC as per CISPR -15, lenses for beam angle 30 deg-120deg as per the application and the project requirement deg., suitable tilt able fitting, life time (LED, Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM (Standard Deviation Colour Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c external connections with 1.5 sq. mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥105 <120 lm/Watt output. LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted.. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				
a)	50 watt	2.00	Each	1436.00	2872.00
23	Supplying, installation, Testing & Commissioning of min. size 600 mm LED surface mounted batten light, powder coated die cast aluminium/polycarbonate body with built in driver, Operating voltage AC100-240Volt, freq 50/60hz, Operating temprange -15 deg to 40 deg centigrade, internal surge protection of 2.5KV with Short & Open circuit protection, THD<15%, P.F.≥0.95, IP20, CRI>80, life time of minimum 50000				

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	Burning Hours with, 70% of initial Lumen maintained till life ends, CCT 4000°K/5700°K/6500°K, Maximum power consumption should not more than the specified rating and complete in all respect i/c connections with 1.5 sqmm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required",System lumen efficacy ≥100 and ≤110lm/W at out put.				
(a)	10 Watt	8.00	Each	583.00	4664.00
24	Supplying, installation, Testing & Commissioning of LED bulk head, powder coated die cast aluminium/Extruded alluminium with built in driver, Operating voltage AC100-240Volt, freq 50/60hz, Operating temprange -15 deg to 40 deg centigrade, internal surge protection of 2.5KV with Short & Open circuit protection, THD<10%, P.F.≥0.95, IP65/66, IK-08, CRI>80, life time of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends, CCT 4000°K/ 5700°K/6500° K, Maximum power consumption should not more than the specified rating and complete in all respect i/c connections with 1.5 sqmm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required",System lumen efficacy ≥100 and ≤110 lm/W at out put.				
(a)	10 Watt	7.00	Each	1787.00	12509.00
25	Supplying, installation, testing and commissioning of Passive Infrared (PIR) technology based occupancy sensor having high performance, non regulating programmable type, suitable for connected load upto 10Amp, for mounting height up to 2.8 mtr and for 5 m diameter coverage area along with necessary fixing arrangements i/c programming at site etc. complete as required.	12.00	Each	4896.00	58752.00
26	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 volts, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
(a)	16 way, Double door	1.00	Each	3367.00	3367.00

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AE(E)(P)

27	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 volts, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	4 way (4 + 12), Double door	4.00	Each	4377.00	17508.00
b)	8 way (4 + 24), Double door	4.00	Each	6337.00	25348.00
28	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 volts, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 amps tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCB's (but without MCB's and incomer) as required . (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)				
a)	4 way (4 + 12), Double door	3.00	Each	7951.00	23853.00
29	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	20.00	Each	14.00	280.00
30	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	Single pole	184.00	Each	285.00	52440.00
b)	Triple pole and neutral	2.00	Each	1301.00	2602.00
31	Supplying and fixing following rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	63 A TP MCB,10kA	4.00	Each	2438.00	9752.00
b)	40 A FP MCB,10kA	2.00	Each	3078.00	6156.00
c)	63 A FP MCB,10kA	8.00	Each	3078.00	24624.00
32	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 300 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				

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AE(E)(P)

a)	63 A	1.00	Each	3597.00	3597.00
33	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, Ics=100% Icu and Operational Voltage 690V etc. as required.				
a)	63 A, 16 KA,TPMCCB	2.00	Each	6610.00	13220.00
b)	160 A, 25 KA, TPMCCB	1.00	Each	14152.00	14152.00
34	Supplying and fixing Cable End Box (Loose wire box) (IP 43) suitable for following single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with testing and commissioning etc. as required.				
a)	For 14 way, Double door SPN MCBDB	1.00	Each	990.00	990.00
35	Supplying and fixing Cable End Box (Loose wire box)(IP 43) suitable for following triple pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with testing and commissioning etc. as required.				
a)	For 4 way, Double door TPN MCBDB	4.00	Each	1177.00	4708.00
b)	For 8 way, Double door TPN MCBDB	4.00	Each	1448.00	5792.00
36	Supplying and fixing Cable End Box (Loose wire box) suitable for triple pole and neutral, sheet steel, Vertical MCB distribution board, 415 V, on surface/ recess, complete with testing and commissioning etc. as required.	3.00	Each	1271.00	3813.00
	Sub Head - 2 (Compound Light Work)				
37	Supply and erection of 6 Mtr height Octagonal pole having 130 mm dia at bottom & 70mm dia on top with openable door/window made with 3mm thick hot dip galvanised sheet welded with 200mm x 200 mm x12mm thick GI Base Plate at bottom & supplying and fixing 1 No. 6 Amp 'C' series SP MCB i/c suitable size 3 Nos aluminium bus bar strip, 6mm thick bakelite sheet, din bar with accessories & making cement concrete foundation strictly as per OEM issued Foundation drawing & details supported with OEM issued design calculation for sizing of Foundation, Finalising the Design Mix of the Foundation and approved by Engineer-in-charge including supplying fixing of 4 Nos. OEM Recommeded(as per design and drawing	12.00	Each	19171.00	230052.00

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	issued by OEM and approved by CPWD) J type GI foundation bolt & nuts,(Foundation bolts & Nuts to be provided by OEM of GI Pole only) & Templates for Foundation Bolts and including Excavation, Centering, shuttering, compacting, Refilling, levelling etc for Foundation work.				
	Providing HDPE/HARD 65mm dia pipe for cable entry and supplying and fixing of 1 Mtr long single arm suitable GI bracket for installation of fitting (To be provided by OEM of pole) i/c connection and testing etc. complete as reqd.				
38	Supplying, installation, Testing & Commissioning of Street light LED fixture powder coated pressure die cast aluminium body with driver as per the requirement with Driver efficiency >85%, Input voltage: 140-270 Volt AC, frequency 50/60 hz, Operating temp range -5°C to 50°C, internal surge protection of 5 KV L, N, E as per IEC 61000-4-5, Driver efficiency >85%, THD < 10% as per IEC 61000-3-2, P. F. =0. 95, IP-66, IK-10, CRI >70, under voltage and over voltage protection, EMI- EMC As per CISPR -15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time (LED, Driver & electrical circuitry) of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM (Standard Deviation Colour Matching) <5, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c external connections with 1. 5 sq. mm FRLS/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy =105 <120 lm/Watt output . LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing				

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	such that LED junction temperature shall not rise above 90°C).				
(a)	45 watt	12.00	Each	1366.00	16392.00
39	Supplying, installation, Testing & Commissioning of LED Post top liminaire, powder coated die cast aluminium/Extruded alluminium with built in driver, Operating voltage AC100-240Volt, freq 50/60hz, Operating temprange -15 deg to 50 deg centigrade, internal surge protection of 4KV with Short & Open circuit protection, THD<10%, P.F.≥0.95, IP65, IK-05, CRI>70, suitable for fixing upto 65mm dia pipe, life time of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends, CCT 4000°K/5700°K/6500°K, Maximum power consumption should not more than the specified rating and complete in all respect i/c connections with 1.5 sqmm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required",System lumen efficacy ≥100 lm/W at out put.				
(a)	45 watt	4.00	Each	7994.00	31976.00
40	Supply, Installation, Testing and Commissioning of straight Garden Bollard luminaire Light with 10 watt inbuilt LED i/c cement concrete foundation block on existing surface i/c digging of all type of soil upto required depth and minimum IP 65 and height 1.0 mtr. The block shall have suitable foundation bolts for Installation of Bollard Fitting complete etc. as required.	10	Nos.	4274.00	42740.00
	Sub Head - 3 (Earthing)				
41	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	8.00	Set	8351.00	66808.00
42	Earthing with Copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	4.00	Set	15004.00	60016.00

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43	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe from earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	30.00	Metre	1638.00	49140.00
44	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	60.00	Metre	755.00	45300.00
45	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	30.00	Metre	1246.00	37380.00
46	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	100.00	Metre	287.00	28700.00
47	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing along with existing surface/ recessed conduit/ submain wiring/ cable as required.	100.00	Metre	50.00	5000.00
	Sub Head - 4 (Lightning Conductor)				
48	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	2.00	Set	8351.00	16702.00
49	Providing and laying G.I. tape 32 mm X 6 mm from earth electrode directly in ground as required.	20.00	Metre	221.00	4420.00
50	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required.	2.00	Each	609.00	1218.00
51	Jointing copper / G.I. tape (with another copper/ G I tape, base of the finial or any other metallic object) by riveting / nut bolting/ sweating and soldering etc as required.	2.00	Each	139.00	278.00
52	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For horizontal run)	100.00	Metre	148.00	14800.00
53	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For vertical run)	20.00	Metre	238.00	4760.00

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54	Providing and fixing testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.	2.00	Each	140.00	280.00
	Sub Head - 5 (Lifts)				
55	Supplying, Installation, Testing & Commissioning of following capacity passenger Machine room less (MRL) lift with regenerative drive as per CPWD General Specification for Electrical Works (Part-III Lift & Escalator) 2003, BIS Codes, NBC 2016 as amended upto date having provision for barrier free access as per Harmonised Guidelines & Standards for Universal Accessibility in India - 2021 of MoHUA, serving different floors in the lift shaft as per detailed specifications enclosed and as under including all other equipment and accessories complete as required :-				
	(i) Speed-1 MPS				
	(ii) Floors-2 (G+1)				
	(iii) Travel -5-7 Meters (approx.)				
	(iv) Stops & opening- 2 stops and 2 openings				
	(v) Controller: A. C. variable voltage & variable frequency				
	(vi) Automatic rescue device (ARD) complete with dry maintenance free batteries as required.				
	vii) Operation: Microprocessor based single automatic push button/simplex selective collective/duplex collective selective with/without attendant				
	(viii) Power-415 Volts+10%, 3 phase, 50 Hz, 4 wires system				
	(ix) Car Enclosure: Stainless steel scratch proof (Moon Rock/Honeycomb/ Hairline Finish) on all sides and stainless steel decorative ceiling with fans (indirect throw) and LED fitting.				
	(x) The car flooring should be smooth and antiskid as approved by engineer-in-charge.				
	(xi) Type of doors				
	(a) Car: Power operated, centre opening horizontal sliding stainless steel scratch proof (Moon Rock/Honeycomb/ Hairline Finish).				
	(b) Landing doors: stainless steel scratch proof .				

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	(xii) A hand rail not less that 600mm long at 900mm above floor level to be fixed adjacent to control panel in the lift car.				
	(xiii)Voice announcement system in the car to announce the position of the elevator in the hoist way as the car passes or stops at floor served by the elevator.				
	(xiv) Closed loop Control System, protection against power fluctuation, self diagnostic control, Landing doors 2 hours Fire rated, Overload detection and protection, Overspeed Governer, Dot Matrix LED D & P Indicators In Car & Landings, BMS Compatibility, tamper proof infrared curtain covering almost the entire height of the lift car door, Alarm horn, Anti Nuisance Operation, CCTV camera system with 4 MP IP camera, suitable NVR and HDD for 30 days storage backup, Firemen switch, 2/3 way intercom, Emergency Stop Switch with battery backup for fan and light fitting for 1 hour, pit ladder.				
	(xv) The lift doors shall have a vision panel to enable persons with hearing impairment to signal for help or assistance in the event of an emergency.				
	(xvi) An appropriate technological support be provided (Through emergency messaging |services or alarms etc.) to respond to the emergency requirements of person with hearing impairment or deafness.				
	(xvii) In case of failure of ARD or other electronic devices, a provision of manual rescue be provided				
(a)	13 passenger (884kg)	1.00	Each	846810.00	846810.00
	Sub Head - 6 (Air Conditioning System)				
56	Supplying, Installation, Testing and Commissioning of Air Cooled Hi Wall split type Air conditioners complete with Indoor unit (IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 3 Mtr (IDU to ODU), copper power cable upto 3. 5 Mtr (IDU to ODU) i/c drain pipe R-32/R-410/ R-407 Green Refrigerant, wireless Remote control, suitable for working between 180-260V with low & high voltage cutoff and 50 hz, 1 phase AC supply capable of performing cooling, dehumidification, air circulation of				

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	following capacity with Scroll / rotary compressor. The system shall be able to deliver 100% of the rated capacity upto 42° C. Min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB). Must comply : Electrical cable IS 694 or IS 9968 temperature sensing control IS /International Electrotechnical Commission (IEC) 60730, hermetic compressor IS 10617, heat exchanger IS 11329, capacitor IS 2993 and motor IS 12615. Complete as per CPWD specification and IS : 1391 Part II 2023. The system shall be able to operate up to 50° C (out door ambient temperature).				
	Inverter Type - Hot & Cold				
a)	1.5 TR with 3 Star BEE Rating	26.00	Each	41768.00	1085968.00
57	Supply, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastomeric nitrile rubber tubular sleeves sections of 19 mm thick insulation as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :				
a)	6.4 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	100.00	Meter	256.00	25600.00
b)	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	100.00	Meter	487.00	48700.00
58	Supply, Installation, Testing & commissioning of PVC drain piping for indoor units complete with necessary elbow, tees, reducers etc. duly insulated with 6 mm thick closed cell elastomeric nitrile rubber tubing/sheet rapping as per following size:Complete as per site requirement.				
a)	25 mm dia	200.00	Meter	141.00	28200.00
59	Providing and Fixing of following size PVC insulated PVC Sheathed copper conductor flexible armoured control cable for connection between indoor & outdoor units complete etc. in existing pipe/cable tray/on surface i/c connection etc complete as				

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	required.				
a)	4 core 2.5 Sqmm	100.00	Meter	540.00	54000.00
60	Providing and fixing of GI Wall Stand for AC outdoor unit etc complete as required.	26.00	Each	1146.00	29796.00
	Sub Head - 7 (Fire Alarm System)				
61	Supplying, installation, testing & commissioning of main control and indicating panel made out of 16 SWG MS sheet to accommodate the following items duly powder coated in approved colour with louvers for ventilation, locking arrangement, audio and visual indication for fire alarm and public address system, monitoring system including connections, interconnections etc complete as required.				
	6 zone panel for fire alarm system				
	100 watt amplifier racks suitable for operation on 230V AC/24V DC supply conforming to IEC-268-3 complete with all accessories as required- 2 Nos. (one to act as standby)				
	Talk back master station with LED PTT (press to talk) push button for operation on 230V AC/24 V DC supply conforming to IEC-268 for simplex mode of operation/communication suitable for 20 Nos. talk back unit -1 set.				
	Announcement control desk suitable for selection of different zones selectively and ON ALL CALL switch with visual indication etc., complete as required- 1 set.				
	Amplifier change over switch for inter changing amplifier- 1 No.				
	Monitor panel for loudspeaker complete output selector ON/OFF switch, fuse visual indications etc. complete as required- 1 No.				
	Gooseneck microphone with stand and ON/OFF switch -1 No.				
	Mains ON/OFF switch, fuse indication lamps, DC and AC voltmeters & ammeters terminal blocks etc. complete as required -1 set.				
	Battery charger trickle cum boost to take complete load of fire alarm & PA system complete with all accessories including providing & fixing of 2 nos. 12 volt, 30 AH each sealed maintenance free batteries -1 set.	1.00	Each	52258.00	52258.00

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62	Supplying, installation, testing & commissioning sector panel suitable for following zones, complete with visual indications for short circuit fault, open circuit fault, fire condition and all other standard facilities as per IS:2189 with mimic diagram for all area/zone covered, complete with all connections, interconnections as required.				
a)	4 Zone	1.00	Each	9808.00	9808.00
63	Supplying, installation, testing & commissioning of heat detector operating at 54ºC/57ºC with rate of rise cum fixed temperature (dual thermistor) type with mounting base complete with all connection etc. as required.	2.00	Each	1136.00	2272.00
64	Supplying, installation, testing & commissioning of smoke detector with builtin LED and mounting base complete with all connections etc. as required.	64.00	Each	1223.00	78272.00
65	Supplying, installation, testing & commissioning of manual call box of ABS type in surface/recess with stainless steel chain & hammer assembly complete with glass and push button etc. as required.	4.00	Each	444.00	1776.00
66	Supplying, installation, testing & commissioning response indicator on surface/recess MS box having two LEDs metallic cover complete with all connections etc. as required.	28.00	Each	222.00	6216.00
67	Supplying, installation, testing & commissioning fire alarm sounder with facility to make announcement, mounted in A.B.S. box with hinged cover plate & suitable for operation with amplifier i/c line matching transformer etc. complete as required.	4.00	Each	530.00	2120.00
68	Supplying, installation, testing & commissioning talk back slave station in surface/recess suitable for operation on simplex mode complete with P.T.T. knob & speaker/microphone enclosed in a M.S.(16 SWG)/ ABS box with break glass in front etc. complete as required.	2.00	Each	963.00	1926.00
69	Supplying & laying of 2x1.5 sqmm fire survival armoured cable, 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer	500.00	Metre	386.00	193000.00

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	sheath complete as required.				
	Sub Head - 8 (Fire Fighting System)				
	Down Comer System				
70	(a) Supplying, installation, testing and commissioning of electric driven terrace pump conforming to IS 12469: 2019 suitable for automatic operation and consisting of following, complete in all respects, as required: (Terrace Pump)(b) Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal as required.(c)Suitable HP squirell cage induction motor TEFC type suitable for operation on 415 volts, 3 phase, 50 Hz, AC supply with IP55 class of protection for enclosure, horiziontal foot mounted type with Class 'F' insulation, conforming to IS-12615: 2018. (d) M.S.fabricated common base plate, coupling,coupling guard, foundation bolts etc.as required.(e) Suitable cement concrete foundation duly plastered and with anti vibration pads.				
a)	450 lpm at 35 m Head	2.00	Each	91384.00	182768.00
71	Supplying, Installation, Testing and commissioning of totally enclosed compartmentalised front operated outdoor type cubical type floor mounted panel board of suitable size fabricated from 2mm thick CRCA sheet for mounting of following mounting/switch gear with support having 4 strip vertical Aluminium busbar of suitable length, cable alley with gland plate at the top/bottom and suitable size to accomodate the following switch Gears, MCBs, danger notice plate, Connections/ interconnections, earthing, numbering, painting etc. as required with multifunctional/ intelligent digital panel meter, LED pilot lamps making foundation for errection, complete as reqd.				
A-	**INCOMER-**				
(a)	63A 4P 10kA C-Curve MCB - 1 No.				
(b)	Multifunction Meter LCD display, 3Ph Class 1, showing parameters Voltage, Amperage, Frequency, Power factor, kW, kVA - 1 Nos.				
(c)	RYB LED phase indicator, 220V AC - 3 Nos.				
(d)	30/5A 15VA Tape Wound Acc. Cl: 1 Current Transformer - 3 Nos.				

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(e)	6A 1P 10kA C-Curve MCB - 3 Nos.				
	Outgoing : 12.5 HP Star Delta Starter - 2 Nos.				
(a)	40A 3P 10kA C-Curve MCB - 2 Nos.				
(b)	AC3: 25A AC1: 45A 3P Power Contactor, Coil: 240V AC - 4 Nos.				
(c)	AC3: 12A AC1: 30A 3P Power Contactor, Coil: 220V AC, Aux. Contact: 1NO - 2 Nos.				
(d)	2NO+2NC Add-on Auxiliary Contact Block Front Mounting - 6 Nos.				
(e)	6-10A Thermal Overload Relay, Directly Operated, Direct Mounting - 2 Nos.				
(f)	Star-Delta Timer, Time Range: Run time: 30 / 60 Sec, Change over: 50 / 100ms, 2 C/O, Voltage: 230V AC, - 2 Nos.				
(g)	Single Phasing Preventor (for Agricultural Pump Starters), Auto Reset, 1 NO, 415V AC.- 2 Nos.				
(h)	Ammeter(AC) 1Ph, Acc. CL: 1, Input: 1A/5A, Aux. Supply: 40-300V AC/DC - 2 Nos.				
(i)	6A Ammeter Selector Switch, Line Currents with OFF with CT - 6 Nos.				
(j)	60/5A 15VA Resin Cast Acc. Cl: 1 WOUND Primary Current Transformer - 6 Nos.				
(k)	RYB LED phase indicator, 220V AC - 6 Nos.				
(l)	6A 1P 2Way Local - Remote/ Auto-Manual Switch with Center OFF - 2 Nos.				
(m)	Start Push Button with NO Element - 2 Nos.				
(n)	Stop Push Button with NC Element - 2 Nos.				
(o)	6A 1P 10kA C-Curve MCB - 6 Nos.				
(p)	Power Connector - 4 Nos.				
	Bus Bar :-				
(a)	100 A, TPN 415V, Aluminium Bus Bar with Heat Shrinkable Coloured Insulated PVC Sleeves	1.00	Nos.	122572.00	122572.00
72	Providing laying, testing & commissioning of 'C' class heavy duty MS Pipe conforming to IS 1239/Class -II of IS: 3589 i/c fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. in ground including welding, excavation & providing cement concrete blocks as supports, anticorrosive treatment with coaltar/asphalt tape as per IS 10221, refilling the trench etc. of following sizes complete as required.				

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a)	100 mm dia	20.00	Metre	3880.00	77600.00
73	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 1239/Class -II of IS: 3589 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required.				
a)	80 mm dia	20.00	Metre	2277.00	45540.00
b)	100 mm dia	25.00	Metre	3077.00	76925.00
c)	150 mm dia	6.00	Metre	4299.00	25794.00
74	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required :				
a)	100 mm dia	6.00	Each	7271.00	43626.00
75	Supplying, fixing, testing & commissioning of double flanged sluice valve of rating PN 1.6 with non rising spindle, bronze/gun metal seat, ISI marked complete with nuts, bolts, washers, gaskets and conforming to IS 780 of following sizes as required :				
a)	100 mm dia	2.00	Each	15603.00	31206.00
76	Providing, installation, testing and commissioning of Non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc.as required :				
a)	100 mm dia	3.00	Each	11853.00	35559.00
77	Providing, installation, testing and commissioning of stainless steel Y-strainer fabricated out of 1.6 mm thick stainless steel, Grade 304, sheet with 3 mm dia holes with stainless steel flange				
a)	100 mm dia	2.00	Each	7270.00	14540.00
78	Supplying and fixing first-aid Hose Reel with MS construction spray painted in post office red, conforming to IS 884 complete with the following as required. (a) 20 mm nominal internal dia water hose thermoplastic (Textile reinforced) type -2 as per IS: 12585 (b) 20 mm nominal internal dia gun metal globe valve & nozzle.				

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	(c) Drum and brackets for fixing the equipmets on wall. (d) Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket.				
a)	30 m	5.00	Each	9440.00	47200.00
79	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female couplings duly bound with Gl wire, rivets etc. conforming to IS 636 (type-A) as required:				
a)	Stainless steel (Grade 304)	10.00	Each	4667.00	46670.00
80	Supplying & fixing 63 mm dia gun metal Short branch pipe with 20 mm nominal internal diameter size nozzle conforming to IS 903 suitable for instantaneous connection to interconnect hose pipe coupling as required:				
a)	Stainless steel (Grade 304)	5.00	Each	1756.00	8780.00
81	Supplying and fixing single headed internal hydrant valve with instantaneous Gunmetal/Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required :				
a)	Single headed stainless steel	5.00	Each	6632.00	33160.00
82	Supplying and fixing of fire brigade connection of cast iron body with gun metal male instantaneous inlet couplings complete with cap and chain as reqd. for suitable dia MS pipe connection conforming to IS 904 as required:				
a)	2 way-100 mm dia M.S. Pipe	1.00	Each	7262.00	7262.00
83	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.	1.00	Each	19402.00	19402.00
84	Providing & fixing of pressure switch in M.S. pipe line including connection etc. as required.	2.00	Each	1670.00	3340.00
85	Providing and fixing in position industrial type pressure gauges with gun metal / brass valves complete etc. as required.	6.00	Each	1491.00	8946.00
	Fire Extinguisher System				

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86	Supplying & fixing of CO_2 type fire extinguisher 4.5 Kg capacity ISI marked confirming to IS:15683:2006 complete with delivery hose horn, squeeze grip release valve, locking arrangement, operation manual, bracket with two screw and sleeve, Operating Temperature: - 30ºC to +60ºC etc. as required.	10.00	Each	6562.00	65620.00
87	Supplying and fixing ABC Fire Extinguisher 6 kg capacity (Stored pressure type) duly ISI marked conforming to IS 15683:2006 with IS14609 ABC (MAP 90%) powder complete with Squeeze grip release valve discharge pipe locking arrangment, pressure gauge, operation manual valve suspendet bracket, Operating Temperature: -30ºC to + 60ºC etc complete as reqd.	10.00	Each	5764.00	57640.00
	Sub Head - 9 (CCTV, LAN & EPABX System)				
	CCTV Surveillance System				
88	Supplying Installation Testing and Commissioning of 4MP IP IR Dome Camera having following specifications and features etc :-				
	1) Signal System: PAL/NTSC, Signal to Noise Ratio: > 50 dB, Camera should display Camera title, Date & Time in live & recorded video				
	2)Image Sensor: 1/2. 8" or better progressive Scan CMOS to get color image even at night condition (Minimum Illumination: 0. 006 Lux@ F1. 4, AGC ON, 0 lux with IR or better) True Day & Night High Performance Mechanical IR cut filter with auto switch, Integrated IR Source (Auto, Manual)- Inbuilt IR LED's with effective distance upto 50 meter or better and 30 meter for colour view in night, Imaging: 1/3s to 1/30000s electronic shutter support, Auto Gain Control, White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking.				
	3) Compression (Minimum): Video:- H. 265 or better, Audio:- G. 711U/A, G. 711Mu, G. 726, AAC, G. 723				
	4) Wide Dynamic Range:- WDR (120dB or more)				
	5) Digital Noise Reduction:- DNR (3D) On/Off				

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	6) Video Streaming & Frame Rates :- Triple streaming, configurable Main stream: 4MP (2560×1440)25/30fps, Sub streams minimum: 720P@25/30 fps				
	7) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser, Edge Analytics: Tripwire, Intrusion, Motion Detection				
	8) Cyber Security: AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, account lockout, video encryption, IP/MAC filtering, HTTPS, trusted upgrade				
	9) Onboard Storage: Camera should support built-in Micro SD/ SDHC/ SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card.				
	10) Recording Management: Format SD, overwrite, storage management, video to NAS device,				
	11) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection				
	12)Network Protocol: SFTP, IPv6, IPv4, DNS, RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast,				
	13) System Capability: ONVIF, Camera shall support open source VMS				
	14) Ethernet: 1 RJ 45 10/100 Ethernet port				
	15) Audio : It should support 1 x Built-In Mic and 1/1 Alarm In/ Out for External Mic. and Speakers as per site requirement.				
	16) Power Input: The camera should support simultaneous dual power input—12 VDC (via power adapter) and PoE (802. 3af)—to ensure continuous operation in the event of a failure in one power source.				
	17) Power Requirement: 12VDC/24 VDC/PoE (802. 3af)/ePoE				
	18) Housing/ Enclosure:- IP67 weather proof, IK10, Metallic body				
	19) Operating Condition:- Ambient Temperature:- (-)05°C to 50°C, humidity 95% (max) (non-condensing)				

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	20) IR life: 40000 hours or higher				
	21) Video Bit rate: 32 KBPS - 8 MBPS or better				
	22) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS				
a)	4MP @ 25/30fps@1440P (2560 x 1440) Dome Camera with 2. 8/ 3. 6/ 6/8/12 mm fixed lens (as per site requirement).	10.00	Each	10365.00	103650.00
89	Supplying Installation Testing and Commissioning of 4MP IP IR Outdoor Bullet Camera having following specifications and features etc :-				
	1) Signal System: PAL/NTSC, Signal to Noise Ratio: > 50 dB, Camera should display Camera title, Date & Time in live & recorded video				
	2)Image Sensor: 1/2. 8" or better progressive Scan CMOS get color image even at night condition (Minimum Illumination: 0. 006 Lux@ F1. 4, AGC ON, 0 lux with IR or better) True Day & Night High Performance Mechanical IR cut filter with auto switch, Integrated IR Source (Auto, Manual)- Inbuilt IR LED's with effective distance upto 50 meter or better and 30 meter for colour view in night, Imaging: 1/3s to 1/30000s electronic shutter support, Auto Gain Control, White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking.				
	3) Compression (Minimum): Video:- H. 265 or better, Audio:- G. 711U/A, G. 711Mu, G. 726, AAC, G. 723				
	4) Wide Dynamic Range:- WDR (120dB or more)				
	5) Digital Noise Reduction:- DNR (3D) On/Off				
	6) Video Streaming & Frame Rates :- Triple streaming, configurable Main stream: 4MP (2560×1440)25/30fps Sub streams minimum: 720P@25/30 fps				
	7) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser, Edge Analytics: Tripwire, Intrusion, Motion Detection				

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	8) Cyber Security: AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, account lockout, video encryption, IP/MAC filtering, HTTPS, trusted upgrade				
	9) Onboard Storage: Camera should support built-in Micro SD/ SDHC/ SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card.				
	10) Recording Management: Format SD, overwrite, storage management, video to NAS device,				
	11) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection				
	12)Network Protocol: SFTP, IPv6, IPv4, DNS, RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast,				
	13) System Capability: ONVIF, Camera shall support open source VMS				
	14) Ethernet: 1 RJ 45 10/100 Ethernet port				
	15) Audio : It should support 1 x Built-In Mic and 1/1 Alarm In/ Out for External Mic. and Speakers as per site requirement.				
	16) Power Input: The camera should support simultaneous dual power input—12 VDC (via power adapter) and PoE (802. 3af)—to ensure continuous operation in the event of a failure in one power source.				
	17) Power Requirement: 12VDC/24 VDC/PoE (802. 3af)/ePoE				
	18) Housing/ Enclosure:- IP67 weather proof, IK10, Metallic body				
	19) Operating Condition:- Ambient Temperature:- (-)05°C to 50°C, humidity 95% (max) (non-condensing)				
	20) IR life: 40000 hours or higher				
	21) Video Bit rate: 32 KBPS - 8 MBPS or better				
	22) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS				
a)	4MP @ 25/30fps@1440P (2560 x 1440) Outdoor Bullet Camera with 2. 8/ 3. 6/6/8/12 mm fixed lens (as per site requirement)	8.00	Each	10063.00	80504.00

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90	Supplying Installation Testing and Commissioning of following Channel Network Video Recorder (NVR) with camera licenses to record for all channels having specifications and features etc as mentioned below :				
	1) Network Video Recorder Embedded/ Installed OS (Linux) along with Camera Licenses to record per NVR and to provide a live view, storage and simultaneously Multi-channel playback of all IP camera or more and must be ONVIF with minimum support of 384 Mbps incoming Bandwidth.				
	2) NVR should support video compressions : H. 265 or better, H. 264, MJPEG.				
	3) Must support 1 channel RCA Input, 2 channel RCA Output for Two-way Talk with G. 711U/A, G. 711u, PCM, G726 audio compressions.				
	4) Intelligent auto power on when power resumes after power outage.				
	5) Storage: It should support minimum 8 SATA Slots with 16TB capacity/ Slot and RAID support of RAID 0/1/5/6/10.(4 SATA (32 Channel) & 8 SATA Slat for 64 Channel)				
	6) Connectivity Interface : 2 Nos. x 10/100/1000 Mbps Ethernet Ports, 1x RS485, 1x RS232, 1x eSATA Port				
	7) Backup Interface : Its should have 4 Nosx USB port (2x USB3. 0, 2xUSB2. 0)				
	8) Video Output Ports: 2x HDMI and 2 VGA				
	9) Alarm Ports: It should have 16/8 Ch In/ Out ports to connect various type of external sensors and output devices like hooter/ Siren etc.				
	10) Email & SMS Altert options: Option for SMS/ Email Alerts to minimum 5 designated mobile number for power failure, HDD failure, vandalism, tempring, network disconnection and panic				
	11) Web & Mobile Application: Web, Mobile app (For iPhone, iPad, Android Phone) for alerts and viewing.				
	12) Protocols: HTTP, HTTPS, TCP/IP, IPv4/IPv6, UDP, DHCP, DNS, SMTP, UPnP, IP Filter, PPPoE, FTP, DDNS, Alarm Server, IP Search, Multicast, Auto Registration, ONVIF (Profile T, Profile S, Profile G), CGI,				

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	SDK and OEM Cloud for remote monitoring without any public IP need.				
	13) Standards: CE, FCC, RoHS, BIS Certified				
	14) Power Supply : Should support AC100-240V, 50/60Hz Power supply.				
	15) Operating Condition : -5°C to 50°C, humidity 90% (max) (non-condensing)				
	16) The VMS application shall support all the features & functionalities of the offered cameras.				
	17) VMS should consist Licenses for all channels to record Cameras with General, motion detection, intelligent, alarm and POS recording modes. VMS should be provided with Camera Licenses, with no dependency of VMS licenses by binding with the MAC address of the cameras to achieve the functionality.				
	18) The NVR OEM shall be responsible for providing a mobile application compatible with both Android and iOS devices, enabling remote monitoring and playback of cameras/NVR footage.				
	19) The OEM must provide its own DDNS server hosted in India, eliminating the need for a public IP address for remote monitoring over the Internet.				
	20) Must support Continuous, Alarm, Motion, Instant, Panic Recording Mode				
	21) It should support Resolution: 32MP; 24MP; 16MP; 12MP; 8MP; 5MP; 4MP; 1080p; 720p; D1; CIF; QCIF				
	22) When alarm recording is enabled and an event occurs, you can click the alarm icon on monitoring page to view the alert details. The snapshot function is supported on monitoring and playback page				
	23) The Network Video Recorder (NVR) shall be configured to send email whenever a system message is created or an alarm event occurs. The email server shall be a valid SMTP server. Each recipient email address shall be configured to receive any combination of critical, warning, or informational messages or alarm notifications. When an alarm occurs, the email message includes the NVR name, time of alarm and a list of camera that is				

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	configured to record upon alarm				
	24) It should have Web and GUI interface.				
	25) Built-In Artificial Intelligence: NVR should have built-in AI :- - 2 Channel face detection and recognition, - Minimum 4 Channel perimeter protection, - Minimum 8 Channel Smart Motion Detection				
	26) Face Recognition Database Capacity: It should support total Blacklist and Whitelist capacity of Minimum 20, 000 Faces or more with Face Detection speed of 12 face images/sec and facility to add Name, gender, birthday, address, credential type, credential No., countries & regions and state to each face image.				
	27) Face & Human Attributes Search: Search Pictures/ Video by Gender, age group, glasses, expressions, face mask, beard, Top color, top type, hat, bag, age, gender and umbrella.				
	28) ANPR Capability: It should support ANPR Camera with License plate, plate color, vehicle body, vehicle model, vehicle logo, calling, seatbelt, vehicle registration location etc vehicle attributes.				
	29) Alarm Notifications based on: Motion detection, video tampering, video loss, scene changing, PIR alarm, Camera external alarm, Face detection, face recognition, perimeter protection (intrusion and tripwire), ANPR, people counting, stereo analysis, crowd distribution, heat map, Disk Full, Storage Error, IP Conflict and abnormal behavior of fan, cybersecurity exception				
	30) Alarm Notification should be linked with Recording, snapshots, Camera external alarm output, buzzer, logs, presets and email.				
	31) General AI Based Search: Search Pictures by channel, time, event type, target classification (Fall Detection, People Approach Detection, People No. Exception Detection, People Staying Detection, Violence Detection.				
	32) Smart playback function: Should support smart search for the selected area in the video and smart playback to improve the playback efficiency				

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	33) VCA (Video Content Analytic): Should support multiple video contented analytics based on camera analytics				
	34) Analytics by NVR: Perimeter protection and face recognation				
a)	32 Channel Network Video Recorder (NVR) having display split :- Main screen: 1/4/8/9/16/25/32 (36), 2nd screen: 1/4/8/9/16	1.00	Each	64784.00	64784.00
91	Supplying, Installation, Testing and Commissioning following capacity Serveillance grade Hard Disk with upto 256MB/s Transfer Rate, 256 MB Cache, 7200 RPM Disk Speed, 3. 5 inch form factor, SATA Interface, BSMI, ICES-003/NNB-003, CE, FCC, KC, Maghreb, RCM, UKCA, VCCI, CB-Scheme, TUV, UL Certifications.				
a)	8TB (Terabytes)	1.00	Each	20119.00	20119.00
92	Supplying, Installation, Testing and Commissioning of following size LED display (LED monitor) industrial grade with 3840x2160 resolution or better, USB playback, bluetooth and miracast connectivity, 4X HDMI 2. 0, DP 1. 2, HDR 10/10+, brightness: 500-nits or better, Video wall mode should be available, contrast ratio: 1200:1, OPS slot, viewing angle (H/V): 170°/ 170°, response time less than 12ms, Display control shall be on monitor screen and programmable with remote (remote shall be supplied with system), Key Board, Optical Mouse, etc. as required.				
a)	42 inch or larger	1.00	Each	51459.00	51459.00
93	Supplying, installation, Testing and commissioning of following capacity 24 port Layer 2 indoor Network Switch having features and specifications etc. as mentioned here under:				
	At least 24 X RJ-45 Gigabit Ethernet Ports and additional 2 X 10G Base -T with 4 X SFP Ports with non-blocking architecture by having Switching capacity of min. 168Gbps and packet forwarding rate of 125Mpps or higher, 16K MAC table. Console Port, USB port, Stacking support of min. 8 units per stack. Internal dual AC Power supply, STP, RSTP, MSTP, BPDU Filter, BPDU Restriction, Min. 9K Jumbo Frame, LBD, IGMP Snooping V1/V2/V3, MLD Snopping				

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	V1/V2. IGMP /MLD Groups 1K or more, IPv4/IPv6 Loopback Interface, 16 L3 IP Interface, Ipv6 ND, VRRPv3, UDP Helper, ECMP. VLAN: 802. 1O, Port based, O-in-O, Multicast VLAN, Protocol VLAN, VLAN Trunking, DHCP Snopping, Server, server Screening. RADIUS, TACACS+ Authentication, OoS: 802. 1P, 8 queues per port, OoS : WRR, Strict+WRR, WRED, 802. 1p.				
	ACL: MAC based, IPv4C IPv6, TCP/UDP Port number, time based ACL, TFTP Client, SNMP V1, v2c, v3, SNMP traps, RMON, DHCP server, relay, client, LLDP, LLDP-MED, OAM, Dying Gasp, 802. 3ah, sflow, RIP, OSPF v2/v3, policy based route, SSL, SSH. 6 kV surge protection on all Gigabit Ethernet ports and on all GE RJ-45 access ports.				
	Certifications: UL, CE, FCC, RoHS, MTCTE, OEM/Product must be on Trusted Telecom Portal of Department of Telecommunication, Government of India etc. complete as required.				
a)	24 port PoE Layer 2 Network Switch with PoE Support of 370W or higher with each copper port supporting 802. 3at PoE+ min.	3.00	Each	125393.00	376179.00
94	Supplying and fixing of following size Wall Mount Rack having Fixed Structure with 0. 8mm CRCA Sheet, completely knocked-down condition (CKD) Shape, Vertical Mounting Rail 1. 6 mm with 'U'Marking, Minimum 2 cable entry/exit provision at Top and bottom with rubber protection, Front 5mm Toughened Glass with lock, wall mounting kit, Powder coated Color- RAL-7035, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1 number, etc. complete as required.				
a)	9U Rack	3.00	Each	8960.00	26880.00
95	Supplying Installation Testing and Commissioning of 24 port Cat6 Patch Panel loaded. Must be of 1U height with clear label holders and white label with the panel. 24 Ports Cat-6 Patch Panel should have ETL/UL verification program certificate for compliance with ANSI/TIA-568. 2-D etc.	3.00	Each	5278.00	15834.00

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	complete as required.				
96	Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) ON LINE Uninterrupted Power Supply (UPS) system suitable for Single Phase input, Single Phase output AC Supply. The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. The UPS systems shall be Microprocessor based Digital Control, using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter with PWM (Pulse Width Modulation) Technology. The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >95% at 100% non-linear loads. Current total harmonic distortion (ITHD)/ total demand distortion (TDD) on the input grid shall be < 5% at 100%load. (The required LC filters shall be included in UPS cost), extreme power factor kit to be include to limit the input pf to 0. 99 and output power factor shall be unity (i. e. kw rating of the UPS shall be kva rating x 1) however UPS shall be suitable to take load at 0. 7 laging to 0. 7 leading power factor loads. UPS shall be suitable for incoming supply AC single phase 160-270V 50 Hz and delivering output AC supply true sine wave single phase 220/230/240 Volt, 50 Hz +/- 0. 2Hz, Overload capacity of 120% for 10 mins and 150% for 1 minute.				
	Operating temperature 0 to 40 0C, Relative humidity 0-95% non condensing, noise level less than 60db at 1 meter distance, Protection for Under voltage, over voltage, abnormal output voltage, battery over charging, output over current, short circuit, battery deep discharge, 10 KV surge. Display for watt/VA, Amp and Voltage power parameters etc. UPS shall comply with low voltage				

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	electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI) type UPS (as per standard IEC 62040-1, 2 & 3) . The UPS should be with IGBT Based Inverter Technology, Communication RS232/ RS485/ SNMP port open protocol for BMS integration as per approved by Engineering in charge. Required battery racks, DC breaker of suitable rating and interconnecting copper conductor cable of suitable size and connectors and all required accessories are inclusive in the cost. The UPS should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc				
a)	2KVA	1.00	Each	45894.00	45894.00
97	Supplying, drawing, Installation, Testing and commissioning of CAT6 UTP LSZH 23AWG Twisted Pair Cable in existing conduit/ on surface, Category 6 Unshielded Twisted Pair, 4 pair should be complied as per UL/ETL verification program for compliance with ANSI/TIA-568. 2-D standard. Outer diameter should be in the range of 6. 1mm nominal with Operating Temperature Range : -5° to +60°C, Bending Radius : < 4 X Cable Diameter at -5°C ± 1°C and Pulling Force : 11. 5Kg etc. complete as required.				
(a)	1 Run of cable	1000.00	Mtrs.	60.00	60000.00
(b)	2 Run of cable	300.00	Mtrs.	96.00	28800.00
(c)	3 Run of cable	130.00	Mtrs.	131.00	17030.00
98	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.				
a)	25 mm	1000.00	Metre	168.00	168000.00
	LAN System				
99	Supplying, Installation, Testing and commissioning of CAT6 Copper Information Outlet (IO) with face plate of color as per site requirement, should have ETL/UL verification program certificate for compliance with ANSI/TIA-568. 2-D. All copper Cable and Components should be from same OEM to maintain compatibility and interoperability etc. complete as required.	40.00	Each	212.00	8480.00

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100	Supplying, Installation, Testing and commissioning of RJ45 Connector for CAT 6/6A Cables. RJ45 modular plug supports 4 twisted pairs, 8 positions, 8 connectors. Housing: PC, UL94V-2, transparent color, Use for 24- 26 AWG stranded wires etc. complete as required.	40.00	Each	9.00	360.00
101	Supplying, Installation, Testing and commissioning of following CAT6 Patch Cord should have ETL/UL verification program certificate for compliance with ANSI/TIA-568. 2-D etc. complete as required.				
a)	Copper Patch Cords of length 1m (3ft)	40.00	Each	151.00	6040.00
	(EPABX System)				
102	Supply Installation Testing and Commissioning of Digital EPABX System with 08 PNT incoming lines, 20 IP Ports, 80 Extension Analog Extension lines. Expandable Upto 256 Ports (It should have built-in participant's conference. i.e. 3 party conference. The system should have set of hybrid cards, the system shall have Auto Attended In build. The system shall support IP Users, VoIP (SIP) Trunks.System Should Have Voice mail 8 Port . EPABX system should have with flexibility of routing callers to desired extension or delivering information depend upon the selection, (Approved Makes: SYNTEL , AVAYA , ALCATEL)	1.00	Each	291986.00	291986.00
103	Supplying, Installation, Testing & Commissioning of Analog phones having standard feautres like 16 digit LCD display, 2 way speaker, caller ID and number storage facility etc. complete as required.	10.00	Each	11698.00	116980.00
104	Supplying, Installation, Testing & Commissioning of Type 1 IP Phone having 2 VoIP account, 120 x40 DOT matrix screen with backlight, Full HD duplex speaker phone, IPV6, Gigabit Etherent, PoE etc. complete as required.	10.00	Each	11698.00	116980.00
	Sub Head - 10 (Diesel Generator Set)				
105	Supplying, Installation, Testing & Commissioning of 'Silent Type Diesel Generating set as per CPCB IV + or better norms along with having Prime Power Rating of KVA as below, 415 volts at 1500 RPM, 0. 8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0. 85 Load				

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	Factor, including testing at factory and site with fuel, load for test and other necessary arrangements Complete as per CPWD specifications, should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. and consisting of the followings:				
	(A) Diesel Engine:				
	Tourbocharged Diesel engine 4 stroke water cooled, multi cylinder, dynamically balanced fly wheel, electric start of suitable BHP at 1500 RPM suitable for above output of alternator at 40 0C, 50% RH & at 1000 Meter MSL, capable of taking 10% over loading for one hour after 12 hours of continuous operation. The engine will be with Electronic governor, Dry type Air filter with service indicator, first filling of engine fuel (after commissioning) lubricating Oil, Coolant and other consumables complete with all the required accessories, the Electronic governor shall be as per ISO 8528. The engine shall comply to the latest CPCB norms (CPCB IV + or better) and Conforming to BS 5514, BS 649, IS 10000, IS 10002, IS 13018 and as per CPWD specifications.				
	(B) Engine mounted Instrument Panel fitted with and having digital dis Plate for following:				
	(i) Start-stop switch with key				
	(ii) Water temperature indication				
	(iii) Lubrication oil pressure indication				
	(iv) Lubrication oil temperature indication				
	(v) Battery charging indication and Voltage indication				
	(vi) RPM indication				
	(vii) Over speed indication				
	(viii) Low lubricantion Oil trip indication				
	(ix) Engine Running Hours indication				
	(x) Fuel Level				
	(C) Alternator: Synchronous alternator rated of appropriate KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0. 8 lagging power factor at 40 0C, 50% RH & at 1000 Meter MSL. The alternator shall be having Screen Protected Drip Proof (SPDP) enclosure IP23, brushless, continuous duty,				

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	dynamically balanced rotor, capable of taking 10% over loading for one hour after 12 hours of continuous operation, self cooled, self-excited and self-regulated through AVR conforming to IS13364 (Part 2)/IS: 4722/BS 2613 suitable for tropical conditions and with class- H insulation.				
	(D) Base Frame & Foundation: Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer.				
	(E) FUEL TANK: Daily service fuel tank of suitable liters capacity as per CPWD Specifications, fabricated out of 3 mm thick M. S. sheet complete with all standard accessories and fuel piping between fuel tank and diesel engine with MS class 'C' pipes of suitable dia. Complete with valves, level indications & accessories as required as per specifications.				
	(F) Exhaust System: Dry exhaust manifold with hospital type exhaust silencer and catalytic convertor.				
	(G) Starting System: 12V/24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete with suitable numbers of batteries (180 AH capacity lead acid SMF type) as required as per specifications. The battery shall be housed inside the acoustic enclosure of DG Set.				
	(H) Acoustic and weather proof enclosure with arrangement for fresh air intake for cooling of the engine & alternator, extraction, discharging hot air in to the atmosphere and the temperature rise inside the enclosure, noise level outside enclosure. The acoustic enclosure should be suitable for cable connection/connection through bus-trunking. Such arrangements on acoustic enclosure should be water proof & dust-proof conforming to IP-65 protection. The enclosure shall be as per CPCB IV + or better norms etc. and as per CPWD specifications.				

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	(I) AMF Panel: Free standing floor mounted IP 42 automatic mains failure control panel including auto by-pass, suitable for KVA as below for silent type DG set complete with relays, timers, set of CTs for metering & protection and energy analyser to indicate currents, phase and line voltages, frequency, power factor, KWH, Kilo Volt Ampere Reative Hour (KVARH), KVA (Phase & Total), KW & provision for overload, short circuit, restricted earth fault, under frequency, power (aluminium) and control (copper) cabling of suitable size upto 15 meter between AMF panel, LT Panel and DG Set including connection interconnection etc. as required, all complete and inter locking and communication/ Ethernet /RS485/SNMP port open protocol for BMS integration including suitable software, the panel shall be of DG Set OEM make etc. as per approved by Engineering in charge and including the following:				
	1. Suitable numbers and appropriate capacity 4 pole motorised electrically operated draw out with cradle type 3 position ACB/ MCCB with electronic release for O/C & E/F and shunt trip.				
	2. Auto/Manual/Test/Off selector switch				
	3. Protection for under and over voltage phase reversal (2 nos Over voltage relay, 2 Nos. reverse power relay and 2 Nos. under voltage relay).				
	4. 3 Sets of current transformers 15 P 10 accuracy for protection and 15 VA class-I for metering				
	5. Energy analyser unit to indicate current, Voltage (L- N & L_L), kW, kVA (Phase & Total), Frequency, KWH, PF.				
	6. LED Indicating lamps for load on mains and load on set				
	7. Fuse/ MCB for instruments				
	8. Battery charger, complete with transformer/ rectifier, D. C. voltmeter and ammeter, selector switch for trickle, off and boost and current adjustment.				
	9. Main supply failure monitor				
	10. Supply failure timer				
	11. Restoration timer				

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	12. Control unit with three impulse automatic engine start/stop and failure to start lockout.				
	13. Impulse counter with locking and reset facility.				
	14. ON/OFF/Control circuit switch with indicator				
	15. Audio/Video annunciation for (i) High water temperature				
	(ii) Low lubricating oil pressure				
	(iii) Engine over speed				
	(iv) Engine fails to start				
	(v) Full load/maximum load warning				
	16. Protection for over/under Frequency, Loss of AC sensing, Over Current, Unbalancing load with suitable number of relays and accessories				
	17. Maintenance notification based on Engine Run Hour & due date. 18. Load Management through PLC to achieve auto opening and closing of incomer breakers, bus coupler switching of essential panel, interlocking providing signal to AMF Panel for load status and AMF shall give command to DG Set to auto start / auto stop depending upon load status and requirement etc. and necessary hardware and software required to perform the operation shall be provided by the contractor including all control wiring.				
a)	62.5KVA	1.00	Each	597453.00	597453.00
	Sub Head - 11 (Uninterrupted Power Supply System)				
106	Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) at operating temperature 0 to 40 0C, Relative humidity 0 to 95%, Online double conversion true sine wave Uninterrupted hot swapable (allow for the replacement or addition of battery modules without shutting down the entire system) modular Power Supply (UPS) system with N+1 modules (N denotes total number of modules required for rated capacity). The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static				

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	Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. UPS shall have inbuilt phase sequence correction. The UPS systems offered are to be of the latest technology with Digital Control Microprocessor based for reliable operation using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter (3 Level) with PWM (Pulse Width Modulation). The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE.				
	The operating efficiency of the UPS systems shall be >96% while operating on battery mode and delivering quality power to the 100% non-linear loads. Current total harmonic effect (ITHD) on the input grid shall be < 5% at 50%load. (The required LC (inductor (L) and a capacitor (C)) filters shall be included in UPS cost), extreme power factor kit to be included to limit the input power factor (PF) to 0. 99 and output power factor shall be unity (i. e. kw rating of the UPS shall be kva rating x 1), however UPS shall be suitable to take load at 0. 7 laging to 0. 7 leading power factor loads. UPS shall be suitable for incoming supply AC : 3Phase 400V +/-20%, 50 Hz +/-5 Hz, AC Output voltage: 3Phase 415 Volt, 50 Hz +/- 0. 2Hz, Overload capacity of 120% for 10 mins, Sine wave output. Non condensing, noise level less than 60db at 1 meter distance, protections: Input Under voltage over voltage, abnormal out voltage, battery over charging, output over current, short circuit protection, battery deep discharge protection, 10KV surge. UPS must comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI)-type UPS. . Communication RS232/RS485/SNMP port open protocol for BMS integration, all hardware & software for iOT Communication as per approved by Engineering in charge. Required battery racks and interconnecting copper conductor cables of suitable size and connectors and all required accessories are				

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	inclusive of the cost).				
	This system must provide a means for logging and alarming of all monitored points plus email notification. Forced air-cooling with integral inbuilt fans with redundancy (if one fan fail UPS should be able to handle at least 80% of the load, Noise Level 65 DB at 1 meter distance. The system shall be in compliance IEC 62040- 1, 2 & 3, IS: 16242 and CPWD Specification. Display Panel (minimum) (In-build 5 inch or more LC Display / LED) to display : a) Input: Voltage, current, Frequency. b) Bypass: Voltage, Frequency. c) Output: Voltage, frequency, Current. d) Battery: Voltage, Capacity. e) Load: KVA, KW, Percentage. f) Temperature: STS, Inverter, PFC. g) Event Logging & Statistical Data (On LCD/LED): UPS should capture and display up to 3000 events like: Over temperature / DC Bus Fail / Fan Fail / Fuse Fail / Overload / Short-circuit / Device Fail / Inverter Fail / Rectifier Fail / Bypass Fail, etc. h) Statistical Data: No. of power failures / Transfers to Bypass / Total Running time, etc.				
	i) Mains Mode of Operation /Battery Mode of Operation / Bypass feeding the load / UPS Fault /Battery charging and discharging, overload, battery voltage and battery capacity. j) Audible Alarms : Mains Failure, Battery Low Alarm, UPS Overload, Fault, Shutdown, Input Over, Under Voltage, Output Over, Under Voltage, Battery Over, Under Voltage, Over Load and short circuit, Over Temperature. The UPS should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc				
a)	30KVA (Each Power module shall be < 10 KVA)	1.00	Each	505748.00	505748.00
107	Supplying and fixing FP sheet steel enclosure on surface/ recess along with 63 A 415 V "C" curve 10 kA FP MCB complete with connections, testing and commissioning etc. as required.	2.00	Nos.	3936.00	7872.00
	Sub Head - 12 (Solar Photovoltaic Power Plant)				
108	Solar Photovoltaic Power Plant Supplying Installation, Testing and Commissioning of on-grid Solar Photovoltaic Power Plant				

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	conforming to various applicable standards BIS, IEC, MNRE guidelines, the Central Electricity Authority Regulations and CPWD Specifications as amended up to date, consisting of Mono/Poly Crystalline silicon solar cells module, net metering facility, necessary control, protections, earthing, cabling, mounting structure, junction boxes, power conditioning units, Real time online web interfaced Data Monitoring System, Distribution panels, grid connecting arrangement, conduits, pipes, cable trays and other accessories etc. as required.				
	a) High Energy Efficiency Solar Photovoltaic Module of capacity 330 Wp or above, manufactured in India, conforming to IS 14286/IEC 61215, IS/IEC 61730- Part-1, IS/IEC 61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 23% at STC with temperature coefficient of Pmax better than -0. 30% per 0C. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.				
	Solar Modules shall be designed to operate in relative humidity upto 100% with temperature between -10 0C and +85 0C. Further, each PV module used in any solar power project must have Radio frequency identification tag with information such as name of manufacturer, month and year of manufacturing, country of origin (separately for Solar cell and module), I-V curve, Unique Serial No and Model No of the module, Wattage, Im, Vm and FF, name of test lab issuing IEC certificate.				
	b)Power Conditioning Unit (PCU) of 350-800 V DC Input voltage range and 415 V AC, three phase, 4 wire, 50Hz +/- 2. 5 Hz, output voltage suitable to generate AC with a variation of 10% at nominal voltage. Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 0C, Minimum IP-65 for outdoor and Minimum IP 21 for indoor, Built-in meter and data logger, MPPT, switching devices IGBT/MOSFETs and controller Microprocessor /DSP.				

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	PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown. The PCU shall be able to withstand unbalanced load conforming to IEC standard with shutdown/standby mode. It must be provided with grid islanding along with manual disconnect pole isolation switch besides automatic disconnection.				
	Minimum protections: Mains Under / Over Voltage, Over current, Over/Under grid frequency, Over temperature, Surge voltage induced at output due to external source, Short-circuit, Lightening, Anti Islanding (for grid synch. Mode) and other protections as per applicable standards. LCD/LED display of minimum parameters: DC input voltage, DC current, AC Voltage and current (all 3 phases, in case of 3 phase), Instantaneous & cumulative AC output power, Daily DC energy produced and other parameters applicable standard. Communication interface RS 485 / RS 232.				
	c) Module mounting structure: The roof top solar plant generation units shall be installed by using supporting Aluminium/Galvanized MS structure (mass of zinc coating shall be as per IS4759) having minimum head room clearance of 2. 4 meter above the terrace level / ground level. The mounting structure would be designed to sustain wind load and seismic parameter of the site of installation. All the structure shall be design as per applicable BIS code and the material shall also confirm the applicable BIS Code. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. The suitable arrangements for maintenance and cleaning shall be provided.				
	d) Real time online web interfaced Data Monitoring System complete with accessories for various parameters such as Solar Irradiance, temperature, AC Output Voltage and current, Output Power, Power factor, DC Input Voltage and Current, Time Active, Time disabled, Time Idle, Power produced and other parameters as per standard practices.				

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	e) Array junction box & Main junction box with IP 65 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required. Each junction box shall be made of GRP/FRP/Powder Coated Aluminium /cast aluminium alloy with full dust, water & vermin proof arrangement with High quality Suitable capacity Metal Oxide Varistors (MOVs) (semiconductor diode with resistant applied voltage)/ surge arrestors and suitable Reverse Blocking Diodes, isolation switches isolate the DC input to Inverter, copper bus bar etc.				
	f) Lightning, surge voltage protection, earthing protection and grid islanding.				
	g) Cables: Connections & Interconnections by required size IR/UV protected XLPE insulated copper conductor 1. 1 kV grade armored power and control cables (ISI Marked) along with supplying & fixing of necessary channel/conduit, GI cable trays, supports, lugs, thimble and other accessories etc. as required.				
	h) DC Distribution Board And AC Distribution Panel Board: IP65, free standing, metal cladded, having copper bus bar, having required protection and control gears, connection-interconnection, etc. as required.	25.00	kWp	54280.00	1357000.00
	Sub Head - 13 (Sub Station, HT Panel, LT Panels etc)				
109	Supply, installation, testing & commissioning of 11 KV compact substation outdoor type designed for natural cooling, comprising of Dry type transformer and SF-6 insulated compact switchgear enclosed in robotically sealed stainless steel tank, low-voltage switchboard, interconnection between HT switchgear to transformer using Aluminium conductor Cables and transformer to LT-switchgear using Aluminium busbars, factory built ready for connection type, internal GI earthing provided complete with other associated equipments etc. complete as required conforming to IEC 62271-202 and relevant IS specifications, as regards to design, manufacturing, type-testing, routine-testing and general operator safety precautions.				

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	The enclosure shall have modular construction using G.I. Sheet steel and shall be powder-coated from exterior. The Transformer compartment will have IP-23D ingress protection, whereas the transformer used shall be dry type specially designed as per IS tolerance. The compact substation shall primarily consist of :-				
	(a) HT SWITCHGEAR having 01 no. Fixed-Type VCB (feeding into Transformer) and 2 Nos. LBS, enclosed in common tank, made of robotically welded non-magnetic/non-ferritic Stainless Steel sheets, filled with SF6 gas acting as an excellent insulating medium, IP-67 tank design having leakage rate less than 0.1% per-annum, whereas it shall be Arc-Proof design with Internal Arc criteria of 21kA/3-sec individually.				
	The Compact Switchgear shall be a front-flushed design with integrated spring-charging handle and associated Capacitive Voltage LED Indicators for arc-proof cable box, with associated Terminal Protector boots and front-facia semaphore mechanical indication for breaker ON/OFF/EARTH.				
	The breaker will be provided with integrated self-powered /Auxillary powered 3OC+1EF relay with Low and High set for Over current and Earth Fault. Relay should have facility to display the maximum loaded phase current also. Relay shall record minimum 5 fault records with time stamping, and shall be operated via Resin cast Ring Core Protection CTs of suitable ratio and burden.				
	(b) TRANSFORMER shall comprise of 125 KVA 11/0.433 KV, 3 Phase, 50 Hz. Dyn11, Dry type , copper wound Class A insulation associate with winding temperature indicator actuated by means of Resistance Temp. Dedecture embedded in L.V. Winding indoor type transformer with approxmately 5% impedence with OFF load tap changing arrangement on HV side in steps of +/- 2.5%, + 5% to -10%. transformer must have appropriate size. cable and boxes on HV Side incoming Boots suitable for 11KV, HT XLPE Cable size 3C x 120 Sq.mm and 1 No. Neutral Bushing brought out for Neutral earhting of transformer, having cable end boxes on HV side suitable for 3x120 Sqmm.				

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	XLPE cable of 11 KV grade for connection from RMU to Transformer and on L.V. side for connection suitable for 600 Amp bus trunking complete with all accessories confirming to losses of transformer shall be as per ECBC code 2017.				
	(c) LV-PANEL shall be made up of 1.6/2mm thick CRCA sheet with 3 mm gland plates and consisting of :- - Incomer MCCB from Transformer rated for 315A, 415V, FP, 36kA with fix manual type microprocessor based OC+EF(LSIG) release, associated MFM, RYB, ON,OFF,TRIP LEDs, feeding into 400A, Aluminium busbar arrangement.				
	(d) OUTDOOR ENCLOSURE shall comprise of having construction of Galvanised Sheet Steel of thickness 2 mm The Enclosure shall have IP54 degree of protection for HT & LT switchgear compartment & IP23D degree of protection for Transformer compartment. The enclosure shall be Powder Coated. Each compartment will be provided with the door and pad locking arrangement.				
	The Compartment illumination lamp with door operated switch shall be provided for HT, LT compartment with switch operated for transformer compartment. The Enclosure design shall be a type tested design as per IEC 62271-202 for Internal arc classification to the tune of 21kA for 1 sec for both IAC AB criteria. Make of Transformer & Compact Sub-Station shall be same etc i/c required foundation.	1.00	Set	2452280.00	2452280.00
	Note:- Any other parts/items not specified above but have been considered essential for smooth and safe functioning of the RMU system shall be included in the item and are covered against the quoted rate.				
110	Supplying, Installation, Testing and commissioning of totally enclosed compartmentalised front operated Outdoor Type Non-Essential cubical type floor mounted panel board of min. nominal size 1.5 sqmtr front face area fabricated from 2mm thick CRCA sheet for mounting of following mounting/switch gear with support having 4 strip Aluminium busbar of suitable length, cable alley with gland plate of suitable size to accomodate the following switch Gears,				

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	MCCBs with Rotary handles, danger notice plate, Connections/ interconnections, earthing, numbering, painting etc. as required with multifunctional/ intelligent digital panel meter, LED pilot lamps making foundation for errection, complete as reqd. (Note all the MCCB should be Ics=100%Icu) (Not less than 300 mm depth)				
A-	**INCOMER-**				
1	160A 25kA 4P MCCB TM Release -1 No.				
2	Standard extended rotary handle for 160A MCCB - 1 No.				
3	Spreader Links (Set of 4) 4P - 2 Nos.				
4	Digital Ameter, 96 Sq.mm., Class-1, Three Phase with Selector Switch - 1 No.				
5	Digital Voltmeter, 96Sq.mm., Class-1, Three Phase with Selector Switch - 1 No.				
6	CT -200/5A , 5VA , Class -1 Tape Wound for Metering - 3 Nos.				
7	RYB Phase Indicator LED type (220V AC) - 3 Nos.				
8	On, OFF Push button - 2 Nos.				
9	6A 10kA SP MCB C-Curve - 3 Nos.				
B	**Outgoing**				
1	125A 16kA 3P MCCB TMD Release - 2 Nos.				
2	63A 16kA 3P MCCB TMD Release - 2 Nos.				
	Bus Bar				
1-	Bus Bar- Al. Bus bar 4-strip min. 250 Amp each of suitable size and provision of copper earthing strip as per CPWD specification.	1.00	Set	134636.00	134636.00
111	Supplying, Installation, Testing and commissioning of totally enclosed compartmentalised front operated Outdoor Type Essential cubical type floor mounted panel board of min. nominal size 1.0 sqmtr of face front area fabricated from 2mm thick CRCA sheet for mounting of following mounting/switch gear with support having 4 strip Aluminium busbar of suitable length, cable alley with gland plate of suitable size to accomodate the following switch Gears, MCCBs with danger notice plate, Connections/ interconnections, earthing, numbering, painting etc. as required with multifunctional/ intelligent digital panel meter, LED pilot lamps making foundation				

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	for errection, complete as reqd. (Note all the MCCB should be Ics=100%Icu) (Not less than 300 mm depth)				
A-	**INCOMER-**				
1	125 A,36KA,FPMCCB TM Release - 1 No.				
2	Digital Ameter, 96 Sq.mm., Class-1, Three Phase with Selector Switch - 1 No.				
3	Digital Voltmeter, 96Sq.mm., Class-1, Three Phase with Selector Switch - 1 No.				
4	CT -125/5A , 5VA , Class -1 Tape Wound for Metering - 3 Nos.				
5	RYB Phase Indicator LED type (220V AC) - 3 Nos.				
6	On, OFF Push button - 2 Nos.				
7	6A 10kA SP MCB C-Curve - 3 Nos.				
	Outgoing				
1	63A 16kA 3P MCCB TM Release -3 Nos.				
2	40A 10kA 3P C-Curve MCB - 3 Nos.				
	Bus Bar				
1-	Bus Bar- Al. Bus bar 4-strip min. 200 Amp each of suitable size and provision of copper earthing strip as per CPWD specification.	1.00	Set	100459.00	100459.00
112	Supplying, Installation, Testing and commissioning of totally enclosed compartmentalised front operated outdoor type feeder panel board for street light of min. nominal size 0.8 sqmtr face front area fabricated from 2mm thick CRCA sheet for mounting of following mounting/switch gear with support having 4 strip Aluminium busbar of suitable length, cable alley with gland plate of suitable size to accomodate the following switch Gears, MCCBs with danger notice plate, Connections/ interconnections, earthing, numbering, painting etc. as required with multifunctional digital panel meter, LED pilot lamps making foundation for errection, complete as reqd. (Not less than 300 mm depth)				
A-	**INCOMER-**				
1	63A 16 kA 4P MCCB TM Release - 1 No.				
2	Digital Ameter, 96 Sq.mm., Class-1, Three Phase with Selector Switch - 1 No.				
3	Digital Voltmeter, 96Sq.mm., Class-1, Three Phase with Selector Switch - 1 No.				

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4	CT -100/5A, 5VA , Class -1 Tape Wound for Metering - 3 Nos.				
5	RYB Phase Indicator LED type (220V AC) - 3 Nos.				
8	On, OFF Push button - 2 Nos.				
9	6A 10kA SP MCB C-Curve - 3 Nos.				
	Outgoing				
1	32A 10kA DP MCB C-Curve - 6 Nos.				
2	Time switch - 1 No.				
3	Power contactors - 1 No.				
	Bus Bar				
1-	Bus Bar- Al. Bus bar 4-strip min. 100 Amp each of suitable size and provision of copper earthing strip as per CPWD specification.	1.00	Set	76323.00	76323.00
	Cabling Work				
113	Supplying of one number power cable of 11 KV grade (Earthed HT Cable) Al.conductor XLPE insulated flast strip armoured & over all PVC sheathed cable conforming to IS 7098 / (PART-II) 1985 with latest amendments etc. as required.				
a)	3 x 120 sqmm	50.00	Metre	2638.00	131900.00
114	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
a)	Upto 120 sq. mm	40.00	Metre	98.00	3920.00
115	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing masonry open duct as required.				
a)	Upto 120 sq. mm	10.00	Metre	80.00	800.00
116	supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required:				
(a)	120 sq. mm	2.00	Each	15989.00	31978.00
117	Supply of 4C x 10 sqmm armoured cable, 650/1100 V grade as per IS 7098 (Part 1) 1988 rated with annealed copper conductor having XLPE insulation, steel wire armouring etc complete as required.	40.00	Metre	1698.00	67920.00

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118	Supply of following sizes of Aluminium LT cables, XLPE insulated, cores laid up, PVC outer sheathed, armoured with galvanized round steel wire or steel strip cables with stranded Aluminium conductor suitable for rated voltage of 1.1 KV grade, ISI marked conforning to IS:7098(Part-I)/1988 with latest amendements etc. as required.				
a)	2 X 10 sq. mm	500.00	Metre	248.00	124000.00
b)	3½ X 25 sq. mm	120.00	Metre	465.00	55800.00
c)	3½ X 35 sq. mm	80.00	Metre	600.00	48000.00
d)	3½ X 95 sq. mm	50.00	Metre	1381.00	69050.00
e)	3½ X 120 sq. mm	40.00	Metre	1732.00	69280.00
f)	3½ X 240 sq. mm	40.00	Metre	3256.00	130240.00
119	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
a)	Upto 35 sq. mm	530.00	Metre	47.00	24910.00
b)	Above 35 sq. mm and upto 95 sq. mm	40.00	Metre	72.00	2880.00
c)	Above 95 sq. mm and upto 185 sq. mm	30.00	Metre	97.00	2910.00
d)	Above 185 sq. mm and upto 400 sq. mm	30.00	Metre	170.00	5100.00
120	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
a)	Upto 35 sq. mm (clamped with 1mm thick saddle)	210.00	Metre	64.00	13440.00
b)	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	10.00	Metre	151.00	1510.00
c)	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	10.00	Metre	180.00	1800.00
d)	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	10.00	Metre	271.00	2710.00
121	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
a)	2 X 10 sq. mm (19mm)	4.00	Each	295.00	1180.00
b)	3½ X 25 sq. mm (28mm)	2.00	Each	371.00	742.00
c)	3½ X 35 sq. mm (32mm)	3.00	Each	437.00	1311.00
e)	3½ X 95 sq. mm (45mm)	1.00	Each	684.00	684.00
f)	3½ X 120 sq. mm (45mm)	1.00	Each	710.00	710.00
g)	3½ X 240 sq. mm (62mm)	1.00	Each	1160.00	1160.00

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122	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc. direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.				
a)	63 mm dia (OD-63 mm & ID-51 mm nominal)	790.00	Metre	289.00	228310.00
b)	90 mm dia (OD-90 mm & ID-76 mm nominal)	40.00	Metre	336.00	13440.00
	Sub Head - 14 (RO System & Water Cooler)				
123	Supply, installation, testing, and commissioning of a packaged-type RO water purification system housed in a compact, robust Mild Steel (MS) powder-coated frame, providing an average product flow capacity of 50 LPH. The system shall handle inlet water TDS levels up to 1500 ppm, achieving minimum 90% salt rejection and 30% pure water recovery. The complete assembly must include 1 No. sand filter, 1 No. sediment filter, 1 No. activated carbon filter, an electronic metering system, 1 No. pH dosing system with tank, pressure gauges, auto cut-off facility, auto membrane flushing, a dry-run protection pump, and an online treated water quality monitor. The unit shall operate on an input supply of 230V ± 10% AC (24V DC internal operating voltage) including all internal piping, plumbing, electrical connections, testing, and commissioning complete as per the instructions of the Engineer-in-Charge.	2.00	Each	40627.00	81254.00
124	Supply, installation, testing and commissioning of fully stainless steel Storage Type water cooler Storage capacity 120 Ltrs, cooling capacity 60 LPH i/c Hermetic type with suction cooled motor equipped rotary compressor with over load protector suitable for R-134A refrigerant with propeller type quiet condenser fan with automatic control temperature thermostat suitable for operation on 230 Volts ± 10%, 50 Hz, Single phase A.C. Supply i/c providing suitable connection wire etc complete as required.	2.00	Each	58843.00	117686.00
	Sub Head - 15 (Boom Barrier)				

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125	Supply, installation, testing, and commissioning of an intensive-duty Automatic Motorized Electro-Mechanical Boom Barrier featuring a 6.0-meter extruded aluminum profile arm with high-visibility reflective strips, designed for an optimized 3.0 to 4.0-second opening/closing cycle. The system must operate on a 240V, single-phase, 50Hz AC power supply and be housed in a weather-proof enclosure providing a minimum protection rating of IP54. The unit must feature a robust electro-mechanical drive for high duty cycles, an integrated control board supporting electronic anti-crush safety logic, an automatic close timer, obstacle detection interfaces, and a dedicated key-operated manual override mechanism for power failures, inclusive of all foundational anchoring, internal control wiring, and calibration required to make the barrier fully operational etc complete as required.	1.00	Each	140884.00	140884.00
126	Supplying, installation, testing and commissioning of romote control system complete as required.	1.00	Each	7860.00	7860.00
	Sub Head - 16 (LED Signage)				
127	Supplying & Fixing of Autoglow self maintain photo luminescent SWGS Signages in 2mm thick Aluminum sheet ARS 10000 with strong self adhesive, life: 10-15 years weather proof, self extinguishing. The sign not contain any radioactive substances in toxic terms the product is considered as safe, Non peel able, non scratch able, on breakable, silk screen printed high quality paint with UV resistance, as per PSPA class - A/DIN 67510 part with high photo luminescent luminous intensity. The color should be RED/GREEN/ BLUE/YELLOW with graphics symbol in white confirm as per the IS 9457-2005, IS 12349 etc complete as required.				
(a)	Electrical Shaft (150x400mm)	2.00	Nos.	1354.00	2708.00
(b)	Lift Signage (200x200mm)	2.00	Nos.	903.00	1806.00
(c)	Fire Extinguishers (100x300mm)	10.00	Nos.	677.00	6770.00
(d)	Hydrant (150x400mm)	2.00	Nos.	1354.00	2708.00
(e)	Indoor exit down stairs (100x300mm)	2.00	Nos.	677.00	1354.00
	Total Rs.				**14485565.00**

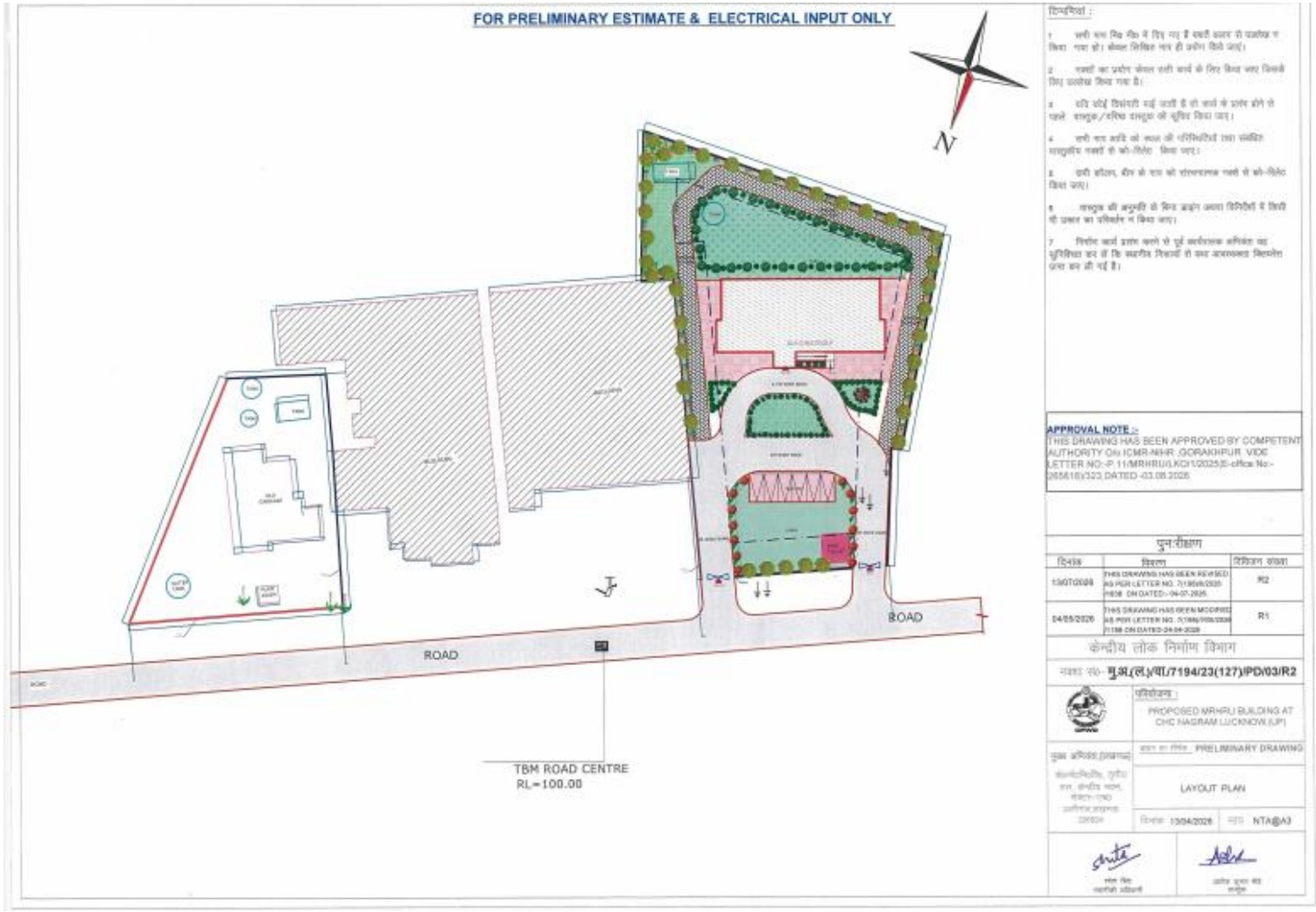
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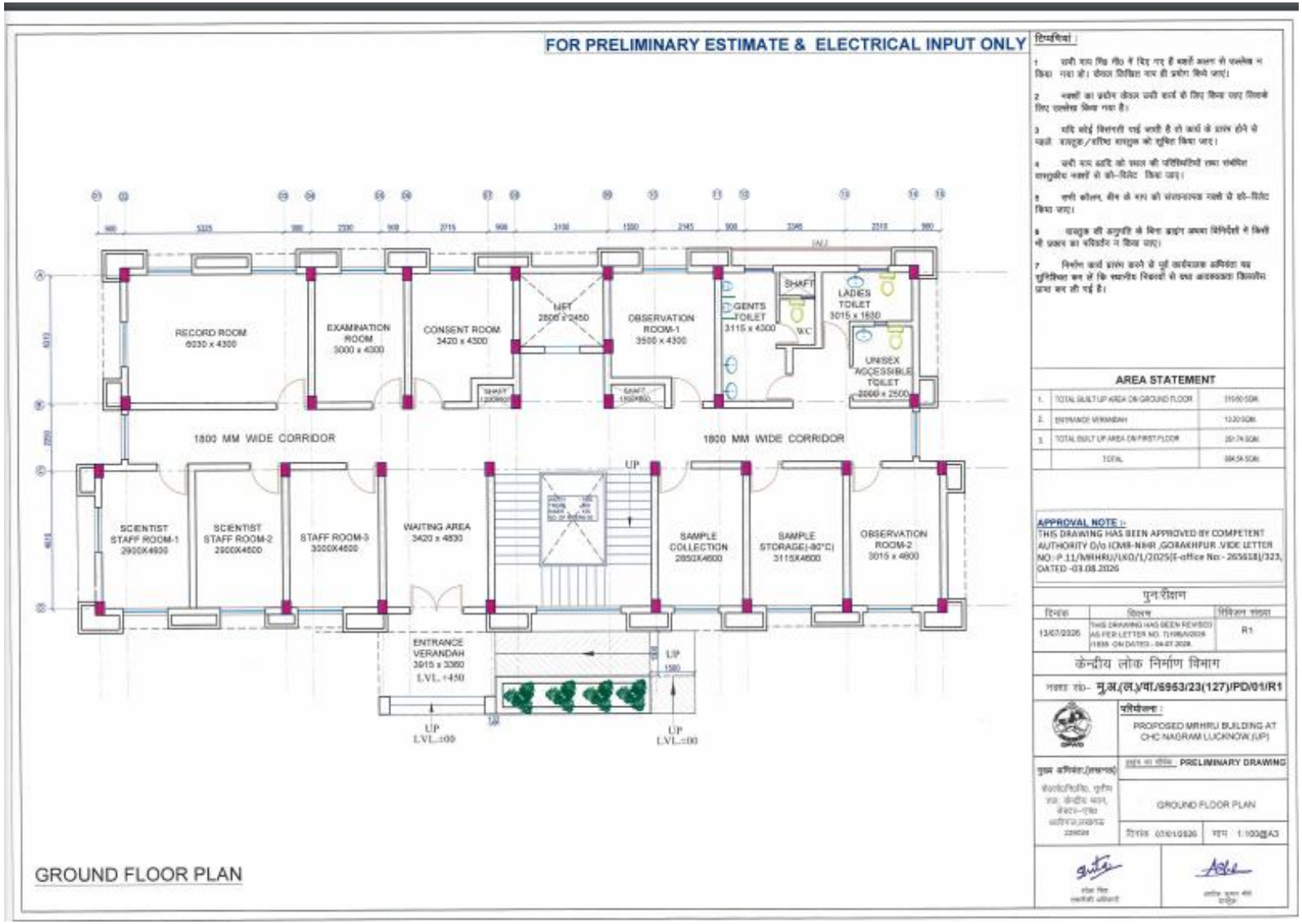
PART-D

(Basic drawings for reference.)

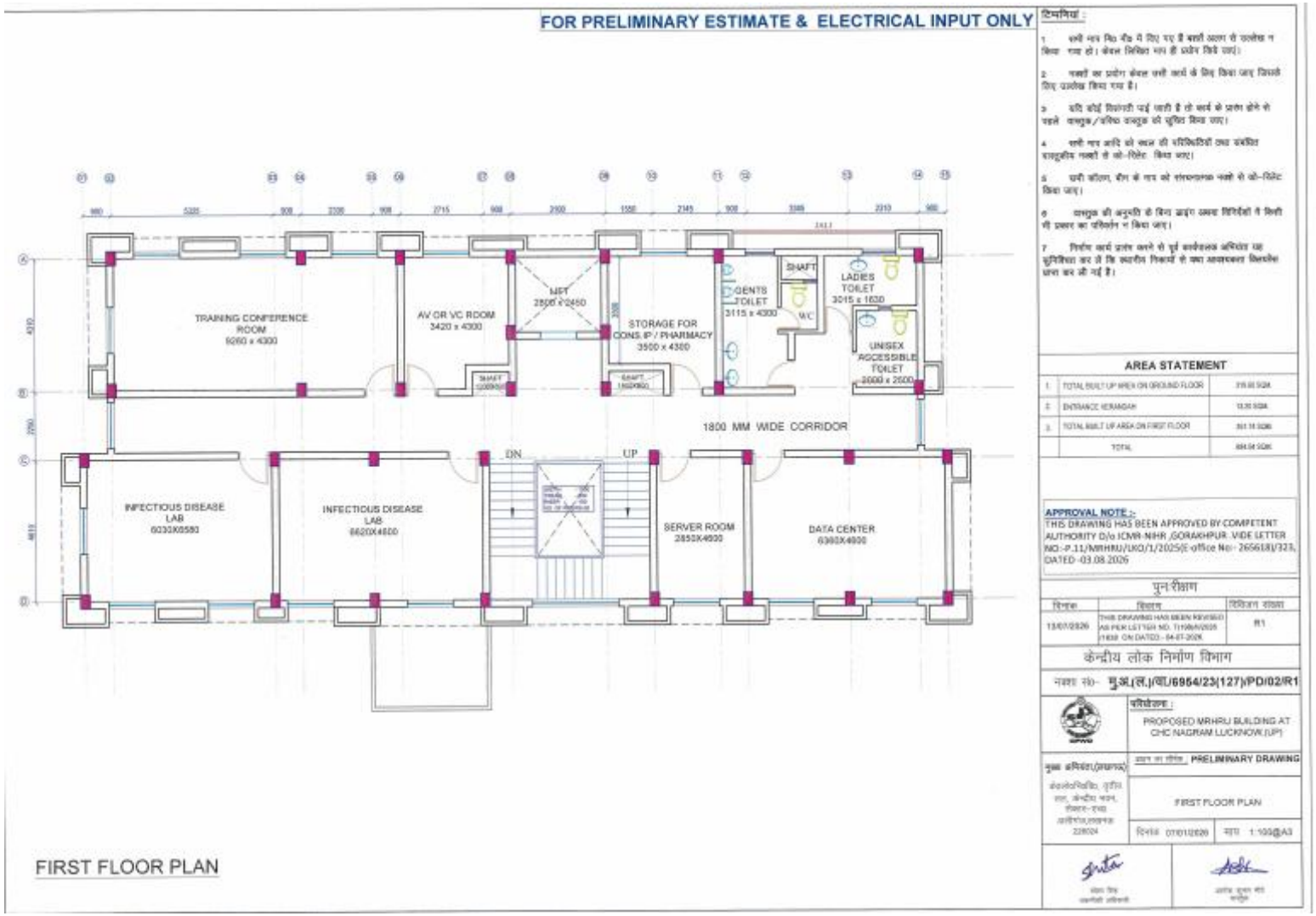
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FOR PRELIMINARY ESTIMATE & ELECTRICAL INPUT ONLY
N
ROAD
ROAD
TBM ROAD CENTRE
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APPROVAL NOTE :-
THIS DRAWING HAS BEEN APPROVED BY COMPETENT AUTHORITY O/o ICMR-NIHR ,GORAKHPUR VIDE LETTER NO:-P.11/MRHRU/LKO/1/2025/E-office No:-265616/323 DATED -03.09.2025
पुनरीक्षण
दिनांक
विवरण
विशिष्ट संख्या
13/07/2026
R2
04/05/2026
R1
केन्द्रीय लोक निर्माण विभाग
PROPOSED MRHRU BUILDING AT CHC NAGRAM LUCKNOW (UP)
PRELIMINARY DRAWING
LAYOUT PLAN
NTA@A3

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FOR PRELIMINARY ESTIMATE & ELECTRICAL INPUT ONLY
RECORD ROOM 6230 x 4300
EXAMINATION ROOM 3000 x 4300
CONSENT ROOM 3420 x 4300
LIFT 2500 x 2450
OBSERVATION ROOM-1 3500 x 4300
GENTS TOILET 3115 x 4300
SHAFT
W.C
LADIES TOILET 3015 x 1630
UNISEX ACCESSIBLE TOILET 3000 x 2500
1800 MM WIDE CORRIDOR
1800 MM WIDE CORRIDOR
SCIENTIST STAFF ROOM-1 2900X4600
SCIENTIST STAFF ROOM-2 2900X4600
STAFF ROOM-3 3000X4600
WAITING AREA 3420 x 4600
UP
SAMPLE COLLECTION 2850X4600
SAMPLE STORAGE(-80°C) 3115X4600
OBSERVATION ROOM-2 3015 x 4600
ENTRANCE VERANDAH 3915 x 3360 LVL.+450
UP LVL.±00
UP LVL.±00
GROUND FLOOR PLAN
टिप्पणियां :
AREA STATEMENT
1. TOTAL BUILT UP AREA ON GROUND FLOOR 1100 SQM.
2. ENTRANCE VERANDAH 123.0 SQM.
3. TOTAL BUILT UP AREA ON FIRST FLOOR 257.74 SQM.
TOTAL 980.74 SQM.
APPROVAL NOTE :-
THIS DRAWING HAS BEEN APPROVED BY COMPETENT AUTHORITY O/o ICMR-NIHR ,GORAKHPUR VIDE LETTER NO:-P.11/NIHRHRU/UKO/1/2025(E-office No:- 2656618/323, DATED -03.08.2026
पुनरीक्षण
दिनांक 13/07/2026 विवरण THIS DRAWING HAS BEEN REVISED AS PER LETTER NO. TI/NIHR/0836 ON DATED - 04.07.2026 रिविजन संख्या R1
केन्द्रीय लोक निर्माण विभाग
नक्शा संख्या- मु.अ.(ल.)/पी./6953/23(127)/PD/01/R1
परियोजना :
PROPOSED MRHRU BUILDING AT CHC NAGRAM LUCKNOW (UP)
PRELIMINARY DRAWING
GROUND FLOOR PLAN
दिनांक 07/01/2026 स्केल 1:100@A3

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FOR PRELIMINARY ESTIMATE & ELECTRICAL INPUT ONLY
TRAINING CONFERENCE ROOM 6260 x 4300
AV OR VC ROOM 3420 x 4300
LIFT 2800 x 2450
STORAGE FOR CONS.IP / PHARMACY 3500 x 4300
GENTS TOILET 3115 x 4300
SHAFT
W.C
LADIES TOILET 3015 x 1620
UNISEX ACCESSIBLE TOILET 2000 x 2500
1800 MM WIDE CORRIDOR
DN
UP
INFECTIOUS DISEASE LAB 6033X6580
INFECTIOUS DISEASE LAB 6620X4600
SERVER ROOM 2853X4600
DATA CENTER 6360X4600
FIRST FLOOR PLAN
टिप्पणियां :
AREA STATEMENT
APPROVAL NOTE :-
THIS DRAWING HAS BEEN APPROVED BY COMPETENT AUTHORITY D/o ICMR-NIHR ,GORAKHPUR. VIDE LETTER NO:-P.11/MRHRU/UKO/1/2025/E-office No:- 2656181/323, DATED -03.08.2026
पुनरीक्षण
केन्द्रीय लोक निर्माण विभाग
PROPOSED MRHRU BUILDING AT CHC NAGRAM LUCKNOW.(UP)
PRELIMINARY DRAWING
FIRST FLOOR PLAN

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