GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT
EXECUTIVE ENGINEER & SENIOR MANAGER (E)
IIT ROORKEE PROJECT ELECTRICAL DIVISION

(E-mail: hrwee-rped@cpwd.gov.in)

NOTICE INVITING TENDER

Name of Work	**:**	Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**
NIT No.	**:**	**03/EE&SM(E)/IITRPED/2026-27**
Estimated Cost	**:**	**Rs. 53,06,138.00/-**
Earnest Money	**:**	**Rs. 1,06,200.00/-**
Performance Guarantee	**:**	(a) 5% of 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 tendered amount.
Security Deposit	**:**	**2.5% of tendered value**
Completion Period	**:**	**60 days**

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Name of work: Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

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Executive Engineer & Senior Manager (E),
IIT Roorkee Project Electrical Division,
CPWD, Roorkee

APPROVAL

Name of Work: - Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

NIT No.: - **03/EE&SM(E)/IITRPED/2026-27**

Notice Inviting Tender (NIT) amounting to Rs 53,06,138.00 /- (Rupees Fifty Three Lakh Six Thousand One Hundred Thirty Eight Only) from page number 01 to 61 is approved.

Executive Engineer & Senior Manager (E),
IIT Roorkee Project Electrical Division,
CPWD, Roorkee

PART-A

INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR e-TENDERING FORMING PART OF BID DOCUMENT

The Executive Engineer & Senior Manager (E), IIT Roorkee Project Electrical Division. CPWD, Roorkee, (Telephone No. 01332-271640 & Email id: hrwee-rped@cpwd.gov.in) on behalf of the President of India invites online Percentage rate bids from approved and eligible contractors of appropriate class of the **Building and Roads** category in single bid system for the following work**:**

Sl. No.	NIT No.	Name of work & location	Estimated cost put to bid	Earnest Money	Stipulated Period of Completion of work	Last date & time of online submission of bid, copy of receipt of deposition of original EMD and other documents as specified in NIT	Date of time of opening of bid
1	2	3	4	5	6	7	8
1.	03/EE&SM(E)/IITRPED/2026-27	Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**	**Rs. 53,06,138.00/-**	**Rs. 1,06,200.00/-**	**60 days**	**25/11/2026 Up to 3:00 PM**	**25/11/2026 Up to 3:30 PM**

1. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should submit his bid only 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 & 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.**

4. Mode of Deposit Earnest Money

1. The Earnest Money is accepted only in the following forms:
(i) Banker's Cheque of a Commercial Bank
(ii) Account Payee Demand Draft of a Commercial Bank
(iii) Fixed Deposit Receipt (FDR) of a Commercial Bank
(iv) Insurance Surety Bonds
(v) Bank Guarantee including e- Bank Guarantee (for balance amount as prescribed) from a Commercial Bank.

2. A part of earnest money is acceptable in the form of Bank Guarantee including e- Bank Guarantee also. In such cases 50% of earnest money or Rs. 20 lakh whichever is less, will have to be deposited in shape prescribed above and balance can be accepted in form of Bank Guarantee issued by a Commercial Bank.

5. 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 (for balance amount as prescribed) from any of the Commercial Bank towards EMD in favour of **Executive Engineer (E), DCED, CPWD, Dehradun**, receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE), CPWD and other documents as specified.
6. 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

7. 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 ofhttps://etender.cpwd.gov.in.
8. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
9. Contractor can upload documents in the form of JPG format and PDF format.
10. Contractor must ensure to quote rate in the prescribed column(s) meant for quoting rate in figures that 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).
If a tenderer does not quote any percentage above/below on the total amount of the sub head (Civil & Electrical component) in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
11. Contractor should quote the percentage above or below upto two places of decimal.

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

a. Insurance Surety Bond/ Demand Draft/ Account Payee Banker's Cheque / FDR/ Bank Guarantee of any commercial Bank against EMD (A part of earnest money is acceptable in the form of Bank Guarantee including e- Bank Guarantee also. In such cases 50% of earnest money or Rs. 20 lakh whichever is less, will have to be deposited in shape prescribed above and balance can be accepted in form of Bank Guarantee issued by a Commercial Bank).

b. Copy of receipt for deposition of original EMD.

c. Enlistment Order of the Contractor.

d. Copy of Certificate against successful completion of ERP training.

e. Copy of PAN (Permanent Account Number).

f. Address with Phone No. and email-ID of bidder.

g. Electrical license from competent authority in the name of Contractor or undertaking that **"I, hereby confirm that I will either obtain valid electrical license at the time of execution of electrical work or associate CPWD registered contractor having valid electrical license of eligible class."**

h. Undertaking for declaration for execution of non-defective work (Form 'F')

i. 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".

List of Documents to be submitted after acceptance of Bid.

Licenses/ Registrations or Proof of applying for Labour Licenses, registration with EPFO, ESIC & BOCW Welfare Board.

CPWD-6 FOR e-TENDERING

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT
NOTICE INVITING TENDER

1. Percentage rate bids are re-invited on behalf of the President of India from approved and eligible Building and Roads category contractors of CPWD in Single bid system for the following work:

   Name of Work: Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

   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 total cost Rs. 53,06,138.00/-
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.

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 **60 days** 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.~~

(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 program 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 www.tenderwizard.com/CPWD 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 or withdraw it before last date and time of submission of bid as notified. No post-tender modification is allowed by the tenderers except through negotiations, if required in case any tenderer does so, the tender will rejected and the tenderer will be debarred for future tendering in CPWD for two years by the concerned enlisting authority (in case of CPWD enlisted contractor) and by the concerned CE/SE (in case of non-enlisted contractor).

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. **Earnest Money Deposit**

Earnest Money of **Rs. 1,06,200.00/-**in the form of Demand Draft or Pay order or Banker's Cheque or Fixed Deposit Receipt (drawn in favor of **Executive Engineer (E), DCED, CPWD, Dehradun** shall be scanned and uploaded to 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 lacs, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any scheduled bank having validity for six months or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders. Copy of Enlistment Order and certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in press notice shall have to be submitted by the lowest bidder only along with physical EMD of the scanned copy of EMD uploaded 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.

8 A. The contractors registered prior to 01.04.2015 on e-tendering portal of CPWD shall have to deposit tender processing fee at existing rates, or they have option to switch over to the new registration system without tender processing fee any time. The bid submitted shall be opened at 03:30 PM.

The bid submitted shall be opened at 15.30 hours on **25/11/2026**

9. The bid submitted shall become invalid and e-Tender processing fee (if applicable) shall not be refunded if:

a. The bidder is found ineligible.

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

c. 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.

d. If a tenderer does not quote any percentage above/below on the total amount of the sub head (Electrical component) in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

10. (a) The contractor whose bid is finally accepted will be required to furnish performance guarantee of (i)5% of tendered value or Estimated Cost Put to Tender (ECPT) (whichever is higher). (ii) 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 (i) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount. 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 format as given in General Conditions of Contracts 2023 for Construction work i/c amendments upto date. 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.

(b) 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. Within 30 days after award of work and also ensure the compliance of aforesaid provisions by the sub contractors if any engaged. The agency shall submit the affidavit on a stamp paper of Rs. 100 that the employee are where engaged fully and exclusively on the work and for which the claim is being made for reimbursement of ESI and EPF contribution paid by the contractor.

11. The description of the work is as follows:

Sl. No	Location of site	Location	Details of work
1	**Western Academic Block - A & B**	**IIT Roorkee, Roorkee, Uttarakhand**	Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

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 bidder 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.

12. The competent authority 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 assignment any reason. All bids in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

13. 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 to rejection.

14. The competent authority 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.

15. 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 as 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 Urban Development. 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 works shall remain open for acceptance for a period of **30 (thirty) days** from the date of opening of bids. If last date of opening of bids is extended, then such extended date shall become the last date of opening of the bid. Further,

(i) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department within **7 days after last date and time (24 hours basis)** 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 the facts whether the letter of acceptance for the work is issued or not.

(ii) If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department after expiry of **7 days after last date and time (24 hours basis)** 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 the facts whether the 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.

(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 rebidding 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 special conditions, particular 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 – GCC 2023 for Construction work. (amended up to date)

19 The bid document will include following three components:
Part A:- CPWD-6, CPWD-7 including Standard General Conditions of Contract 2023 for Construction works as amended/ modified upto the previous day of submission of tender.
Part B:- Schedule A to F for major component of the work, General / specific conditions, specifications applicable to major component of the work.
Part C:- Schedule of Quantities for E&M Work for percentage rate Tender.

20. The contractor shall have to associate other agency for execution of each of the works, which fulfils the eligibility criteria as defined below after taking prior approval. The contractor and the associated specialized agencies shall give required affidavit to confirm their association. Tender accepting authority may approve change of associate agency in case he is not satisfied with the performance or it is required during the currency of contract. However the contractor shall also be eligible to carry out himself if he fulfill the eligibility criteria of any or all of these works without associating any specialized agency provided -

a) He fulfills 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.

Eligibility Criteria

SI. No.	Item of work(s)	Eligibility Criteria of Associated Agencies
i)	EI Works	a) Certificate of registration of CPWD in appropriate class of composite category. Electrical contractor license **OR** undertaking that they will either obtain valid electrical license at the time of execution of electrical work **OR** associate contractor having valid electrical license of appropriate class.

ii)	VRV/VRF System (31.26 Lakh)	Experience of having successfully completed works during last seven years ending 7 years ending last day of the month previous to the one in which tenders are invited. Three similar completed works each of value not less than Rs. 12.50 Lakhs. i.e. 4**0%** of cost of this component. or Two similar completed works each of value not less than Rs. 18.76 Lakhs i.e. **60%** of cost of this component. or One similar completed work of value not less than Rs. 25.01 Lakhs i.e. **80%** of cost of this component. Similar work shall mean "**SITC of VRV/VRF System.**" Note :- **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 day of submission of tenders.**
iii)	DG Set (21.80 Lakh)	Experience of having successfully completed works during last seven years ending 7 years ending last day of the month previous to the one in which tenders are invited. Three similar completed works each of value not less than Rs. 8.72 Lakhs ie. **40%** of cost of this component with capacity of individual being 80% individual capacity of DG Set.. or Two similar completed works each of value not less than Rs. 13.08 Lakhs i.e. **60%** of cost of this component with capacity of individual being 80% individual capacity of DG Set.. .or One similar completed work of value not less than Rs. 17.44 Lakhs i.e. **80%** of cost of this component with capacity of individual being 80% individual capacity of DG Set.. Similar work shall mean "**SITC of DG Set**." Note :- **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 day of submission of tenders.**

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 associated agency 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)"

20.1.1. After acceptance of the bid by competent authority, the EE in charge of the work shall issue letter of award 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 and has also to sign two copies of agreement.

20.1.2. The main contractor has to associate with 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 (**within 07 days after award of work**). Name of the agency(s) to be associated shall be approved by Engineer-in-charge of relevant component(s).

20.1.3. In case the main contractor intends to change any of the associate agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge.

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.

20.1.4. The main contractor has to enter into MoU with agency(s) associated by him. Copy of such MoU shall be submitted to EE in charge of each relevant 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. 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 (Telephone No. 01332-271640 & Email id: hrwee-rped@cpwd.gov.in) or ERP help line No. 18001803286 or e-mail id 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.

Executive Engineer & Senior Manager (E),
IIT Roorkee Project Electrical Division,
CPWD, Roorkee

CPWD-7

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT

STATE	UTTARAKHAND	DIVISION	EE&SM (E), IITRPED
BRANCH	B & R	ZONE	SEcumPD, IITPR
		REGION	ADG, Chandigarh

Percentage Rate Composite Tender & Contract for Works

Tender for the work of Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

(i) To be uploaded/submitted by tenderers upto 15.00 hours on **25/11/2026**
(ii) On CPWD website.
(iii) To be opened in presence of bidders or their authorized representative who may be present at 15:30 hours on 25/11/2026 in the office of The Executive Engineer & Senior Manager (E), IIT Roorkee Project Electrical Division. CPWD, Roorkee

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 condition of contract and all other contents in the tender document for the work.

I/We hereby tender for the execution of the work specified for the President of India within the time specified in Schedule "F", viz., schedule of quantities and in accordance with the specifications, designs, drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respects in accordance with, such condition so far as applicable.

I/We agree to keep the tender open for **30 (thirty) days** from the date of opening of 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 the 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 banks, is scanned and uploaded. If I/We, fail to furnish the prescribed performance guarantee of tender form 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 his 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 work referred to in the tender document upon the term and condition 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-tendering process 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 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

Postal Address_____*_____

Witness: **_____ _____*_____

Address: **_____

Occupation: **_____ Telephone No._____*_____

Fax _____*_____

E-Mail_____*_____

(*) To be filled in by the Contractor (**)
To be filled in by the Witness.

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 Rs. * _ _ _ _ _ _ _ (Rupees *_ _ _ _ _ _ _

PROFORMA OF SCHEDULES FOR E&M WORKS

SCHEDULE 'A'			
Schedule of Quantities		**E&M**	Attached
SCHEDULE B			
Schedule of materials to be issued to the contractor:			**NIL**
SCHEDULE C			
Tools and plants to be hired to the contractor:			**NIL**
SCHEDULE 'D'			
Extra schedule for specific requirements/documents for the work, if any:			**NIL**
SCHEDULE 'E'			
Reference to General Conditions of contract: -		General Conditions of Contract (GCC)- Construction Work - 2023 (with correction slips issued up to a day previous to last date of submission of bid)	
Name of Work:		**Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. (SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**	
Estimated cost of work:		**Rs. 53,06,138.00/-**	
(i)	Earnest money:	**Rs. 1,06,200/-** (to be returned after receiving performance guarantee)	
(ii)	Performance Guarantee:	(a)5% of 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 tendered amount.	
(iii)	Security Deposit:	2.5% of tendered value	
SCHEDULE 'F'			
General Rules & Directions:			
Officer inviting tender:		Executive Engineer & Senior Manager (E), IIT Roorkee Project Electrical Division, Roorkee, Uttarakhand	
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2, 12.4 & 12.5		See below under clause 12.2(A), 12.2(B), 12.2(C)	
Definitions:			
2 (vi)	Engineer-in-Charge	Executive Engineer & Senior Manager (E), IIT Roorkee Project Electrical Division, Roorkee, Uttarakhand or his successor thereof	

2 (viii)	Accepting Authority	SE cum PD, IIT Project Roorkee or his successor thereof
2 (x)	Percentage on cost of materials and labour to cover all overheads and profits.	15%
2 (xi)	Standard Schedule of Rates	a. Following Schedule of Rates (as amended/modified upto the previous day to last date of submission of bid): • DSR 2025 for E&M Works b. Applicable Minimum Wages Rate w.e.f. October 2026.
2 (xii)	Department	Central Public Works Department
9 (ii)	Standard CPWD contract form	General Conditions of Contract (GCC)-Maintenance Work - 2023 (as amended/modified upto the previous day to last date of submission of bid)
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, in days.		7 days
Maximum allowable extension with late fee @ 0.1% per day of performance guarantee amount beyond the period as provided in (i) above.		3 days
Clause 2		
Authority for fixing compensation under clause 2.		SE cum PD, IIT Project Roorkee or his successor thereof
Clause 5		
Number of days from the date of issue of letter of acceptance for reckoning date of start:		10 days
Clause 6		
Computerised Measurement Book (CMB) / Electronic Measurement Book (EMB)		As Applicable
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		15 Lakh
Clause 7A		
Whether Clause 7A shall be applicable		Running account bill shall be paid only for the work until the applicable GST registration, labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-charge

Clause 7B	
Whether Clause 7B shall be applicable	Yes
Clause 8	
Competent Authorities to inspect and issue completion certificate	Executive Engineer & Senior Manager (E), IIT Roorkee Project Electrical Division, Roorkee, Uttarakhand or his successor thereof
Clause 10A	Yes
List of testing equipment to be provided by the contractor at site lab.	As per requirement of site and direction of Engineer-in-charge.
Clause 10C	Not Applicable
Clause 10CC	Not Applicable
Clause 11	Specifications to be followed for execution of work
	CPWD General Specifications for Electrical Works: 1. Part-I Internal - 2023 2. Part-II External – 2023 3. CPWD General Specifications for Heating, Ventilation & Air-Conditioning (HVAC) - 2024, as amended upto date. 4. CPWD General Specifications for Part VII D.G. Sets, as amended upto date.
Clause 12	Engineer-in-Charge shall have proper check on the amount of work under execution. Prior approval from competent authority is required when completion cost of work is likely to go beyond 1.25 times of contract amount. Competent authority is ADG/SDG in case of construction contract. It may be ensured by the Engineer-in-charge that completion cost shall not exceed 1.5 times of contract amount. In case, completion cost is expected to exceed beyond 1.5 times of contract amount and additional work is required to complete the defined scope of work, Engineer-in-Charge may take up such additional work separately.
Type of work	Construction work
Clause 12.2 (A), 12.2(B)	As per GCC Construction 2023 amendment upto date
Clause 12.2 (C)	
Deviation Limit beyond which clauses 12.2 (C) shall apply for building work.	100%
Deviation Limit beyond which clauses 12.2 (C) shall apply for foundation work (except items mentioned in earth work subhead in DSR and related items)	100%

Deviation Limit for items mentioned in earth work subhead of DSR and related items	100%
Clause 12.4	As per GCC Construction 2023 amendment upto date
Clause 12.5	As per GCC Construction 2023 amendment upto date
Clause 14	Applicable
Clause 16	
Competent Authority for deciding reduced rates.	SE cum PD IIT Project Roorkee or his success thereof.
Clause 17	
Contractor liable for damages, defects during defect liability period	Defect liability period shall be 1 (one) year to be reckoned after the actual date of completion of the work or as per warranted/guarantee for a particular component given by OEM whichever is more.
Clause 18	
List of mandatory machinery, tools & plants to be deployed by the contractor at site	1. Earth Tester 2. Megger 500 V 3. Line Tester 4. Test Lamp 5. Die & Vice 6. Chase Cutting Machine 7. Crimping Tools 8. Tong Tester and /or as per requirement at site / as per the contract provisions and as per direction of Engineer-in-charge.
Clause 19C	
Authority to decide penalty for each default	Engineer-in-Charge
Clause 19D	
Authority to decide penalty for each default	Engineer-in-Charge
Clause 19G	
Authority to decide penalty for each default	Engineer-in-Charge
Clause 19K	
Authority to decide penalty for each default	Engineer-in-Charge
Clause 19L	
Authority to decide penalty for each default	Engineer-in-Charge
Clause 25	
(i) Conciliator	ADG, Chandigarh or his successor thereof.
(ii) Arbitrator Appointing Authority	SE cum PD IIT Project Roorkee or his successor thereof.
(iii) Place of Arbitration	To be decided by the Arbitral Tribunal in consultation with both the parties, failing any such agreement, then the Arbitral Tribunal shall decide the Venue

Clause 32

Requirement of Technical Representative(s) & recovery Rate:

Sl. No.	Minimum Qualification of Technical Representative	Designation (Principal Technical / Technical Representative	Minimum Experience	Number	Rate at which recovery shall be Made from the Contractor in the event to not fulfilling	
					Figures	**Words**
1	Graduate Engineer or Diploma Engineer	Project Planning / Quality / Billing Engineer	2 years or 5 years respectively	1	Rs. 15,000/-	Fifteen Thousand per month per person.

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

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.

Executive Engineer & Senior Manager (E)
IIT Roorkee Project Electrical Division,
CPWD, Roorkee, Uttarakhand

(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).....(hereinafter 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 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.
   Bank Seal

2. Signature……..
   Name and address

*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.

PROFORMA FOR THE RECEIPT TO BE ISSUED BY THE EE RECEIVING THE EMD

Receipt of deposition of original

EMD (Receipt No. ……./ date.....**)**

Name of work :- Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

NIT No. 03/EE&SM(E)/IITRPED/2026-27

Estimated Cost: Rs. 53,06,138.00/-

Amount of Earnest Money Deposit: Rs. 1,06,200.00/-

Last date of submission of bid – 25/11/2026

Name of contractor..... *

Form of EMD..... *

Amount of Earnest Money Deposit..... *

Date of Submission of EMD..... *

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

(*To be filled by EMD receiving officer)

PART B

(E&M Works)

CONDITIONS FOR ENGAGEMENT OF ASSOCIATED AGENCIES FOR E&M WORKS

1. The applicant should either himself meet the eligibility conditions for the respective E&M components or otherwise he will have to associate with agencies, fulfilling the eligibility requirements and hence consent letter from at least One eligible Associate Agency of the respective components of E&M work shall also be submitted as per attached **Proforma as per Form "G".**

   In case the main contractor is himself eligible (as per eligibility criteria) for executing any specific E&M component and intends doing the job himself, he may not be required to associate with another agency for that E&M component of work. In such cases the main contractor also has to submit the documents as per eligibility criteria mentioned for associated agency of individual E&M component.

   However, the Composite category contractor shall also be eligible to carry out himself any or all of these works without associating any specialized agency provided:

(a) He fulfills 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/specialized agency, all as per the eligibility criteria mentioned in NIT.

2. The main tenderer have to submit the following documents for association of contractor within 07 days of award of work otherwise a penalty of Rs. 5000.00 per day for each specialized work will be imposed.

(i) In support of the eligibility conditions of the proposed Associated Contractor, copy of their registration documents, Electrical License, GST Documents duly attested by the applicants (Main Contractor) shall be submitted to the **Executive Engineer & Senior Manager (E)**, **IITRPED, CPWD, Roorkee** for deciding the eligibility. Each such Associated Contractor will certify that they are not debarred as on the day of application for sale of tender. Each such associate agency submit his willingness in willingness certificate in **Form- "H".** Proposal for associating agency for E&M components of work shall be submitted in Form- "G" of this tender document from each associate independently for all electrical and mechanical components.

(ii) The main contractor will submit Affidavit of MOU signed with eligible associated contractor. The Affidavit of MOU in the enclosed Form "I" shall be signed by both contractors, Main contractor as 1st party and associated contractor as 2nd party, independently for each specialized work depending upon the eligibility condition for **Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. (SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)** Specified as above.

(iii) If the main contractor fails to associate agency for execution of E&M components of work within 07 days of award of work a penalty of Rs. 5000.00 per day for each specialized work will be imposed and if the contractor furnishes incomplete details or furnishes details of ineligible agencies even after the tenderer is given due opportunity, the entire scope of such component of work shall be withdrawn from the tender and the same shall be got executed by the

Engineer-in–Charge at the risk and cost of the main contractor.

(iv) Verifiable completion certificates of the work, registration/approval documents, Valid Electrical license, self-attested GST registration documents in respect of the associated agencies as the case may be, duly attested by the applicant shall be submitted within 10 days of award of work otherwise a penalty of Rs. 5000.00 per day for each specialized work will be imposed.

3. In the event of the concerned E&M agency not performing satisfactorily or failure of associate contractor to complete the E&M work, the main contractor on written directions of the department, shall remove the Associate contractor deployed on the work and shall submit name of new associate who fulfil the conditions mentioned in NIT to execute the left over work without any loss of time or variation in cost to the department. **Such associates shall also give an undertaking along with the main tenderer but both of them together will stand guarantee for the equipments already supplied for which payment has been released by the department in part**. If any equipment supplied for the work, during the currency of the earlier Associate contractor and paid partly by the Dept., becomes redundant /not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of E&M work, the main contractor shall be liable for replacement of the equipment(s) at no cost to Department. No change of Associated Contractor will be allowed without prior approval of the Engineer-in-charge of the work.

I. In respect of all works i.e "**Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. (SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)"**

II. The materials shall be procured only from the original equipment manufacturers/authorized dealers of OEM. The contractor shall submit all documentary details in fulfilment of this conditions regarding procurement of materials including relevant test certificates.

III. Executive Engineer (E) shall be the Engineer-in-charge as far as E & M works are concerned. Separate tender schedule abbreviated CPWD-7 and Special Conditions for E & M Work are appended with this tender. It will be obligatory on the part of the contractor/tenderer to sign the tender documents for all the component parts.

IV. The main contractor shall be responsible and liable for proper and complete execution of the E & M work and ensure coordination and completion of both civil and E & M work.

V. The main contractor has to enter into agreement with contractor associated by him for execution of E&M component.

The associate contractor shall attend the inspection of the work by the Engineer-in- Charge of E&M works as and when required.

Form-F

To Be Executed by The Contractor for Removal of Defects and defective works.

The agreement made this _____day of _____Two Thousand and _____between _____ son of _____ (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 workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable and guaranteed against faulty workmanship, finishing unsound materials, and other related problems.

NOW THE GUARANTOR hereby guarantees that work executed by him will remain structurally stable after the expiry of the maintenance period prescribed in the contract for the **minimum life of 1 (one) year** to be reckoned after the date of completion of the work.

The decision of the Engineer-in-charge about the nature and cause of the defect shall be final. During this period of guarantee, the guarantor shall make good all defects to the satisfaction of the Engineer-in-charge calling upon him to rectify the defects failing which the work shall be 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, and 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 because 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 parties.

IIN 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. _____

FORM –G

PROPOSAL FOR ELIGIBLE ASSOCIATING AGENCIES FOR E&M COMPONENTS OF WORK

I/we hereby propose the following agencies as per mentioned against each for executing corresponding E&M components of work. Their Willingness Certificates are also attached as per **Form-H**.

Sl.No	Name of Associated Contractor	Category and Class of registration	Enlistment copy/completion Certificates attached	Monetary Limit of work	Validity of registration	Consent letter attached (Yes/No)

Note: Self Attested photocopies of enlistment order, valid electrical contractor license, work experience certificates of each agency for each component of E&M work shall be submitted.

Signature of contractor

FORM –H

WILLINGNESS CERTIFICATE

Name of work: Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

I hereby give my willingness to work as Associate Specialized Agency for electrical component of 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 engage full time technically qualified supervisor/engineer for the works. I will attend inspection of officers of the department as and when required.

Dated:

Signature of the Associate Specialized Agency

FORM-"I"

Memorandum of Understanding
Rs. 100/- Non-judicial stamp

This Memorandum of Understanding (MOU) is made on the _____ at _____

Between

M/s _____ (Main Contractor) having his registered office at _____which expression shall unless repugnant to the subject or context include its administrators, successors and assigns.

And

M/s _____ (Associate contractor) registered in CPWD as class : _____ Electrical contractor and having his registered office at _____which expression shall unless repugnant to the subject or context include its administrators, successors and assign.

Whereas, the Central Public Work Department, have issued tender papers to quote for the following work to M/s _____(Main Contractor).

Name of work : Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

Whereas, This Memorandum of Understanding has been entered into to execute the above work by the Main Contractor and Associate Contractor.

Whereas, both the parties have gone through and understood the various conditions and clauses of the tender and willingly agree to abide by them.

This MOU shall be valid till the duration of completion of above work and shall be extended if so required by the CPWD.

Now, therefore it is agreed between the parties here to as follows :-

1 The associated electrical contractor shall completely execute, perform and do all the works mentioned and described in the main agreement for its electrical components according to the specifications, terms and conditions etc. of the main agreement.
2 The associated electrical contractor shall execute and complete the works in all respect up to full satisfaction of the CPWD officers and attend to them during their inspection at site, meetings etc., whenever required by the CPWD officers.
3 The cost of electrical works executed by the associated electrical contractor will include the cost of all the materials, accessories, equipment's, tools & plants, laborers technical persons required etc. in all respect.
4 The associated electrical contractor is responsible for getting recorded measurements and preparation, submissions & pursuance of payment of the bills of the work done for electrical portion of the main agreement.
5 **The rate will be as per the schedule enclosed.**
6 The Quantity will be as per actual measurement as received from CPWD to main contractor and the rate will be as per the mutually agreed.
7 The payment to associate contractor will be released after the payment to main contractor is made by the CPWD.

8 The guarantee of the installation after the completion of the work shall be responsibility of the associate electrical contractor as required by the CPWD.

9 There is Service Tax (GST) liability; work being related to the construction of the Central Govt. Deptt. However, if any liability of the Service Tax (GST) is imposed on the associated electrical contractor then it will be paid by main contractor.

10 Either party shall not repudiate the contract in midway without the consent of each other. Otherwise, it will be treated as breach of agreement for any reason whatsoever.

11 The main agency shall be solely responsible for deferment & rescheduling of each milestone fixed as per contract documents and in such eventuality, the consequences arising out of the same rests on main agency.

12 The main contractor only shall be responsible for getting extension of delay regularized and liability what so ever flowing out shall lies with them. There shall be no direct or indirect impact on associate contractor.

13 TDS shall be deducted by the main contractor as per Income Tax law from associated agency. In case liability of tax other than Income Tax (Such as GST, or any other mechanism formed) is levied on associated contractor then the main agency will reimburse it in full to associated agency.

14 The associated contractor shall be bound to execute work upto a deviation limit of 100% in quantities of items of work at the agreement rate. Beyond deviation limit the rates will be decided by main & Associated contractor on mutually agreed basis.

15 For the items such as extra items, substitute items and new items other than the items of main agreement, if any incorporated in the work, then the main contractor shall pay the full amount so approved to the associate contractor.

16 The validity of rates shall be _____ months after finalization & acceptance of MOU by the competent authority.

17 In case main contractor delays the payment to associated contractor after the payment is released by department to the main contractor then on receipt of delay in payment from associate contractor the CPWD shall directly make the payment to associated contractor.

18 The main contractor shall at their cost provide necessary requisite arrangement for storage of material.

19 Sand & cement used in the electrical work shall be provide by main contractor.

20 Security Deposit as deducted by the CPWD will be reimbursed by main contractor to associate contractor. However associated electrical contractor will deposit 2 ½ % of Agreement amount of Rs. _____in shape of FDR towards S/D to be retained by main contractor which will refunded to electrical contractor after completion of electrical work.

21 The Income tax, Commercial tax and labour cess tax deducted by the CPWD from the bills of electrical work shall be reimbursed by the main contractor in favour of the associated electrical contractor accordingly.

In witness whereof we have put our hand seal on date _____.

Enclose :- Schedule of rates.

Signature
(Associate Contractor)
Address : _____

Signature
(Major Contractor)
Address : _____

BRIEF SCOPE OF WORK (E&M)

The scope of work comprises of providing E & M installations for - “Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. (SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)”.

The main features of the work are described below:-

1. SITC of VRV/VRF System.
2. SITC of 380 KVA DG Set

GENERAL TERMS AND CONDITIONS APPLICABLE FOR ALL E&M COMPONENTS

1 *GENERAL*

1.1 The work shall be generally carried out in accordance with tender/bid specifications and the following specifications / rules with upto date amendments.

a. CPWD General Specifications for Electrical Work: Part – I internal 2023, as amended upto date.
b. CPWD General Specifications for Electrical Work: Part – II external 2023, as amended upto date.
c. CPWD General Specifications for Electrical Work: HVAC 2024,as amended upto date..
d. CPWD General Specifications for Part VII DG Set - 2013,as amended upto date.
e. Commercial and Additional conditions for this work.
f. The Indian Electricity Act, 2003, as amended upto date.
g. Indian Electricity Rules 1956 amended upto date.

1.2 Order of Preference:
Should there be any difference or discrepancy between the description of items as given in the Schedule of Quantities, technical specifications for individual items of work (including additional and commercial conditions) and IS Codes etc., the following order of preference shall be followed:

a) Description of Schedule of quantities.
b) Commercial and Additional conditions for this work.
c) Drawings.
d) CPWD General Specifications of that particular work.
e) Relevant IS or any other International code in case IS code is not available. Commercial and Additional conditions of that particular work 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 and conditions, as the same are to be read along with schedule of quantities for the work.

1.3 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 equipment of all E&M components of the tender.

1.4 The tenderer should in his own interest visit the site and get familiarize with the site conditions before tendering.

1.5 No T&P shall be issued by the Department and nothing extra shall be paid on account of this.

2 *COMMERCIAL CONDITIONS*

Type of Contract: The work to be awarded by this tender shall be treated as indivisible works contract.

Income tax, GST, labour cess & other statutory deductions etc. shall be made at source as per the prevalent laws. The deductions of Security Deposit, Income- Tax etc. shall be done as applicable on the gross payments and net payment shall be paid accordingly.

3 *RATES*

The rates quoted by the tenderer, shall be firm and inclusive of all taxes (including GST, labour

cess etc.,). and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site including temporary construction of storage, risks, over head charges, general liabilities/obligations and clearance from CEA. However, the fee for the CEA inspections shall be reimbursed/ borne by the agency. EPF & ESI contributions are to be made by the contractor. The department will not issue Octroy exemption certificate.

4.1 The contractor has to rectify the defects within the Defect Liability period of 12 months or as decided by the Engineer –in – Charge from the date of handing over. Nothing extra shall be paid on this account.

4.2 In case of Specialized E&M works if Engineer-in-charge desires, the tenderer should submit the following documents from OEM for that particular E&M component

a) Authorization certificate.

b) The OEM is unconditionally support the lowest tenderer technically throughout the execution of contract as well as for Maintenance/Comprehensive Maintenance Contract for the useful life of the system, and

c) OEM is provide all the spares required for healthy functioning of the equipment for at least seven years from the date of supply of equipment.

4.3 In case the same item appears more than once in the schedule of work under the same sub head or among the different subhead of works, the lowest rate quoted for that item elsewhere shall be considered for other items also during evaluation of tender.

5 ***COMPLETENESS OF TENDER***

All sundry equipment, fittings, unit assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections, and all 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.

6 ***STORAGE AND CUSTODY OF MATERIALS***

The agency has to make his own arrangements. No 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/client.

7 ***CARE OF THE BUILDING:***

Care shall be taken by the contractor while handling and installing 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.

8 ***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.

9 ***GUARANTEE***

9.1 All equipments shall be guaranteed for a period of 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 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 & binding on the contractor.

9.2 **Defect Liability Period : 12** months, after completion of work or recorded of final completion certificate whichever is later.

9.3 The tender shall guarantee among other things, the following:

a. Quality, strength and performance of the materials used as per manufacturers standards.

b. Safe mechanical and electrical stress on all parts under all specified conditions of operation. Satisfactory operation during the maintenance period.

10 *POWER SUPPLY:*

The contractor has to make its own arrangement for power supply required for execution of the work.

11 *WATER SUPPLY:*

The contractor has to make its own arrangement for water supply required for execution of the work.

12 *ACCEPTABLE MAKES OF VARIOUS EQUIPMENTS:*

The acceptable makes of various equipments/components/accessories have been indicated in "Acceptable Makes" appended with the tender documents. The tenderer shall work out the cost of the offer on this basis. Alternate makes are not acceptable.

13 *DATA MANUAL AND DRAWINGS TO BE FURNISHED BY THE TENDERER:*

After award of work

The successful tenderer would be required to submit the following drawings after award of work for approval as per mile stones of tender.

a) General arrangement drawing, including detailed shop drawings of all E&M components, conduit size and route layout, Panel Drawing, DG Set, VRF AC Distribution Layout and other drawings of all E&M components to be submitted by the agency well in advance to get the approval from the JE(E)/AE(E)/EE (E) and care shall be taken not to avoid any delay in the slab casting for all individual E&M component.

b) Details of foundations for the equipments and the weights of assembled equipments.

c) Any other drawings necessary for the job.

d) The successful tenderer should furnish well in advance of start of work, three copies of detailed instructions and manufacturer's manuals of all equipments regarding installation, operation and maintenance, preventive maintenance & trouble shooting with all the relevant data sheets, spare parts catalogue, etc.

14. ***EXTENT OF WORK***

14.1 The work shall comprise of entire labour including supervision, all materials necessary to make a complete installation, 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 been mentioned in details in the tender document in connection with this contract as this is a turnkey job.

14.2 The cables and all other items shall be brought to site only after taking correct measurements as per actual requirement of work. Excess quantities shall not be accepted and paid. i.e., Quantity of item brought to site and used in work as per actual requirement shall only be measured and paid irrespective of quantities of BOQ / work schedule.**The item brought at site and paid, if not used in the project have to be taken back by the contractor and deductions in the payment shall be adjusted in subsequent bills.** The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

14.3 In addition to supply, installation, testing and commissioning, of all E&M equipment, following works shall be deemed to be included within the scope of work to be executed by the tenderer.

a) Minor building works necessary for installation of equipments, foundation, making of opening in walls or in floors and restoring them to their original condition finish and necessary grouting etc. as required.

b) All necessary supports may be arranged.

c) Testing of PTs/CTs for metering & protection purpose & relay calibration & setting.

d) Getting inspection done & obtaining approval from Central Electrical Authority and local fire authority for energizing the installation. However, necessary fees for inspection shall be borne by the agency.

15. ***INSPECTION AND TESTING***

15.1 All major equipments (as per the guidelines of **Quality Assurance Policy & Check List of E & M Services/specifications)** shall be offered for initial inspection. Contractor will intimate the date of testing of equipments at the manufacturer's works before dispatch. The successful tenderer shall give advance notice of minimum two weeks regarding the dates proposed for such tests to the department's representative to facilitate his presence during testing.

The Engineer-in-charge or his representative may witness such testing. The cost of the Engineer's visit to the factory will be borne by the Department. Equipments will be inspected at the manufacturer/ Authorized Dealers premises, before dispatch to the site by the contractor if so desired by the Engineer-in-charge. Engineer-in-charge at his discretion may waive off inspection at factory /at the manufacturer's works before dispatch.

15.2 Copies of all documents of routine and type test certificates of the equipment, carried out at the Manufacture's premises shall be furnished to the Engineer-in- charge. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

15.3 After completion of the work in all respects the contractor shall offer the installation for testing and operation. The contractor should submit all the related documents of completed E&M equipment to the department for further handing over to client department.

15.4 All E&M equipments / materials shall be tested from reputed laboratories as per guidelines of Quality Assurance Policy and check list of E&M Services / Specifications. The laboratories

shall be preferably Government labs / Government autonomous body or as approved by the competent authority. However, necessary fees for testing / inspection shall be borne by the agency only.

16. *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 this specification.

16.1 In particular, the equipment and installation will comply with the following:
Factories Act.
Indian Electricity Rules.
Workmen's compensation Act.
B.I.S. & other standards as applicable.
Statutory norms prescribed by local bodies like CEA, Power Supply Co., Fire authorities, etc.

16.2 After completion of the installation, the same shall be offered for inspection by the representatives of the Local Pollution Authority if required. The contractor will extend all help including test facilities to the representatives of Local Pollution authority. The observations of Local Pollution authority will be attended to by the contractor. The installation will be commissioned only after getting clearance from Local Pollution authority. Contractor should get inspection done & obtain approval from Local Pollution Authority.

16.3 Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

17. *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 there during the period of erection, construction and putting into operation the equipments and ancillary equipment under the supervision of the successful tenderer to the extent 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.

18. *ERECTION TOOLS:*

No tools and tackles either for unloading or for shifting the equipments for erection purposes would be made available by the department. The successful tenderer shall make his own arrangement for all these facilities.

19. *COOPERATION WITH OTHER AGENCIES:*

The successful tenderer shall co-ordinate with other contractors and agencies engaged in the construction of buildings, if any, and exchange freely all technical information so as to make the execution of this work/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 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 work was not undertaken by the tenderer himself.

The work will be carried out with least disturbance during shifting & shut down taken in consultation with the client department.

20. *INSURANCE AND STORAGE:*

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.

21. *VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION:*

The contractor shall have to produce all the relevant records to certify that the genuine equipments from the manufacturers has been supplied and erected to the satisfaction of the Engineer-in-charge.

22. *PAINTING:*

This shall include cost of painting of the entire installation. The major equipments like ~~HT panel, transformers,~~ LT panel~~, bus duct, cable trays,~~ fire fighting equipments etc. shall be factory final finish painted. The agency shall be required to do only touching to the damages caused to the painting during transportation, handling & installation at site, if there is no major damage to the painting. ~~However hangers, supports etc. of bus trunking & cable tray etc. shall be painted with required shade including painting with two coats of anticorrosive primer paint at site.~~

23. *TRAINING:*

The scope of works includes the on job technical training of two persons of Department at site as decided by Engineer – in - charge. Nothing extra shall be payable on this account.

24. *MAINTENANCE:*

Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of one year from the handing over of the installation.

25. *APPROVAL OF DRAWINGS, MAKES AND MODELS OF EQUIPMENT/MATERIALS FOR ALL E&M COMPONENTS :*

25.1 The agency shall submit drawings and details such as makes and models of the equipments/materials offered by him along with specifications for all E&M components to the Engineer-in-charge of the work, before ordering the equipment/materials for approval of the department.

25.2 The Engineer-in-charge shall scrutinize the proposal and approve the makes and models which are acceptable as per the schedule, specifications, conditions of the agreement and inform the agency for procurement.

25.3 After approval of the equipment/materials by the department the agency shall procure the equipment/ materials from the OEM/ authorized distributor/dealer as the case may be.

26. *ADEQUATE CARE THAT ONLY TESTED AND GENUINE MATERIALS OF PROPER QUALITY ARE USED IN WORK SHALL BE ENSURED BY FIRM. THE FIRM SHALL ALSO ENSURE THAT:*

i. Material will be ordered & delivered at site only with the prior approval of the department to ensure timely delivery.

ii. As and when the order is placed for the fittings/ fixtures, cables, switchgears, poles, other main items etc, its copy shall be endorsed to the Engineer-in-charge of work.

iii. The contractor will submit makes & brands of electrical fittings wires & cables, conduits and

switchgears, rising mains, poles , outdoor fittings etc. of preferred make list as per tender documents for approval of Engineer-In- Charge, whose decision will be final in the matter.

iv. The firm will be required to procure material directly from the manufacturer/ authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the department.

v. Inspection at factory or at godown, as required, shall be arranged by the firm for a mutually agreed date.

vi. Delivery of material shall be taken up only with the consent of department, after clearance of the material.

vii. Department shall reserve the right to waive off inspection in lieu of suitable test certificate, at its discretion.

viii. All the materials to be supplied by the contractor shall be procured & brought to site as per requirement at site of work in consultation with department so that these materials are not damaged & their manufacturer's warrantee.

27. ***Safety Codes & Statutory Regulations:***

c. Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.

d. Successful tenderer shall arrange for compliance with statutory provisions of safety regulations 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.1000/- 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.

C-1: ADDITIONAL SPECIFICATION, TERMS AND CONDITIONS FOR INTERNAL EI

1. The work shall be carried out strictly in accordance with CPWD specification for electrical works 2023 (Internal) and 2023 (External) and amended up to date and in accordance with Indian Electricity Rules, 1956, India Electricity Act, 1910 as amended upto date and as per instructions of the Engineer-in-Charge i/c as below and nothing will be paid extra.
2. All the material to be used on this work by the contractor shall be approved from the Engineer-in-Charge in advance before installation at the site.
3. The work shall be carried out according to approved drawing/details which shall be subsequently issued to the successfully qualified bided tenderer for execution, in stages as per instruction 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.
4. All damages done to the building during the 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. In case, the repair is not satisfactory, the department will get it rectified &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 & binding on the contractor.
5. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost of the satisfaction of the Engineer-in-Charge. The program of electrical works are to be coordinated in accordance with the building work and considering that the allottees are senior officers and there may be restrictions in working hours but no claim for idle labour will entertained in case of occupied quarters.
6. The work is to be carried out in Western Academic Block - A & B, IIT Roorkee, Roorkee, Uttarakhand. The work is basically up-gradation work according to the requirement. The work has to be carried out in shortest possible time with minimum inconvenience to the allottee. For that the, requirement of material& manpower has to be well planned, the labour should be technically competent and there should be no communication gap at any time.
7. All the debries of the electrical works should be removed and the site should be cleared by the contractor immediately after the accruing of debries daily. Similarly any rejected material should be immediately cleared off from the site by the contractor.
8. Cement for this benefited work is to be arranged and used by the contractor himself and nothing extra will be paid on this account.
9. The contractor or his engineer is bound to sign the site order book as and when required by the Engineer-in-Charge and to comply with the remarks therein.
10. The size of conduit and wiring shall be got approved from the Engineer-in-Charge before the execution of work.
11. The contractor shall make his own arrangement at his own cost for Electrical/ General tools and plants required for the work. In case, proper tools are not available, the department will purchase the tools for bonafide use of work at the risk & cost of the contractor.
12. The quoted rates should be inclusive of all taxes etc. i.e. GST and nothting extra will be paid.
13. The connection inter connection, earthing and inter earthing shall be done by the contractor wherever required and nothing extra shall be paid on this account.
14. The contractor has to make his own arrangements for stores and watch and ward and no extra claim for this will be entertained.

C-2: ADDITIONAL SPECIFICATION, TERMS AND CONDITIONS FOR VRV/VRF SYSTEM

1. General

1.1 This specification covers manufacturing , testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, final testing commissioning, i/c one year guarantee period for the following work

1.2 The work shall be executed as per CPWD General specifications for HVAC works 2024, CPWD General specifications Electrical works Part-I (2013) & Part- II as amended upto date, relevant IE rules, relevant IS and as per directions of Engineer-In-Charge.

1.3 The tenderer should in his own interest visit the site and get familiarize with the site conditions before tendering.

1.4 No T&P shall be issued by the Department and nothing extra shall be paid on account of this.

1.5 The contractor has to do the full load heat calculation and make a complete design of AC system and get it approved with engineer in charge. The quantity take in BOQ are tentative.

2. The scope of this section comprises the design, supply erection, testing and commissioning of inverter technology based Scroll / rotary Type VRV/ VRF type system of air conditioning conforming to these specification/ Explanatory Note and in accordance with the requirements of Drawing and Schedule of Quantities. The prices quoted shall include all the equipment ancillary material as specified and all such items whatsoever and which may be required to fulfill the intent and purpose as laid down in the specification and the approved drawings. The tenderer shall also include all necessary MS frame work for installation of outdoor and indoor units in VRV/ VRF based air condition system. The cost quoted by tenderer shall also include the refrigerant gas R410A & its charging for proper & specified functioning of air conditioning system.

3. The scope in the tender schedule also covers detailed designing of complete air-conditioning system based on inverter technology based Scroll VRV air conditioner with air cooled outdoor units system capable of cooling and heating (reverse cycle) as per individual or season requirement suitable for operation on 415 V+ 10%, 3 Phase, 50 Hz AC electric supply. The outdoor units shall have both cooling & heat pump mode, consisting of multiple outdoor unit with single circuit of refrigerant piping. Each indoor unit Air Handling Units should have capability to cool or heat as per seasonal weather changes. This shall also include complete capacity calculation for indoor and outdoor units complete with CAD drawing, designing & layout of following.

I. Outdoor units. II. Indoor units. III. Refrigerant piping IV. Condensate water piping & disposal. V. Power & Control Cables between Outdoor units & Indoor units. Necessary approval shall be accorded based on design analysis and discussions on the subject and submission of date by the contractor. In case of any deviation from the parameters specified below, the technical issues involved shall be brought to the notice of Engineer-in-charge for seeking necessary approvals to achieve these parameters. Engineer-in-charge, however, reserves to right to permit any deviations from the parameters as specified.

Outside summer condition: 47.0° C DB; 23.9° C WB Monsoon: 35.0° C DB‟ 28.3°C WB Winter: 7.2° C DB‟ 5.0° C WB Inside conditions summer: 24°C ± 1°C Monsoon: RH not exceeding 55% ± 5% Winter: 21°C ± 1°C The unit offered should be suitable to above designed data after considering the derating factors.

4. OUTDOOR UNIT

i. The outdoor unit shall be factory assembled, weather proof casing (Material of Maintenance of casing shall be vendor's standard design), constructed from heavy gauge GI sheets steel panels OR MS powder coated with baked enamel finish. The outdoor unit shall be completely factory wired, tested with all necessary controls & filled with first charge of refrigerant before delivering at site.
ii. The inverter technology based Scroll OR Rotary type VRV/VRF equipment should be capable so that refrigerant piping between indoor units and outdoor unit shall be extendable upto 165m of equivalent length with maximum height difference between outdoor & indoor unit of 50m. All the outdoor units comprising of multiple modules should have at least one inverter type compressor in each module.
iii. The contractor shall submit the energy efficient ratio value for all selected model of VRV unit, from the original equipment manufacturer.
iv. The outdoor unit shall be factory tested and filled with first charge of refrigerant R-410A before delivering at site.
v. It should also be provided with duty cycling for inverter based Scroll OR Rotary compressors capable of changing the rotating speed of compressor by inverter controller to follow variation in cooling & heating loads & switching starting sequence for better stability and prolonging equipment life or similar features if available in Scroll will also be accepted.
vi. The unit shall be provided with its own microprocessor control panel with provision for integration with the building management system for Air-conditioning system.
vii. The machine must have a sub cool feature to use coil surface more effectively through proper circuit/ bridge so that it prevents the flushing of refrigerant from long piping due to this effect thereby achieving energy savings.
viii. The outdoor unit should be fitted with low noise level and should not be more than 67 db (A) at normal operation when measured at 1.5m distance from ground level.
ix. The outdoor unit should be fitted with low noise aero spiral design fan with aero fitting grill for spiral discharge airflow to reduce pressure loss and should be fixed with DC/AC fan motor for better efficiency.
x. In case of trouble occurs in an indoor units (s), the continuous operation of system should be possible.
xi. The unit shall be designed in such as way that cleaning of drain Pan should be easy & inspection/ replacement of compressor should be easy.
xii. The condensing unit shall be designed to operate safely when connected to multiple fan coil units.
xiii. The outdoor unit shall be modular in design with possible future expenses and the unit shall be provided microprocessor type control panel.

5. Compressor

i. The compressor in inverter based Scroll OR Rotary System shall be highly efficient. The system should response efficiently in accordance to the variation in cooling or heating load requirement.

ii. All outdoor units shall have multiple steps of capacity control to meet load fluctuation and indoor unit individual control. All parts of compressor shall be sufficiently lubricated stock. Forced lubrication may also be employed. The refrigerant has to be CFC Free as per Griha Compliance.

6. Refrigerant Circuit

The refrigerant circuit shall include liquid and gas shut-off valves and a solenoid valves at condenser end. The equipment must have inbuilt refrigerant stabilization control for proper refrigerant distribution. All necessary safety devices shall be provided to ensure the safe operation of the system.

7. Heat Exchange

The heat exchanger shall if applicable should be as per standard manufacturer practice.

8. Safety Devices

All necessary safety devices shall be provided to ensure safe operation of the system. Following safety devices shall be part of outdoor unit:- high pressure switch, fuse, fan drive overload protector, fusible plug, crankcase heater, over load relay, overload protection for inverter however standard manufacturer practice and safety devices shall be accepted.

9. The Contractor shall submit derating of VRF/VRV System from OEM as per outdoor and indoor design conditions as mentioned in Para 3 above, and shall prepare Heat Load Calculation and Layout Drawings and take approval from Engineer-in-charge before start of work.

INSPECTION AND TESTING

9.1 Initial Inspection & testing

i) Initial inspection of VRV Type AC Units at manufacturer's in India work will be done by the engineer-in-charge or his representative. 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 contractor shall give sufficient advance notice regarding the dates proposed for such tests to the department representative(s) to facilitate his presence during testing. The Engineer-in-charge at his discretion may witness such testing. Equipments will be inspected at the manufacturer/ authorized dealers premises, before dispatch to the site by the contractor. ii) The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make arrangements for the same. iii) The materials duly inspected by Engineer-in-Charge or his authorized representative shall be dispatched to site by the contractor. iv) No additional payment shall be made to the contractor for initial inspection /testing at the manufacturer's works by the representative of the Engineer-in-Charge. However, the department will bear the expenses of its representative deputed for carrying out initial inspection/testing.

Note:- All the equipments /Item/Accessories/Misc.

C-3: : ADDITIONAL SPECIFICATION, TERMS AND CONDITIONS FOR DG SET

1.0 Technical

Detailed technical specifications for the equipment and installations are indicated here under:-

1.1 Diesel Engine

a) **Engine Rating**

The engine shall be multi cylinders, vertical 4 stroke cycle, air/water cooled, diesel engine developing required B.H.P. as per BS 649/1958 with upto date amendments under SITE CONDITIONS for giving a continuous output of specified KVA at the load terminals of alternator, exclusive of the power requirements of auxiliaries while running at 1500 rpm. (Both naturally aspirated and turbo charged are acceptable).The tender shall submit the de rating calculations along with the technical bid to prove the required output that will be available at the site conditions. The DG Set shall compliance to latest CPCB-IV+ norms amended up to date.

The engine shall have 10% over load capacity of one hour in any period of 12 hours continuous run.

The Engine shall be with following accessories.

i. Fly wheel, dynamically balanced.
ii. Necessary flexible coupling and guard for alternator and engine.
iii. Air cleaner dry type / oil bath type as per manufacturer's recommendation.
iv. Corrosion resistor.
v. Radiator complete with hoses fan, fan drive and guard.
vi. Fuel tank inside the Acoustic Enclosure and an additional fuel tank of 990Ltrs. capacity outside the Acoustic Enclosure.
vii. Fuel Pump.
viii. Hydraulic governor/mechanical governor as per manufacturer's recommendations.
ix. Electric starter 24 Volt D.C./ as per manufacturer's recommendations.
x. Heavy duty batteries with lead and terminals as per actual requirements.
xi. Fuel oil filter.
xii. Lubricating oil filter.
xiii. Necessary pumps for cooling water, lubricating oil.
xiv. Necessary turbo chargers (exhaust gas driven) in turter changed engines only.
xv. Instrument panel comprising of starting switch with key, lubricatingoil pressuregauge,watertemperaturegauge,batterychargingammeter,hourmeterwithRPM indicator.

b) **Cyclic variation**

Cyclic variation of set shall be within the time specified in B.S.5514 and IS10002.

c) **Governor**

Governor shall be as per OEM.

d) **Frequency variation:**

Frequency variation of constant load including no load shall remain within a band of 1% of rated frequency.

e) **Fuel system**

It shall be suction fed to engine driven fuel pump. A replaceable element of fuel filter shall be suitably located to permit easy servicing and Daily service fuel tank suitable for 12 hours continuous operation shall be complete with necessary supports, gauges, inlet, outlet connections, drain plug, connecting piping (MS class B) etc. both to the engine as well as for filling pump. The system shall

be complete with semi-rotary pump.

f) **Lubricating Oil system**

It shall be so designed that when the engine starts even after a long shut down lubricating Failure does not occur.

g) **Cooling system**

A closed circuit, self-contained system, comprising of pump, radiator fan, which shall be driven directly by the engine shall be provided.

h) **Starting System**

This shall comprise of necessary heavy duty battery 24 Volt DC or as per manufacturer's recommendations, starter motor, axial type gear to match with the toothed ring on the fly wheel. A bimetallic relay protection to protect the starter motor from excessively long cranking runs suitably integrated with the engine protection system shall be included within the scope of the work. Battery capacity shall be suitable for meeting the needs of the starting system as well as the requirements of control panel. The scope shall cover all cable leads, terminations initial charging etc.

i) **Silencer**

Dry Exhaust manifold with Residential type silencer confirming to latest CPCB Norms amended up-to-date shall be provided.

j) **Instrumentation and control**

Engine instrumentation shall be centralized on the instrument panel. The instrument panel shall be re silent mounted on the engine and shall have the following mountings;-

- Cooling water temperature gauge.
- Engine speedo meter.
- Lubricating Oil pressure gauge.
- Hour meter.
- Engine push buttons and key.
- High cooling water temperature cut off.
- Low. Lubricating Oil pressure cut off.
- Battery charging ammeter.

k) **Solid state Monitoring & control panel**

In additional to the engine instrumentation mentioned above there shall be a separate solid state monitoring & control panel for monitoring and control of the following parameters.

- **Lubrication system**

The Lub. Oil pressure, oil level and conditions shall be monitored.

- **Cooling System**

The oil and water temperature shall be monitored through electronic sensors.

1.1.11.3. Override system

There shall be an over ride system operated by a switch key by which the engine can be operated further even after warnings are given, taking a safe risk.

l) **Barring gear**

Suitable manual operating barring facility shall be provided on the fly wheel.

m) **Piping work**

All piping work including necessary fittings and accessories required inside the engine room and outside for exhaust piping shall be provided. The supply shall include necessary flexible pipes in the

exhaust, fuel, lubricating Oil and water lines as necessary. The installation shall cover clamps, supports, hangers lagging on exhaust pipe work etc. as are necessary for completing the work.

n) **Common bed plate**

Engine and alternator shall be mounted on a common bed plate together with radiator. The bed plate shall be such that it will be feasible to remove the engine sump without disturbing the engine assembly.

o) **Anti Vibration Mounting**

Suitable anti-vibration mountings Cushy foot shall be used for mounting the unit so as to prevent transmission of vibration to the structure. The mountings offered shall be as recommended by the manufacturer of D.G. Set.

2.0 Alternator

2.1.1 Rating

The alternator shall be rated for a continuous output of specified KVA (NTP) in BOQ

0.8 P.F. or better , at 415 Volts, 3 phase. 50 cycles suitable for the 4 wire system exclusive of power requirement of auxiliaries. The tenderer should provide de-rating calculations for the alternator & indicate the output at site conditions. Winding is to be star connected and neutral shall be brought out through a separate terminal and will be solidly grounded. Speed of the alternator shall match the engine for a direct drive.

2.1.2.1 Excitation (Brushless Excitation)

Self excited, self regulated and preferably with static excitation facility. The excitation unit should preferably be mounted on the control panel and not on the alternator assembly. The rectifier shall be suitable for operation at high ambient temperature at site.

- **Standards**

The alternator shall be in accordance with the following standards as are applicable:

- IS:4722-68/BS-2613-1970.The electrical performance of rotating electrical machine.
- IS:4889-68/BS-269 rules for method of declaring efficiency of electrical machine.

- **Performance**

Voltage regulation from no load to rated load shall be within a range of 5 % of rated voltage. The frequency regulation from no load to full load shall be as defined by the Engineer-governor, Voltage dip. For any addition of load upto and including 90% load shall not exceed 20% of rated voltage and shall recover to

and remain within the steady band within not more than 1.5 sec. Similarly the frequency shall recover to the steady state frequency band within 5 seconds. The windings shall not develop hot spots/ pockets exceeding safe limits due to an imbalance of 25% between any two phases from no load to full load.

- **Voltage Regulations**

An automatic voltage regulator system compatible with excitation system described above shall be provided, so as to furnish a performance as defined herein under all condition of load. A manual rheostatic control or an equivalent alternative to vary the set point from 400 to 433 volts may be incorporated on the regulator panel or control panel.

- **Enclosure**

Alternator enclosure should be screen protected drip proof. The level of guaranteed IP level of protection should be indicated in the tender.

- **Terminal Box**

Shall be suitable for necessary PVC 1.1 KV grade underground cable confirming specification to IS1554 part-I with sufficient space for bifurcation inside the box, necessary removable gland plate, cable lugs, connections shall all be included. Suitable segregation shall be available for other cables such as excitation, control etc. the terminal box shall be suitable for with standing the mechanical and thermal stresses developed due to any short circuit at the terminals.

- **Earth Terminals**
  Two Nos. earth terminals on opposite side with vibration proof connections, non ferrous hardware etc.With galvanized or plate and passivated washers of minimum size 12 mm dia shall be provided.
- **Winding**
  Class of insulation should be as per standard manufacturer product.

3.0 Control Panel

- **General Features**

The control panel shall be fabricated out of sheet steel, totally enclosed, dust, damp and vermin proof free standing floor mounted type and front of board operated. It shall preferably be made into sections such that as far as feasible, there is no mixing of control, power D.C. and A.C. functions in the same section and they are sufficiently segregated, except where they come together on unit like relay/contactor etc is necessary. Sheet steel used for fabrication shall not be less than 2 mm thick. Hinged doors shall be provided at the rear and front, preferably double leaf, for each section for access to routine inspection from the rear etc. All indicating lamps, instruments meters etc. shall be in the front. The degree of protection required will be IP 42 confirming to IS 2147-1962.

- **Earthing arrangement**
  One No. 25 mm x 5 mm copper strip shall be run at the rear of the board/connecting all the sections suitable bonding to earth. Earth terminals shall be vibration proof with all hardware of nonferrous or galvanized/ plated and passivated in case of ferrous hardware.

- **Gland Plates**
  Removable gland plates sectionalized for receiving various cables that are to enter on to the section and undrilled or with suitable knockout shall be provided at the bottom of the panel sections.Where heavy cable are to be brought and suitable clamps shall also be incorporated to relieve the stress on the glands due to the weight and bends of the cable covers.

- **Terminal blocks and wirings**
  Terminal blocks of robust type and generally not less than 15 Amps capacity, 250 V grade for DC upto 100 V and 660 Volts grade for AC and rest of the junctions shall be employed in such a manner that they are freely accessible for maintenance. All control and small wiring from unit to unit inside the panel shall also be done with not less than 2.5 sq.mm. copper conductor PVC insulated and 660 volts grade. Suitable colour coding can be adopted. Wiring harness shall be neatly formed and run, preferably function wise and as far as feasible segregated voltage wise. All ends shall be identified with ferrules at the ends.

- **Lables**
  All internal components shall be provided with suitable identification lables suitably engraved. Lables shall be fixed on buttons, indication lamps etc.

- **Painting**
  The entire panel shall be given primer coat after proper treatment and two coats of final paint of approved shade before assembly of various items.

- **Equipment requirements:**
  The control cubical shall incorporate in the assembly, equipments as under:-

- Control system equipments and components such as relays, contactors, circuit breakers etc as required for/automatic manual operation.
- Necessary controls for testing the generating set's healthiness, with test mode, on mains.
- Necessary instruments and accessories such as voltmeter power factor meter ammeter, selector switches,
- Necessary indication lamps, fuses, terminal blocks, push buttons control switches etc. as required.
- Necessary set shut down devices due to faults/abnormalities with indications alarm.
- Necessary battery charger and wiring from mains supply.
- Necessary excitation control and voltage regulating equipment.

4.0 System operation

These facilities provided the following operational requirements.

i) **Manual Mode**

xiv. In a manual mode it shall be feasible to startup the generator set only by the operator pressing the start push button.

xv. Alternator contactor/circuit breaker close and trip preparation shall be also through operator only, by processing the appropriate button on the panel, closure shall be feasible only after alternator has built up full voltage.

xvi. Engine shutdown, except otherwise due to faults, shall be manual, by pressing a 'stop' button.

ii) **Test Mode**

iii. When under 'test' mode, the engine shall get the start signal even though the main supply is healthy and the alternator start building up voltage but the set not take load by closing of alternator contractor/breaker. However, if during the test mode the power supply has failed the load shall be automatically get transferred to alternator.

iv. However,itshouldbepossibletoloadthesetlocally,throughaTESTcontactor (which cannot be closed when the set is in the normal "MANUAL" mode).

iii) **Auto mode**

1. A line voltage monitor shall monitor supply voltage and/or frequency on each phase. When the main supply fails completely or fails below set value (adjustable between 80% to 95% of normal value) on any phase. The monitor module shall initiate start up of diesel engine through master timer and sequence timer.
2. To avoid initiation due to momentary dips or system disturbances, a time delay adjustable between 0 to 5 seconds shall be incorporated in the initiation of the starting system.
3. Three at tempts starting facility shall be provided through the sequence timer (6 seconds ON, 5 seconds OFF with repeat facility).
4. If at the end of third attempt the engine has not been started and built up voltage, engine shall be locked out for start and "engine fails to start" signal appears. The master timer shall have provision for this function.
5. However the engine will restart if the operator presses, there set button or if the engine is started manually.
6. Sequence timer will have facility to make it feasible ovary independently ON- OFF setting periods from one to ten seconds.
7. If alternator for any reason does not build up voltage after the first or second start as the case may be, further starting attempt will not be made and the starting facility will be reset.
8. Once the engine has built up speed and the alternator has started developing the voltage, the starting facility will be reset.
9. When the alternator voltage reaches the prescribed value the contactor or circuit breaker shall close to connect load to the alternator. The load is now supplied by the alternator.
10. When the mains supply is resorted and is healthy as sensed by the line voltage monitor the load shall be transferred automatically to mains supply from the alternator through suitable timer which can be set between one to ten minutes.
11. The diesel engine automatically restarts after two minutes and reverts to stand by position for next situation as explained above.
12. Alternator and mains contactors are in variably electrically and mechanically interlocked so that when one is ON the other cannot be made ON.

iv) **Engine shutdown and alternator protection equipments**

Following shutdown and protection system shall be integrated in the control panel.

1. Engine

1. Low lub. Oil pressure shutdown.

2. High coolant (water) temp shutdown.

3. Engine over speed shut down. The type of arrangement offered should be indicated in the tender.

2. Alternator

It shall have overload short circuit and earth leakage protection to trip the circuit breaker/contactor in the event of overloads backed up with MCCBs for short circuit protection, and/or in the vent of earth faults, the O/L trip to be adjustable between 80% to 120% E/L trip to be adjustable between 10% to 40%. An alternator over voltage trip also shall be incorporated. MCCBs shall be for 31 MVA at 415 Volts repturing capacity confirming to ISS.

- **Earthing System:**

This shall confirm to CPWD General Specifications for electrical works Part-II internal 2023 upto date.

- **Installation**

- Suitable vibration isolation mountings shall be provided by the Contractor, as per the recommendations of the manufacturer of the DG Set and approved by the Engineer-in-charge of the work.
- The scopes of work include delivery of DG Set at site including loading, unloading, handling etc and also placement of the same on the foundation. All necessary tools, tackles, labours etc. required for the purpose shall be arranged bythe Contractor.
- The sets shall be accurately leveled so as to ensure trouble free and smooth operation.
- All pipe work, cable work etc shall be carried out in a workman like manner to the satisfaction of the Engineer-in-Charge. The work includes all sundry materials and flexible connections as required to avoid transmission of vibrations.
- The work shall also include suitable supports for pipes cable etc if required.

- **Battery Charger Kit**

  When set it not in operation, controlled from the load side so that the charger shall only be energised when mains are energised. It shall remain off when the set is in operation. This shall consist of:-

(i) Mains transformer of adequate rating with taping on secondary side for TPICKLE/BOOST CHARGING.
(ii) Rectified Bridge type Rectifier.
(iii) DC Voltmeter 0 – 30 Volt, Square flush mounting type.
(iv) DC Ammeter 0 – 30 A Square flush mounting type.
(v) Charge rate (Trickle/ Boost) selector switch.
(vi) Facia window indicate to battery charger "ON" indication.

- **Installation of AMF Panel –As per OEM standards & recommendations**

- **Installation of DG Set**

(i) The alternator coupled to the diesel engine with horizontal coupling shall be mounted on a heavy duty common base plate of suitable steel channel of welded construction. The foundation shall be made with the cement concrete not less than 1:2:4 ratio and should be of suitable size as per manufacturer's recommendation. The copy (drawing) of layout of complete foundation plan and cross section shall have to be supplied prior to the commencement of foundation work.
(ii) The contractor will execute the work so as to comply all the requirements of state/ competent Pollution Control Board.
(iii) The Contractor shall have to extend the exhaust pipe –outside the DG Set Room, which is in the scope of work.
(iv) All exhaust joints shall be welded to prevent escape of flue gases and smoke inside the Generator room. As best osrope shall be fixed on full length (in side the room)of exhaust pipe which is in the scope of work.
(v) All the connection from tank to the Engine shall be provided with MS pipe fixed on ground with suitable clamps/saddles etc. as required.
(vi) Anti-corrosive solution shall be filled (first filling) by the contractor free of cost in the cooling system.
(vii) Prevention/Protective covering on the and filling around foundation shall be liability of contractor.

INSPECTION AND TESTING OF DG SET

Initial Inspection & testing:-

Initial inspection of DG Set at manufacturer's site in India work will be done by the engineer-in-charge or his representative. 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 contractor shall give sufficient advance notice regarding the dates proposed for such tests to the department representative(s) to facilitate his presence during testing. The Engineer-in-charge at his discretion may witness such testing. Equipments will be inspected at the manufacturer/ authorized dealers premises, before dispatch to the site by the contractor. ii) The department also reserves the right to inspect the fabrication job at factory and the successful tenderer has to make arrangements for the same. iii) The materials duly inspected by Engineer-in-Charge or his authorized representative shall be dispatched to site by the contractor. iv) No additional payment shall be made to the contractor for initial inspection /testing at the manufacturer's works by the representative of the Engineer-in-Charge. However, the department will bear the expenses of its representative deputed for carrying out initial inspection/testing.

Note:- All the equipments /Item/Accessories/Misc.

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LIST OF PREFERRED MAKES OF MATERIAL

Sr. No.	Brief Description	Makes
1.	M.S. Conduit Pipe	BEC/M KAY/ NIC/AKG/STEEL CRAFT/RMCON (ISI MARKED-ERW)
2.	PVC Insulated Copper Conductor Wires.	RR KABEL/ POLYCAB /HAVELLS/BATRA HANLAY /AKG/ SKYDA/GRANDLAV/ BCH/ Lauritz Knudsen (formally L&T) / Rallison/ Anchor By Panasonic
3.	Modular Plate Type Switch/ Socket White & Its Boxes	LEGRAND {MOSAIC)/ SCHNEIDER{CLIPSAL) (OPALE)/ WIPRO NORTHWEST) PLATIA/ MK (WRAPOROUND)/ HAVELLS {CRABTREE)/ Anchor by Panasonic {Roma Plus)
4.	Prewired MCB DB/Isolator	LEGRAND/ SCHNEIDER/ Lauritz Knudsen (formally L&T) /SIEMENS/ Polycab/ Anchor by Panasonic {Roma Plus)
5.	MCB'S / RCCBS	LEGRAND (LEXIC) / SCHNEIDER (MULTl-9)/Lauritz Knudsen (formally L&T) / SIEMENS (BETAGUARD)/ Polycab
6.	MCCB'S Upto 250A (Thermal Release) MCCB'S Above 250A (Micro Processor Release)	LEGRAND / SCHNEIDER / Lauritz Knudsen (formally L&T)/ SIEMENS
7.	VRV / VRF Outdoor Unit	Daikin/ Mitshubishi Electric / Toshiba/ O General
8.	VRV / VRF Indoor Unit	Daikin/ Mitshubishi Electric / Toshiba/ O General
9.	Y-Joints & Fittings	Daikin/ Mitshubishi Electric / Toshiba/ O General
10.	Central & Remote Controller	Daikin/ Mitshubishi Electric / Toshiba/ O General
11.	GSS Sheet	Sail / Tata / Jindal
12.	Closed Cell Fire Retardant XLPE	Paramount / Supreme / Trocylene
13.	Nitrile Rubber Insulation (For Duct / Drain Pipe / Refrigerant Pipe Insulation)	Armaflex / K-flex / Eurovatax
14.	Expanded / Extruded Polystyrene (For Underdeck Insulation)	Mettur Beardsell / Styrene Packing / Toshiba
15.	Paints	ICI / Asian/ Nerolac/ Dulux
16.	Dash Fasteners	Canon / Fisher / TKS
17.	Copper Refrigerant Piping	Rajco / Mandev / Shree Shyam
18.	Refrigerant/Drain Piping Insulation	Trocellen / Supreme / Armaflex / Superlone
19.	Control Cable & Accessories	Havelles / Gemscab / Polycab/ Grandlay/ Finolex

20.	MS Painted / GI Cable Tray (Factory Fabricated)	SLOTCO / PILCO / KEPL / RICCO
21.	DG Set Engine	Caterpillar/ Cummins/ KOEL Green/Volvo Penta/ Perkins/ Greaves Cotton
22.	All other items not covered above	As per approval of the Engineer-In-Charge.

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PART-C

(Schedule of Quantities)

Schedule of Quantities (E&M Work)

Name of Work : Construction of Western Academic Block building including internal EI, HVAC, electrical substation, firefighting, fire alarm, DG Set, lift installations & development works at IIT Roorkee, Roorkee, Uttarakhand. **(SH: Providing VRV/VRF System for Data Hub Rooms and UPS Room and 1 No. 380 KVA DG Set) (Recall)**

Item No	Description of Items	Qty	Unit	Rate	Amount
	SH-I: VRV/VRF SYSTEM				
1	Supplying, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s), minimum two compressors (with individual separate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condenser fan shall be capable to operate at different speed with respect to load. The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 0C. The unit shall be suitable to work on 400V +/- 10%, 3 Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kWr ISEER 5.4, Capacity > 40 and <70 ISEER 5.5, Capacity > 70 ISEER 5.6 for ECSBC Building) For Cooling or Heating or Both				
1.1	14 HP to 22 HP	64.0	Per HP	17,997.00	11,51,808.00

2	Supplying, Installation, Testing and Commissioning of following minimum capacity High wall type Indoor unit equipped with and comfort washable synthetic media prefilter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, outer cabinet, cord less remote control, drain pan, necessary accessories etc., suitable for operation on 230 V ± 10%, 50 Hz, single phase AC supply, complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 0C DB and 19 0C WB temperature. (Make will be same as of Outdoor)				
2.1	1.6 TR	30.0	Each	20,743.00	6,22,290.00
3	Supplying, Installation, Testing and Commissioning of Y/T/Multi Joints. Joints shall be of same Original Equipment Manufacturer (OEM) make as of ODUs and IDUs				
3.1	Indoor Units	14.00	Each	4,271.00	59,794.00
3.1	Outdoor Multi Joint	4.00	Each	7,626.00	30,504.00
4	Supplying, 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 elastometric 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 :				
4.1	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	225.0	Mtr.	326.00	73,350.00
4.2	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	225.0	Mtr.	579.00	1,30,275.00
4.3	19 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	225.0	Mtr.	696.00	1,56,600.00
5	Supply installation Testing and Commissioning of Touch Type centralised controller suitable for Controlling to connect atleast 64 indoor units or more To Operate, Monitor, On / Off, Temperature Setting complete as required.Should be cloud based with inbuilt backnet card having automated power monitoring system AI based complete etc. as required.	2.00	Each	2,49,001.00	4,98,002.00

6	Supply installation Testing and Commissioning Refrigent gas charging of R410 green gas as per piping design and length complete etc. as required.	50.00	Kg	933.00	46,650.00
7	Supplying, Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power copper armoured cable of 1.1 k grade of following size on cable tray/surface as required.				
7.1	4 Core x 16 sqmm	150.00	Mtr.	2,378.00	3,56,700.00
	SH-II: DIESEL GENERATOR SET				
8	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 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 Leve				
	(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, 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.				
	(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				
	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.				
8.1	380KVA	1	Each	26,77,537.00	26,77,537.00
9	Deduction for AMF Panel: Deduction for the cost of the AMF (Automatic Mains Failure) Panel for 380 kVA DG Set against Item No. 1, as the same has not been provided/executed under the said item.	1	Job	-4,97,372.00	-4,97,372.00
	TOTAL				**53,06,138.00**

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