

INDEX

Name of work:- **Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat.**

Sl.No.	CONTENTS	PAGE No.
	PART -A	2
1.	Press Notice (E- Tendering)	3
2.	Information And Instructions For Contractors/Bidders For E-Tendering	4-6
3.	CPWD-6 For E-Tendering	7-10
4.	Copy of Receipt of EMD submission as per Annexure-A	11
5.	Form of Earnest Money Deposit Bank Guarantee Bond	12
5.	GST declaration as per Annexure-B	13
6.	Cpwd-7	14-16
7.	Schedule A To F	17-20
8.	Integrity Pact & Integrity Agreement	21-27
	PART –B	28
9.	Special Conditions	29-68
10.	Form of Bank Guarantee for Earnest Money Deposit /Performance Guarantee/Security Deposit/Mobilization Advance	69-70
	PART-C	71
11.	Schedule of quantities(SOQ) for Civil works	72-80
12.	Price Bid	81

Certified that this N.I.T. contains page 1 to 81 (One to Eighty Pages Only)

Executive Engineer & Sr. Manager (E),
IITGN Project Electrical Division,
CPWD, Gandhinagar

Part- A

CENTRAL PUBLIC WORKS DEPARTMENT

NOTICE INVITING e-Tender

The Executive Engineer & Sr. Manager (E), IIT Gandhinagar Project Electrical Division, CPWD, IIT Gandhinagar, Palaj, Gandhinagar, Gujarat (Telephone-079-2395-2841 / email ID: pucpwdiitgn@gmail.com) invites on behalf of President of India, online percentage rate bids from **the approved and eligible contractors of appropriate class of CPWD** for following works:-

Name of work:- **Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat**

NIT No. : 06/EE & SM (E) / IITGNPED /2026-27

Estimated Cost : Rs. 90,00,058.00

Earnest Money : Rs. 1,80,001.00

Period of completion : 3 months

Last time and date of submission of online bid Up to 15:00 Hrs. on **14.08.2026** and opening date at 15:30 Hrs. on **14.08.2026**.

The bid forms and other details can be obtained from the website www.etender.cpwd.gov.in The Press Notice is also available on (URL <https://www.eprocure.gov.in>)

Note: Bidders are advised to keep visiting the above mentioned web-sites from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updated thereof, if any. An incomplete application may be liable for rejection.

Executive Engineer & Sr. Manager (E),
IITGN Project Electrical Division,
CPWD, Gandhinagar

INFORMATION AND INSTRUCTIONS FOR BIDDER FOR e-TENDERING FORMING PART OF TENDER DOCUMENT AND TO BE POSTED ON WEBSITE

The Executive Engineer & Sr. Manager (E), IIT Gandhinagar Project Electrical Division, CPWD, IIT Gandhinagar, Palaj, Gandhinagar, Gujarat (Telephone-079-2395-2841 / email ID: pucpwdiitgn@gmail.com), invites on behalf of the President of India online **percentage rate bids** from the approved and eligible contractor of appropriate class of CPWD for the following work of:-

S. No.	NIT No.	Name of work & Location	Estimated cost put to tender	Earnest Money	Stipulated Period of Completion of work (in months)	Last date of online submission of bid, copy of receipt of deposition of original EMD and other document as specified in the bid document.	Date & time of opening of bid
1	2	3	4	5	6	7	8
1	06/EE(E) / IITGNPED /2026-27	Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat	Rs. 90,00,058.00	Rs. 1,80,001.00	3 month	14.08.2026 up to 15:00 Hrs	14.08.2026 at 15:30 Hrs

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

4. But the bid can only be submitted after deposition of original EMD either in the Office of Assistant/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 Demand Draft or Pay order or Banker's Cheque or Deposit at call Receipt or Fixed Deposit Receipt and Bank Guarantee of any Scheduled Bank towards EMD in favour of **Executive Engineer, Gandhinagar Central Division-1, Central P.W.D, Gandhinagar** as mentioned in NIT, uploading scanned copy of receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE/AE), CPWD and other documents as specified.
5. Those contractors not registered on the website mentioned above, are required to get registered beforehand. If needed, they can be imparted training on online bidding process as per details available on the website.
6. The intending bidder must have valid Class-III digital signature to submit the bid.
7. On opening date, the contractor can login and see the bid opening process. After opening of bids, he will receive the competitor bid sheets.
8. Contractor can upload documents in the form of **JPG** format and **PDF** format.
9. Contractor must ensure to quote rate above or below in percentage rate . The column meant for quoting rate in figures appears in pink colour and the moment rate is entered, it turns sky blue.
10. 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).
11. If a tenderer quotes Nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section/sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
12. SC/ST contractors enlisted under class V category are exempted from processing fee payable to ITI.
13. **The tenderer must study special conditions before submitting the bid.**
14. **No water charges have been added in the estimate hence no deduction will be made from the Bill.**
15. **GST has been included in the estimate. Contractor need to quote rates after including GST.**
16. SC/ST contractors enlisted under class V category are exempted from processing fee payable to ITI.

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

- I. Treasury Challan / Demand Draft/Pay order or Banker's Cheque /Fixed Deposit Receipts/Deposit at Call Receipt/FDR/ Bank Guarantee of any Scheduled Bank against EMD.
- II. Copy of receipt for deposition of original EMD to division office of any Executive Engineer, (including NIT issuing EE) CPWD.
- III. Enlistment Order of the CPWD Contractors in appropriate class in composite category.
- IV. Copy of Valid Electrical Contractor License
- V. 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 undertaking along with other 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”.

- VI. Letter Head indicating valid e-mail ID and Mobile No. of Firm.
- VII. Copy of Pan card
- VIII. ERP Training Certificate issued through LMS (Learning Management System) in ERP to the Contractor or his authorized representatives.
- IX. Any other document as specified in the NIT.

Note: If any of the above documents is not scanned and uploaded while submitting the bid, the bid shall become invalid and will not be entertained in e-tender process and the bid shall be summarily rejected.

**GOVERNMENT OF INDIA
NOTICE INVITING TENDER
FOR e-TENDERING**

Online percentage rate bids are invited on behalf of President of India from approved and eligible contractors of CPWD for the following work:-

Name of work:- Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat

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

- 1.1 The work is estimated to cost of **Rs. 90,00,058.00**. 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 indicates the estimated cost of each component separately. The eligibility of bidders will correspond to the combined estimated cost of different components put to bid.

- 1.2 Intending bidders is eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below:
2. Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD 7 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 **3 (Three) Months** from the date of start as defined in Schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
4. (i) The site for the work is available.
(ii) ~~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 the 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 from website www.etender.cpwd.gov.in or www.eprocure.com free of cost.

6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.
8. Earnest Money in the form of Treasury Challan or Demand Draft or Pay order or Banker's Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of **Executive Engineer, Gandhinagar Central Division-1, Central P.W.D, Gandhinagar***) 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 at **(Annexure D)** uploaded by tender inviting EE in the NIT.

The receipt shall also be uploaded to the e-tendering website by the intending bidder upto the specified bid submission date and time.

*** Executive Engineer, Gandhinagar Central Division-1, Central P.W.D, Gandhinagar is DDO for IIT Gandhinagar Project Electrical Division.**

A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 Lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any scheduled bank having validity for a period Six months or more from the last date of submission of bids **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 same should also be scanned and uploaded by the intending bidders.

This receipt of deposition of bank guarantee shall also be uploaded to the e-tendering website by the intending bidder up to the specified bid submission date and time.

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.

- (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.
- 8.A The bid submitted shall be opened at **15:30 Hrs on 14.08.2026**
9. The bid submitted shall become invalid if:
 - (i) The bidder is found ineligible.
 - (ii) **The bidder does not deposit original EMD with division office of any Executive Engineer, CPWD.**
 - (iii) The bidder does not upload all the documents (including GST registration) as stipulated in the bid document.

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

10. The contractor whose bid is accepted, will be required to furnish performance guarantee of 5%**(Five Percent)** of tendered amount or ECPT (which ever is higher) Where the tendered amount is less than eighty percent (80%) of the ECPT the PG , 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 within the period specified in Schedule F. This guarantee shall be in the form of cash (in case guarantee amount is less than Rs. 10,000/-) or Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F' including the extended period if any, the contractor shall be suspended for one year and shall not be eligible to bid for CPWD tenders from date of issue of suspension order. **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 and ensure the compliance of aforesaid provisions by the sub-contractors, if any engaged by the contractor for the said work within the period specified in Schedule F.**

11. The description of the work is as follows:

Name of work:- **Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat**

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids ~~as to the nature of the ground and sub soil (so far as is practicable)~~, the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidders 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 the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.

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 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 gazette officer in the Central Public Works Department or in the Ministry of Housing & Urban Affairs. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
16. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the previous 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 bid for the works shall remain open for acceptance for a period of **Thirty (30) days** from the date of opening bid. If any bidder withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to suspended the contractor for one year and the contractor shall not be eligible to bid for CPWD tenders from date of issue of suspension order.
18. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
 - a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - b) Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as mentioned.
19. **In case of reduction in scope of work, no claim on account of reduction in value of work, loss of expected profit, consequential overheads etc. shall be entertained.**
20. Recovery on account of labour welfare cess/ work contract Tax / Income Tax/GST/ Sur-charge ETC. shall be deducted from the bills of contractor against the amount payable to contractor for work.

Information and Instruction for Executive Engineer for e-tendering

1. The Executive Engineer of all divisions including NIT issuing division/sub-division of CPWD should receive the original EMD for tender of other division.
2. The NIT approving authority/EE at the time of issue of NIT shall also fill and upload the following prescribed format of receipt of deposition of original EMD along with NIT:-

Receipt of deposition of original EMD (Receipt No...../Dated.....)

Name of work :- Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat

- | | | |
|----|---------------------------------|---------------------------------------|
| 1. | NIT No. | : 06/EE & SM (E) / IITGNPED /2026-27. |
| 2. | Estimated Cost | : Rs. 90,00,058.00 |
| 3. | Amount of earnest money deposit | : Rs. 1,80,001.00 |
| 4. | Last date of submission of bid* | : 14.08.2026 up to 15.00 PM. |

(*To be filled by NIT approving authority/EE at the time of issue of NIT and uploaded along with NIT)

- | | |
|----|---------------------------------------|
| 1. | Name of contractor.....# |
| 2. | Form of EMD# |
| 3. | Amount of earnest money deposit.....# |
| 4. | Date of submission of EMD.....# |

Signature, Name and Designation of EMD receiving officer
(EE/AE(P)/AE/AAO) along with Office stamp
(# To be filled by EMD receiving EE)

3. The Executive Engineer receiving EMD in original form shall examine the EMD deposited by the bidder and shall issue a receipt of deposition of earnest money to the agency in a given format uploaded by tender inviting EE. The receipt may be issued by the AE(P)/AE/AAO.
4. The Executive Engineer receiving original EMD shall also intimate tender inviting Executive Engineer about deposition of EMD by the agency by mail/ fax/ telephonically.
5. The original EMD receiving Executive Engineer shall release the EMD after verification from the e-tendering portal website (<https://etender.cpwd.gov.in/tenders> free view> advance search>awarded tenders) that the particular contractor is not L-1 tenderer and work is awarded.
6. The tender inviting Assistant / Executive Engineer will call for original EMD of the L-1 tenderer from EMD receiving Executive Engineer immediately.

Executive Engineer & Sr. Manager (E)

**Form of Earnest Money Deposit
Bank Guarantee Bond**

WHEREAS, contractor..... (Name of contractor) (hereinafter called "the contractor") has submitted his tender dated (date) for the construction of (name of work) (hereinafter called "the Tender")

KNOW ALL PEOPLE by these presents that we (name of bank) having our registered office at (hereinafter called "the Bank") are bound unto **Executive Engineer, Gandhinagar Central Division-1, CPWD, Gandhinagar** in the sum of Rs. (Rs. in words) for which payment well and truly to be made to the said **Executive Engineer, Gandhinagar Central Division-1, CPWD, Gandhinagar** the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank thisday of 20.... THE CONDITIONS of this obligation are:

- (1) If after Technical Bid opening of tender; the Contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;
- (2) If the contractor having been notified of the acceptance of his tender by the **Executive Engineer, Gandhinagar Central Division-1, CPWD, Gandhinagar** .
 - (a) fails or refuses to execute the Form of Agreement in accordance with the Instructions to contractor, if required;

OR

- (b) fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and Instructions to contractor,

We undertake to pay to the **Executive Engineer, Gandhinagar Central Division-1, CPWD, Gandhinagar** either up to the above amount or part thereof upon receipt of his first written demand, without **Executive Engineer, Gandhinagar Central Division-1, CPWD, Gandhinagar** having to substantiate his demand, provided that in his demand the **Executive Engineer, Gandhinagar Central Division-1, CPWD, Gandhinagar** will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date* after the deadline for submission of tender as such deadline is stated in the Instructions to contractor or as it may be extended by the **Executive Engineer, Gandhinagar Central Division-1, CPWD, Gandhinagar** notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE

SIGNATURE OF THE BANK

WITNESS

SEAL

(SIGNATURE, NAME AND ADDRESS)

*Date to be worked out on the basis of validity period of 6 months from last date of receipt of tender

UNDERTAKING REGARDING GST REGISTRATION IN THE STATE OF GUJARAT

To,

The Executive Engineer & Sr. Manager (E),
IIT Gandhinagar Project Electrical Division, CPWD
IIT Gandhinagar, Palaj
Gandhinagar, Gujarat

Name of work : Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat

Sir,

Having examined the details given in bid document for the above work, I/we hereby submit the following:

“If work is awarded to me, I/we shall obtain GST registration Certificate in the state of Gujarat, 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 a/c of the work executed and/or for any action taken by CPWD or GST department in this regard.”

Seal of bidder:

Date of submission:

Signature(s) of Bidder(s)

14
CPWD-7
GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT

STATE : Gujarat
BRANCH : Civil
ZONE : PRM

CIRCLE : IIT Gandhinagar Project Circle
DIVISION : IIT G'nagar Project Elect. Div.
SUB-DIVN : IIT G'nagar Project Elect.Sub-Div.-1

Percentage Rate Tender & Contract for Works

Percentage Rate Tender for the work of:-

“Name of work:- Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat

(i) To be submitted/uploaded by 15.00 Hrs on **14.08.2026** to Executive Engineer & Sr. Manager (E), **IIT Gandhinagar Project Electrical Division, C.P.W.D., Gandhinagar (Gujarat)** by uploading at www.etender.cpwd.gov.in

(ii) To be downloaded (opened) in presence of tenderers who may be present at 15:30 Hrs on **14.08.2026** in the office of Executive Engineer and Senior Manager(E), IIT Gandhinagar Project Electrical Division, C.P.W.D., IITGN Campus, Palaj, Gandhinagar(Gujarat)-382355.

T E N D E R

I/We have read and examined the notice inviting tender, schedule, A, B, C, D, E & F, Specification applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

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 in all respect with the specifications, designs, drawing 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 respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for **Thirty(30) days** from the due date of its opening in case of single bid system / ~~Ninety(90) days from the date of opening of technical bid in case tenders are invited on 2 bid/envelop system/ One hundred twenty(120) days from the date of opening of technical bid in case bids are invited on 3 bid/envelop system for specialized work (strike out as the case may be) and not to make any modification in its terms and conditions.~~

A sum of **Rs. 1,80,001.00** is hereby forwarded in cash/receipt treasury challan /deposit at call receipt of a scheduled bank/fixed deposit receipt of scheduled bank/demand draft of a scheduled bank/bank guarantee issued by a scheduled bank as earnest money.

A copy of earnest money in receipt treasury challan /deposit at call receipt of a scheduled bank/fixed deposit receipt of scheduled bank/demand draft of a scheduled bank/bank guarantee issued by a scheduled bank is scanned and uploaded **(strike out as the case may be)**. If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, in office

shall without prejudice to any other right or remedy, be at liberty to suspend the undersigned for one year and the undersigned shall not be eligible to bid for CPWD tenders from date of issue of suspension order. Further, if I/We fail to commence work as specified, I/We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-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 start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

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

Dated

Signature of Contractor

Witness:

Postal Address

Address:

Occupation:

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 _____ only.)

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

a)

b)

c)

Dated:

For & on behalf of the President of India.

Signature

Designation

PROFORMA OF SCHEDULES**SCHEDULE 'A'**

Schedule of quantities (asperPWD.3)

As per enclosed SOQ.

<u>SCHEDULE 'D'</u> Extra schedule for specific requirements/ document for the work, if any.	NIL
<u>SCHEDULE 'E'</u> Reference to General Conditions of contract.	General Conditions of Contract for Central PWD Works 2023 for Maintenance work incorporating amendments up to previous day of the last date of submission of tender.
Name of Work	Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat
Estimated cost of work	Rs. 90,00,058.00
Earnest money	Rs. 1,80,001.00
Performance guarantee	5% of tendered amount or ECPT (which ever is higher) Where the tendered amount is less than eighty percent (80%) of the ECPT the PG , 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. PG shall remain valid for a minimum period of six months beyond the date of completion of all contractual obligations as per GCC.
Security deposit	2.5% of tendered value
<u>SCHEDULE 'F'</u> GENERAL RULES & DIRECTIONS:	
Officer inviting tender	Executive Engineer & Sr. Manager (E), IIT Gandhinagar Project Electrical Division, CPWD, Palaj, Gandhinagar.
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 &12.3:	As per relevant clause below.
Definitions:	
2(v) Engineer-in-Charge	Executive Engineer & Sr. Manager (E), IIT Gandhinagar Project Electrical Division, CPWD, Palaj, Gandhinagar.

2(viii) Accepting Authority	Competent Authority as per delegated Financial powers of CPWD.
2(x) Percentage on cost of materials and labour to cover all overheads and profits:	15%
2(xi) Standard Schedule of Rates	DSR 2025 E&M with up to date correction slips up-to Last date of submission of bid and market rates.
2(xii) Department)	Central Public Works Department.
9(ii) Standard CPWD Contract Form	General Conditions of Contract for Central PWD Works 2023 for maintenance work incorporating amendments up to previous day of the last date of submission of tender.
<u>Clause 1</u>	
(i) Time allowed for submission of performance guarantee, program 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.	7 days
(ii) Maximum allowable extension with late fee at 0.1% per day of performance guarantee amount beyond the period provided in (i) above	3 days
<u>Clause 2</u>	
Authority for fixing compensation under clause 2	Superintending Engineer and Project Director, IIT Gandhinagar Project Circle, CPWD, Palaj, Gandhinagar / or his successor.
<u>Clause 2A</u>	
Whether Clause 2A shall be applicable	No
<u>Clause 5</u>	
Number of days from the date of issue of letter of acceptance for reckoning date of start.	10 days
Mile stone(s) as per table given below:- Not Applicable	
Time allowed for execution of work	3 Months
<u>Authority to decide:</u>	
(i) Extension of time	EE and SM (E), IITGNPED, CPWD, Gandhinagar
(ii) Rescheduling of mile stones	SE and PD, IITGNPC, CPWD, Gandhinagar
(iii) Shifting of date of start in case of delay in handing over of site	SE and PD, IITGNPC, CPWD, Gandhinagar
Schedule of handing over of site	

Part	Portion of Site	Description	Time Period for handing over reckoned from date of issue of letter of intent
Part A	Portion without any Hindrance	-	10 days
Part B	Portions with Encumbrances	-	Not applicable
Part C	Portions dependent on work of other agencies	-	Not applicable
<u>Clause 5.2</u> Nature of Hindrance register (either Physical or Electronic)		Physical	
<u>Clause 7</u> Gross work to be done together with net payment / adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment.		Rs. 15.00 lakh or reasonable part thereof to facilitate progress of the work.	
<u>Clause 7A</u> Whether Clause 7A shall be applicable		Yes	
<u>Clause 10A</u> List of testing equipment		Not Applicable	
<u>Clause 10B (i) & (ii)</u> Whether Clause 10 B(i) & (ii) shall be applicable		Not Applicable	
<u>Clause10C</u> Component of labour expressed as percent of value of work		100% (excluding 15% contractor profit and overheads).	
<u>Clause10CA</u>		Not Applicable	
<u>Clause10CC</u>		Not Applicable	

<u>Clause 11</u>	
Specifications to be followed for execution of work	CPWD Specification Part-I Internal - 2023 , 2023 (Amendments) Part-II External - 2023 Heating, Ventilation & Air-Conditioning (HVAC) 2024 Amended up to date
<u>Clause 12</u>	Applicable as per DG/CON/Construction 2023/03 dated 06/12/2023. The completion cost shall, in no case, exceed 1.5 times the contract amount. Contractor will devise a system to keep a watch on quantum of work taken up vis-a-vis balance items required to complete defined scope of work and will give the alerts to Engineer-In-Charge before taking up extra item(s), deviation(s) so that completion cost does not exceed above limit. Work executed beyond above limit will neither be recorded nor be paid.
Type of work	Maintenance work
12.2. & 12.3 Deviation limit beyond which clauses 12.2 & 12.3 shall apply for building work	unlimited
<u>Clause 16</u>	
Competent authority for deciding reduced rates.	Superintending Engineer and Project Director, IIT Gandhinagar Project Circle, CPWD, Palaj, Gandhinagar/ or his successor.
<u>Clause 18</u>	
List of machinery, tools & plants to be deployed by the contractor at site:-	Not applicable.
<u>Clause 19C, 19D, 19G, 19K</u> <u>Authority to decide penalty for each default</u>	EE and SM(E), IITGNPED, CPWD, Gandhinagar
<u>Clause 25</u>	
Constitution of Dispute Redressal Committee (DRC)	Competent authority to appoint DRC
DRC shall constitute one chairman and two members	Special Director General (PR), Mumbai/ Additional Director General (Mumbai) or successor.
Place of arbitration	Gandhinagar.
<u>Clause 32:</u>	
Requirement of technical representative(s) and recovery rate	Not applicable.
<u>Clause- 38</u>	Not Applicable

INTEGRITY PACT

To,

.....

.....

.....

Sub: NIT No. for the work

Dear Sir,

It is here by declared that CPWD is committed to follow the principle of transparency, equity and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer /bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the CPWD.

Yours faithfully

`Executive Engineer & Sr. Manager (E)

INTEGRITY PACT

To,

Executive Engineer,

.....

.....

Sub: Submission of Tender for the work of.

Dear Sir,

I/We acknowledge that CPWD is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/bid document.

I/We agree that the Notice Inviting Tender (NIT) is an invitation to offer made on the condition that I/We will sign the enclosed integrity Agreement, which is an integral part of tender documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that THE MAKING OF THE BID SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE of this condition of the NIT.

I/We confirm acceptance and compliance with the Integrity Agreement in letter and spirit and further agree that execution of the said Integrity Agreement shall be separate and distinct from the main contract, which will come into existence when tender/bid is finally accepted by CPWD. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the line with Article 1 of the enclosed Integrity Agreement.

I/We acknowledge that in the event of my/our failure to sign and accept the Integrity Agreement, while submitting the tender/bid, CPWD shall have unqualified, absolute and unfettered right to disqualify the tenderer/bidder and reject the tender/bid in accordance with terms and conditions of the tender/ bid.

Yours faithfully

(Duly authorized signatory of the Bidder)

To be signed by the bidder and same signatory competent / authorized to sign the relevant contract on behalf of CPWD.

INTEGRITY AGREEMENT

This Integrity Agreement is made at..... on this day of..... 20

BETWEEN

President of India represented through Executive Engineer,

(Name of Division)

CPWD, , (Hereinafter referred as the

(Address of Division)

‘Principal/Owner’, which expression shall unless repugnant to the meaning or context here of include its successors and permitted assigns)

AND

(Name and Address of the Individual/firm/Company)

through (Hereinafter referred to as the (Details of duly authorized signatory) **“Bidder/Contractor”** and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal / Owner has floated the Tender (NIT No)

(hereinafter referred to as “Tender/Bid”) and intends to award, under laid down organizational procedure, contract for (Name of work) hereinafter referred to as the “Contract”.

AND WHEREAS the Principal/Owner values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relation with its Bidder(s) and Contractor(s).

AND WHEREAS to meet the purpose aforesaid both the parties have agreed to enter into this Integrity Agreement (hereinafter referred to as “Integrity Pact” or “Pact”), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Bid documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this Pact witnesses as under:

Article 1: Commitment of the Principal/Owner

(1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

- a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

- b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
 - c) The Principal/Owner shall endeavor to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- (2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

Article 2: Commitment of the Bidder(s)/Contractor(s)

1. It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
2. The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
 - a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
 - b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
 - c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
 - d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participate in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
 - e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.

3. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
4. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.
5. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

Article 3: Consequences of Breach

Without prejudice to any rights that may be available to the Principal/Owner under law or the Contract or its established policies and laid down procedures, the Principal/Owner shall have the following rights in case of breach of this Integrity Pact by the Bidder(s)/Contractor(s) and the Bidder/ Contractor accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

1. If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.
2. Forfeiture of EMD/Performance Guarantee/Security Deposit: If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.
3. Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.

3. If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

Article 5: Equal Treatment of all Bidders/Contractors/Subcontractors

1. The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Bidder/Contractor shall be responsible for any violation(s) of the principles laid down in this agreement/Pact by any of its Subcontractors/sub-vendors.
2. The Principal/Owner will enter into Pacts on identical terms as this one with all Bidders and Contractors.
3. The Principal/Owner will disqualify Bidders, who do not submit, the duly signed Pact between the Principal/ Owner and the bidder, along with the Tender or violate its provisions at any stage of the Tender process, from the Tender process.

Article 6- Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the Competent Authority, CPWD.

Article 7- Other Provisions

1. This Pact is subject to Indian Law, place of performance and jurisdiction is the Head quarters of the Division of the Principal/Owner, who has floated the Tender.
2. Changes and supplements need to be made in writing. Side agreements have not been made.
3. If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
4. Should one or several provisions of this Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
5. It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.

Article 8- LEGAL AND PRIOR RIGHTS

All rights and remedies of the parties hereto shall be in addition to all the other legal rights and remedies belonging to such parties under the Contract and/or law and the same shall be deemed to be cumulative and not alternative to such legal rights and remedies aforesaid. For the sake of brevity, both the Parties agree that this Integrity Pact will have precedence over the Tender/Contact documents with regard any of the provisions covered under this Integrity Pact.

IN WITNESS WHEREOF the parties have signed and executed this Integrity Pact at the place and date first above mentioned in the presence of following witnesses:

(For and on behalf of Principal/Owner)

(For and on behalf of Bidder/Contractor)

WITNESSES:

1.....

(signature, name and address)

2.....

(signature, name and address)

Place:

Dated :

Part- B

GENERAL TERMS AND CONDITIONS

1. The work shall be generally carried out in accordance with tender specifications and the following specifications /rules with up to date amendments.
 - i. CPWD General specifications for Electrical work Part-I(Internal)-2023
 - ii. CPWD General Specifications for Electrical work Part-II(External)-2023
 - iii. CPWD General Specifications for Electrical work Part-IV(Substation)-2013
 - iv. CPWD General Specifications Part-VII(D.G Sets)-2013
 - v. CPWD General Specifications Wet Riser and Sprinkler System Part V-2020,
 - vi. CPWD General Specifications Fire Detection and Alarm System Part VI-2018
 - vii. CPWD General Specifications Heating, Ventilation & Air-Conditioning(HVAC)-2024 all above modified & corrected up to last date of receipt of tender
 - viii. Commercial and Additional conditions for this work.
 - ix. The Indian Electricity Act, 2003, as amended up to date.
 - x. Indian Electricity Rules 1956 amended up to date.
 - xi. Local Fire Regulations, National Electrical Code 2011 amended up to date and relevant sections of relevant IS codes of latest edition and CPWD special publications available on CPWD website. (Note: The higher specifications/ stringent conditions of CPWD specifications or NBC-2018 shall be followed). Relevant BIS standards as modified up to date.
2. Interpreting Specifications:
In the case of discrepancy between the Schedule of Quantities, the Specifications and / or the Drawings, the following order of preference shall be observed:-
 - i. Description of Schedule of Quantities.
 - ii. Particular Technical Specification and Special Condition, if any.
 - iii. Commercial and Additional conditions or this work.
 - iv. Drawings.
 - v. CPWD Specifications
 - vi. Indian Standard Specifications of B.I.S. OR other International codes in case IS code is not available.

However, nothing extra shall be paid on account of these, as the same are to be read along with schedule of quantities for the work.
3. If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document and his decision shall be final and binding on the contractor.

Any error in description, quantity or rate in Schedule of Quantities or any omission therefrom shall not vitiate the Contractor release the Contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.
4. 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.

General Information for Electrical Works

Note: Electrical work or E&M works have been interchangeably used. They mean the same thing.

Name of work: Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat.

Package C1 to C2

The **NFSU, at Gandhinagar** is to be provided with VRF Air conditioning system basement of Firing range in Ballistic building along with through this tender. This E&M works comprising of packages C1 to C2 deals with Electrical and Mechanical Services as below.

Package C1: Internal Electrical installation & LT panels, cables etc. This package covers internal electrical wiring and replacement of main LT panel, SITC of HVAC and UPS Panel with necessary aluminium conductor armoured cables and etc.

Package C2: VRF Air conditioning system- The scope of work includes SITC of VRF system— Indoor AHU & Outdoor units, Ducting work, control wiring with allied copper refrigerant piping and drain piping with power points, Outdoor power supply panel & copper cables etc.

Structure of the tender document:

The E&M works have been sub-divided into following packages

Package C1: Internal Electrical installation & LT panels, cables etc

Package C2: VRF Air conditioning system

ADDITIONAL CONDITIONS (GENERAL) FOR ALL E&M PACKAGES

Unless otherwise specified following specifications shall be followed for the E&M works:

- i) CPWD General Specifications for Electrical Works Part I Internal–2023, amended up to date.
- ii) CPWD General Specifications for Electrical Works Part II External–2023, amended up to date.
- iii) CPWD General Specifications for Electrical Works Part IV Substations–2013, amended up to date.
- iv) CPWD General Specifications for Electrical Works Heating, Ventilation & Air-Conditioning (HVAC) – 2024 , amended up to date.
- v) Any additional item of work, if taken up subsequently, shall also confirm to the relevant CPWD specifications mentioned above.

Should there be any difference or discrepancy between the description of items as given in the schedule of quantities, particular specifications for individual items of work (including special conditions) and I.S. Codes etc., the following order of preference shall be observed :

- i. Description of items as given in Schedule of Quantities.
- ii. Particular Technical Specification and Special Condition, if any.
- iii. Commercial and Additional conditions of this work.
- iv. CPWD Specifications and with up to date corrections as on last date of submission of Bid
- v. Drawings.
- vi. Indian Standard Specifications of B.I.S. OR other International code in case IS code is not available.
- vii. Manufacturer catalogue & specifications
- viii. National Building Code 2016
- ix. Sound Engineering practices.
- x. Decision of Engineer-in-charge
- xi. Site information

Taxes and duties

- i) The work shall be treated on indivisible works contract basis and the rates tendered shall be for complete items of works inclusive of all taxes, GST, duties, and levies etc. and all charges for items contingent to the work, such as packing, forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site i/c temporary constructional storage, risk, overhead charges, general liabilities/ obligations etc.
- ii) All Statutory deductions as applicable rates will be made from the Contractors bill.

INSPECTION OF SITE

The Contractors are advised to inspect and examine the site and its surroundings and satisfy themselves with the nature of site, the means of access to the site, the constraints of space for stacking material/machinery, labour etc. Constraints put by local regulations if any, weather conditions at site,

General ground/subsoil conditions etc. or any other circumstances which may affect or influence their tenders. The site is available for work. The contractor shall, immediately on issue of letter of acceptance of tender, make arrangements for starting the work.

The nomenclature of the item given in the schedule of quantities gives in general the work content but is not exhaustive i.e. does not mention all the incidental works required to be carried out for complete execution of the item of work. The work shall be carried out, alliance cordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and / or described in the specifications, provided that the same can be reasonably inferred there from. There may be several incidental works, which are not mentioned in the nomenclature of each item but will be necessary to complete the item in all respect. All these incidental works/ costs which are not mentioned in item nomenclature but are necessary to complete the item shall be deemed to have been included in the rates quoted by the contractor for various items in the schedule of quantities. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation/change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such items in all respects) on account of the directions of Engineer-in-Charge. Nothing extra shall be payable on this account.

Unless otherwise provided in the Schedule of Quantities, the rates quoted by the Contractor shall be inclusive of carrying out the work sat and / or up to all heights, lifts, leads and depths. The contractor shall make all arrangements for the same. Nothing extra shall be payable on this account.

All ancillary and incidental facilities required for execution of work like labour camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp, temporary structure for plants and machineries, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates, completion certificates from local bodies etc., protection works, barricading, testing facilities / laboratory at site of work, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary(for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts.

INTEGRATED PROGRAMME CHART

The Contractor shall prepare and submit to the Engineer-in-charge, an integrated programme chart. The integrated programme chart submitted by the contractor shall not have any discrepancy with the financial milestones attached in the contract agreement. The contractor shall execute the work according to the programme submitted to and approved by the Engineer-in-Charge.

INTEGRATED SERVICE DRAWINGS

Before taking up the work, the contractor shall prepare integrated drawings for various civil and electrical works showing details of lay out plan including sectional elevations and submit the same for the approval of Engineer-in-Charge. Integrated drawings shall be prepared and submitted by the Contractor as per local Byelaws and as per the site conditions to facilitate convenient installation as well as maintenance. Nothing extra shall be payable on this account.

PROCEDURE FOR APPROVAL OF MATERIALS, SHOP FLOOR DRAWINGS AND COMMENCEMENT OF WORK

Within prescribed time period as per the mile stone the contractor shall visit the site and submit following documents for approval. List of makes & Model numbers of all items of equipments and accessories for Packages C1 to C2.

Catalogues of the equipments to be supplied. along with design details, technical specification, certifications etc. as required for each product.

- iii) Shop floor drawings of each packages shall be submitted separately for approval. It is the responsibility of the tenderer to get the makes, models and shop floor drawings approved by the department. The makes and models offered should be as per the specification and BOQ of the NIT. The decision of Engineer-in –charge is final in this regard. The materials can be brought to site only after the due approval of drawings, makes, models from the department.

SUPERVISION OF WORK:

The Contractor shall depute Site Engineers & skilled workers as required for the work. He shall submit organization chart along with details of Engineers and supervisory staff. It shall be ensured that all decision making powers shall be available to the representatives of the Contractor at site (NFSU, Gandhinagar) itself to avoid any likely delays on this account. The Contractor shall also furnish list of persons for specialized works to be executed for various items of work. The Contractor shall identify and deploy key persons having qualifications and experience in the similar and other major works, as per the field of their expertise. If during the course of execution of work, the Engineer-in-Charge is of the opinion that the deployed staff is not sufficient or not well experienced; the Contractor shall deploy more staff or better-experienced staff at site to complete the work with quality and in stipulated time limit

SPECIALISED AGENCIES:

The main Contractor has to associate approved specialized agencies for the E&M components Packages C2, as listed in “Information and instructions for contractors for e-Tendering” of NIT.

The contractor shall ensure that the all the specialized agencies under him shall fulfill all the conditions of previous clause (Supervision of work)for the entire period of the contract.

PROTECTIVE/SAFETYMEASURES:

Necessary protective and safety equipments shall be provided to the Site Engineer, workers& Supervisory staff by the Contractor at his own cost for use at site.

DISPLAYPERMISSIONS:

The Contractor shall display all permissions, licenses, registration certificates, bar charts, other statements etc under various labour laws and other regulations applicable to the works, at his site office.

TOOLS AND PLANTS:

No tools and plants including any special T&P etc. shall be supplied by the Department and the Contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.

The Contractor shall maintain all the work in good condition till the completion of entire work. The Contractor shall be responsible for and shall make good, all damages and repairs, rendered necessary due to fire, rain, traffic, floods or any other causes. The Engineer-in-Charge shall not be responsible for any claims for injuries to person/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the Contractor or of any other of his representatives, in his employment during the execution of the work. The compensation, if any, shall be paid directly to the Department / authority / persons concerned, by the Contractor at his own cost.

For completing the work in time, the Contractor might be required to work in two or more shifts (including night shifts). No claim whatsoever shall be entertained on this account, not with-standing the fact that the Contractor may have to pay extra amounts for any reason, to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the Contractor with them.

SUBMISSION OF AS-BUILT DRAWINGS:

The Contractor shall submit 3 sets of “AS BUILT” drawings, for all packages (laminated hard copies + soft copy) on completion of the work& test certificates, warranty certificates failing which Rs. 50,000/- shall be deducted from the final bill.

DEFECT LIABILITY PERIOD

The defect liability/ free maintenance period shall be 12 months after the date of completion of work of this contract agreement.

DEALING WITH INCONSISTENT RATES:

There are certain items of work which are appearing in Schedule of Quantities of more than one package like laying of conduits, cable laying etc. The Contractors shall quote the same rates for the identical items which appear in more than one place. If different rates are quoted by the tenderers for such identical items, the same shall be rationalized by considering the lowest quoted rate for such items, for evaluation and acceptance of tender.

COMMERCIAL AND ADDITIONAL CONDITIONS

1. This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory work, assembly and installation, commissioning putting in to operation of equipment of all **VRF Airconditioning System** components of the tender and final testing.
2. The Tenderer may, before submission of the tender, must study various CPWD specifications; get themselves acquainted with site and site conditions. The department shall not bear responsibility for the lack of knowledge and also the consequences thereof to the Contractor. The information and data showing the drawings and mentioned in the tender document have been furnished in good faith and for general information and guidance only. The Engineer-in-Charge in no case shall be held responsible for the accuracy thereof and/or interpretations or conclusions drawn therefrom by the Contractor and all consequences shall be borne by the Contractor and no claim, whatsoever, shall be entertained from the Contractor, if the data or information furnished in tender document is different from data / drawing for actual construction issued after the award of work or incorrect otherwise. It is presumed that the Contractor has satisfied himself for all possible contingencies, situations, bottlenecks and acts of coordination, which may be required between different agencies.
3. Before commencing the work, the Contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property. Nothing extra shall be payable on this account.
4. There is space constraint for providing new HVAC equipments. The entire process is to be planned in such a way that no interruption shall be caused to existing office working. The work will be carried out with least disturbance during shifting and shut down taken in consultation with the client department as the work is to be executed in an operational office campus with Hostel.
5. **The dismantling of existing HVAC equipments is to be carried out in such a manner to avoid any damage to the office Building and minimum disturbances. The agency shall keep record of dismantled equipments and shall be handed over with gate pass duly signed by JE/AE. The dismantled materials shall be handed over on 'As is where is Basis'**
6. **INSPECTION OF SITE**
The Contractors should in his own interest visit the site, inspect and examine the site and its surroundings, get familiarized with the site conditions before tendering and satisfy themselves with the nature of site, the means of access to the site, the constraints of space for stacking material / machinery, labour etc., constraints put by local regulations, if any, weather conditions at site, general ground / subsoil

conditions etc. or any other circumstances which may affect or influence their tenders. The site is available for work. The contractor shall, immediately on issue of letter of acceptance of tender, make arrangements for starting the work.

7. 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, Labour Cess etc. shall be done as applicable on the gross payments and net payment shall be paid accordingly.

8. RATES

The rates quoted by the tenderer, shall for complete items of works, firm and inclusive of all taxes (including GST, labour cess etc.) duties and levies, all charges for items contingent to the work such as for packing, forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site including temporary construction of storage, equipment required for temporary power connections, risks, overhead charges, general liabilities/obligations and clearance from CEA, local power supply company, local bodies, Fire authorities. However, the statutory fees for the inspections/approvals/NOC from CEA, local power supply company, Fire authorities shall be reimbursed by the department on submission of receipt of payment.

All tools /tackles/cranes/hydra required for lifting, lowering and positioning of existing as well as new equipment- VRF outdoor units, indoor units, LT panels/feeders, lowering of dismantled equipments etc is included in the scope of work. Nothing extra shall be payable on this account.

9. The contractor shall obtain an undertaking from the Original Equipment Manufacturer (OEM) regarding:-
 - a. Authorization certificate.
 - b. Technical Support Commitment :- The OEM shall provide unconditional technical support to the contractor throughout the execution of the project and during the maintenance period for the system's useful life.
 - c. Availability of the Spares :- The OEM shall ensure the availability of all necessary spare parts for healthy functioning of the equipment for a minimum of seven years from the date of supply of equipment.
10. Unless otherwise provided in the Schedule of Quantities, the rates quoted by the Contractor shall be inclusive of carrying out the works at and/or up to all heights, lifts, leads and depths. The contractor shall make all arrangements for the same. Nothing extra shall be payable on this account.

The tenderers shall take into account the element of wastage(s) those are likely to be there in all elements of the work and quote his price, taking that into account. The tenderers shall study all the items from the point of view of wastage(s), which are likely to take place as the work is to be executed in a working Institute office building. Nothing extra shall be payable on this account.

11. Mobilization advance: No Mobilization advance shall be paid for this work

11. Insurance and Storage:

All consignments are to be duly insured up to the destination from warehouse at the cost of the contractor. The insurance covers shall be valid till the equipment is handed over duly installed, tested and commissioned.

12. The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material or work beyond set out tolerance limits shall be summarily rejected by the Engineer-in-charge.

The work is to be carried out in workman like manner and generally in accordance with the plans. However the contractor will be bound to carry out the work with minor deviation over the plan supplied if desired by the Engineer-in-Charge of the work.

All ancillary and incidental facilities required for execution of work like labour camp, stores fabrication yard, watch and ward, temporary ramp, temporary structure for plants and machineries, installation and consumption charges of temporary electricity, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates/clearances, completion certificates from local bodies etc., protection works, barricading, facilities for all field tests and for taking samples etc. during execution or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor, for various items in the schedule of quantities. Nothing extra shall be payable on these accounts. All incidental charges of any kind including cartage, storage, wastage and safe custody of material etc. shall be the sole responsibility of the Contractor & shall be borne by him and no claim whatsoever shall be entertained on this account.

The contractor shall give due notices to Municipality/Corporation, Police and/or other authorities that may be required under the laws/rules under force and obtain all requisite permissions/licenses for temporary obstructions/enclosures and pay all charges which may be livable on account of his execution of the work under the agreement. Nothing extra shall be payable on this account.

13. The Contractor shall prepare the programme chart for the execution of the work showing clearly all activities from the start of work to the completion, with details of requirements of materials, man power, equipment and machinery deployment, required for the completion of the work within the stipulated period and submit the same to the Engineer-in-Charge, as prescribed, after award of work. The Contractor shall also submit monthly programme and progress reports and update/re-schedule the same every month. These shall be submitted by the contractor in soft copy also besides forwarding hard copy of the same.

14. The contractor shall coordinate with local bodies/licensing authorities/supply company etc for getting approvals/clearances and shall submit necessary documents required for the same. No extra payment shall be made for the same. However

statutory charges for such approvals/clearances shall be reimbursed by the department.

15. **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.

16. **STORAGE AND CUSTODY OF MATERIALS**

The agency has to make his own arrangements for storage of materials. The contractor shall be responsible for the safe custody of the electrical installation in the building, including fitting, fixtures and equipment till the installations handed over to the client/department. No storage accommodation shall be provided by the department. He should make his own arrangement for proper watch and ward, safe custody of the site/property/material provided by him and materials issued by the department against pilferage and breakage during the period of execution and thereafter till the work is completed and physically handed over to the client/department at his risk and cost. No claim will be entertained on this account.

17. **CARE OF THE BUILDING:**

Care shall be taken by the contractor while handling and installing the various equipment and components of the work to avoid damage to the building/existing equipment. 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.

The contractor or his representative, labour should not remove/disturb/dislocate the existing equipment and its parts from its positions until and unless it is authorized by the Engineer-in-charge. Care shall be taken not to damage the Civil/Electrical installation by improper handling etc. The contractor shall be responsible for any damage on account of negligence of the contractor's staff, the same will have to be made good at contractor's own cost. He shall also remove at his cost all unwanted and waste materials arising out of the maintenance from the site of work. Nothing extra shall be paid on this account..

18. **INTEGRATED PROGRAMME CHART**

The Contractor shall prepare and submit to the Engineer-in-Charge, an integrated programme chart. The integrated programme chart shall show clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the programme within the stipulated period or earlier, and submit the same for approval to the Engineer-in-Charge.

The integrated programme chart submitted by the contractor shall not have any discrepancy with the milestones attached in the contract agreement. The contractor shall execute the work according to the programme submitted to and approved by the Engineer-in-Charge.

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

19. INTEGRATED SERVICE DRAWINGS

Before taking up the work, the contractor shall prepare floor-wise AutoCAD integrated drawings for various electrical works/services showing details of layout plan and submit the same for the approval of the Engineer-in-Charge.

Integrated drawings shall be prepared and submitted by the contractor as per local bye-laws and as per site conditions, to facilitate convenient installation as well as maintenance.

Nothing extra shall be payable on this account.

20. APPROVAL OF MATERIALS, SHOP FLOOR DRAWINGS AND COMMENCEMENT OF WORK

The design layout plans/drawings/other documents pertaining to E&M services shall have to be submitted for approval and got checked within the time period specified in the table of milestones. After award of work, the contractor shall visit the site and submit the following documents for approval as per the specified timeline:

1. List of makes & model numbers of all items/equipment and accessories offered for all packages.
2. Catalogues of equipment to be supplied — detailed technical literature, drawings, specifications, pamphlets, and performance data for appraisal and evaluation.
3. Shop floor drawings of each package separately for approval. *(It is the tenderer's responsibility to get makes, models, and shop floor drawings approved by the department.)*
4. All general arrangement drawings.
5. Any other drawing/information not specifically mentioned above but deemed necessary for the job by the contractor.

Material Equivalence: All materials equivalent to the one specified should be got approved by the Engineer-in-Charge before use in the work.

Approval Process: The Engineer-in-Charge shall scrutinize the proposal and approve makes/models acceptable as per the schedule, specifications, and conditions of the agreement, and inform the agency for procurement. After approval, the agency shall procure the equipment/materials from the OEM/authorized distributor/dealer, as applicable.

Quality Assurance — the firm shall ensure:

- i) Material is ordered and delivered at site only with prior approval of the department, to ensure timely delivery.
- ii) Material is procured directly from the manufacturer/authorized dealers to ensure genuineness & quality, as per approved makes only. Proof shall be submitted if required by the department.

Manufacturing Date: Year of manufacturing of all equipment — VRF system/fittings/cables — shall be current or not more than 6 months old.

Manuals & Documentation: The successful tenderer shall furnish, well in advance, three copies (in triplicate) of detailed manufacturer instructions and manuals for all items/equipment covering:

- Installation, adjustment, operation, and maintenance
- Preventive maintenance and troubleshooting
- Relevant data sheets, spare parts catalogue, and workshop procedures for repair, assembly, and adjustment

21. **SUPERVISION OF WORK**

Since the work is a prestigious project where quality is paramount:

- The contractor shall depute Site Engineers and well-experienced skilled workers, and deploy modern T&P and other equipment.
- Details of Engineers and supervisory staff shall be submitted.
- All decision-making powers shall be available to the contractor's site representatives, to avoid delays.
- A list of persons for specialized works shall be furnished.
- Key personnel with relevant qualifications and experience shall be identified and deployed as per their field of expertise.
- If the Engineer-in-Charge finds deployed staff insufficient or inexperienced, the contractor shall deploy more/better-experienced staff to maintain quality and schedule.

Licensing: All skilled persons/supervisors executing electrical work must possess required licenses issued by approved authorities — otherwise they will not be permitted to work. Consequences of non-compliance are the contractor's sole responsibility.

Site Order Book: The contractor or authorized representative shall sign the site order book and comply with remarks entered by the Department's representative.

22. **SPECIALISED AGENCIES**

- The main contractor must approved specialized agencies for specialized E&M components as listed in the tender documents, per CPWD manual provisions (as amended).
- The contractor shall ensure all specialized agencies under him fulfill all NIT conditions for the entire contract period.

23. **PROTECTIVE/SAFETY MEASURES**

- Necessary protective/safety equipment shall be provided by the contractor, at his own cost, to Site Engineers, workers, and supervisory staff, and used at site.
- The contractor shall arrange for his workmen's safety at his own cost; the Department bears no responsibility for accidents during work.
- Safety precautions shall include caution boards (day/night), speed limit boards, red flags, red lights, barriers, and other necessary measures. The contractor is responsible for damages/accidents due to his negligence.
- No hindrance shall be caused to traffic/general office working during execution.
- In case of accidents to labour/contractual staff, entire responsibility (including any compensation payable) rests with the contractor; the Department has no role in this.

24. **DISPLAY PERMISSIONS**

The contractor shall display, at his site office, all permissions, licenses, registration certificates, bar charts, and other statements required under various labour laws and applicable regulations.

25. **INDEMNITY**

- The successful tenderer shall at all times indemnify the Department in connection with this works contract.
- The tenderer shall be liable, per Indian Law and Regulations, for any accident occurring due to any cause; the Department shall not be responsible for accidents/damage/claims arising during erection, construction, and commissioning — to the extent the tenderer is responsible.
- The tenderer shall provide all insurance, including third-party insurance, as necessary to cover the risk.
- **No extra payment shall be made on this account.**

26. **COOPERATION WITH OTHER AGENCIES**

- The successful tenderer shall coordinate with other contractors/agencies engaged in construction and freely exchange technical information for smooth execution.
- No remuneration shall be claimed from the Department for such cooperation.
- If unreasonable hindrance is caused to other agencies (requiring dismantling/re-doing of completed work) due to lack of cooperation/coordination by the tenderer, the resulting expenditure will be recovered from the tenderer — unless he himself undertakes the restoration to original condition/specification.

27. **COMPLIANCE WITH REGULATIONS AND INDIAN STANDARDS**

All works shall be carried out per relevant statutory regulations and applicable Indian Standards, including compliance with:

- Factories Act
- Indian Electricity Rules
- I.S. & B.S. Standards, as applicable
- Workmen's Compensation Act
- Statutory norms of local bodies (CEA, Power Supply Company, fire authorities, etc.)
- Safety Codes & Statutory Regulations

Nothing in this specification relieves the tenderer of responsibility for design, manufacture, and installation in accordance with applicable statutory regulations and safety codes.

28. **Labour Safety:**

- The contractor, at his own expense, shall arrange safety provisions per statutory provisions, BIS recommendations, Factories Act, Workmen's Compensation Act, CPWD code, and instructions issued from time to time.
- Failure to provide safety requirements makes the tenderer liable for a penalty of **Rs. 500/- per violation**. Additionally, the Engineer-in-Charge may arrange facilities himself and recover the cost from the contractor.

Insertion:Nil

Correction:Nil

Omission:Nil

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- The contractor shall provide necessary barriers, warning signals, and other safety measures to avoid accidents, and shall indemnify CPWD against related compensation claims.
- The contractor is liable under Indian Law for any accident; the Department bears no responsibility for accidents/damage/claims during execution.
- The contractor shall provide all insurance, including third-party insurance.
- **No extra payment shall be made on this account.**

29. INSPECTION & TESTING

- After completion, the installation shall be offered for inspection and testing, with results submitted to the Department.
- The Department may get the equipment/machinery inspected by any external inspection agency; the contractor shall cooperate.
- All defects/observations by the inspecting agency shall be complied with by the contractor **without any extra cost.**

30. DOCUMENTATION/PHOTOGRAPHY

The contractor shall render all help and assistance in documenting the project sequence via photography, etc.

Nothing extra shall be payable; cost of photographs shall be borne by the contractor.

31. TOOLS AND PLANTS

- No tools, plants, or tackles (including special T&P for unloading/shifting/positioning equipment for erection) shall be supplied by the Department.
- The contractor shall make his own arrangements for all such facilities, at his own cost, and shall provide modern T&P.
- No claim of hindrance (or any other claim) shall be entertained on this account.
- Scaffolding and other T&P required for execution, testing, and commissioning shall be arranged by the contractor and are included in the tendered cost.

32. EXTENT OF WORK

The work comprises entire labour, supervision, and materials necessary for a complete installation, including tests, adjustments, and commissioning as required by the Department. "Complete installation" includes not just major plant/equipment items but all incidental sundry components necessary for complete execution and satisfactory performance — whether or not detailed in the tender document — since this is a **turnkey job**.

a) Material Quantities:

- Cable, sand, and other items shall be brought to site only after taking correct measurements per actual requirement.
- Excess quantities shall not be accepted/paid — only quantity actually used shall be measured and paid, irrespective of BOQ/work schedule quantities.
- Any material brought and paid for but not used must be taken back by the contractor, with deductions adjusted in subsequent bills.
- The Engineer-in-Charge's decision on this is final and binding.

b) Deemed Included in Scope (nothing extra payable):

- i) Minor building works for equipment installation — wall/floor/slab openings, core cutting, restoration to original condition/finish, grouting; breaking/restoring CC/RCC roads, horizontal boring, paver block removal/relaying.
- ii) All necessary supports/clamps for cable and equipment.
- iii) Closing cable entry points in walls/rooms/shafts against water seepage, rodents, etc.
- iv) Necessary testing equipment for commissioning.
- v) Removal of all debris arising from the works, promptly upon completion.
- vi) All chases, minor holes, recesses, etc. for conduits, GI/DWC pipes, cables, and allied work — done within the tendered amount, restored to original finish including cement/putty (approved brand) and two-plus coats of acrylic distemper (approved brand) to match original shade/colour, at no extra cost. Contractor shall coordinate so building work is not hampered.

c) Third-Party Testing:

All E&M equipment/materials shall be tested from 3rd-party laboratories per the CPWD Quality Assurance Policy (govt./government-autonomous labs preferred, or as approved by competent authority). Testing charges shall be borne by the Department only when samples satisfy the specified provisions/requirements.

33. MAINTENANCE OF WORK / DAMAGE RESPONSIBILITY

- The contractor shall maintain all work in good condition until completion of the entire work.
- The contractor is responsible for making good all damages/repairs necessitated by fire, rain, traffic, floods, or other causes.
- The Engineer-in-Charge is not responsible for claims of injury to persons/workmen or structural damage to property arising from neglect, default, want of proper care, or misconduct by the contractor or his representatives during execution.
- Any compensation shall be paid directly to the Department/authority/persons concerned, by the contractor, at his own cost.
- Any damage to the building during electrical work execution is the contractor's responsibility and shall be made good immediately, at his own cost, to the Engineer-in-Charge's satisfaction. The Engineer-in-Charge's decision is final and binding.

34. SHIFT WORK

- To complete work on time, the contractor may need to work in two or more shifts (including night shifts).
- No claim shall be entertained on this account, even if the contractor incurs extra costs for labour/staff per statutory/labour regulations and agreements with them.

35. ELECTRIC POWER SUPPLY AND WATER SUPPLY

It is the contractor's responsibility to arrange 415V, 3-phase, 4-wire, 50Hz AC power supply and water supply for installation and testing during the contract period.

Nothing extra shall be paid on this account.

36. **FOREIGN EXCHANGE**

- No foreign exchange shall be made available by the Department for importing equipment, plant, machinery, materials, or any other items required during execution.
- No delay or claim of any kind shall be entertained due to variation in foreign exchange rates, customs duties/charges, or other levies.

37. **SUBMISSION OF AS-BUILT DRAWINGS**

- The contractor shall submit the completion certificate and completion plan (per Clause 1.26 of General Specifications for Electrical Works Part-I, Internal 2023) and one framed set of layout diagram/drawings.
- The contractor shall submit **5 sets of "AS BUILT" drawings** for all services — copper piping layout, VRF system layout (laminated hard copies + soft copy) — on completion, before bill finalization.
- **Failing this:** recovery of **2.5% of tender amount** (subject to a maximum of **Rs. 50,000/-**) shall be made from the final bill.

38. **DEFECT LIABILITY PERIOD**

- The defect liability/free maintenance period is **12 months** (except LED fittings: **60 months**) from the date of work completion and equipment being put to use.
- During this period, the contractor shall carry out preventive & routine maintenance of installed equipment per manufacturer's standards/recommendations for 12 months from completion.
- **Nothing extra shall be paid on this account.**
- The contractor shall promptly attend to any defects/deficiencies noticed during this period, to the Engineer-in-Charge's satisfaction.

39. **GUARANTEE**

- All equipment is guaranteed for **12 months** (LED fittings: **60 months**) from completion, against unsatisfactory performance/breakdown due to defective design, workmanship, or material.
- Defective equipment/components/parts found during the guarantee period shall be forthwith repaired or replaced **free of cost**, to the Engineer-in-Charge's satisfaction.
- If the Department feels the contractor is causing undue delay, the work will be got done by the Department at the contractor's risk and cost. The Engineer-in-Charge's decision is final.
- The firm must attend breakdown calls as required and ensure timely periodic checks per CPWD Specifications and standard trade practice.

40. **The tenderer shall warrant, among other things:**

- a) Quality, strength, and performance of materials used.
- b) Safe mechanical and electrical stress on all parts under all specified operating conditions.
- c) Satisfactory operation during the maintenance period.

41. **Payment terms for all E&M Packages:** The following percentage of contract rates

Insertion:Nil

Correction:Nil

Omission:Nil

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shall be payable against the stages of work shown herein:

Stage	Items	On initial inspection of materials and delivery at site in good condition on	On completion of pro-rata installation	On completion of testing and commissioning	On submission of inventory and
Package	Percentage of Rate on prorata basis				
C2	Internal EI, earthing, LT Panels & cable laying	As per work progress/Percentage of Rate on pro rata basis			
C1	VRF System	70	10	10	10

Here's the document with proper spacing restored and each clause reorganized into clear sub-points:

STAGE PAYMENT

- Stage payment for various minor components of work shall be regulated as per CPWD Specifications.
- For works where the % payment is not specifically mentioned in the specification, the rate of stage payment shall be decided by the Engineer-in-Charge.
- Payment shall be made to the contractor as per deposits/budgetary allocation/authorization and L.O.C. available from the client/department.
- The contractor cannot claim anything extra due to delay in payment of bills, etc. Payment will be made as and when the respective fund is available.

42. HIDDEN WORK

All hidden work shall be carried out in the presence of the Engineer-in-Charge or his authorized representative.

43. PAYMENT TO LABOUR

- The contractor shall pay labourers (workers) through account payee cheque/ECS.
- Proof of payment made to labourers shall be submitted in two copies.
- Payment details shall include: name of worker, bank account details, photocopy, amount due, amount paid, and cheque number/ECS statement.
- Payment to workers shall be at rates not less than the minimum labour rates published by the Labour Department, Central Govt.

44. NO WAIVING OF LEGAL RIGHTS AND POWERS

The Engineer-in-Charge shall not be precluded or stopped from:

- Taking any measurements and framing estimates, or detaining certificates made either before or after completion, acceptance, and payment of work
- Showing the true amount and character of work performed and materials furnished by the contractor
- Showing that any such measurements, estimates, or certificates were untrue or incorrectly made
- Recovering from the contractor any damages sustained due to the contractor's failure to comply with the terms and conditions of the contract

45. **QUALITY ASSURANCE**

- Quality assurance procedures for E&M services shall follow O.M. No. 51(4)/CE(Elect.)/CSQ/2016/293(H) dated 31.03.2016, issued by the Directorate, CPWD, New Delhi.
- On request, the contractor shall make available for record: copies of challans, cash memos, receipts, other certificates, and vouchers toward quantity/quality of materials procured.
- These records shall include: manufacturer's name, product identification, manufacturer's instructions/warnings, date of manufacturing, test certificates for each consignment delivered at site, and shelf life (if any) — to help the department verify materials were procured from an approved source and of approved quality.
- Day-to-day account of material receipt shall be maintained at site, as regulated by the department.
- **Nothing extra shall be payable on this account.**

46. **INSPECTION, TESTING AT MANUFACTURER'S WORKS BEFORE DISPATCH**

a) Testing Before Dispatch:

- All major equipment (per QA guidelines) shall be offered for initial inspection.
- The contractor shall intimate the testing date at the manufacturer's workplace before dispatch, with a minimum **two weeks' advance notice** to the Engineer-in-Charge to facilitate his presence.
- All routine tests shall be conducted before dispatch — no equipment shall leave the manufacturer's premises before tests are conducted and results recorded. Test certificates shall accompany the supply. **Testing shall be done without any cost implication (to the Department).**
- The Engineer-in-Charge or representative may witness such testing; the cost of the Engineer's visit (travel, boarding, lodging) shall be borne by the Department. The Engineer-in-Charge may, at his discretion, waive this factory inspection.

b) Documentation & Protection:

- Copies of all routine and type test certificates from the manufacturer's premises shall be furnished to the Engineer-in-Charge, whose decision on equipment conformity is final and binding.
- Prior to dispatch, all equipment shall be adequately protected and insured for the entire transit/storage/erection period against corrosion, vermin, sunlight, rain, heat, humidity, or other adverse conditions.
- If the department wants samples tested at an accredited laboratory, the contractor shall supply all materials/labour for sample preparation and testing, **at his own expense**, in the presence of the Engineer-in-Charge's representative. **All charges/costs of such testing shall be borne by the contractor.**

47. **QUALITY OF MATERIAL AND WORKMANSHIP**

- All equipment parts shall be of design, size, and material to function satisfactorily under all rated operating conditions, with adequate safety factor.
- Fabrication/assembly shall follow sound engineering practice, based on "Fail Safe Design."
- Mechanical parts subject to wear and tear shall be easily replaceable.
- Construction shall facilitate easy operation, inspection, maintenance, and repair.
- Connections/contacts shall minimize risk of accidental short circuits from animals, birds, vermin, etc.
- Identical items and their components shall be fully interchangeable, including spare parts.

Defects During Guarantee/Warranty:

- The contractor is responsible for removing all defects during the guarantee/warranty period.
- If failure is attributable to poor material quality or bad workmanship, the contractor must rectify it at his own cost — failing which, the department may get it rectified at the contractor's risk and cost.
- The contractor shall also carry out his own inspection/testing during this period and attend to any defects arising.

48. **INSPECTION AND TESTING AT SITE**

After full completion, the contractor shall offer the installation for testing and operation:

- i) The installation is subject to inspection at every erection stage by the Engineer-in-Charge or authorized representative; the contractor shall provide all facilities/assistance for this.
- ii) The completed installation shall be inspected and tested by the Engineer-in-Charge, in a manner determined by him in consultation with the agency.
- iii) All instruments and facilities necessary for tests shall be provided by the agency.
- The contractor shall arrange for insulation and other tests as per rules, in the presence of the Engineer-in-Charge's representative when required, and submit the test report in triplicate before the work is considered complete.

49. **QUALITY CONTROL AND TESTING OF MATERIALS**

- All materials used shall bear the ISI certification mark, unless a specific make is stated in the item/special conditions.
- If ISI-marked material or the specified material is unavailable, the Engineer-in-Charge's decision is final and binding.
- Materials shall conform to applicable CPWD specifications or IS Code; the Engineer-in-Charge shall satisfy himself of quality and approve in writing.
- Only first-quality articles (as classified by manufacturers) shall be used, unless otherwise specified.
- Materials without ISI mark shall be tested as per relevant ISI specification; the Engineer-in-Charge may relax testing requirements for small quantities.
- Proper proof of procurement from authentic manufacturers shall be provided for ISI-marked materials, to the Engineer-in-Charge's satisfaction.
- All materials equivalent to the one specified must be approved by the Engineer-in-Charge before use.

50. **PAINTING**

- Includes cost of painting all exposed ironwork in the installation.
- Major equipment (LT panels, cable trays, equipment frames, etc.) shall be factory final-finish painted before dispatch to site.
- The agency shall only touch up damage caused during transportation/handling/installation (where there's no major damage).
- Hangers, supports, etc. for cable trays/stands shall be painted at site with the required shade, including two coats of anti-corrosive primer.

51. **COMPLETENESS OF WORK**

- Installations shall be completed in all respects and put into operation, even where certain details are not mentioned/left out in the specifications. Discrepancies may be raised in the pre-bid meeting.
- i) All E&M services (Internal Electrical installations, VRF system, etc.) shall be declared complete after a **15-day trial run** or completion of the whole work, whichever is later. The DLP/warranty period for all works/machines/equipment shall commence from the date of completion of the complete project.
- ii) All electrical & mechanical fittings/fixtures/appliances (where BEE certification is available) should have a **5-star BEE rating**.

52. **COMPLETION PERIOD**

The completion period indicated in the tender documents covers the entire work: planning, designing, drawing approvals, arrangement of materials & equipment, delivery at site (including transportation), installation, testing, commissioning, and handover of the entire system to the Engineer-in-Charge's satisfaction.

53. **ACCEPTABLE MAKES OF VARIOUS EQUIPMENT**

- Acceptable makes of equipment/components/accessories are listed in "Preferred Makes" appended to the tender documents. The tenderer shall base his cost offer on this. **Alternate makes are not acceptable.**
1. To ensure genuineness, the contractor will procure materials from authorized dealers only.
 2. Material shall be procured only after assessing exact quantity at site, in consultation with the Engineer-in-Charge.

54. **DATA, MANUAL AND DRAWINGS TO BE FURNISHED BY THE TENDERER (After Award of Work)**

The successful tenderer shall submit the following for approval, as per tender milestones:

- General arrangement drawings, including detailed shop drawings of all E&M components — VRF copper piping, drain piping layout and route, tray/floor trunking layout, panel drawings, cable routes, and locations — prepared in AutoCAD (or equivalent) and submitted well in

advance for approval by the EE(E), taking care to avoid delays across individual E&M components.

- a) Details of foundations for equipment and weights of assembled equipment.
- b) Any other drawings necessary for the job.
- c) Layout plan incorporating all likely equipment, submitted for approval before starting actual work, considering all E&M components.
- d) Three copies of detailed instructions and manufacturer's manuals for all equipment (installation, operation, maintenance, preventive maintenance & troubleshooting, datasheets, spare parts catalogue, etc.), furnished well in advance of work start.

55. **INSPECTION AND TESTING**

After full completion, the contractor shall offer the installation for testing and operation, and submit all related documents of the completed E&M equipment to the department for further handover to the client department.

56. **INSURANCE AND STORAGE**

All consignments shall be duly insured up to the destination from the warehouse, at the contractor's cost. Insurance cover shall remain valid until the equipment is handed over duly installed, tested, and commissioned.

57. **VERIFICATION OF CORRECTNESS OF EQUIPMENT AT DESTINATION**

The contractor shall produce all relevant records certifying that genuine equipment from the manufacturer has been supplied and erected, to the Engineer-in-Charge's satisfaction.

58. **TRAINING**

The scope of work includes on-the-job technical training for all services, for **2 to 4 persons** of the client/department at site, as decided by the Engineer-in-Charge.

Nothing extra shall be payable on this account.

59. **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 date of completion of work.

60. **DEFECT LIABILITY PERIOD**

- The defect liability/free maintenance period shall be **12 months** from the date of completion of work.
- The contractor shall carry out preventive & routine maintenance per manufacturer's standards for 12 months from the date of handing over.
- **Nothing extra shall be paid on this account.**

61. **GUARANTEE**

- All equipment shall be guaranteed for **12 months** from the date of completion, against unsatisfactory performance and/or breakdown due to defective design, workmanship, or material.
- Defective equipment/components/parts found during the guarantee period shall be forthwith repaired or replaced **free of cost**, to the Engineer-in-Charge's satisfaction.
- If undue delay is caused by the contractor, the department may get the work done at the contractor's risk and cost. The Engineer-in-Charge's decision is final.
- The firm shall attend breakdown calls as required and ensure timely periodic checks per CPWD Specifications and standard trade practice.

The tenderer shall warrant, among other things:

- a) Quality, strength, and performance of materials used.
- b) Safe mechanical and electrical stress on all parts under all specified operating conditions.
- c) Satisfactory operation during the maintenance period.

ELIGIBILITY CRITERIA FOR ASSOCIATION OF SPECIALIZED FIRMS FOR E&M WORKS

1. The contractor shall have to associate other agency /agencies within 7 days of start of work of E&M sub heads that full fills the following requirements, shall be eligible to apply. Joint ventures are not accepted.

- (a) Three similar works each of value not less than 40% of **Estimated cost put to tender for the component.**

OR

- (b) Two similar works each of value not less than 60% of **Estimated cost put to tender for the component.**

OR

- (c) One similar work of value not less than 80% of **Estimated cost put to tender for the component.**

2. Definition of Similar work is mentioned below in table.

S No.	Description of work	Similar Work Definition
1.	PACKAGE C-2: VRF/VRV SYSTEM WORK	Similar work shall mean SITC of VRF / VRV Air Conditioning system.

PACKAGE C-1 (Internal EI and LT Panels, Cables)

PARTICULAR SPECIFICATION

The work shall generally be carried out in accordance with tender specifications and the following:

a) Governing Codes/Standards:

- CPWD General Specification for Electrical Work — Internal Part-I (2023), External Part-II (2023), Sub-Station Part-IV (2013), as amended up to date
- Indian Electricity Act 2003 (amended up to date)
- National Electrical Code
- Indian Electricity Rules 1956 (amended up to date)
- National Building Code 2016
- Other Acts and Rules

The installation shall also comply with:

- i) Factories Act, wherever applicable
- ii) Any other Act or Rules in force

Safety Codes and Labour Regulations:

- For all labour employed directly/indirectly, the contractor shall, at his own expense, arrange safety provisions per statutory regulations, ISI recommendations, and CPWD codes.
- In case of default, the department may make arrangements itself and recover costs from the contractor.
- The contractor shall provide necessary barriers, warning signals, and safety measures to avoid accidents, and shall indemnify CPWD against related compensation claims.
- Nothing in these specifications relieves the contractor of his responsibility for design, manufacture, and installation per applicable statutory regulations and safety codes.

All items/equipment specifications shall conform to the relevant sections of CPWD General Specification for Electrical Works — Internal Part-I (2023) & External Part-II (2023), as amended.

GENERAL CONDITIONS

1. All materials to be used shall be got approved from the Engineer-in-Charge well in advance.
2. No T&P shall be provided (by the Department).
3. Earthing, cement concrete works, and installation testing shall be done in the presence of the Engineer-in-Charge or authorized representative.
4. On completion, the contractor shall test the installation and produce a test certificate and completion plan (in triplicate) per CPWD specification — failing which, recovery of **2.5% of estimated cost** (max **Rs. 50,000/-**) shall be made from the bill.
5. Water and electricity for installation shall be arranged by the contractor; on completion, the Department shall provide electricity for testing and final handover.
6. G.I. pipes shall be medium class per ISI specification, single piece, without joints.
7. All debris at site shall be removed by the contractor before handing over the installation.
8. General arrangement drawing of the switch board shall be approved by the Engineer-in-Charge before fabrication begins.
9. The contractor shall make his own arrangements for storage and watch-and-ward of materials (whether brought by him or supplied by the department), remaining responsible until commissioning and handover.
10. Cement required shall be procured by the contractor. The electrical contractor shall cut chases in brickwork for conduits/metal boxes per elevation drawings, fix conduits/boxes, close chases with cement mortar (1:4), and plaster/finish the surface smoothly. **Nothing extra shall be paid** for this, regardless of whether chases are made before or after wall plastering.
11. The contractor is advised to visit the site before execution; failure to do so does not absolve him of responsibility for work as specified in the agreement.
12. All light and fan points shall be properly earthed with 1.5 sq.mm FRLS PVC-insulated copper wire.
13. Termination of wiring inside DBs and main boards shall use crimped copper lug connections — **no extra payment** for this.
14. Ceiling roses shall be provided for all point wiring.
15. All metallic parts must be properly bonded to earth; earthing lugs provided to all copper earth wires, fixed with anodized bolts/nuts where required.
16. Any damage to walls/ceilings caused by the contractor shall be made good to original finish, within the tendered amount — **nothing extra paid**.
17. Quoted rates shall be inclusive of all taxes, levies, works contract taxes, duties, etc.
18. Concealed metal boxes & modular accessories shall be of the same make.
19. Number of inspection boxes for conduit shall be kept to a bare minimum — preferably avoided.
20. Steel fish wire of proper gauge shall be drawn into the conduit while laying in slab/wall.
21. Shop drawings shall be approved by the Engineer-in-Charge before work starts.
22. Modular accessories shall be of the same make.
23. Conduit size shall be suitable to accommodate insulated copper earthing wire.
24. Before fabrication, the contractor shall prepare Main Board drawings for approval by the Engineer-in-Charge. The Panel Board shall be fabricated with sheet metal of specified thickness (per Schedule of Quantity) with powder-coated painting.
25. Panels/Feeder Pillars shall be provided with M.V. danger notice plates.
26. Lifting hooks and suitable louvers shall be provided in the panels.
27. The panel/feeder pillar shall be fabricated by a C.P.R.I.-approved fabricator.
28. Any damage to walls/ceiling by the contractor shall be made good in original finish, within the tendered amount.

29. The contractor shall use approved makes only, after obtaining approval of the Engineer-in-Charge.
30. Contractor shall warrant LED fittings against manufacturing defects for **1 year**, and provide guarantee for driver & LED for **5 years** from installation date.
31. The contractor shall submit all test results per CPWD Specification, along with the completion certificate.
32. The contractor must deploy an Engineer and Electrical Supervisor holding proper certification per I.E. Rules.
33. The contractor must submit labour license (if applicable), ESI, EPF, etc., before work starts.
34. All materials brought to site shall be approved by the Engineer-in-Charge before use, with test reports provided. The Department reserves the right to check material genuineness.
35. Labour laws per GCC 2023 must be strictly complied with.
36. Civil works (wall repairs, painting after fixing outlets) shall be done by the contractor. Completion will be certified only after walls/ceilings/floors are in good finished state. Quoted rates are inclusive — **nothing extra paid**.
37. The contractor must submit sketch/drawing of streetlight poles and obtain approval from the Engineer-in-Charge before fabrication.
38. ESIC and EPF shall be reimbursed to the agency upon submission of genuine proof of payment made to labourers.
39. Payment to contract labour deployed at site shall be as per Central Govt. minimum wage norms.
40. Guarantee / Warranty :
 - The contractor shall submit manufacturer's guarantee/warranty for light fixtures to the department, and stand performance guarantee for LED fittings/fixtures for **60 months** from work completion/handover (whichever is earlier).
 - A **bank guarantee** amounting to the total agreement value of LED fixtures shall be deposited by the bidder before release of the Performance Guarantee, valid for **5 years** from completion date. Released after successful completion of the 60-month guarantee period.
 - Any light fixture failing/malfunctioning shall be replaced by the Department from available stock; the defective fixture shall be handed to the contractor for repair/replacement within **15 days** of handover — failing which, the performance guarantee amount shall be forfeited absolutely.
 - The guarantee/warranty period is counted from the date of building handover.

CABLE WORKS

Scope: Supply, laying, jointing, testing, and energizing of all cable work.

Specification of Cable:

- a) **11kV grade** XLPE insulated, PVC sheathed, armoured Aluminum/Copper cable, 3-core earthed, per specified sizes. Conforms to **IS 7098 (Part-II) 1985** with latest amendments.
- b) **1.1kV grade** XLPE insulated, PVC sheathed, armoured Aluminum/Copper cable, 3½/4-core, per specified sizes. Conforms to **IS 7098 (Part-I) 1988** with latest amendments.
- c) All control wires: **650V grade** copper conductor, Halogen-free fire retardant or FRLS PVC insulated, conforming to **IS 694**. Minimum size: **1.5 sq.mm**.

Installation:

Insertion:Nil

Correction:Nil

Omission:Nil

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- Cable shall be laid in ground, trenches, cable trays, and on walls, as specified, with all required supports/clamps.
- Work shall follow CPWD General Specifications for Electrical Works — Part II (External) 2023 (as amended).
- Cables shall preferably be laid on cable trays rather than fixed directly on walls.

Cable Identification Tags:

- Where multiple cables run side by side, permanently attached marker tags (with cable ID details) shall be placed in manholes/open ducts.
- Similarly attached to cables laid directly in ground, at suitable intervals, before trenches are filled.

Jointing for 11kV Grade Cable Glands:

Jointing shall be carried out only by a licensed, experienced cable jointer, per CPWD General Specifications — Part II (External) 2023.

Earthing for 11kV Grade Cable Glands:

- All HV cable glands shall be connected to earth with **2 nos. 38.6mm copper** (or equivalent G.I.) conductors.
- Selection per Table V of CPWD General Specifications for Electrical Works — Part II (External) 2023.

Testing:

- Testing per Clauses 2.8.2 and 2.8.3 of CPWD General Specifications — Part II (External) 2023.
- Cables tested before laying with **500V megger** (1.1kV grade) or **2,500/5,000V megger** (higher voltage grades). Cores tested for continuity, absence of cross-phasing, insulation resistance to earth/sheath/armor, and insulation resistance between conductors.
- All cables subjected to these tests during laying, before covering with protective covers/backfilling, and before jointing.

Power Distribution System Losses:

- Power cabling shall be sized to keep distribution losses $\leq 1\%$ of total power usage; design calculation records shall be maintained.
- Cables designed per voltage drop regulations at peak load; losses calculated based on assessed load during day/week/year (not limited to peak load).
- Cable schedule shall be proposed and approved by the Engineer-in-Charge before laying — indicating point-to-point laying, number of runs, voltage drop, number of terminations, cable size, gland selection, etc.

Route Marker:

- Route markers provided along straight cable runs, generally at intervals not exceeding **100m**, and at direction changes/underground joint locations. **Included in scope — nothing extra paid.**
- Markers: **100mm × 100mm × 5mm** GI/Aluminum plate, welded/bolted onto **35mm × 35mm × 6mm angle iron, 60cm long**, mounted parallel to and ~0.5m from the trench edge.
- Marker shall inscribe the word "Cable" and details such as voltage grading, size, etc.

CABLE TRAYS

1. Perforated ladder-type cable trays and accessories (tees, bends, elbows, reducers) fabricated from **12-gauge (2.5mm) mild steel**. Prefabricated perforated-type trays/accessories fabricated from **14-gauge (2mm) white CRCA sheets**. Trays shall be corrosion-resistant material, or adequately protected against corrosion if not.
2. Cable tray accessories: one shop coat of red oxide zinc chromate primer + two side coats of aluminum alkyd paint.
3. No sharp edges, burrs, or projections that could damage wiring insulation jackets.
4. No side rails or equivalent structural members; fittings/suitable means provided for direction/elevation changes.

Cable Tray Mounting (unless otherwise noted on layout drawing):

- a) Mounting arrangement type as marked on layout drawing.
- b) Tray mounting structure assemblies supplied, fabricated, erected, and painted by the electrical contractor.
- c) Tray mounting structures welded to plate inserts or structural beams, duly approved by the Engineer-in-Charge.
- d) Where embedded plates/structural beams aren't available for welding, the contractor shall supply MS plate and fix to floor slab with 4 anchor fasteners (min. 16mm dia, min. holding power 5,000 kg), **at no extra cost**.
- e) Maximum loading on horizontal support arm: **120 kg/meter** of cable run.
- f) Width of horizontal support arms matches tray widths per layout drawings, plus length required for welding to vertical supports.
- g) Length of vertical supporting members to suit number of tray tiers per layout drawings.
- h) Spacing between horizontal support arms of vertical tray runs: **300mm**.
- i) Cable trays welded to their mounting supports.
- j) Minimum clearance between topmost tray tier and structural member: **300mm**.
- k) Cables in vertical raceways clamped by saddle-type clamps to horizontal slotted angles; clamps fabricated from 3mm thick aluminium strip at site by the contractor, to suit cable groups.
- l) Structural steel per latest IS:2062 & IS:808 Rev III (1989); welding per latest IS:816 Rev I (1969). All structural steel: one shop coat red oxide/oil primer + finishing coat aluminium alkyd paint. Cuts/holes on finished steelwork sealed against oxidation with red oxide + matching finish paint. Steel sheet covers similarly painted where indicated.

PACKAGE C-2: VRF/VRV SYSTEM WORK

Work shall be carried out strictly per CPWD General Specifications for Electrical Work (Part-I Internal 2023 and Part-II External 2023), HVAC Works 2024 (as amended), relevant IE Rules, relevant IS, and directions of the Engineer-in-Charge.

1. **Scope:**

- Comprises design, supply, erection, testing, and commissioning of inverter-technology-based Scroll Type VRF/VRV air conditioning system, conforming to specification, drawings, and Schedule of Quantities.
- Quoted prices shall include all equipment, ancillary materials, and items required to fulfill the specification's intent and approved drawings.
- The contractor shall calculate equipment capacity based on specified design parameters, and verify all quantities/sizes of refrigerant pipe, fittings, cables, control cable, pipes, insulation, indoor units, and outdoor units before installation, to avoid shortfall or surplus.
- Includes all necessary civil work/MS framework for installation of outdoor and indoor units.
- Quoted cost shall include refrigerant gas **R-410A** and its charging for proper functioning.

2. **Civil/MS Framework:**

- All cuttings for civil/MS framework related to VRF equipment shall be properly finished to match the original surrounding finish.
- Outdoor unit installation on the terrace shall be structurally checked, with mounting structurally safe.
- This covers:
 - a) Cutting of walls and floors/ceiling
 - b) Making holes
 - c) Sleeves
 - d) Foundation

3. **Detailed System Design:**

- Covers detailed design of the complete air-conditioning system: inverter-based Scroll VRF air conditioner with air-cooled outdoor units, capable of cooling and heating (reverse cycle) per individual/seasonal requirement, suitable for 415V, 3-phase, 50Hz AC supply.
- Outdoor units shall have both cooling & heat pump mode, with one/multiple outdoor units on a single refrigerant piping circuit and multiple indoor units of various types. Each indoor unit shall be capable of cooling or heating per seasonal changes.
- Includes complete capacity calculation (heat load sheet submission) for indoor/outdoor units, with CAD drawing, design, and layout of:
 - I. Outdoor units
 - II. Indoor units
 - III. Refrigerant piping
 - IV. Condensate water piping & disposal
 - V. Power & control cables between outdoor and indoor units

4. Design Considerations:

- Outdoor units shall be selected for suitable capacity based on the design data, economizing on available floor area and optimizing outdoor unit utilization.
- Indoor units shall be sized per heat load calculations for individual rooms/areas — over-capacity should be avoided.
- Condensate drain water disposal design must prevent leakage inside rooms or along the pipeline route.
- Refrigerant piping layout must not disturb building/room aesthetics, avoid future inadvertent damage along the pipe route, and use optimum pipe length for efficient air conditioning.
- After completion, **four sets of "as erected/commissioned" drawings** of the above activities shall be submitted.

5. TECHNICAL SPECIFICATIONS — VRV/VRF SYSTEM

System Design:

Dedicated VRF/VRV air conditioning units shall maintain **24°C ± 2°C** with relative humidity at **55% ± 5%**.

6. Design Parameters:

Design parameters assumed for air-conditioning the proposed building are tentative in nature; however, all efforts shall be made to achieve the specified design parameters.

Climatic Data

Out door Design Conditions:		Remarks
Dry Bulb Temp.		Location: Gandhinagar NFSU
Wet Bulb Temp.		

Internal Design Conditions:		Remarks
Dry Bulb Temp.	24±2deg.C	Office areas
Relative Humidity.	55%±5%	

Here's the document with proper spacing restored and organized into clear sections:

7. GENERAL DESCRIPTION

a) System Type: The system selected is a modular system, with a number of indoor units connected to centrally located outdoor units. The outdoor units for all systems shall be air-cooled type.

b) Factory Assembly: All VRF air conditioners shall be fully factory assembled, wired, internally piped, and tested. The outdoor unit shall be pre-charged with the first charge of refrigerant R410A; additional charge shall be added as per refrigerant piping at site. All units shall be suitable for:

- Outdoor units: 415V $\pm 10\%$, 50Hz $\pm 3\%$, 3-phase supply
- Indoor units: 220V $\pm 10\%$, 50Hz $\pm 3\%$, 1-phase supply

c) System Configuration: VRV/VRF equipment shall be air-cooled, consisting of outdoor units and multiple indoor units for cooling in summer and heating in winter (where heat pumps are specified).

d) Components: The system shall consist of suitable outdoor units, indoor units, interconnecting refrigerant piping, drain piping with insulation, control cabling, and accessories, as required.

e) Multi-Unit Connectivity: Multiple indoor units may be connected on a single refrigerant circuit. Indoor units on any circuit may be of different types and should allow individual control.

8. Compressor & Operation:

- All outdoor unit compressors shall be suitable for variable loading.
- The VRF system shall provide stable, trouble-free, safe operation with flexibility to operate desired indoor units.
- Outdoor units must deliver capacity exactly proportional to the number of indoor units switched on and the heat load in the air-conditioned area, achieved by varying refrigerant flow.
- Operation shall be through independent wired/wireless remote controllers, as specified.

9. Scope also includes:

- Pressure testing of the entire system, holding pressure for a minimum of **24 hours**
- Flushing the system
- Refrigerant gas (R410A) charging/topping up
- Final commissioning
- Providing and fixing fire sealant to close cutouts of all cables, refrigerant pipes, and trays, to the Engineer-in-Charge's satisfaction

Capacity Requirement: All VRF outdoor units should deliver desired capacity at **39°C ambient condition** without deration. If deration occurs at 39°C, a higher-capacity unit must be selected.

Design Conditions: The system shall meet specified Internal Design Conditions. Any deviation from specified parameters shall be brought to the Engineer-in-Charge's notice for necessary approvals — who reserves the right to permit deviations.

OUTDOOR UNIT

Compressor & Module Requirements:

- i. Inverter-controlled Scroll Compressor, hermetically sealed. Outdoor units with multiple modules should have an inverter-type compressor in each module.
- ii. Each module must have at least 100% variable/inverter compressor capacity, suitable for part-load operation proportional to indoor requirement.
- iii. The contractor shall submit the Energy Efficiency Ratio (EER) value for all selected VRV models, furnished in original by the OEM with seal and signature.
 - *ISEER requirements: Capacity <40kW_r → 7.4; Capacity 40–70 → 7.5; Capacity >70 → 7.6 (for Super ECBC Building)*
- iv. Unit shall have its own microprocessor control panel, with provision for integration with the Building Management System.

Piping & Level Differences:

- v. Outdoor units must be suitable for the actual refrigerant piping length to the farthest indoor units; allowable level difference per manufacturer recommendations.
- vi. Allowable level difference between indoor units connected to one outdoor unit: up to **10 metres**.

Operating Range:

- vii. Ambient temperature range: **5°C to 48°C** in cooling mode; **-20°C to 15°C** in heating mode.
- viii. Entire outdoor unit operation shall be through independent indoor unit remotes — no separate Start/Stop function required.
- ix. Compressor starter: Direct-On-Line type; inverter compressor starts first at minimum frequency to reduce inrush current.

Construction:

- x. Complete refrigerant circuit and oil balancing/equalizing circuit shall be factory assembled and tested.
- xi. Factory-assembled unit in sturdy weatherproof casing, rust-proofed mild steel panels, powder-coated finish.
- xii. Low-noise aero spiral-design fan with aero fitting grille for spiral discharge airflow (reduced pressure loss); DC/AC fan motor for better efficiency.
- xiii. Condensing unit designed to operate safely when connected to multiple fan coil units.
- xiv. Design shall allow easy drain pan cleaning and easy compressor inspection/replacement.
- xv. Each module: scroll compressor(s), air-cooled condenser (heat exchanger), high-efficiency propeller fans with low-noise motor, internal refrigerant piping, safety controls, air inlet grilles, fan protection grille — all in weatherproof housing.

Redundancy & Safety Devices:

- xvi. Outdoor unit shall have multiple scroll compressors and operate even if one compressor breaks down (smallest capacity unit may have only one compressor). Safety devices required:
 - High pressure switch
 - Fan drive overload protector
 - Over current relay
 - Overload protector
 - Fusible plug

Additional Requirements:

- Suitable for mix-and-match connection of various indoor unit types/capacities as per demand.
- Noise level: not more than **67 dB(A)** under normal operation (measured horizontally, 1m away, 1.5m above ground).
- Modular design allowing side-by-side installation of multiple outdoor units.
- Built-in microprocessor control panel for automatic operation and capacity control.
- Suitable for Refrigerant R-410A.
- Suitable single-phase preventer (protection against single-phasing, phase reversal, phase unbalance) with built-in timer for 415V supply, including enclosure and connections.

Compressor Details: 100% inverter-based scroll system, highly efficient, responsive to cooling/heating load variation. Multiple steps of capacity control for load fluctuation and individual indoor unit control. Compressor parts sufficiently lubricated (forced lubrication may be employed); oil heaters in compressor casing or per manufacturer standards. **Compressor and VRF unit shall be of the same make.**

Condensing Unit:

- Air-cooled condenser coil, copper tubes and aluminium fins, adequate size, integral sub-cooler circuit for liquid sub-cooling.
- Refrigerant-side working pressure: **400 psig**, with anti-corrosive treatment.
- Multiple piping/cabling connection options.
- Pump-down facility via quality hand/shut-off valves (avoid refrigerant loss during maintenance).
- Condenser fans: propeller type, aluminium blades, low speed, low vibration, quiet operation, **IP55 protection**.
- All screws/bolts in outdoor unit: SUS410, zinc-nickel alloy plating, zinc chrome acid film treatment, rust inhibitor coating.

Oil Recovery System: Equipped with oil recovery system for stable operation with long refrigerant piping lengths; oil balancing circuit to avoid poor lubrication.

Refrigerant Circuit: R410A refrigerant. Circuit includes liquid and gas shutoff valves and solenoid valves at condenser end. Built-in refrigerant stabilization control for proper distribution; all necessary safety devices for safe operation.

Heat Exchanger: Copper tubes mechanically bonded to aluminium fins (cross-fin coil); refrigerant-side working pressure **400 psig**; condenser fins with anti-corrosive and hydrophilic coating from factory; necessary number of direct-driven low-noise propeller fans for vertical discharge, each with a safeguard.

Safety Devices (Outdoor Unit): High pressure switch, fuse, fan drive overload protection, fusible plug, crankcase heater, overload relay, overload protection for inverter.

Field-Installed Accessories: Outdoor unit shall be a factory-assembled weatherproof casing, heavy-gauge MS panels, baked enamel finish.

Wired/Cordless Remote Controller:

- Must have display screen showing complete operating status.
- Digital display allows temperature setting at **1°C intervals**.
- Individually programmable timer for start/stop within a maximum of **72 hours**.

Insertion:Nil

Correction:Nil

Omission:Nil

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- Equipped with thermostat sensor for more comfortable room temperature control.
- Monitors room temperature vs. preset temperature via microcomputer; can auto-select cool/heat mode.
- Constant malfunction monitoring with "self-diagnosis function" — immediate alert message on malfunction.
- Corded remote: wire able up to **50 metres**.

AIR HANDLING UNITS

Ceiling-mounted TFA unit specifications:

- Outer skin: 0.6mm precoated GSS
- Inner skin: 0.6mm plain GSS
- Panels: 40mm thick PUF insulation, density $42 \pm 2 \text{ kg/m}^3$
- Free intake with EU4 pre-filter (box type/50mm), washable media pre-filter
- Fan section: low-noise fan/dynamically balanced blower, multi-speed motor
- Coil section: 4-row DX copper coil, electronic expansion valve
- Corded remote control, outer cabinet, drain pan, drain pump, insulation, necessary supports, vibration isolation
- Operation: 230V $\pm 10\%$, 50Hz single-phase AC supply
- Automatic force shutdown provision in case of fire — all indoor units should have force-shutoff option connectable to fire alarm adaptor
- Cooling capacity rated at air inlet conditions of 27°C DBT / 19°C WBT (total static pressure not less than 35 psi)

Centralized/Master Remote Controller — Facilities include: Permit/prohibit, operational lock, schedule operation, gas amount checking, night setback function, automatic heat/cool changeover, temperature limitation, sliding temperature, all energy-saving functions, fan speed setting, air flow direction, etc. Should have BMS connectivity with required hardware.

REFRIGERANT PIPING

- i. Piping up to 19.1mm dia: soft seamless copper tubes. Above 19.1mm dia: hard seamless copper tubes (hard-drawn copper pipe). Forged copper fittings for refrigerant piping. Arrangement per good engineering practice, including charging connections, suction line insulation, and other standard items (except Y-joint/separation tubes).
- ii. Supplier shall choose sizes as designed and erect proper interconnections of the complete refrigerant circuit.
 - Pipe thickness: not less than **1.2mm** up to 28.58mm OD (soft/hard drawn); **1.62mm** for 31.8mm–41.27mm OD (hard drawn), with **19mm** thick insulation.
- iii. All copper piping joints: swaged joints using low-temperature brazing and/or silver solder.
- iv. Before jointing, pipe/fitting interiors shall be thoroughly cleaned (clean cloth via wire/cable through entire length), kept clean during joint construction, then blown out using nitrogen.
- v. Refrigerant lines sized to limit pressure drop between evaporator and condensing unit to less than **0.2 kg/cm²**.
- vi. After installation, pressure tested using Freon mixed with nitrogen: **20 kg/cm²** (high side), **10 kg/cm²** (low side), maintained for **24 hours**.
- vii. System then evacuated to a minimum vacuum of **70 cm Hg**, held for 24 hours (vacuum change not to exceed 12 cm Hg). Testing done in presence of Engineer-in-Charge or authorized representative.

- viii. After successful pressure testing: full charging of refrigerant gas (R410A), topping up if required, and final commissioning.
- ix. All VRV/VRF refrigerant piping: hard-drawn seamless copper pipe (soft, half-hard, or hard, per manufacturer chart).
- Branching from main line: manufacturer-approved specially designed Tee connectors or 'Y' joints, ensuring each branch receives required refrigerant flow.
- All refrigerant pipes properly supported/anchored to the building/structure using steel hangers, fasteners, brackets, supports (fixed via inserts/expansion shields/anchor fasteners of adequate size/number).
- Pipe sizing based on manufacturer's sizing data, ensuring adequate oil return to the compressor.

Refnet Joints/Header Joints: Supply and installation of Y-Joint/Ref-net separation refrigerant pipe joints and headers in appropriate orientation for correct refrigerant distribution. Distribution joints insulated with pre-formed sections of expanded polystyrene/equivalent.

PIPE INSULATION

1) Refrigerant Pipe Insulation:

- a) Liquid and suction refrigerant lines (including fittings, valves, strainer bodies) insulated with **19mm thick Nitrile closed-cell rubber** to prevent condensation.
- b) Joints properly sealed with synthetic glue for proper bonding.

2) Condensate Drain Piping & Insulation:

- a) UPVC pipe (conforming to IS) for condensate drain; joints via gluing/solvent cementing per manufacturer recommendation; laid with proper slope for efficient drainage.
- b) Drain pipe insulated with **9mm nitrile rubber** insulation (K-value 0.037 W/mK at mean temp 20°C, min. density 55 kg/m³); joints sealed with synthetic glue.
- c) Pipe supports: pre-fabricated, pre-painted slotted angle supports, properly installed with clamps.

Associated Civil Work: Includes chase-making in walls and restoration to original shape (re-plastering, repainting, etc.). Drain-pipe arrangement shall not affect building aesthetics and shall be maintenance-friendly and easily accessible.

PERFORMANCE TESTS

Upon completion, the installation shall be balanced and tested, with the following submitted to the department:

- Air volume passing through each unit, duct, grille, aperture
- Inside DB temperature and relative humidity over a specified period
- Electrical current readings (amperes) of full and average load running, and starting current, together with nameplate current of each electrical motor
- Continuous recording (over a specified period) of ambient wet/dry bulb temperatures under varying internal heat load, use, and occupation in each building zone

HANDING OVER OF THE VRF SYSTEM

The following readings/data shall be generated as part of handover (in addition to air-side and indoor design condition data):

Outdoor

Units:

Inlet temperature · Discharge pipe temperature · Suction pipe temperature · Oil pressure · Condensing pressure · Evaporating pressure · Power supply voltage · Inverter compressor frequency · Inverter current · Fan operating current · Total ODU current

Indoor

Units:

Operation On/Off (from remote) · Operation On/Off (from thermostat) · Remote control preset temperature · Suction temperature · Indoor liquid pipe temperature · Indoor gas pipe temperature · Electronic expansion valve opening · Fan operating current

B) MAINTENANCE OF VRF SYSTEM DURING DLP PERIOD

- Sufficient trained and experienced staff shall be available to meet any work exigency during the **guarantee period of one year** from completion.
- During this period, the contractor shall carry out preventive, routine, and comprehensive maintenance per manufacturer's standards/recommendations, for 12 months from completion. **Nothing extra shall be paid on this account.**
- **5% of tendered amount** shall be withheld from various R.A./Final Bills toward one-year comprehensive maintenance work. Released only after satisfactory maintenance and submission of service/maintenance reports, duly verified by AE(E)/JE(E) and found satisfactory.

General Maintenance Conditions:

1. Routine preventive maintenance schedule per CPWD specifications/OEM manufacturer practice, standards, and recommendations (as amended).
2. Any accident during routine/preventive maintenance is the contractor's responsibility — he shall indemnify the department against resulting losses/theft, etc.
3. All local bylaws and regulations to be strictly and regularly observed.
4. All dismantled materials returned to the contractor against DLP-period free replacement.
5. All materials (except as noted) shall be arranged by the contractor. Spares/materials used/replaced shall be new, good quality, genuine, OEM make only — proof (bill/challan/invoice) to be produced to the Engineer-in-Charge. Responsibility for genuine material procurement rests with the contractor.

Included in Scope of Work:

- a) All maintenance cleaning materials (soap/detergent, insulation tape, screws, nails, test lamp).
- b) Cotton waste, duster, old cloths, etc.
- c) All spares/materials for VRF A.C. unit repairs shall be provided by the contractor for: compressor, condenser coil/evaporator coil, microprocessor, lubrication oil, grease, PCB cards, consumables, wires, cotton waste, refrigerant gas, capacitors, selector switches, loading/unloading compressor, fan motor control relay, remote, metering equipment, indicator lamp, small in-panel wiring, thimble, lugs, contactor, safety control, etc.

Contractor Services (within quoted rates):

- a) Preventive servicing of all machines, with work details entered in the service card and furnished to the Engineer-in-Charge.
- b) Overhauling/repair/replacement of parts as needed, including refrigerant gas charging. Contractor to keep sufficient spare parts to minimize breakdown periods.
- c) If maintenance checks aren't carried out timely, a suitable amount shall be recovered from the withheld amount — Engineer-in-Charge's decision is final and binding.
- d) Only genuine spare parts to be used for replacement/maintenance, including refrigerant gas. All materials/spares shall be new, genuine, and approved by the Engineer-in-Charge. Contractor shall preserve invoice/gate pass copies to prove genuineness. Responsibility for genuine procurement rests with the contractor.
- e) Breakdowns (reported telephonically or in writing) shall be attended promptly:
 - Unit out of order for more than 3 days after reporting → recovery of **Rs. 200/unit/day**, max **Rs. 2,000/unit/month**, from contractor's bill.
 - Failure to supply required components within **48 hours** → penalty of **Rs. 200/day** deducted from withheld amount.
- f) During Comprehensive Maintenance period, the firm shall provide:
 - **Preventive Maintenance:** Quarterly (4 times/year) per standard OEM/service provider checklist.
 - **Routine inspection/cleaning:** Monthly, with service report/card submitted to the Engineer-in-Charge. Default → recovery of **Rs. 500/default/month/unit**.
 - Additional preventive maintenance as required per manufacturer recommendations, during the agreement's currency.

Breakdown Calls: As required/requisitioned. Preferential attention to emergency breakdowns within **4 hours** of written/telephonic intimation — otherwise **Rs. 3,000 /machine** penalty for every 12-hour delay.

Reach Time: Every effort to attend complaints within **4 hours**.

Major Breakdown Repairs: May take up to **24 hours** from complaint date/time, in consultation with the Engineer-in-Charge, depending on complaint nature.

If maintenance checks/exercises aren't carried out timely, suitable recovery shall be made from the bill — Engineer-in-Charge's decision is final and binding.

CONDITIONS OF ANNUAL COMPREHENSIVE MAINTENANCE CONTRACT FOR VRV/VRF SYSTEM

The contractor shall depute trained service technicians for regular inspection (cleaning, lubricating, checking, adjustments, etc.) as follows:

# Activity	Frequency
1 Leak testing and topping up refrigerant gas (if required)	Half-yearly
2 Inspection/adjusting refrigerant controls	Quarterly
3 Checking general functioning of all chiller unit equipment	Quarterly
4 Descaling of condensers, chemical cleaning of evaporator coils	Yearly (if required)
5 Plant shutdown, checking, servicing whole system per manufacturer's manual	Yearly

Breakdown Calls — attend minor/major breakdowns, repair/replace equipment at site/workshop as needed, at **no extra payment**, including:

- a) Replacement/topping of refrigerant gas and compressor oil.
- b) Replacement of defective/worn-out parts with new genuine OEM parts (compressor, thermostats, cut-outs, etc.).
- c) Replacement of consumables like V-belts.
- d) Checking compressor drive/coupling tension/alignment; replacement/readjustment as necessary.
- e) Repair/replacement of thermostats, flow switches, temperature meters, pressure gauges.
- f) Testing of safety controls (L.P., H.P., O.P. cutouts) — repair or replace if malfunctioning.
- g) Checking correctness of pressure gauges in the gauge board of the package chiller/condensing unit — replace if necessary.

Excluded from Comprehensive Maintenance Scope:

- a) Day-to-day operation, maintenance, and housekeeping.
- b) Quality and quantity of inputs to the machine (power, water, air).
- c) All kinds of civil and structural work.
- d) Any other item not specifically included in the scope of work.

Payment: Payment will be made to the agency as per the terms above.

LIST OF PREFERRED MAKES (Electrical)

Description	Makes
HVAC Works:	
Variable Air Volume Units- Direct Expansion type Outdoor Units, Indoor Units, Y joints and fittings, Central and Remote controller, Cassette VRF type four directional air flow DX split indoor air conditioning units etc.	Daikin / Toshiba / LG / Mitsubishi / O-General / Hitachi
Air Handling units	Zeco/ Edgetech/ VTS/ Casevent Aircon /Flaktwoods / waves / System Air
AHU Fan	Kruger/Nicotra/Greenheck/Wolter/Air Flow
Control cables	Finolex/Havells/RRkabel/Polycab
Insulated Flexible Ducting	7Star/Caryaire/Nutech/RadiantAirSystem/UPTwiga
Refrigerant Copper pipe	Rajco Metals/ Mandev/Mexflow /Totaline/ Nippon/ Hindustan Copper /Mettube / Mettube/
Nitrile Rubber insulation	ARMAFLEX/Vidoflex/Eurobatex/Thermaflex/A-Flex/K-Flex
Class O rubber insulation for duct thermal insulation	A-Flex/K-flex/Armacall/APL
PVC/UPVC pipe	Astral/Supreme/Finolex/Prince
Volume Control Damper, Fresh/ Exhaust air louver	Titus / Trox/ System Air /Caryaire/Conair/ Mapro / Airmaster/ Dynacraft/ Cosmos
Duct Dampers / Grills / Diffuser /VCD I Collar Damper / Louvers / Door Grilles etc.	Caryaire / Nagori / Conaire / Dynacraft / Systemair I Cynor / Air Flow
Motorised ON-OFF Damper Actuator	Siemens/ Danfoss /Honeywell/ Balimo
Fire Dampers I Smoke Dampers	Trox I Greenheck I Ruskin Titus I Systemair / Caryaire / Conaire I Cynor
Fire Damper Actuator	Siemens / Danfoss / Honeywell I Balimo
Control:	
Room thermostat /Temperature sensors	Danfoss/Greystone/Honeywell/Johnsoncontrol / Siemens
HP/LP cutout switch, Oil Pressure Safety switch, Expansion Valves,	As per OEM standards
3pinplugtop	Anchor/Leader/Havells/Cona
Vibration Isolators/Rubberpad/Duct support arrangement	Resistoflex/ SuryaIndustry/ Emerald/ Dunlop/Cori/Easyflex
Factory Fabricated GI Duct	Zeco/Asawa/Aircare/Ductofab
Floor and ceiling grills	Unitile/AETF lexispace/ Balaji
Flexible pipe connections	Resistoflex/ SuryaIndustry
GI sheet	Jindal/Tata/Nippon/SAI / ESSAR / LLOYD
Filters	Thermodyne/Anfilco/Trucool/Purolator/Spectrum
DIDW Centrifugal Fan, Inline Fan, Axial Flow Fan	Kruger/Marathon/Crompton/Nictora / Greenheck/ Flakt wood/Caryaire/System Air with motor fromt heir approved OEM
AHU Motor	ABB/Havells/Crompton Greaves/Bhart Bijli/
Resin bonded Glass Wool Insulation	UP Twiga / Owens Coming I Kimmco I K-flex

List of preferred make (Electrical)

S.No.	Materials	Approved Make
1.	GI modular box of size with cover plate and switch socket, Fan Regulator ,modular MCB	Legrand/ MK Honey well / Havells/ North West /Anchor Panasonic /ABB
2.	PVC insulated copper conductor cable/ T.V. Coaxial wire/ Telephone Wire.	Polycab/ Havell's/ RR Kabel / Finolex / ESC Cables / Pressfit
3.	FRLS PVC insulated wires/cables(ISI marked)	Polycab/ Havell's/ RR Kabel / Finolex / ESC Cables / Pressfit
4.	MCB/RCCB	Legrand/ L&T(LK)/Siemens/Schneider /ABB
5.	MCB DBs	Legrand/Siemens/Schneider/ABB/L&T (LK)
6.	MCCB	L&T(LK)/ABB/ Legrand /Siemens/ Schneider/ HPL
7.	Straight through Joint	Denson/M-Seal/Raychem
8.		
9.	LT Panel	Any CPRI Approved Panel manufacturer
10.		
11.	MS Conduit pipe	AKG/BEC/ NIC
12.	PVC Conduit	BEC/AKG/NIC/MK/NORPACK/AKG
13.	XLPE Aluminium conductor Cable	Polycab/ Havells/ RRRKabel/Finolex / Esc cables ISI marked
14.	Brass Compression gland	Commex /Griwell /Hansel/Johnson
15.	DWC pipe	Gemini / Dutron / Astral

NOTE:-

- The contractor will submit three brand of material to obtain prior approval of above said make list from the Engineer-in-charge and Engineer-in-charge will approve one brand of material out of this.
- Items which are not mentioned in above list but required at site, shall be of BIS approved and supplied with prior approval of CPWD with complete documentation.
- Equivalent superior makes shall be considered only on non-availability of approved specified makes. In general no change in brand will be entertained, however, the executing agency / vendor having similar experience will be / can be considered in case of non-availability of any material with certification from manufacturer, from the above list with cost adjustment (if any). Subject to proof being offered by the Contractor for equivalence to his satisfaction.
- The Contractor shall obtain prior approval from the Engineer-in-charge before placing order for any specific material. The Contractor shall make a detailed submittal with catalogues and highlighted proposed specifications, as well as full details of the works executed by the specialized agency, as specified.

Insertion:Nil

Correction:Nil

Omission:Nil

AE(E)..... /

EE(E).....

UNDERTAKING FROM OEM

Name of Work: Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), Campus Gandhinagar, Gujarat.

NIT No.: 06/EE & SM (E) / IITGNPED /2026-27

This certifies that the OEM/Manufacturer undertakes to support all spare parts and allied accessories of the VRF System for **seven (7) years** on a payment basis, for healthy functioning of the equipment — in addition to the **five-year unconditional guarantee** against manufacturing defects and malfunctioning under the defect liability period, from the date of equipment commissioning.

Contractor /Agency

OEM/Manufacturer

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 **Performance Guarantee**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.
2. 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.
3. We, (indicate the name of the bank)(herein after referred to as "the Bank"), hereby undertake to pay to the Government an amount not exceeding Rs.,,,,,,, (Rupees only) on demand by the Government within 10 days of the demand.
4. 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. (Rupeesonly).
5. 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.
6. We, (indicate the name of the Bank) further agree that the Government shall have the fullestliberty 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 thingwhatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
7. 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.

8. This guarantee will not be discharged due to the change in the constitution of the bank or the Contractor.
9. We, (indicate the name of the Bank), undertake not to revoke this guarantee except with the consent of the Government in writing.
10. This Bank Guarantee shall be valid up tounless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs.....(Rupees..... only) and unless a claim in writing is lodged With us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date.....

Witnesses:

1. Signature.....
Name and address

Authorized signatory

Name

Designation

Staff code no.

2. Signature
Name and address

Bank seal

*Date to be worked out on the basis of validity period of 90 days where only financial bids are invited and 180 days for two/three bid system from the date of submission of tender.**In paragraph 1, strike out the portion not applicable. Bank Guarantee will be made either for earnest money or for performance guarantee/security deposit/mobilization advance, as the case may be.

PART C

SOQ

Name of Work :- Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), Campus Gandhinagar, Gujarat.					
S.L.	Description of Items	Qty	Rate	Unit	Amount
1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit, with piano type switch, phenolic laminated sheet, suitable size M.S. box and earthing the point with 1.5 sq.mm. FRLS/HFFR PVC insulate copper conductor single core cable etc. as required.				
a	Group C	20 Pts.	1680.00	Point	33600.00
2	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
a	Group C	20 Pts.	994.00	Point	19880.00
3	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.				
a	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	50.00 Mtr.	370.00	Metre	18500.00
b	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	200.00 Mtr.	476.00	Metre	95200.00
c	4 X 4 sq. mm + 2 X 4 sq. mm earth wire	250.00 Mtr.	744.00	Metre	186000.00
d	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	250.00 Mtr.	1001.00	Metre	250250.00
4	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	10 Nos.	545.00	Each	5450.00
5	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	40 Nos.	659.00	Each	26360.00
6	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a	3 pin 5/6 A socket outlet	30 Nos.	136.00	Each	4080.00

7	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator).				
a	6 way (4 + 18), Double door	4 Nos.	5299.00	Each	21196.00
8	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs (but without MCBs and incomer) as required . (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)				
a	8 way (4 + 24), Double door	4 Nos.	10724.00	Each	42896.00
9	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	Single pole	72 Nos.	285.00	Each	20520.00
b	Triple pole	32 Nos.	1070.00	Each	34240.00
10	Supplying and fixing following rating, four pole, 415 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	63 A	4 Nos.	1115.00	Each	4460.00
11	Providing and fixing following rating and breaking capacity and pole MCCB with thermo-magnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, Ics=100% Icu and Operational Voltage 690V etc. as required.				
a	125 A,36KA,FPMCCB	4 Nos.	8644.00	Each	34576.00
12	Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess etc. as required.				
a	3 Module (100mmX75mm)	33 Nos.	384.00	Each	12672.00
b	4 Module (125mmX75mm)	2 Nos.	401.00	Each	802.00
13	Supplying & fixing modular 16 Amp SP MCB, "C" curve in existing modular box including connections, etc. as required.	8 Nos.	287.00	Each	2296.00
14	Supplying and fixing 20 A, 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 A "C" curve, SP, MCB, in sheet steel enclosure, on surface or in	8 Nos.	1806.00	Each	14448.00

	recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.				
15	Supplying and fixing 30 A, 415 V, TPN Industrial type socket outlet, with 4 pole and earth, metal enclosed plug top along with 30 A "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	24 Nos.	4348.00	Each	104352.00
16	Supplying and installing following size of perforated Hot Dipped Galvanized Iron cable tray (Galvanization thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastener etc as required.				
a)	100 mm width X 50 mm depth X 1.6 mm thickness	100 Mtr.	754.00	Each	75400.00
17	Supplying and laying of following size XLPE insulated conductor as per ISI codes 7098 : PT 1 : 1998 on surface etc. as reqd.				
a	3.5 x 50 Sq. mm (aluminium armoured cable)	200.00 Mtr	781.00	Mtr.	156200.00
b	4 x 50 Sq. mm (Copper. Flexible cable)	10.00 Mtr	4448.00	Mtr.	44480.00
c	3.5 x 95 Sq. mm (aluminium armoured cable)	150.00 Mtr	1268.00	Mtr.	190200.00
d	4 x 16 sq mm (aluminium armoured cable)	200.00 Mtr	396.00	Mtr.	79200.00
18	Fabricating, supplying, installation, testing & commissioning of Self supported, dust free, vermin proof, totally enclosed free standing, compartmentalized cubical L.T. Indoor single door panel of suitable size fabricated from 2 mm (14 SWG) thick CRCA sheet, with 250 Amps 415 Volt, 50 Hz, 3 Phase, 4 Wires 50 K.A. copper bus-bars, (100 % - Neutral) A.C. supply i/c following switchgear, interconnection, earthing with 25 mm x 5 mm 2 Nos. copper Earth strips, cable alleys, segregated cable gland plates in two halves etc. The panel will be powder coated, shall be installed on suitable brick masonry pedestal for ease of operations etc. The panel shall be fabricated by any manufacturer from CPRI approved list as required.				
	A) INCOMING :400 Amp 4 Poles MCCB with microprocessor based release of 35 KA with RHOM ----- 1 No				
	B)OUT GOINGS : a) 160 amps FP (Ics = 100% Icu) MCCB with Thermal - Magnetic Release ---- -- 3 Nos.				
	b) 63 amps TPN MCB with Thermal - Magnetic				

	Release ----- 6 Nos.				
	c) 40 amps DP MCB with Thermal - Magnetic Release ----- 2 Nos.				
	d) 4 strip copper busbar of 500 A capacity including busbar support etc. as required.-----1 set				
	e) Multi function 3 phase digital panel meter with CT's interconnection , AC auxiliary complete as required---1 set				
	f) Indicating lamp RYB with toggle switch & Kit kat fuses----1 set	1 Set	400907.00	Set	400907.00
19	Fabricating, supplying, installation, testing & commissioning of Self supported, dust free, vermin proof, totally enclosed free standing, compartmentalized cubical L.T. Indoor single door panel of suitable size fabricated from 2.00 mm (14 SWG) thick CRCA sheet, with 250 Amps 415 Volt, 50 Hz, 3 Phase, 4 Wires 50 K.A. copper busbars, (100 % - Neutral) A.C. supply i/c following switchgear, interconnection, earthing with 25 mm x 5 mm 2 Nos. copper Earth strips, cable alleys, segregated cable gland plates in two halves etc. The panel will be powder coated, shall be installed on suitable brick masonry pedestal for ease of operations etc. The panel shall be fabricated by any manufacturer from CPRI approved list as required.				
	A) INCOMING :160 Amp 4 Poles MCCB with microprocessor based release of 35 KA with RHOM ----- 1 No				
	B)OUT GOINGS : a) 100 amps FP (Ics = 100% Icu) MCCB with Thermal - Magnetic Release ---- -- 5Nos.				
	b) 40 amps TPN MCB with Thermal - Magnetic Release ----- 6 Nos.				
	c) 4 strip copper busbar of 200 A capacity including busbar support etc. as required.-----1 set				
	d) Multi function 3 phase digital panel meter with CT's interconnection , AC auxiliary complete as required---1 set				
	e) Indicating lamp RYB with toggle switch & Kit kat fuses----1 set	1 Set	412649.00	Set	412649.00
	VEF System				
20	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 up-to 39 °C. 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 kW ISEER 7.4, Capacity > 40 and <70 ISEER 7.5, Capacity > 70 ISEER 7.6 for Super ECSBC Building)	72 HP	21659.00	HP	1559448.00
21	Supply, installation, testing and commissioning of Factory built double skin DX based ceiling suspended air handling units made of 25mm thick panels consisting of pre coated G.I casing made of thickness 0.6mm outside layer and Aluminium sheet of thickness 0.6mm inside layer with polyurethane foam (PUF) insulation of density 38kg/m3 factory				
	injected between them by injection molding machine & thermal break profile, Mixing Box section with R/A & F/A damper, complete with blower section with blower DIDW backward curved centrifugal fan with suitable static pressure, 6 Row Multi rows deep DX/VRF based Cooling Coil Section, 16 TR, MERV-8 50mm thick Pre filter section, mixing box in pre filter section, SS304 20G insulated drain pan belt drive package with TEFC drive motor (IE-2) with IP-54 protection and 415+/-, 10% volts, 50 Hz, 3 phase, A.C. supply, variable speed motor, drain connections with drain valve, stainless steel drain pan, fire rated flexible inside AHU, necessary vibration isolation arrangement, etc, complete as per specifications of following capacities.				

a	6000 CFM	5 Nos.	375748.00	Each	1878740.00
22	Supply & Installation of AHU Kit & accessories, complete with necessary electronic expansion valves, sensors, controller & remote etc as required.	5 Nos.	51827.00	Each	259135.00
23	Supplying, installation, balancing and commissioning of fabricated at site GSS sheet metal rectangular/ round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports, bends, transitions, reducers, end caps, collars etc as required complete in all respect in confirmation with IS : 655 and approved drawings and specifications of following sheet thickness complete as required.				
a	Thickness 0.80 mm sheet	700 Sq. m	1415.00	Sq.m	990500.00
24	Supplying, installation, testing and commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc in confirmation to SMACNA/IS and as per specifications complete etc. as required.	9 Sq. m	7580.00	Sq.m	68220.00
25	Supplying, Fixing, installation, testing and commissioning of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers in confirmation to SMACNA/IS and as per specifications complete etc. as required.	2 Sq. m	9623.00	Sq.m	19246.00
26	Supplying, Fixing, installation, testing and commissioning of supply air diffusers of powder coated aluminium with aluminium volume control dampers with anti smudge ring & removable core in confirmation to SMACNA/IS and as per specifications complete etc. as required.	8 Sq. m	12841.00	Sq.m	102728.00
26	Supply, installation testing and commissioning of duct acoustic insulation inside the Duct with Engineered Nitrile Rubber open cell foam with Density 140 - 180 Kg/m ³ passing Class 1 Fire Performance test , Rubber based Adhesive in a blend of solvents. and as per specifications complete etc. as required.				
a	10 mm thick duct acoustic lining	40.00 Sq. m	1037.00	Sq.m	41480.00
27	Supplying and fixing of following thickness duly laminated aluminium foil of mat finish closed cell Nitrile rubber (Class "O") insulation on existing duct after applying suitable adhesive for Nitrile rubber. The joints shall be sealed with 50 mm				

	wide and 3 mm thick self adhesive nitrile rubber tape insulation complete as per specifications and as required.					
a	25mm	800.00	Sq. m	1033.00	Sq.m	826400.00
28	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 :					
a	6.4 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	20.00	Mtr.	256.00	Mtr.	5120.00
b	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	200.00	Mtr.	487.00	Mtr.	97400.00
c	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	20.00	Mtr	615.00	Mtr.	12300.00
d	25.4 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	200.00	Mtr.	1068.00	Mtr.	213600.00
e	34.9 mm dia (OD) (Hard drawn) with tube thickness 1.62 mm	30.00	Mtr	1286.00	Mtr.	38580.00
29	Providing and fixing of PVC drain pipe of 6 Kg /cm2 pressure rating complete with 6mm thick closed cell nitrile rubber insulation, fittings, supports, valves as per specifications & drawings					
a	25 mm dia	50.00	Mtr	366.00		18300.00
b	32 mm dia	30.00	Mtr	519.00		15570.00
30	Supplying and laying of one number following size PVC insulated and PVC sheathed Copper flexible cable of 1.1 KV grade on surface/ in conduit between indoor and out door unit.					
a	2C X 1.5 sq.mm	200.00	Mtr	247.00		49400.00
31	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required					
a	20 mm	200.00	mtr	151.00		30200.00
32	Supplying and laying of following size XLPE insulated conductor as per ISI codes 7098 : PT 1 : 1998 on surface etc. as reqd.					
a	3.5 x 95 Sq. mm (aluminium armoured cable)	90.00	Mtr	1268.00	Mtr.	114120.00
b	4 x 6 sq mm (Copper armoured cable)	200.00	Mtr	785.00	Mtr.	157000.00

33	Fabricating, supplying, installation, testing & commissioning of Self supported, dust free, vermin proof, totally enclosed free standing, compartmentalized cubical L.T. Indoor single door panel of suitable size fabricated from 2.00 mm (14 SWG) thick CRCA sheet, with 250 Amps 415 Volt, 50 Hz, 3 Phase, 4 Wires 50 K.A. copper busbars, (100 % - Neutral) A.C. supply i/c following switchgear, interconnection, earthing with 25 mm x 5 mm 2 Nos. copper Earth strips, cable alleys, segregated cable gland plates in two halves etc. The panel will be powder coated, shall be installed on suitable brick masonry pedestal for ease of operations etc. The panel shall be fabricated by any manufacturer from CPRI approved list as required.				
	A) INCOMING :160 Amp 4 Poles MCCB with microprocessor based release of 35 KA with RHOM ----- 1 No				
	B)OUT GOINGS : a) 3.7 Kw DOL starter --- 6 Nos.				
	b) 63 amps FP (Ics = 100% Icu) MCB with Thermal - Magnetic Release ----- 7 Nos.				
	c) 4 strip copper busbar of 200 A capacity including busbar support etc. as required.-----1 set				
	d) Multi function 3 phase digital panel meter with CT's interconnection , AC auxiliary complete as required---1 set				
	e) Indicating lamp RYB with toggle switch & Kit kat fuses----1 set	1 Set	228063.00	Set	228063.00
34	Dismantling of old unserviceable ductable type Air Conditioning System comprising ceiling suspended indoor unit(s) installed at an average height of 6.0 m, outdoor unit(s), refrigerant piping, drain piping, control cabling, power wiring, supports, hangers and all other connected accessories, disconnecting electrical connections, lowering the equipment safely. The item includes all labour, T&P, scaffolding/ lifting arrangements, carriage, and incidental works complete as required and as directed by the Engineer-in-Charge.	4 Job	3611.00	Job	14414.00
35	Dismantling of existing GI ducting for air conditioning system installed at a height of 6.0 metres, including dismantling and removal of all associated hanger supports, supports, flanges, cleats, insulation (where applicable), and accessories, complete. The item includes safe access arrangements, labour, tools, tackles, lowering, shifting, stacking, and disposal of dismantled materials as directed by the Engineer-in-Charge, complete in all respects.	350 Sq. m	155.00	Sq.m	54,250.00

36	Credit for dismantled old unserviceable ductable type Air Conditioning System.				
a	5.5 TR Ductable AC indoor and outdoor unit drain piping, control cabling, power wiring, supports, hangers	4 Job	-5000.00	Job	-20000.00
b	Refrigerant Copper piping	100 Kg.	-650.00	Kg.	-65000.00
				Total:-	90,00,058.00

Executive Engineer & Sr. Manager (E),
IITGNPED, CPWD,
Palaj, Gandhinagar

<u>Central Public Works Department</u>					
NIT/ RFP No: 06/EE & SM (E) / IITGNPED /2026-27					
Name of work:- Renovation and up-gradation of Internal Electrical Installation, UPS and Air Conditioning system of existing Firing Range at National Forensic Science University (NFSU), campus Gandhinagar, Gujarat					
SCHEDULEOFQUANTITIES					
Name of the Contractor/Company Name					
Sl. No.	Name of component	Estimated cost	Percentage above or below the estimated cost	% in Figures	Total Cost
1	As per schedule of work	90,00,058.00	Select	0.00	-
	Grand Total				-