

**Government of India**  
**Central Public Works Department**

**NIT No. 30/EE/E-TVM/2026-27**

Name of Work: Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement level-1, BMT Wing, SCTIMST, Poojappura, Trivandrum.

**Index**

Sl. No	Description	Page No.
<b>1</b>	<b>Part A</b>	1
1.1	Information and Instructions for Bidders for e-Tendering forming part of NIT and to be posted on website	2
1.2	CPWD – 6	6
1.3	Brief Particulars of the project	11
1.4	Information & Instructions for Bidders	12
1.5	Proforma of Receipt of Original EMD	15
1.6	Undertaking for GST Registration Certificate	16
1.7	Letter of Transmittal	17
1.8	Financial Information	18
1.9	Form of Banker's certificate from a Commercial bank	19
1.10	Form of Certificate of net worth from chartered accountant	20
1.11	Details of Eligible similar nature of works	21
1.12	Performance Report of works	22
1.13	Structure & Organization	24
1.14	Affidavit of Not having Blacklisted/Debarred	25
1.15	Affidavit of not executing the works through another contractor on back to back basis	26
1.16	Undertaking for ERP Training in CPWD	27
1.17	CPWD-7	28
1.18	Performa of Schedules	30
<b>2</b>	<b>Part B – Major component (E&amp;M)</b>	36
2.1	General Terms & Conditions for E&M Component	37
2.2	Additional Conditions for Internal Electrical Installations	52
2.3	Additional Conditions & particular Specifications for fire fighting with wet riser and sprinkler system	58
2.4	Additional Conditions & particular Specifications for fire alarm & PA System	64
2.5	Additional Conditions for HVAC system	70
2.6	List of Approved Makes	87
<b>3</b>	<b>Part C – Minor Component (Civil)</b>	94
3.1	Performa of Schedules	95
3.2	Specification for Labs	103
3.3	Special Conditions	107
3.4	Special Conditions for Cement and Steel Brought by the contractor	118
3.5	List of Approved Makes	123
<b>4</b>	<b>Part – D</b>	133
4.1	Schedule of Quantities – Major Component (E&M)	134
4.2	Schedule of Quantities – Minor Component (Civil)	148

Certified that this NIT contains **157** Pages only

NIT approved for **Rs. 70,97,840/-** (E&M: Rs. 40,22,746/- + Civil: Rs. 30,75,094/-)

**PART-A**

**FOR ALL COMPONENTS OF WORK  
INFORMATIONS AND INSTRUCTIONS FOR CONTRACTORS FOR e-  
TENDERING,  
CPWD-6, CPWD-7/8, PROFORMA OF SCHEDULE  
SPECIFIC CONDITIONS FOR ALL COMPONENTS**

## INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR e-TENDERING FORMING PART OF NIT AND TO BE POSTED ON WEB SITE

The Executive Engineer (Electrical), CPWD, Trivandrum – 695 522 (Kerala) e-mail ID: eetvmtced.cpwd@gov.in on behalf of the President of India invites online bids from approved and eligible CPWD enlisted contractors of appropriate class in Building and Roads category/specialized Contractors/firms of repute in two bid system i.e. “Eligibility bid” and “Financial bid” for the following work:

NIT No.	<b>30/EE/E-TVM/2026-27</b>	
Name of Work & Location	<b>Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level - 1, BMT Wing, SCTIMST, Poojappura, Trivandrum.</b>	
Estimated cost put to bid	<b>E&amp;M Component</b>	<b>Rs. 40,22,746/-</b>
	<b>Civil Component</b>	<b>Rs. 30,75,094/-</b>
	<b>Combined Cost</b>	<b>Rs. 70,97,840/-</b>
Earnest money Deposit	<b>Rs. 1,41,957/-</b>	
Stipulated period of completion of work	<b>06 (Six) Months</b>	
Last time & date of online submission of bid, copy of receipt of deposition of original EMD and other documents as specified in the bid document	<b>08.07.2026 up to 15:00 Hrs</b>	
Time & date of online opening of Eligibility bid	<b>08.07.2026 on 15:30 Hrs</b>	
Time & date of online opening of Price bid	<b>Will be intimated later to eligible bidders</b>	

1. Bidders who fulfil the following requirements shall be eligible to apply. Joint ventures / Consortium and Special Purpose vehicle are not accepted.

CPWD Enlisted Contractors of appropriate class has to fulfil the requirements mentioned at 1.1, 1.5 & 1.6

Firms/ Contractors of repute (Non-CPWD enlisted contractors) has to fulfil the requirements mentioned at 1.1, 1.2, 1.3, 1.4, 1.5 & 1.6.

1.1. **Experience of having completed works of similar nature:**

The bidder should have satisfactorily completed the works as mentioned below during the last Seven years ending last day of the month previous to the one in which tenders are invited.

(For this purpose, cost of work shall mean gross value of the completed work including cost of materials supplied by the Government/ client but excluding those supplied free of cost. This should be certified by an officer not below the rank of Project Manager / Executive Engineer / Senior Manager or Equivalent.)

Three similar works each costing not less than **Rs. 28.39 Lakhs**

OR

Two similar works each costing not less than **Rs. 42.59 Lakhs**

OR

One similar work costing not less than **Rs. 56.78 Lakhs**

Similar work shall mean works of **Bio-containment facilities including BSL-2 labs and their validation and/or certification as required.**

**NOTE:-**

- Only works executed in India shall be considered for similar work.
- Qualified similar works shall be physically inspected by the CPWD engineers to ascertain the completion, performance on quality of works for finalizing the eligibility bids, if required.

- c) If private work is shown in support of eligibility criteria, certified copy of Tax deducted at source (TDS) Certificate Form 16A and 26AS) shall be submitted along with the experience certificate and TDS amount shall tally with the actual amount of work done. Otherwise, the amount that tally with TDS shall only be considered for eligibility.
  - d) The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last day of submission of tender
  - e) Completion of work for the purpose of considering experience shall mean completion of entire work in contract and not completion of some portion of the contract even though some portion may be satisfying the magnitude and physical attributes of similar work
- 1.2. The Bidder should have had Average Annual Financial Turnover of **Rs. 21.29 Lakhs** on construction works during the last seven consecutive financial years ending 31st March 2026. (Scanned copy of Certificate from Chartered Accountant with Unique Document Identification Number (UDIN) to be uploaded). The value of annual turnover figures shall be brought to the current value by enhancing the actual turnover figure at simple interest rate of 7% per annum. The year in which no turnover is shown would also be considered for working out the average.
  - 1.3. The Bidder should not have incurred any loss (profit after tax should be positive) in more than two years during the last five years (The balance sheet in case of Pvt. / Public Ltd. Company means its standalone financial statement and consolidated financial statement both, duly audited and certified by the Chartered Accountant) ending 31st March 2026.
  - 1.4. The Bidder should have a Banker's Certificate from a commercial Bank for **Rs. 28.39 Lakhs**.  
OR  
The Bidder should have Net worth Certificate of minimum **Rs. 7.10 Lakhs** issued by the certified Chartered Accountant with Unique Document Identification Number (UDIN).
  - 1.5. Affidavit for non-execution of eligible similar work(s) through another contractor on back-to-back basis or subletting basis
  - 1.6. Affidavit for Non-Black Listing
2. 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.
  3. Information and instructions for bidders posted on website shall form part of bid document.
  4. The bid document consisting of plans, Specifications, 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](http://www.etender.cpwd.gov.in)** or **[www.cpwd.gov.in](http://www.cpwd.gov.in)** free of cost.
  5. But the bid can only be submitted after deposition of original EMD either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission and uploading the mandatory scanned documents such as Insurance Surety Bonds, Account Payee Demand Draft or Banker's Cheque or Fixed Deposit Receipts or/ and Bank Guarantee including e-Bank Guarantee (for balance amount as prescribed) from any of the Commercial Bank towards EMD in favour of Executive Engineer as mentioned in NIT, receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE / AE), CPWD and other documents as specified.
  6. Those contractors who are not registered or have not updated their profile on the website mentioned above, are required to get registered/ update their profile beforehand. The necessary training material including the videos with step-to-step process are available on download section of <https://etender.cpwd.gov.in>.
  7. The intending bidder must have valid Class-III digital signature certificate with encryption key (combo type) to perform any operations/ transactions on the e-tendering portal / website and the bidder should download and install the eMSigner on their system as per instruction available on download section of <https://etender.cpwd.gov.in>.
  8. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
  9. Contractor can upload documents in JPG format and PDF format. **Bidder should ensure that the document uploaded is legible and full documents page is properly scanned.**
  10. Certificate of Financial Turn Over: At the time of submission of bid contractor may upload Affidavit /

Certificate from chartered accountant mentioning Financial Turnover of last seven (7) years ending 31st March 2026 or for the period as specified in the bid document and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.

11. Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in yellow colour and the moment rate is entered, it turns sky blue.  
In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO).

12. The eligibility bid shall be opened first on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the Eligibility Bid shall be communicated to them at a later date.

13. ~~Pre-Bid conference shall be held in the office of Executive Engineer(E) Trivandrum, CPWD, CGO Complex, Vellayani, P.O, Trivandrum, PIN – 695 522 at **\*\* hours on \*\*** to clear the doubt of e-tendering bidders if any~~

~~**Corrigendum will be issued within the next 3 days after the pre-bid meeting. Any changes in the conditions /BoQ will be reflected in the corrigendum. Bidders may submit their bids only after uploading of the corrigendum. Sufficient time of at least 14 days will be given to the bidders after issue of the corrigendum. Even if there is no change on the conditions/BoQ/specifications of the tender, a NIL corrigendum will be issued to indicate that the bidder can go ahead and submit their bids. Bids submitted before the issue of the corrigendum will be rejected unless otherwise the corrigendum issued is a NIL corrigendum, with no changes in conditions/BoQ.**~~

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

15. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.

16. The existing enlisted contractor either himself or his authorized representative shall take compulsory ERP (Enterprise Resource Planning) training through any of the CPWD Regional Training Institutes (RTIs) at Delhi, Mumbai, Chennai and Kolkata, National CPWD Academy (NCA) Ghaziabad, Training arranged by Graduates of ERP "Train the Trainers Programme" conducted by NCA, Ghaziabad or through any other special training arranged by ERP unit of CPWD before last date of submission of Bids. Training will be valid only when participants are registered in LMS (Learning Management System) of ERP and certificate is issued through LMS of ERP.

From 01.07.2024, the enlisted contractor will not be allowed to participate in the tendering process without uploading the certificate of above training. The bid uploaded without attaching the certificate of ERP Training will not be considered for opening of Technical Bid and such bids will be REJECTED.

17. In case of non-enlisted contractor being first lowest in the tender then either contractor himself or his authorized representative shall take compulsory ERP (Enterprise Resource Planning) Training through any of the CPWD Regional Training Institutes at Delhi, Mumbai, Chennai and Kolkata, National CPWD Academy (NCA) Ghaziabad, Training arranged by Graduates of ERP "Train the Trainers Programme" conducted by NCA, Ghaziabad or through any other special training arranged by ERP Unit of CPWD within two months from the date of issue of letter of acceptance/ intent. Training will be valid only when non enlisted contractor is registered in LMS of ERP and certificate is issued through LMS of ERP. Failure to do so, a recovery of Rs. 10,000/- per week shall be made from the R/A bill without giving any show cause notice in this regard.

18. **List of documents to be scanned and uploaded within the period of bid submission:**
  - 18.1. CPWD enlisted contractors of appropriate class have to scan and upload the documents from Sl. No. 01 to 16 except 06, 07, 10, & 13.
  - 18.2. Firms / Contractors of repute (Non-CPWD enlisted contractors) have to scan and upload the documents from Sl. No. 01 to 16 except 03.

Sl. No	List of Documents
--------	-------------------

1.	Insurance Surety Bond, Demand Draft / Account Payee Banker's Cheque / Fixed Deposit Receipt/ Bank Guarantee / e-Bank Guarantee (For balance amount) of any Commercial Bank against EMD
2.	Copy of Receipt for deposition of original EMD to division office of any EE, CPWD (including NIT issuing EE) (Annexure-A) Scanned copy of original Bank Guarantee including e-Bank Guarantee of any commercial bank against EMD
3.	Copy of Enlistment Order in appropriate Class and Category issued by CPWD
4.	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 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 a/c of the work executed and/or for any action taken by CPWD or GST Department in this regard" (Appendix-A4)
5.	Letter of Transmittal (Appendix-A1)
6.	Certificate of Financial Turnover from Chartered Accountant (Form-A)
7.	Banker's Certificate (Form-B) or Net worth Certificate (Form-B1)
8.	Detail of work experience (Form-C). If private works are shown in support of eligibility, certified copy of the contract document and Tax Deducted at source Certificate (TDS) shall also be submitted along with the Experience Certificate and the TDS amount shall tally with the actual amount of work done. Otherwise, the amount that tally with TDS shall only be considered for eligibility.
9.	Performance report of works referred in Form-C (Form-D).
10.	Structure & Organization (Form-E)
11.	Affidavit for non-execution of eligible similar work(s) through another contractor on back-to-back basis or subletting basis (Form-G)
12.	Affidavit for Non-Black Listing (Form-H)
13.	Details of Firm proprietor or Power of attorney with a copy of Partnership Deed for Partnership firm or Power of attorney with copy of the Memorandum of Articles of Association for limited company or a corporation as per Clause 3/3.4 of Information and Instructions for Bidders (Section-II)
14.	ERP Training certificate regarding successful completion of ERP Training if already obtained by the bidder. If Bidder has not obtained ERP (Enterprise Resource Planning) training, then he shall scan and upload the undertaking in the prescribed format (Appendix A5)
15.	Additional documents / any other documents specified in NIT

**Note:**

If any required document is not scanned and uploaded while submitting the bid, the bid submitted shall become invalid and will not be considered for e-Tendering process and the bid shall be summarily rejected.

**GOVERNMENT OF INDIA  
CENTRAL PUBLIC WORKS DEPARTMENT  
NOTICE INVITING e-TENDER**

1. The Executive Engineer(Electrical), CPWD, Trivandrum on behalf of the President of India invites online percentage rate composite bids from CPWD enlisted contractors of appropriate class in Buildings & Roads (erstwhile composite/ Building/ Infrastructure) category and Firms/ Contractors of repute in two bid system for the following work:

**Name of Work :Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level - 1, BMT Wing, SCTIMST, Poojappura, Trivandrum.**

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

- 1.1. The work is estimated to cost **Rs. 70,97,840/- (E&M: Rs. 40,22,746 + Civil: Rs. 30,75,094)**. This estimate, however, is given merely as a rough guide. The estimated rates considered in the BOQ are valid and applicable only for estimation purpose. However, the bidders are required to conduct their own market survey to obtain the latest prevailing rates in the market and to work out their tendered rates accordingly. Any dispute or claim on the validity or correctness of the rates considered in the BOQ shall not be entertained in the operation of contract at any stage.

- 1.2. **Criteria of eligibility for submission of tender documents**

The bidder should have satisfactorily completed the works as mentioned below during the last Seven years ending last day of the month previous to the one in which tenders are invited.

Three similar works each costing not less than **Rs. 28.39 Lakhs**

or

Two similar works each costing not less than **Rs. 42.59 Lakhs**

or

One similar work costing not less than **Rs. 56.78 Lakhs.**

**“Similar Work” shall mean works of “Bio-containment facilities including BSL-2 labs and their validation and/or certification as required”**

To become eligible, the bidders shall have to furnish an affidavit as under (Form G):

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

2. Agreement shall be drawn with the successful bidders on prescribed Form No. **CPWD 7/8** (or other Standard Form as mentioned) which is available as a Govt. of India Publication and also available on website **www.cpwd.gov.in**. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
3. The time allowed for carrying out the work will be **06 (Six) 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. The site for the work is available.
5. The bid document consisting of plans, specifications, the schedules of quantities of various types of items to be executed and set of terms and conditions of the contract to be complied with and other necessary documents except standard general conditions of contract form can be seen on website **<https://etender.cpwd.gov.in>** or **[www.cpwd.gov.in](http://www.cpwd.gov.in)** free of cost.
6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.

No post-tender modification is allowed by the tenderers except through negotiations, if required. In case, any tenderer does so, the tender will be rejected and the tenderer will be debarred for future

tendering in CPWD for two years by the concerned enlisting authority (in case of CPWD enlisted contractor) and by the concerned CE/SE (in case of non-enlisted contractor).

7. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.
- ~~8. When tenders are invited in three stage system and if it is desired to submit revised financial bid then it shall be mandatory to submit revised financial bid. If not submitted then the tender submitted earlier shall become invalid.~~
9. 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 **The Executive Engineer (E), Trivandrum, CPWD, Thiruvananthapuram -22.**) shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The original EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission. The EMD receiving Executive Engineer (including NIT issuing EE/AE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT.

A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 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 six months or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

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

Copy of Enlistment Order and certificate of work experience and other documents as specified in the press notice shall be scanned and uploaded to the e-Tendering website within the period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in press notice shall have to be submitted by the lowest bidder only along with physical EMD of the scanned copy of EMD uploaded within a week physically in the office of tender opening authority. Online bid documents submitted by intending bidders shall be opened only of those bidders, whose original EMD deposited with any division of CPWD and other documents scanned and uploaded are found in order system without tender processing fee any time.

The Eligibility bid shall be opened at the time given in the "Information and Instructions for bidders for e-tendering forming part of bid document"

The bid submitted shall be opened at **15:30 Hrs on 08.07.2026**

10. The bid submitted shall become invalid if:
  - 10.1. The bidder is found ineligible.
  - 10.2. The bidder does not upload all the documents (including GST Registration) as stipulated in the bid document.
  - 10.3. If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of tender opening authority.
  - 10.4. If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/ below on the total amount of the tender or any section/ sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
11. The contractor, whose bid is accepted will be required to furnish performance guarantee and APG (if applicable) at specified percentage of the tendered amount as mentioned in schedule E and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee including e-Bank Guarantee from any of the Commercial Banks in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee and APG (if applicable) within the period as indicated in schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee and APG (if

applicable).

The contractor whose bid is accepted will also be required to furnish either copy of applicable licenses / registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including Provident Fund Code No. If applicable and also ensure the compliance of aforesaid provisions by the sub-contractors, if any engaged by the contractor for the said work within the period specified in schedule F.

12. The description of the work is as follows:

**Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level - 1, BMT Wing, SCTIMST, Poojappura, Trivandrum.**

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid.

A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at their own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
15. The competent authority 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 rates quoted.
16. The contractor (enlisted or non-enlisted in CPWD) shall not be allowed to participate in the tender for work(s) in the CPWD Zone / Circle / Division / Sub-Division responsible for award and/ or execution of contract(s) in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of the Chief Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working or subsequently employed by him and who are near relatives to any officer working in the CPWD. Any breach of this condition by the contractor would render him liable to be debarred for a period upto two years from tendering in CPWD as decided by the accepting authority mentioned in Schedule-F and his decision will be excepted from Clause-25.
17. No Engineer of gazetted rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service
18. The bid for the works shall remain open for acceptance for a period of ~~thirty (30) days from the date of opening of bids in case of single bid system/~~ seventy five (75) days from the date of opening of technical bids in case bids are invited on 2 or 3 bid envelop system.
- 18.1. If any tenderer withdraws his tender within 7 days after last date and time (24 hours basis) of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 50% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.
- 18.2. If any tenderer withdraws his tender after expiry of 7 days after last date and time (24 hours basis) of submission of bids, then the Government shall without prejudice to any other right or

remedy, be at liberty to forfeit 100% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.

- 18.3. Withdrawal of the tender, by the tenderer, shall only be made through e-tender portal. Any other method i.e. through letter / e-mail etc. shall not be considered.
- 18.4. In case of forfeiture of earnest money as prescribed in para (i) and (ii) above, the bidder shall not be allowed to participate in the rebidding process of the same work.
19. This notice inviting Bids 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:
  - 19.1. 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.
  - 19.2. Standard C.P.W.D. Form 7/8 or other Standard CPWD forms as applicable.

20. Composite Bids

- 20.1. The Executive Engineer in charge of the major component will call bids for the composite work. The cost of bid document and Earnest Money will be fixed with respect to the combined estimated cost put to tender for the composite bid.
- 20.2. The Bid document consists of the following five Components. However, all these components constitute a unified single bid document where the information flows across the components. Therefore, while reading, the entire bid document is to be treated as a single unified documents though it consists of following internal components for the purpose of convenience in reading.

Part – A	CPWD-6, CPWD-7 including schedule A to F for the major & minor component(s) of the work, Standard General Conditions of Contract for CPWD as mentioned in schedule A to F, Specific conditions for all component(s) of work
Part – B	General / Specific conditions and Specifications for major component of the work
Part – C	Schedule A to F for minor component of the work (competent authority under clause 2 and clause 5 shall be same authority as mentioned in schedule A to F for major components), General / specific conditions and specifications applicable to minor component(s) of the work.
Part – D	Schedule of Quantities for both major and minor components of work, Financial Bid
Part – E	Drawings, GCC 2023 for Construction works, Amendments

- 20.3. The bidders must associate themselves, with agencies as per NIT conditions
- 20.4. The eligible bidders shall quote rates for all items of major component as well as for all items of minor components of work.
- 20.5. After acceptance of the bid by competent authority, the EE in charge of major component of the work shall issue letter of award on behalf of the President of India. After the work is awarded, the main contractor will have to enter into one agreement with EE in charge of major component and has also to sign two or more copies of agreement depending upon number of EEs / DDH in charge of minor components. One such signed set of agreement shall be handed over to EE/ DDH in charge of minor component(s).  
EE of major component will operate Part A, Part B & Part D of the agreement. EE / DDH in charge of minor component (s) shall operate Part- A, Part C, Part D & ~~Part E~~ of the agreement.
- 20.6. Entire work under the scope of composite bid including major and all minor components shall be executed under one agreement.
- 20.7. Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works.

- 20.8. Running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor components shall be made by the Engineer in Charge of the discipline of minor component directly to the main contractor. The CMB / EMB shall be maintained independently by Engineer in Charge of major and minor components.
  - 20.9. The composite work shall be treated as complete when all the components of the work are complete. The completion certificate of the composite work shall be recorded by Engineer in charge of major component after record of completion certificate of all other components.
  - 20.10. Final bill of whole work shall be finalized and paid by the EE of major component.
  - 20.11. Engineer(s) in charge of other component(s) will prepare and pass the final bill for their component of work and pass on the same to the EE of major component for including in the final bill for composite contract.
21. ~~INTEGRITY PACT: The contractor shall download the Integrity Pact, which is a part of tender documents, affix his signature in the presence of a witness, and upload the same while submitting online bids for all works of estimated cost put to tender equal or more than the threshold value given in Schedule-F. In the event of his failure to sign and upload the Integrity Pact along with other bid documents, his bid shall be rejected.~~
22. The intending bidders are required to update their profile in CPWD e-tender portal and to upload their bids well in advance of last date of submission of tender. Any issue related to updating profile / uploading tender can be resolved through the concerned Executive Engineer / Assistant Engineer inviting tender (as mentioned at Sl. No. 1 of Information and Instructions for Bidders for e-Tendering forming part of Bid Document) or ERP help line No. 18001803286 or e-mail id cpwd.support@techmahindra.com. The e-tendering bidders are also advised not to wait to raise any issues till the last date of submission of bid in their own interest.

**Executive Engineer (E)  
Trivandrum, CPWD,  
Thiruvananthapuram – 695522**

## Section – I

### Brief particulars of the project

1. Salient details of the work for which bids are invited are as under:

SI. No	Name of Work	Estimated Cost			Period of completion
1	Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level – 1, BMT wing, SCTIMST, Poojappura, Trivandrum	E&M Component	Rs.	40,22,746/-	06 (Six) Months
		Civil Component	Rs.	30,75,094/-	
		Combined Estimated Cost	Rs.	70,97,840/-	

2. The work is situated at CD Block, SCTIMST, Poojappura, Trivandrum  
 3. General features and major components of the work are as under:

#### **E&M**

The Proposed area for VRDL is situated at Lower Basement Floor of CD Block building and the following services has been incorporated

1. Wiring for light / AC points/Power points /Data/ with FRLS PVC insulated copper conductor wires with modular type switches, sockets, cover plates, DB, MCB etc as required.
2. SITC of Clean room fitting and dismantling, refixing of existing LED fittings as per site requirements.
3. Modification of existing 6800 CFM AHU unit for achieving the parameters for lab as suggested by the Consultant, SITC of pressurizing unit, Exhaust units & HVAC ducting. Providing Split AC etc are considered as per requirements.
4. Dismantling and refixing of existing CCTV and Speakers as per site requirement.
5. Modification of existing fire alarm system and firefighting system as per site requirement.
6. Providing static and dynamic pass box as per site requirement.

#### **Civil:**

This Estimates provides for the following:

1. Provision for clean room partition with Puf paneling
2. Provision for new door and view panels
3. Provision for Epoxy flooring with coving
4. Provision for Puf veiling in Duffing, Donning, BSL 2 sample processing Room, PCR amplification, A/I and serology room and metal grid false ceiling for other rooms.
5. Provision for wet shower along with plumbing works

## **Section – II**

### **INFORMATION & INSTRUCTIONS FOR BIDDERS**

**1. General:**

- 1.1. Letter of transmittal and forms for deciding eligibility are given in Section III.
- 1.2. All information called for in the enclosed forms should be furnished against the relevant columns in the forms. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a “nil” or “no such case” entry should be made in that column. If any particulars/query is not applicable in case of the bidder, it should be stated as “not applicable”. The bidders are cautioned that not giving complete information called for in the application forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing the information may result in the bid being summarily disqualified. Bids made by telegram or telex and those received late will not be entertained.
- 1.3. References, information and certificates from the respective clients certifying suitability, technical knowledge or capability of the bidder should be signed by an officer not below the rank of Executive Engineer or equivalent
- 1.4. The bidder may furnish any additional information which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. He is, however, advised not to furnish superfluous information.
- 1.5. No information shall be entertained after submission of eligibility criteria document unless it is called for by the Employer. No fresh/ revised mandatory documents is permitted at this stage.

**2. Definitions:**

- 2.1. In this document the following words and expressions have the meaning hereby assigned to them.
- 2.2. Employer: Means the President of India, acting through the **Executive Engineer (E)Trivandrum, CPWD**
- 2.3. Bidder: Means the individual, proprietary firm, firm in partnership, limited company private or public or corporation. Joint Ventures and Special Purpose Vehicles are not accepted as bidders.
- 2.4. “Year” means “Financial Year” unless stated otherwise.

**3. Method of application:**

- 3.1. If the bidder is an individual, the bid shall be signed by him above his full type written name and current address.
- 3.2. If the bidder is a proprietary firm, the bid shall be signed by the proprietor above his full typewritten name and the full name of his firm with its current address.
- 3.3. If the bidder is a firm in partnership, the bid shall be signed by all the partners of the firm above their full typewritten names and current addresses, or, alternatively, by a partner holding power of attorney for the firm. In the later case a certified copy of the power of attorney should accompany the bid. In both cases a certified copy of the partnership deed and current address of all the partners of the firm should accompany the bid.
- 3.4. If the bidder is a limited company or a corporation, the bid shall be signed by a duly authorized person holding power of attorney for signing the bid accompanied by a copy of the power of attorney. The bidder should also furnish a copy of the Memorandum of Articles of Association duly attested by a Public Notary.

**4. Final decision making authority.**

The employer reserves the right to accept or reject any bid and to annul the process and reject all bids at any time, without assigning any reason or incurring any liability to the bidders

**5. Particulars provisional**

The particulars of the work given in Section I are provisional. They are liable to change and must be considered only as advance information to assist the bidder

**6. Site visit**

The bidder is advised to visit the site of work, at his own cost, and examine it and its surroundings to himself collect all information that he considers necessary for proper assessment of the prospective assignment.

## 7. **Criteria for eligibility**

7.1. The bidder should have satisfactorily completed the works as mentioned below during the last Seven years ending last day of the month previous to the one in which tenders are invited.

(For this purpose, cost of work shall mean gross value of the completed work including cost of materials supplied by the Government/ client but excluding those supplied free of cost. This should be certified by an officer not below the rank of Project Manager / Executive Engineer / Senior Manager or Equivalent.)

Three similar works each costing not less than **Rs. 28.39 Lakhs**

OR

Two similar works each costing not less than **Rs. 42.59 Lakhs**

OR

One similar work costing not less than **Rs. 56.78 Lakhs**

Similar work shall mean works of ***“Bio-containment facilities including BSL-2 labs and their validation and/or certification as required”***

### **NOTE:-**

- a) Only works executed in India shall be considered for similar work.
  - b) Qualified similar works shall be physically inspected by the CPWD engineers to ascertain the completion, performance on quality of works for finalizing the eligibility bids, if required.
  - c) If private work is shown in support of eligibility criteria, certified copy of Tax deducted at source (TDS) Certificate Form 16A and 26AS) shall be submitted along with the experience certificate and TDS amount shall tally with the actual amount of work done. Otherwise, the amount that tally with TDS shall only be considered for eligibility.
  - d) The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to previous day of last day of submission of tender
- 7.2. Completion of work for the purpose of considering experience shall mean completion of entire work in contract and not completion of some portion of the contract even though some portion may be satisfying the magnitude and physical attributes of similar work
- 7.3. The Bidder should have had Average Annual Financial Turnover of **Rs. 21.29 Lakhs** on construction works during the last seven consecutive financial years ending 31st March 2026. (Scanned copy of Certificate from Chartered Accountant with Unique Document Identification Number (UDIN) to be uploaded). The value of annual turnover figures shall be brought to the current value by enhancing the actual turnover figure at simple interest rate of 7% per annum. The year in which no turnover is shown would also be considered for working out the average.
- 7.4. The Bidder should not have incurred any loss (profit after tax should be positive) in more than two years during the last five years (The balance sheet in case of Pvt. / Public Ltd. Company means its standalone financial statement and consolidated financial statement both, duly audited and certified by the Chartered Accountant) ending 31st March 2026.
- 7.5. The Bidder should have a Banker's Certificate from a commercial Bank for **Rs. 28.39 Lakhs**.
- OR
- The Bidder should have Net worth Certificate of minimum **Rs. 7.10 Lakhs** issued by the certified Chartered Accountant with Unique Document Identification Number (UDIN).
- 7.6. The bidder should have sufficient number of Technical and Administrative employees for the proper execution of the contract. The bidder shall have to submit a list of these employees stating clearly how these would be involved in this work within 15 days of award of work.
- ## 8. **Evaluation criteria**
- 8.1. The detailed submitted by the bidders will be evaluated in the following manner:
- a) The criteria prescribed in para above in respect of experience of eligible similar works completed, financial turn over, profit and Banker's / Networth Certificate will be scrutinized by Engineer-in-charge and the bidder's eligibility for the work be determined.
  - b) Engineer-in-charge at his sole discretion may call for additional information /documents, clarification from the bidders after submission or their bids to satisfy himself about their eligibility as per tender conditions.

9. **Financial information.**

Bidder should furnish the Annual financial statement for the last five years in (Form "A"). Banker's Certificate in (Form "B") or Networth Certificate in (Form "B-1").

10. **Experience of similar work**

Bidder should furnish the List of eligible similar nature of works successfully completed during the last seven years in (Form "C") and (Form D).

11. **Organization information**

Bidder is required to submit the information in respect of his organization in Forms "E"

12. **Letter of transmittal**

The bidder should submit the Letter of Transmittal attached with the document.

13. **Opening of Price bid**

After evaluation of applications, a list of qualified bidders shall be prepared. Thereafter the financial bids of only the qualified bidders shall be opened at the notified time, date and place in the presence of the qualified bidders or their representatives.

14. **Award Criteria**

14.1. The employer reserves the right, without being liable for any damages or obligation to inform the bidder, to

- a) amend the scope of work and value of contract.
- b) Reject any or all the applications without assigning any reason.

14.2. Any effort on the part of the bidder or his agent to exercise influence or to pressurize the employer would result in rejection of his bid. Canvassing of any kind is prohibited.

**Executive Engineer (E)  
Trivandrum, CPWD,  
Thiruvananthapuram – 695522**

**SECTION-III****Annexure-A****Proforma of Receipt of Original EMD**

1. The EE / Engineer in charge / DDH of any divisions / projects of CPWD or any other officer designated by CPWD Directorate from time to time, are authorized to receive the EMDs. These authorities should receive the original EMD for their tenders or tenders of any other division / projects.
2. The NIT approving authority / Tender inviting authority at the time of issue of NIT also fills and upload the following prescribed format of receipt of deposition of original EMD along with NIT (Format is given at next page).
3. The Authority receiving EMD in original form examines the EMD deposited by the bidder and issues receipt of deposition of earnest money to the agency in a given format uploaded by tender inviting authority. The receipt can also be issued by any subordinate gazetted authority as authorized by the EE / Engineer in charge / DDH.
4. The authority receiving original EMD also intimates tender inviting authority about deposition of EMD by the agency by email / fax / telephonically.
5. The original EMD receiving authority releases the EMD to unsuccessful bidders after the expiry of stipulated bid validity period or immediately after acceptance of the successful bidder, whichever is earlier, after verification from the e-tendering portal website (<https://etender.cpwd.gov.in>>closed Tender>all) that the particular contractor is not L-1 tenderer and work is awarded.
6. The tender inviting authority will call for original EMD of the L1 tenderer from EMD receiving authority immediately.

<b>RECEIPT OF DEPOSITION OF ORIGINAL EMD</b>				
(Receipt No...../ Date.....)				
1	<b>Name of Work</b>	:	<b>Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level – 1, BMT wing, SCTIMST, Poojappura, Trivandrum</b>	
2	<b>NIT No</b>	:	<b>30/EE/E-TVM/2026-27</b>	
3	<b>Estimated Cost</b>	:	<b>E&amp;M Component</b>	<b>Rs 40,22,746/-</b>
		:	<b>Civil Component</b>	<b>Rs 30,75,094/-</b>
		:	<b>Combined Estimated Cost</b>	<b>Rs 70,97,840/-</b>
4	<b>Amount of EMD</b>	:	<b>Rs. 1,41,957/-</b>	
5	<b>Last date of submission of Bid</b>	:	<b>Up to 15.30 hrs on 08.07.2026</b>	
1	<b>Name of Contractor</b>	:		
2	<b>Form of EMD</b>	:		
3	<b>Amount of Earnest Money Deposit</b>	:		
4	<b>Date of Submission of EMD</b>	:		
5	<b>Email ID of EMD Receiving Officer</b>	:		
6	<b>Mobile No. Of EMD receiving officer</b>	:		
<b>To be filled by EMD receiving EE/DDH</b>				

Signature, Name and Designation of EMD  
Receiving officer along with Office stamp

EE(E)/Contr

**Undertaking for GST Registration Certificate**

To  
The Executive Engineer (Electrical)  
CPWD, Trivandrum

Subject: **Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level – 1,  
BMT wing, SCTIMST, Poojappura, Trivandrum**

Dear Sir,

Having examined the details given in the bid document for the above work, I/we hereby submit that I/we has/have not obtained GST registration as applicable hence we here by undertake the following:

“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 a/c of the work executed and/or for any action taken by CPWD or GST Department in this regard.”

Signature of Bidder (s) or

an authorized Officer of the firm with stamp & seal

### Section-III

### Appendix – A1

## INFORMATION REGARDING ELIGIBILITY

### Letter of Transmittal

To

**The Executive Engineer (E) -Trivandrum**  
CPWD, Trivandrum

Sub: **Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level – 1, BMT wing, SCTIMST, Poojappura, Trivandrum**

Sir,

Having examined the details given in the bid document for the above work, I/ We hereby submit the relevant information.

1. I/ We hereby certify that all the statement made and information supplied in the enclosed **form- A to F** and accompanying statement are true and correct.
2. I/ We have furnished all information and details necessary for eligibility and have no further pertinent information to supply.
3. I/We submit the requisite certified solvency certificate or Net worth Certificate and authorize the Executive Engineer(E), CPWD, Trivandrum and/or his authorized staff to approach the Bank issuing the solvency certificate or Net worth Certificate to confirm the correctness thereof. I/We also authorize Executive Engineer(E), CPWD, Trivandrum and/or his authorized staff to approach individuals, employers, Firms, Corporation, etc. to verify our competence and general reputation, experience certificate of similar works and any other document submitted here with the bid document.
4. I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible similar works

S.No.	Name of work	Amount	Experience Certificate from
1.			
2.			
3.			

5. I/We hereby submit undertaking on structural stability and soundness as per prescribed format form 'F'.

**Certificate:** It is certified that the information given in the enclosed eligibility bid are correct. It is also certified that I/we shall be liable to be debarred, disqualified/cancellation of enlistment in case any information furnished by me/us found to be incorrect.

Enclosures:

Seal of bidder

**Date of submission:**

**SIGNATURE(S) OF BIDDER(S):**

**Financial Information**

Name of the firm / contractor.....:

1. **Financial Analysis** – Details to be furnished duly supported by figures in balance sheet / profit & loss account for the last five / seven years duly certified by the Chartered Accountant, as submitted by the applicant to the Income Tax Department (Copies to be attached).

**Note:** At the time of submission of bid, contractor has to upload Certificate of Chartered Accountant mentioning financial turnover and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.

Fig in lakhs Rs.

Sl. No	Particulars	Financial Years						
		2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
1	Gross Annual Turnover on Construction works							
	Reference to Page No							
2	Profit / Loss (standalone finance statement and consolidated financial statement both)							
	Reference to Page No							

2. Financial arrangements for carrying out the proposed work.

**Signature of Chartered Accountant with Seal****Unique Document Identification Number (UDIN) .....****Signature of Bidder(s)**

Note: The Bidder should give information strictly in above format.

**Form of Banker's Certificate from a Commercial bank**

This is to certify that to the best of our knowledge and information that M/s./ Sh..... having marginally noted address, .....as a Customer of our bank are/ is respectable and can be treated as good for any engagement upto a limit of Rs..... (Rupees.....).

This certificate is issued without any guarantee or responsibility on the bank or any of the officers.

(Signature) For the Bank

To,  
The Executive Engineer(Electrical)  
CPWD, Trivandrum

**NOTE:**

1. Banker's certificate should be on letter head of the Bank, addressed to Tendering authority.
2. In case of partnership firm, certificate should include names of all partners as recorded with the Bank.
3. The certificate should not be more than 6 months old.

**FORM "B1"**

**Form for Certificate of net Worth From Chartered Accountant**

It is to certify that as per the audited balance sheet and profit & loss account during the financial year.....,the net worth of M/s..... (name and registered address of individual/firm/company), as on..... (the relevant date) is Rs..... after considering all liabilities. It is further certified that the net worth of the company has not eroded by more than 30% in the last three years ending on.....(the relevant date)

Unique Document Identification Number (UDIN) .....

Signature of the Chartered Accountant

.....

Name of the Chartered Accountant

.....

Membership no. of ICAI

**Date and seal**

**NOTE:**

1. In case of partnership firm, certificate should include names of all partners as recorded with the Chartered Accountant.
2. The certificate should not be more than 6 months old on the last date of Tender Submission.

**FORM 'C'****Details of Eligible Similar nature of Works completed during the last seven years ending last day of Previous month of submission of tenders.**

Name of the firm / contractor.....

Sl. No.	Name of work / project and location	Owner or sponsoring organization	Cost of work in crores of Rs.	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Litigation/ arbitration cases pending / in progress with details*	Name and Address (Postal & E-mail) / telephone number of officer to whom reference may be made	Whether work was done on back to back basis. Yes/no
1	2	3	4	5	6	7	8	9	10

\*indicate gross amount claimed and amount awarded by the Arbitrator.

Signature of bidder(s)

**Performance Report of Works referred to in Form 'C'**

1.	Name of work / project & location		:	
2.	Agreement No.		:	
3.	Estimate cost		:	
4.	Tendered cost		:	
5.	Completion cost		:	
6.	Date of Start		:	
7.	Stipulated date of completion		:	
8.	Actual date of completion		:	
9.	(a)	Whether case of levy of compensation for delay has been decided or not	:	
	(b)	If decided, amount of compensation levied for delayed completion, if any	:	
10.	Amount of reduced rate items, if any		:	
11.	Performance Report			
(i)	Quality of work		:	Outstanding / Very Good / Good / Poor
(ii)	Financial soundness		:	Outstanding / Very Good / Good / Poor
(iii)	Technical Proficiency		:	Outstanding / Very Good / Good / Poor
(iv)	Resourcefulness		:	Outstanding / Very Good / Good / Poor
(v)	General Behaviour		:	Outstanding / Very Good / Good / Poor
12.	Type of Structure (RCC framed or load bearing)		:	
13.	No. of storeys		:	
	(Note: Mumty, Machine Room shall not be counted as Storeys)		:	
14.	Whether the work executed with basement (Yes / No)		:	
15.	Whether the work executed with water supply & sanitary installations (Yes/No)		:	
16.	Whether the work executed with Internal & External electrical installations (Yes / No)		:	

17.	Whether the work executed with Firefighting works (Yes / No)	:	
18.	Whether the work executed with Fire Alarm works (Yes / No)	:	
19.	Whether the work executed with Public address & evacuation system (Yes/No)	:	
20.	Whether the work executed with BMS (Building Management System) (Yes / No)	:	
21.	Whether the work executed with HVAC work (Yes / No)	:	
22.	Whether the work executed with Lift (s) work (Yes / No)	:	
23.	Remarks (If any)	:	

Dated:

Owner / sponsoring organizations signature with date and seal (Project Manager / Executive Engineer / Senior Manager or Equivalent)

**Structure and Organisation**

1.	Name & Address of the bidder	
2.	Telephone No. / Email id/Mobile No. /Fax No.	
3.	Legal status of the bidder (Attach copies of original document defining the legal status)	
	1. An Individual	
	2. A proprietary firm	
	3. A firm in partnership	
	4. A limited company or Corporation	
4.	Particulars of registration with various Government bodies (attach attested photo – copy)	
	ORGANIZATION / PLACE OF REGISTRATION	REGISTRATION No.
	1.	
	2.	
	3.	
5.	Names and Titles of Directors & Officers with designation to be concerned with this work.	
6.	Designation of individuals authorized to act for the organization	
7.	Has the bidder or any constituent partner in case of partnership firm limited company or corporation ever abandoned the awarded work before its completion? If so, give name of the project and reasons for abandonment.	
8.	Has the bidder, or any constituent partner in case of partnership/firm/limited company or corporation ever been convicted by the court of law? If so, give details.	
9.	In which field of Civil Engineering Construction, the bidder has specialization and interest?	
10.	Any other information considered necessary but not included above	

**SIGNATURE (S) OF BIDDER (S)**

**Affidavit of Not having Blacklisted/Debarred**

I/We undertake and confirm that our firm / partnership firm has not been blacklisted presently (as on last date of submission of bid) by any state / Central Department / PSUs / Autonomous bodies of Central Government. Further that, if such information comes to the notice of the department then I / we shall be debarred for this work. Also, if such information comes to the notice of department on any day before date of start of work and during execution stage, the Engineer in charge shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee and APG (if applicable)/ Security Deposit etc.

**NOTE: Affidavit to be furnished on a 'Non-Judicial' stamp paper worth Rs.200/-**

Signature of Bidder(s) or an authorized  
Officer of the firm with stamp

Signature of Notary with seal

Note: In case of any litigation in process or in last seven years, the details of same should be furnished/ (scanned and uploaded at the time of submission of bid) in the following Format.

S.No	Name of work	Year	Details of litigations	Type of litigation	Status of litigation

Signature of Bidder(s) or an authorized  
Officer  
of the firm with stamp

Signature of Notary with seal

**Form H**

**Affidavit of not executing the works through another contractor on back to back basis**

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 bidding / 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 and APG (if applicable).

**Signature of Bidder(s) or an authorized  
Officer of the firm with stamp**

**Signature of Notary with seal**

**NOTE: Affidavit to be furnished on a 'Non-Judicial' stamp paper worth Rs.200/-**

**Undertaking for ERP Training in CPWD**

To  
The Executive Engineer (Electrical)  
CPWD, Trivandrum

Subject: Name of Work: **Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level – 1, BMT wing, SCTIMST, Poojappura, Trivandrum**

Dear Sir,

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

"If work is awarded to me/us, I/we or my/our authorized representative shall obtain ERP (Enterprise Resource Planning) training through any of the CPWD Regional Training Institutes at Delhi, Mumbai, Chennai and Kolkata, National CPWD Academy (NCA) Ghaziabad, Training arranged by Graduates of ERP "Train the Trainers Programme" conducted by NCA, Ghaziabad or through any other special training arranged by ERP Unit of CPWD within two months from the date of issue of letter of acceptance / intent. Training will be valid only if I/we am/are registered in LMS of ERP and certificate is issued through LMS of ERP. Failure to do so, a recovery of Rs. 10,000/- per week shall be made from the R/A bill without giving any show cause notice in this regard.

Signature of Bidder (s) or

an authorized Officer of the firm with stamp

**GOVERNMENT OF INDIA  
CENTRAL PUBLIC WORKS DEPARTMENT  
Percentage Rate Tender & Contract for Works**

Tender for the work of: **Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level - 1, BMT Wing, SCTIMST, Poojappura, Trivandrum.**

- |  |
|--|
| 1. To be uploaded by <b>15:00 Hrs</b> on <b>08.07.2026</b> to /upload at <a href="https://etender.cpwd.gov.in">https://etender.cpwd.gov.in</a> .                           |
| 2. To be opened in presence of tenderers who may be present at <b>15:30 Hrs on 08.07.2026</b> in the office of the <b>Executive Engineer-Electrical, CPWD, Trivandrum.</b> |

**TENDER**

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

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.

I/We agree to keep the tender open for 30 (Thirty) days from the due date of its opening in case of single bid system, 75 (Seventy five) days from the date of opening of technical cum eligibility bid in case tenders are invited on 2 /3 bid/ system for specialised work and not to make any modification in its terms and conditions.

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

A copy of earnest money deposit receipt of prescribed amount deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed) issued by a Commercial Bank, is scanned and uploaded (Strike out as the case may be).

If I/We, fail to furnish the prescribed performance guarantee and APG(if applicable) within prescribed period, I/We agree that the said President of India or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely.

Further, if I/We fail to commence work as specified, I/We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee and APG(if applicable) absolutely. The said Performance Guarantee and APG(if applicable) 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 of the tender form.

Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee and APG(if applicable)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 and APG(if applicable).

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 & integrity of the State.

**Dated:**  
**Witness:**  
**Occupation:**

**Signature of Contractor**  
**Postal Address**

**ACCEPTANCE**

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

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

- (a)
- (b)
- (c)

For & on behalf of President of India

**Dated:** Signature .....  
Designation.....

## PERFORMA OF SCHEDULES

### SCHEDULE 'A'

Schedule of Quantities (as per PWD-3) : As per Part-D

### SCHEDULE 'D'

Extra schedule for specific requirements/  
document for the work, if any: : As per Bid Document

### SCHEDULE 'E'

Reference to General Conditions of contract: (GCC EPC Projects 2022 / GCC Maintenance Works 2023 / GCC Construction Works 2023) : Applicable GCC is CPWD General Conditions of Contract Construction Works 2023 as modified and corrected upto the previous day of last date of submission of bid

Name of Work : **Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement Level - 1, BMT Wing, SCTIMST, Poojappura, Trivandrum.**

Estimated Cost of Work : **Rs. 70,97,840/- (E&M: Rs. 40,22,746 + Civil: Rs. 30,75,094)**

i. Earnest money deposit : **Rs. 1,41,957/-** (to be returned after receiving performance guarantee)

ii. Performance Guarantee : As per OM No. DG/Manual-2024/20 dt. 27.02.2026  
5% of ECPT or contract amount whichever is higher.

A bid will be treated as abnormally low if the quoted bid amount is lesser than 80% of the estimated cost put to tender.

Requirement of Additional Performance Guarantee (APG): In case of abnormally low bids as defined above, the bidder shall be required to submit Additional Performance Guarantee (APG) in addition to the Standard Performance Guarantee (PG). The amount of Additional Performance Guarantee (APG) shall be equivalent to the difference between the 80% amount of ECPT and quoted amount. (e.g. if ECPT is A and quoted amount is 0.7A then the amount of APG shall be 0.8A-0.7A)

Additional Performance Guarantee (APG) shall be in the prescribed format of PG and has to be submitted within the time frame prescribed for submission of PG. The other terms and conditions of release etc. Of APG shall be same as that of PG.

iii. Security Deposit : 2.5% of tendered value

### SCHEDULE 'F'

#### GENERAL RULES & DIRECTIONS:

Officer inviting tender : Executive Engineer (E), Trivandrum, CPWD, or successor as designated by CPWD.

#### Definitions:

2(v)	Engineer-in-Charge	: Executive Engineer (E), Trivandrum, CPWD, or successor as designated by CPWD.
2(viii)	Accepting Authority	: Executive Engineer (E), Trivandrum, CPWD, or successor as designated by CPWD.
2(x)	Percentage on cost of materials and Labour to cover all overheads and profits	: 15%
2(x)b	Standard Schedule of Rates	: DSR E&M 2025 with the amendments thereto issued upto the date of receipt of the tender & Market rate
i	Civil Work	DSR-2023 (Civil works) & corrected upto the last date of receipt of Bid and multiplied by a correction factor of 0.973 & Market Rates for Non-DSR Items.
ii	E&M Work	DSR-2025 (E&M works) with an applied Cost Index for Trivandrum & corrected upto the last date of receipt of Bid and & Market Rates for Non-DSR Items.
2(xii)	Department	: Central Public Works Department
9(ii)	Standard CPWD Contract Form	: CPWD General Conditions of Contract Construction Work 2023 & CPWD Form-7 as modified and corrected upto the previous day of last date of submission of tender.

**Clause 1**

1. Time allowed for submission of : 7 (Seven) days  
Performance Guarantee, programme chart (Time and progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW welfare board or proof of applying there of from the date of issue of letter of acceptance
2. Maximum allowable extension with late fee : 5 (Five) days  
@ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above

**Clause 2**

Authority for fixing compensation under clause 2 : Chief Engineer, Trivandrum, CPWD, or successor as designated by CPWD

**Clause 5**

Number of days from the date of issue of letter of : 12 (Twelve) days  
acceptance for reckoning date of start Mile stone(s)  
as per table given below

Sl. No	Description of Milestone (Physical)	Time allowed in days/ months (from date of start)	Amount to be with- held in case of non-achievement of milestone
1	Submission of drawings, make approvals, association of agencies etc	01 Month	1.25% Tendered value of the work
2	Supply and drawing of wires, Supply & fixing of DB, switches, sockets, LED lights etc.	04 months	1.25% Tendered value of the work

	supplying and laying of HVAC ducting etc, Supply of exhaust & pressurisation unit, laying of fire fighting pipes etc		
3	Modification of existing AHU, Installation of exhaust & pressurisation unit, installation of Split AC, light fittings, detector, sprinkler etc	05 months	1.25% Tendered value of the work
4	Final testing and commissioning of all E&M services including Internal EI, HVAC, fire alarm system, firefighting system etc including completion of entire civil works	06 months	1.25% Tendered value of the work

Time allowed for execution of work : **06 (Six) Months**

**Authority to decide:**

- i. Authority to convey the decision of shifting of milestone and Extension of time : Engineer-in-charge or successor as designated by CPWD.
- ii. Authority to decide Rescheduling of milestone and extension of time : Chief Engineer, Trivandrum, CPWD, or successor as designated by CPWD
- iii. Shifting of date of start in case of delay in handing over of site : Chief Engineer, Trivandrum, CPWD, or successor as designated by CPWD

**Clause 5 Schedule of handing over of site**

Part	Portion of site	Description	Time Period for handing over/reckoned from date of issue of letter of intent.
Part A	Portion without any hindrance	Full	Immediate
Part B	Portions with encumbrances	Not Applicable	Not Applicable
Part C	Portions dependent on work of other agencies	Not Applicable	Not Applicable

**Clause 6**

Computerised Measure Book (CMB) / Electronic Measurement Book (EMB)

- i. Mode of measurement : CMB / ERP Electronic Measurement Book (e-MB)  
(As per DG/SOP 2022/16 dated 13.09.2023)

**Clause 7**

Gross work to be done together with net payment : **Rs. 07 (Seven) Lakhs**  
/adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment

**Clause 7**

Whether Clause 7A shall be applicable : **Yes**  
(No Running Account bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever

applicable are submitted by the contractor to the Engineer-in-Charge.)

**Clause 7B**

Payment to third party : Not Applicable  
(Refer No. DG/CON/310 dated 17/07/2020) (As per DG/SOP-2022/02 dated.30.08.2022)  
Whether Clause 7B shall be applicable (Affidavit per annexure-III to be furnished for effecting 3rd party payments)

**Clause 8A**

Authority to decide compensation on account if the contractor fails to submit the completion plans : Executive Engineer (E), Trivandrum, CPWD or successor as designated by CPWD

**Clause 10A**

List of testing equipment to be provided by the contractor at site lab : NA

1.....	2.....	3.....
4.....	5.....	6.....

**Clause 10B(ii)**

Whether Clause 10 B (ii) shall be applicable : Not Applicable

**Clause 10C**

Component of labour expressed as percent of value of work : 25%

**Clause 10CC**

: Not Applicable

**Clause 11**

Specifications to be followed for the execution of work

1. CPWD General Specifications for electrical works, Part-I: Internal -2023 with up-to-date amendments.
2. CPWD General Specifications for electrical works, Part-II: External 2023 with up-to-date amendments
3. CPWD General Specifications for electrical works, Part-V: Wet riser & Sprinkler system – 2020 with up-to-date amendments
4. CPWD General Specifications for electrical works, Part-VI: Fire Detection & alarm system – 2018 with up-to-date amendments
5. CPWD General Specifications for electrical works, HVAC – 2024 with up-to-date amendments

**Clause 12**

12.2 (c) Deviation limit beyond which Clauses 12.2 (c) shall apply for building works : 100%

Deviation Limit beyond which clauses 12.2 (c) shall apply for foundation work (except items mentioned in earth work subhead in DSR and related items) : 100%

Deviation Limit for items mentioned in earth work subhead of DSR and related items : 100%

**Clause 16**

Competent Authority for deciding reduced rates. : Chief Engineer, Trivandrum, CPWD, or successor as designated by CPWD

**Clause 18**

List of mandatory machinery, tools & plants to be deployed by the contractor at site : As required at site

1..... 2..... 3.....  
4..... 5..... 6.....

**Clause 19C/19D/19G/19K**

Authority to decide penalty for each default: : Engineer-in – charge or successor as designated by CPWD.

**Clause 25**

Constitution of Dispute Redressal Committee (DRC):

- i. Conciliator Additional Director General-Kochi, CPWD, Chennai
- ii. Arbitrator Appointing Authority: Chief Engineer, CPWD, Trivandrum
- iii. Place of Arbitration Trivandrum / as decided by Arbitrator in consultation with both parties

**Clause 32***Requirement of Technical Representative(s) and recovery rate*

SL. No.	Requirement of technical staff		Minimum Experience (Years)	Designation of Technical Staff	Rate at which recovery shall be made from the contractor in the event of not fulfilling
	Qualification	Number			
1	Graduate Engineer or Diploma Engineer	1 +1 (Civil + Electrical)	2 or 5 years respectively	Project Manager cum Planning/Quality/Site/Billing Engineer	Rs. 15,000/- (Rupees Fifteen Thousand Only)

**Discipline for E&M Component:** Electrical/ Mechanical Engineering

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

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

**Clause 38**

: **Not Applicable**

i.	(a)	<del>Schedule/statement for determining theoretical</del>	<del>On the basis of Delhi Schedule of</del>
----	-----	---	--

		quantity of cement & bitumen on the basis of Delhi Schedule of Rates	Rates 2023 printed by C.P.W.D
ii. Variations permissible on theoretical quantities			
	(a)	Cement	
		i.— For works with estimated cost put to tender not more than Rs. 25 lakh	3% plus/minus
		ii.— For works with estimated cost put to tender more than Rs. 25 lakh	2% plus/minus
	(b)	Bitumen for all works	2.5% plus & only nil on minus side
	(c)	Steel Reinforcement and structural steel sections for each diameter, section and category	2% plus/minus
	(d)	All other materials.	Nil

**Executive Engineer (E)**  
**Trivandrum, CPWD,**  
**Thiruvananthapuram – 695522**

## **PART-B**

### **MAJOR COMPONENT**

**General/specific conditions, specifications applicable to major component(s) of the work**

## **General Terms and Conditions for E&M Components**

### **1. General**

- 1.1. The work shall be generally carried out in accordance with tender/bid specifications and the following specifications / rules.
- 1.2. CPWD General Specifications for electrical works, Part-I: Internal -2023 with up-to-date amendments
- 1.3. CPWD General Specifications for electrical works, Part-II: External 2023 with up-to-date amendments
- 1.4. CPWD general specification for Electrical works- Part – V Wet riser & sprinkler system-2020 with up-to-date correction slips.
- 1.5. CPWD general specification for Electrical works- Part-VI- Fire Detection and alarm system-2018 with up-to-date correction slips.
- 1.6. CPWD general specification for Electrical Works – HVAC -2024 with up-to-date correction slips.
- 1.7. Commercial and Additional conditions for this work.
- 1.8. The Indian Electricity Act, 2003, as amended up to date.
- 1.9. Indian Electricity Rules 1956 amended up to date.
- 1.10. Additional technical specifications for this work.
- 1.11. National Electrical Code 2023.
- 1.12. National Building Code 2016.
- 1.13. Relevant IS Codes.
- 1.14. IEC, ASHRAE standards.
- 1.15. KMBR / KPBR amended up to date.
- 1.16. Kerala State Electrical Inspectorate / CEA and Power distribution licensee.

### **2. Order of Preference**

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

- 2.1. Schedule of quantities
- 2.2. Commercial and Additional conditions for this work
- 2.3. Drawings, if any
- 2.4. CPWD General Specifications
- 2.5. Relevant I.S or any other international code in case I.S code is not available.
- 2.6. 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.
- 2.7. This specification covers manufacture, testing as may be necessary before dispatch, delivery at site, all preparatory works, assembly and installation, commissioning putting into operation of equipment of all E&M components of the tender.
- 2.8. The tenderer should in his own interest visit the site and get familiarise with the site conditions before tendering.
- 2.9. No T&P shall be issued by the Department and nothing extra shall be paid on this account.

### **3. Commercial Conditions**

- 3.1. **Type of Contract:** The work to be awarded by this tender shall be treated as indivisible works contract.
- 3.2. Income tax, GST, labour cess & other statutory deductions etc. shall be made at source as per

the prevalent laws. The deductions of Security Deposit, Income-Tax etc. shall be done after calculation of the due payment and net payment shall be reduced accordingly.

- 3.3. RATES: No foreign exchange shall be made available by the Department for importing (purchase) of equipments, plants, machinery, materials of any kind or any other items required to be carried out during execution of the work. No delay and no claim of any kind shall be entertained from the Contractor, on account of variation in the foreign exchange rate.
- 3.4. The rates quoted by the tenderer, shall be firm and inclusive of all taxes (including GST, labour cess etc.) and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc. at site including temporary construction of storage, risks, overhead charges, general liabilities/obligations. However, the fee for the CEA /Kerala State Electrical Inspectorate inspections shall be reimbursed on production of proof of payment.
- 3.5. The contractor has to carry out maintenance as per CPWD General Specifications and manufacturer's standards for a period of 12 months from the date of handing over. Nothing extra shall be paid on this account.

#### **4. 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 necessary for efficient assembly and installation of equipment and components of the work shall be deemed to have been included in the tender irrespective of the fact whether such items are specifically mentioned in the tender documents or not.

#### **5. Storage and Custody of Materials**

The agency has to make his own arrangement for storage of materials. No storage accommodation shall be provided by the department. Watch and ward of the stores and their safe custody shall be the responsibility of the contractor till the final taking over of the installation by the department.

#### **6. Care of the Building**

Care shall be taken by the contractor while handling and installing the various equipment's and components of the work to avoid damage to the building. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove at his cost all unwanted and waste materials arising out of the installation from the site of work.

#### **7. Completion of Period**

The completion period indicated in the tender documents is for the entire work of planning, designing, approval of drawings etc., arrangement of materials & equipment, delivery at site including transportation, installation, testing, commissioning and handing over of the entire system to the satisfaction of the Engineer-in-charge.

#### **8. Guarantee and defect liability period**

All equipments shall be guaranteed for a period of 12 months (except LED fittings & BLDC fans which shall be guaranteed for a minimum of 5 years), from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

The guarantee for LED light fittings & BLDC fans are to be got submitted from the manufacturer /authorized dealer in addition to the guarantee from the contractor. The manufacturer should give undertaking that in case of discontinuation of model and /or non-availability of spares, they will replace the unit with equivalent/ high end model in case of manufacturing defect during the warranty period of 5 years as in **Annexure – X. Type Test certificate, BIS certificate, LM79 and LM80 certificate test report from an NABL accredited laboratory need to be submitted prior for approvals.**

Before completion of defect liability period of one year for the entire work, the main contractor has to submit Security Deposit of 5% of the price quoted by him for SITC of LED fittings & BLDC fans for the remaining 4 years warranty period in acceptable form i.e. FDR/Bank guarantee/DD to the concerned Executive Engineer (E). The Security Deposit deducted from the bills of contractor shall be refunded to the main contractor only after submission of Security Deposit for LED fittings & BLDC Fans to Executive Engineer (E), failing which this Security Deposit towards LED fittings & BLDC Fans at 5% of the price quoted by them for LED fittings & BLDC Fans shall be deducted from Security Deposit for total work and balance amount will be refunded only after completion of defect liability period of one year. The LED fittings & BLDC Fans Security Deposit will be released after completion of warranty period of 5 years.

9. The tenderer shall guarantee among other things, the following:
  - 9.1. Quality, strength and performance of the materials used as per manufacturers standards.
  - 9.2. Safe mechanical and electrical stress on all parts under all specified conditions of operation.
  - 9.3. Satisfactory operation during the maintenance period.

10. **Acceptable Makes of Various Equipments**

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

11. **Data Manual and Drawings to be furnished by the Tenderer:**

11.1. **After award of work**

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

- a) General Layout of all E&M installations
- b) General arrangement drawing for HT/LT installations.
- c) GAD for E&M piping and other details.
- d) General arrangement of lighting & fans etc.
- e) Details of foundations for equipments and the weights of assembled equipments etc.
- f) The voltage drop calculation for external cabling works along with the proposed cable route/layout.
- g) Design of HVAC system including duct drawing, load calculation etc. as per site conditions.
- h) Layout for Firefighting and Fire alarm system.
- i) ~~Details of foundations for the equipments including DG set and the weights of all assembled equipments considering the soil bearing capacity and other relevant factors at site.~~
- j) Any other drawings/details necessary for the job as per general specifications.

The successful tenderer should furnish well in advance of commencement of work with three copies of detailed instructions and manuals of manufacturers for all items of equipments regarding installation, adjustments operation and maintenance including preventive maintenance &

troubleshooting together with all the relevant data sheets, spare parts catalogue etc., all in triplicate.

## 12. **Extent of Work**

- 12.1. The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning, as may be required by the department. The term complete installation shall not only mean major items of the plant and equipments covered by specifications but all incidental sundry components necessary for complete execution and satisfactory performance of installation with all layout drawings whether or not those have been mentioned in detail in the tender document in connection with this contract as this is a turnkey job.
- 12.2. The cables and other linear quantity items shall be brought to site only after taking correct measurements as per actual requirement of work. Excess quantities shall not be accepted. i.e., Quantity of items brought to site and used in work as per actual requirement shall only be measured and to be paid.
- 12.3. In addition to supply, installation, testing and commissioning, of E&M equipments, the following works shall be deemed to be included within the scope of work to be executed by the tenderer as this is a turnkey job.
- 12.4. Minor building works necessary for installation of equipments, foundation, supports, making of opening in walls or in floors and restoring them to their original condition /finish and necessary grouting etc. as required.
- 12.5. Getting inspection done & obtaining approval from Kerala State electrical Inspectorate /CEA authority, as applicable, local fire authority and other local body(s) for the installation. However, necessary fees for inspection shall be reimbursed by the department on production of proof of payment.

## 13. **Exclusion and Work to be done by Other agencies**

The following shall be excluded from the scope of the work:

- 13.1. Major dismantling of any existing building work.

## 14. **Inspection and Testing**

- 14.1. The General intent of this specification is to mention the relevant tests to be done and furnished to the Engineer- in-Charge by the Contractor. These are guidelines. However the Contractor shall carry out all such tests and complete all formalities as per relevant Indian Standard Specifications, Fire Insurance Requirements and/or Electricity Rules and Regulations as per Government Gazette and Publications.
- 14.2. All equipment before installing on the site work shall be tested and all such results produced to the Engineer-in- Charge. Nothing shall absolve the Contractor from reperforming any tests that the Contractor may be called upon specifically by the Engineer-in-Charge or supply company or electrical inspector. All equipment shall be tested jointly with the Engineer-in-Charge as required by various sections of the specifications and test data shall be furnished as required.
- 14.3. **Factory Inspection:** The following items as applicable as per scope of work shall be offered for factory inspection by the Engineer-in-charge or his authorized representatives prior to dispatch of the material at site. Agency has to make necessary co-ordination with the Engineer-in-Charge for such an inspection. The cost of the Engineer's visit will be borne by the department.
  - a) All RMU, HT & LT panel boards
  - b) Chiller plants
  - c) Transformers
  - d) DG Sets

- e) lift
  - f) Any other item as decided by the Engineer-in-charge and as per general specifications.
- However, the Engineer-in-charge may waive the factory inspection at his discretion in lieu of proper test certificates

Copies of all documents of routine and type test certificates of the equipment, carried out at the Manufacturer's premises shall be furnished to the Engineer-in-charge and consignee.

14.4. Pre-commissioning Tests:

- a) All rules, regulations and requirements of Electrical, Government or Local Authorities and of Indian Standard Specifications and/or Rules and Regulations stated in Indian Electricity Act shall be strictly complied.
- b) On completion of erection the contractor shall clean all the equipment thoroughly and inspect the entire installation for correctness and shall furnish a report of completion to the Engineer-in-Charge. Pre-commissioning tests shall commence only on approval of this report by the Engineer-in-Charge.
- c) All tests and the certification thereof shall only be carried out by those authorized, skilled, experienced and certified permit holders of the Supervisor Category of State Government's Electrical Inspectorate / Department. No unauthorized personnel shall ever carry out any such tests as stated herein under.
- d) Mechanical Operational tests for all movable parts of switch gears, breakers, tripping devices etc.
- e) Phase sequence tests at all the relevant points for connecting correct R, Y and B as per the supply utility sequence.
- f) All Panels to be tested for interlocks, control tripping and breakers to be tested for sequential tripping.
- g) Continuity tests shall be done for noting any short circuits and/or earthing of phases.
- h) Earthing tests for continuity of Earth by earth megger, on L.V. side. The earth resistance values shall not exceed 5 ohm.
- i) Insulation resistance test with High Voltage megger on HT side and 500 V megger on LT side.
- j) Testing of relays / trip circuit of HT panel using primary / secondary injection method.
- k) High voltage test (hi-pot test) shall be carried out on all HT equipments and HT cables.
- l) After completion of the work in all respects the contractor shall offer the installation for testing and operation.

15. **Compliance with regulations and Indian Standards:**

All works shall be carried out in accordance with relevant regulation, both statutory and those specified by the Indian Standards related to the works covered by this specification.

- i) Factories Act.
- ii) Indian Electricity Rules.
- iii) B.I.S. & other standards as applicable.
- iv) Work men's compensation Act.

- v) Statutory norms prescribed by local body(s), CEA / Kerala State Electrical Inspectorate, Power Supply Co., KSEB.etc.

After completion of the installation, the same shall be offered for inspection by the representatives of the Central Electricity Authority/Kerala State Electrical Inspectorate as the case may be and by all concerned local body(s). The contractor will extend all help including test facilities to the

representatives of CEA/Kerala State Electrical Inspectorate and the Local body(s). The observations of CEA/Kerala State Electrical Inspectorate and Local body(s) shall be attended by the contractor. The installation will be commissioned only after getting clearance from CEA/Kerala State Electrical Inspectorate and the local body(s).

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

16. **Indemnity**

The successful tenderer shall at all times indemnify the department, consequent on this works contract. The successful tenderer shall be liable, in accordance with the Indian Law and Regulations for any accident occurring due to any cause and the contractor shall be responsible for any accident or damage incurred or claims arising therefrom during the period of erection, construction and putting into operation the equipments and ancillary equipment under the supervision of the successful tenderer in so far as the latter is responsible. The successful tenderer shall also provide all insurance including third party insurance as may be necessary to cover the risk. No extra payment would be made to the successful tenderer on account of the above.

17. **Erection Tools**

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

18. **Location**

The work is to be executed at proposed at **CD Block, SCTIMST-BMT Wing, Poojapura, Trivandrum**. The Contractor is advised to visit the site before submission of their tender and ensure that equipment being offered by them can be accommodated in the spaces available and for assessing the scope of work.

19. **Cooperation with other agencies:**

The successful tenderer shall co-ordinate with other contractors and agencies engaged in the construction of buildings, if any, and exchange freely all technical information so as to make the execution of work/contract smooth. No remuneration should be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies and any completed portion of the work has to be dismantled and re-done for want of cooperation and coordination by the successful tenderer during the course of work, such expenditure incurred will be recovered from the successful tenderer if the restoration work to the original condition or specification of the dismantled portion of the work was not undertaken by the successful tenderer himself.

20. **Verification of Correctness of Equipments at Destination**

The contractor shall have to produce all the relevant records to certify that the genuine equipments from the manufacturers has been supplied and erected.

21. **Painting**

All equipments shall be factory painted unless otherwise mentioned. The agency shall be required to do only making good the damages caused to the painting of various equipments during transportation, handling & installation at site.

22. **Maintenance**

- 22.1. Sufficient trained and experienced staff shall be made available to meet any exigency of work during the guarantee period of 12 months from the date of taking over of the installation.
- 22.2. The maintenance, routine as well as preventive maintenance for 12 months from the date of taking over the installation.

**23. Approval of drawings, makes and models of equipment/materials for all E&M components**

- 23.1. The agency shall submit drawings and details with makes and models of the equipments /materials offered by him along with specifications for all E&M components to the Engineer-in-charge of the work, before ordering the equipment/materials for approval of the department.
- 23.2. The Engineer-in-charge shall scrutinize the proposal and approve the makes and models which are acceptable as per the schedule, specifications, conditions of the agreement and inform the agency for procurement.
- 23.3. After approval of the equipment/materials by the department the agency shall procure the equipment/materials from the OEM/authorized distributor/dealer as the case may be.

**24. Quality & Genuineness of Material**

- 24.1. Adequate care may be taken such that only tested and genuine materials of proper quality are used in work shall be ensured by firm.
- 24.2. The firm shall also ensure that:
- 24.3. The contractor will submit makes & brands of electrical components as per the acceptable makes list in tender documents for approval of Engineer-in-Charge.
- 24.4. The firm will be required to procure material directly from the manufacturer/ their authorised dealers to ensure genuineness & quality and as per the preferred makes only. Proof in this regard shall be submitted by the contractor to the department, if required.
- 24.5. Inspection at factory, as required, shall be arranged by the firm on a mutually agreed date.
- 24.6. Department shall reserve the right to waive inspection in lieu of suitable test certificate, at its discretion.
- 24.7. All the materials to be supplied by the contractor shall be procured & brought to site as per requirement at site of work in consultation with department so that these materials are not damaged & their manufacturer’s warranty is not getting void.
- 24.8. The testing plan shall be as per the Quality Assurance policy and check list for E&M Services 2016 issued by CPWD as follows.

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer’s test certificates required	Sample Size	Location Of Test		
							At manufacture works	At third party Lab	
<b>A – Internal EI</b>									

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
1	LT Panels with ACB	CPWD Specs. Part IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Any	Y	Y	100.00%	Y	N
2	LT panels with incomer of more than 200 A	CPWD Specs. Part IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Up to 2	Y	Y	0	N	N
			>2and<10	Y	Y	1	Y	N
			>10	Y	Y	2	Y	N
3	Rising Main and Bus Trunking	CPWD specs part IV/QA Plan.	Length up to 500 mtr	Y	Y	10% length and fittings	N	N
			Length > 500 mtr	Y	Y	10% length and fittings	Y	N
4	Rigid MS Conduit	IS 9537 Pt 1&2	Up to 2500 mtr	Y	N	N	N	N
			>2500 mtr	Y	Y	1 piece of 1 mtr for every 1000 mtr	N	Y
5	Rigid PVC Conduit	IS 3419:1989	Up to 2500 mtr	Y	N	N	N	N
			>2500 mtr	Y	Y	1 piece of 1 mtr for every 1000 mtr	N	Y
6	Cable Tray	CPWD Specs. Part I/II: Check for perforation area, paint/Galvanising thickness and Material Composition	Length upto 500 mtr	Y	Y	N	N	N
			Length > 500 mtr	Y	Y	One piece for every 500 mtr	N	Y

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
7	DWC/ Corrugated HDPE Pipe	IS 14930, check for thickness, material, Mechanical strength and smoothness	Length Upto 500 mtr	Y	N	N	N	N
			Length >500 mtr	Y	Y	One piece for every 500 mtr	N	Y
8	Wire	IS 694:1990	Up to 10000 mtr	Y	N	N	N	N
			> 10000 mtr	Y	Y	1 piece for every 10000 mtr or less	N	Y
<b>B-Street/Compound Lighting</b>								
1	LT panels with ACB	CPWD Specs. Part IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Any	Y	Y	100%	Y	N
2	LT panels with incomer of more than 200 A	CPWD Specs. Part IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Up to 2	Y	Y	0	N	N
			>2and<10	Y	Y	1	Y	N
			>10	Y	Y	2	Y	N
3	Poles	Whether in conformity with tender specs	Up to 100	Y	Y	N	N	N
			>100	Y	Y	2%	Y	N
4	LT Cable	IS 1554 Part I	Up to 2500 mtr	Y	N	N	N	N
			>2500 mtr	Y	Y	1 piece for every 2500 mtr	N	Y
5	DWC/ Corrugated HDPE Pipe	IS 14930, check for thickness, material, Mechanical strength	Length Upto 500 mtr	Y	N	N	N	N

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
		and smoothness	Length >500 mtr	Y	Y	One piece for every 500 mtr	N	Y
6	Fittings	Whether in conformity with specs	>100	Y	Y	NA	N	N
<b>C-Sub Station, DG Set, UPS</b>								
1	HT panel	CPWD Specs. Part IV/QA Plan: CT ratio and accuracy Class should be invariably checked.	Any	Y	Y	1	Y	N
2	HT panel : metering and protection	Check CT ratio and accuracy Class, Relays and Meters	Any	Y	Y	1	Y	N
3	LT Panels with ACB	CPWD Specs. Part IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Any	Y	Y	1	Y	N
4	LT Panels With incomer of more than 200 A	CPWD Specs. Part IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Up to 2	Y	Y	0	N	N
			>2 and < 10	Y	Y	1	Y	N
			>10	Y	Y	2	Y	N
5	Capacitor Panel	CPWD Specs. Part IV/QA Plan: Check for type of capacitors used, operation of relay, settings, Change the load and its type and check functionality	Any	Y	Y	1	Y	N
6	Rising Main and Bus	CPWD specs part IV/QA Plan.	Length upto 500 mtr	Y	Y	10% length and fittings	N	N

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
	Trunking		Length > 500 mtr	Y	Y	10% length and fittings	Y	N
7	Cable Tray	CPWD Specs. Part I/II: Check for perforation area, paint/Galvanising thickness and Material Composition	Length upto 500 mtr	Y	Y	N	N	N
			Length > 500 mtr	Y	Y	One piece for every 500 mtr	N	Y
8	DWC/ Corrugated HDPE Pipe	IS 14930, Check for thickness, material, Mechanical strength and smoothness.	Length upto 500 mtr	Y	N	N	N	N
			Length > 500 mtr	Y	Y	One piece for every 500 mtr	N	Y
9	Transformer	CPWD Specs. Part IV/QA Plan: Physical verification of accessories as per agreement and Routine tests as per IS:2026 / IS 11171:1985 (whichever applicable), with particular attention to losses meeting ECBC norms/ as per agreement, Type test certificate for exact same design for impulse withstand shall be made available by Manufacturer, Temperature rise test of one transformer of each design shall be done. Copies of the	Any	Y	Y	100%	Y	N

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
		certificate for pressure test, tests for bushing shall be supplied to the department.						
10	DG Set	Load testing as per CPWD specs	Any	Y	Y	100%	Y	N
11	UPS	Load testing and operation logic as per CPWD specs . Check for input and output power quality as per agreement	Any	Y	Y	100%	Y	N
12	HT Cable	IS 1554 Part II	Upto 500 mtr	Y	Y	1	N	N
			>500 mtr	Y	Y	1 piece for every 500 mtr	N	Y
13	LT Cable	IS 1554 Part I	Upto 2500 mtr	Y	N	N	N	N
			>2500 mtr	Y	Y	1 piece for every 2500 mtr	N	Y
<b>D-Air Conditioning</b>								
1	Chiller	CPWD Specs. Part VI/ECBC Code/Agreement/QA Plan: COP, Capacity, IKW/TR, IPLV / NPLV	Any	Y	Y	1	Y*	N
2	Package AC Unit	CPWD Specs. Part VI/ECBC Code/Agreement/QA Plan: COP, Capacity, IKW/TR	Any	Y	Y	1	Y*	N
3	Split/WT AC	As per tender specs. and BEE ratings.	Up to 50	Y	Y	NA	N	N
			>50	Y	Y	1 for every 50	Y*	N
4	Pumps	As per tender specs. and BEE ratings.	Any capacity	Y	Y	100%	N	N
5	MS Pipes	To be tested for	Any	Y	Y	1 for every	N	N

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
		thickness and weight as per applicable IS				100 mtr		
6	Insulation / Acoustics material	To be tested for Density and K value as per tender specs.	Up to 1000 Sq mtr	Y	Y	NA	N	N
			>1000 Sqmtr	Y	Y	1 Sample for every 1000 Sqmtr	N	Y
7	Fans for AHU Ventilation and Pressurization	CPWD Specs. Part VI/QA Plan: Fans to be tested for Db level, static pressure, CFM and leaving velocity	Up to 20 fans	Y	Y	NA	N	N
			> 20 fans	Y	Y	1 for every 20 fans	Y	N
8	AHU's	CPWD Specs. Part VI/QA Plan: To be tested for capacity in assembled condition, Fabrication, Cooling coil and filters material & workmanship to be inspected critically.	Up to 20 AHU's	Y	Y	NA	N	N
			>20	Y	Y	1 for every 20 AHU's	Y	N
9	Ducting material	As per relevant BIS	Up to 1000 Sqmtr	N	N	NA	N	N
			>1000 Sq mtr	Y	Y	1 Sample for every 1000 Sqmtr	N	Y
10	Valves	Flow and controls as per data sheet	Up to 20	Y	N	NA	N	N
			>20	Y	Y	1 for every 20	N	Y
11	LT Panels with ACB	CPWD Specs. Part IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Any	Y	Y	1	Y	N
12	LT Panels	CPWD Specs. Part	Up to 2	Y	Y	0	N	N

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
	With in-comer of more than 200 A	IV/QA Plan: Constructions, Ratings Of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	>2 and < 10	Y	Y	1	Y	N
			>10	Y	Y	2	Y	N
13	Cable Tray	CPWD Specs. Part I/II: Check for perforation area, paint/Galvanising thickness and Material Composition	Length up to 500 mtr	Y	Y	N	N	N
			Length > 500 mtr	Y	Y	One piece for every 500 mtr	N	Y
Y* Tested for its capacity at AHRI certified test bed (either at manufacturer's work or at III Party)								
<b>E Fire Fighting</b>								
i. Before dispatch of material at factory or before use at site								
1	Pumps	As per tender specs. and BEE ratings.	Any Capacity	Y	Y	100%	N	N
2	MS Pipes	To be tested for thickness and weight as per applicable IS	Any	Y	Y	1 for every 100 mtr	N	N
3	Valves	Flow and controls as per data sheet	Up to 20	Y	Y	NA	N	N
			>20	Y	Y	1 for every 20	N	Y
4	LT Panels with ACB	CPWD Specs. Part IV/QA Plan: Construction, Ratings of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Any	Y	Y	1	Y	N
5	LT Panels with in-comer of more than 200 A	CPWD Specs. Part IV/QA Plan: Construction, Ratings of SWG, air gaps between phases, phase to body, IP rating, Short Circuit ratings etc.	Up to 2	Y	Y	0	N	N
			>2 and < 10	Y	Y	1	Y	N
			>10	Y	Y	2	Y	N

Stage / SI No	Material/ Process	Standard Applicable/ Test required to be done	Total Qty (each type) reqd. in agreement or lot size whichever is less	Whether proof of Dispatch required	Whether Manufacturer's test certificates required	Sample Size	Location Of Test	
							At manufacture works	At third party Lab
6	Cable tray	CPWD Specs. Part I/II: Check for perforation area, paint/galvanising thickness and Material composition	Length up to 500 mtr	Y	Y	N	N	
			Length >500 mtr	Y	Y	One piece for every 500 mtr	N	
Y – Yes, N – No								

## 25. Safety Codes & Statutory Regulations

- 25.1. Nothing in this specification shall be construed to relieve the successful tenderer of his responsibility for the design, manufacture and installation of the equipment with all accessories in accordance with currently applicable statutory regulations and safety codes.
- 25.2. Successful tenderer shall arrange for compliance with statutory provisions of safety regulations and departmental requirements of safety codes in respect of labour employed on the work by the tenderer. Failure to provide such safety requirement would make the tenderer liable for penalty as per conditions. In addition, the department will be at liberty to make arrangement for the safety requirements at the cost of successful tenderer and recover the cost thereof from him.
- 25.3. The general guidelines of VRDL as per the ICMR/equivalent institute shall be followed by the agency.

## 26. Power Supply

The contractor shall make his own arrangement for power supply required for execution of the work.

## 27. Water Supply

The contractor shall make his own arrangement for water supply required for execution of the work.

## 28. Conditions for validation of VRDL

- 28.1. It Shall be the responsibility of the agency for obtaining validation of lab, required certificate from the competent authority of VRDL and making the facility operational. Any statutory payment shall be reimbursed by department. All liaisoning with the authorities shall be carried out by agency.
- 28.2. The contractor shall liaison with CPWD, client department authorities as well as other executing agencies for obtaining all mandatory approval/validation/NOC for Bio safety lab etc. at his own cost as required.
- 28.3. If required the agency has to appoint at his own cost consultants to obtaining local body approvals, validation and or certification of Bio containment lab.

## Additional Conditions for Internal Electrical Installations

### 1 Extent of Work

- 1.1 The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning as may be required by the department.
- 1.2 The main agency shall be responsible for all acts of omissions and submissions of the associate Contractor engaged by him, even with approval of department.
- 1.3 Approval of the Engineer-in-charge shall be taken well in advance for all the materials to be supplied and used in all the works by the contractor.
- 1.4 The contractor has to make his own arrangements for stores and watch and ward and no extra claim for this will be entertained.
- 1.5 The main contractor shall be responsible for coordinating the activities of all works and will ensure progress of works as per laid down programme.
- 1.6 The main contractor and / or his associate contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-charge and will comply with the remarks therein.
- 1.7 The contractor shall make his own arrangement at his own cost for electrical / General Tools and plants required for the work.
- 1.8 The contractor shall remove all the debris due to the E & M works from the site as soon as the work is completed.
- 1.9 Guarantee for the electrical installation in the prescribed proforma shall be provided by the agency after handing over of the installation.

### 2 Payment terms

On account payments for part work (after stipulated and statutory deductions) as assessed by the Engineer – in-charge for the applicable items in the Contract shall be payable at part rates not exceeding the percentage indicated against the stages of work as below.

#### 2.1 Items connected with point wiring, circuit wiring, sub-main wiring, power point wiring and light plug wiring.

S.No	Stage of work	Percentage of payment on pro-rata basis
1	On laying of conduits with accessories, switch boxes, etc.	35%
2	On drawing of wires i/c terminations, switches, sockets, cover plates etc.	50%
3	On completion of item and after testing and commissioning.	10%
4	At the time of payment of final bill	5%

#### 2.2 LT panel boards, MCB Distribution Boards, MCBs, RCBOs, LED fittings and other equipments such as Dynamic Pass box, Static Pass box etc.

S.No	Stage of work	Percentage of payment
1	On initial inspection of material and delivery at site in good condition on pro-rata basis.	70%
2	On completion of installation on pro-rata basis.	15%
3	On completion of testing and commissioning.	10%
4	At the time of payment of final bill.	5%

### 3 Additional Conditions

- 3.1 The wiring and conduit layout shall be marked by the contractor in the drawing prior to execution and shall be got approved from the Engineer-in-charge.
- 3.2 The rupturing capacity of the MCBs shall be 10 KA minimum. The MCBs shall have ISI mark. Quantities of MCBs of different rating shall be brought in consultation with the Engineer-in-Charge or his authorized representative.
- 3.3 All the MCCBs shall be rated for  $I_{cs}=100\% I_{cu}$ .
- 3.4 The copper wire to be used on this work shall be FRLS type and ISI marked.
- 3.5 The make of switch boxes, cover plates etc. shall be the same as that of switches. Only the required knockouts of the switch boxes are to be removed for terminating the conduit pipes with PVC glands / check nuts.
- 3.6 Make of MCB/MCCB shall be the same as the make of MCB DB.
- 3.7 All the switch boxes, MCB DBs are to be covered with plastic masking sheet / petroleum jelly when installed in brick work till the plastering / painting is done to avoid sticking of cement plaster/ splashes of paint. Cement plaster / paint are to be cleaned immediately after plaster to avoid rusting of switch boxes and MCB DBs. All plastic sheets are to be removed at the time of handing over.
- 3.8 The E & M works shall be carried out by the contractor, side by side with the progress of civil work.
- 3.9 All PVC conduits accessories shall be of the same make as conduits. The conduit shall be terminated at switch boxes/metallic junction boxes with suitable PVC glands/check nuts.
- 3.10 Cutting of brick walls shall be with chase cutting machine only. All repairs and patch works shall be neatly carried out to match the original finish and to the entire satisfaction of the Engineer -in-Charge.
- 3.11 All metallic conduit shall be ISI marked. The wall thickness of steel conduit shall not be less than 1.6mm(16SWG) for conduits upto 32mm dia and not less than 2mm (14SWG) for conduits above 32mm. These shall be solid drawn or reamed by welding, and finishing with galvanized or stove enamelled surface.
- 3.12 All the sub main and circuit wiring item includes loose wire for connections inside switch boxes and MCB DBs. No payment for these loose wires shall be made. However wires within the cubicle panel board will be measured and paid under relevant item of work.
- 3.13 All the circuits / sub-main wiring are to be suitably numbered with stickers / marker pen at LT panel board, MCB DBs, switch boards (on backside of cover plate) for ease of maintenance. Nothing shall be paid extra on this account.
- 3.14 To facilitate drawing of wires, 18 SWG GI fish wire shall be provided along with laying of recessed conduit for which no extra payment shall be made. For conduits laid for other services where wiring is not done along with Internal EI works, fish wire shall be invariably drawn.
- 3.15 The connection between incoming switch / isolator and bus bar shall be made with suitable size of thimble and cable at no extra cost.
- 3.16 Copper conductor of insulated cables of size 1.5 Sq.mm and above shall be stranded and terminals provided with crimped lugs.
- 3.17 All sub-main wiring shall be terminated in the main board with suitable copper lugs and thimbles for which nothing extra will be paid.
- 3.18 All hardware items such as screws, thimbles, GI wire etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned.
- 3.19 All hardware items such as nuts/ bolts/ screws/ washers etc. to be used in work shall be zinc/ cadmium plated iron.
- 3.20 While laying conduit, suitable size junction boxes shall be provided for pulling wires. The junction box cover should be of phenolic laminated / good quality plastic sheet of thickness not less than 3mm. Nothing extra shall be paid on the account.

- 3.21 All materials to be used in work shall be ISI marked. The make of the materials shall be as indicated in the list of acceptable makes. Alternate makes are not acceptable. The materials to be used in the work shall be got approved by the Engineer in Charge / his representative before use at site. The Engineer-in-Charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not acceptable.
- 3.22 All modular switches/ sockets/ regulator/ telephone/ TV / internet outlets shall be of the same make.
- 3.23 Installation of distribution boards in niches in walls and making good the same shall be in the scope of the work.
- 3.24 All switch boards having fan controls shall be provided with additional two module spare space. Space/provision with blanking plate shall be provided if fan regulator is not provided therein. However, if twin control fan points is provided, the same shall be provided in one of the switch boards and this shall be done as per the direction of the Engineer-in-charge.
- 3.25 A blanking plate shall be provided between 25A switch and 25A socket outlet without extra cost , wherever provided.
- 3.26 Wherever light fittings are proposed to be provided on the false ceiling, the respective light / fan point wiring will have to be brought upto the terminal of the light fittings / fans by the contractor. Flexible metal conduits shall be used for drawing wires from conduits on ceiling to fittings on false ceiling and nothing extra shall be paid to the contractor for the same.
- 3.27 The external cabling works shall be carried out along the route as directed by the Engineer-in-charge.
- 3.28 The voltage drop calculation for the entire external cabling network shall be provided by the agency as per relevant standards for verification by the department. Procurement and laying of cables shall only be done thereafter.
- 3.29 All MCCBs and relays forming protection to the system shall be suitably calibrated and tested for trouble free operation.
- 3.30 The earthing of the installation shall be properly ensured at all parts of the installation.
- 3.31 All LT panel boards shall be compliant to relevant IS standards. The design of the LT panel board shall be sufficient capacity to withstand the fault level at the point of installation. The enclosures shall be designed to take care of normal stress as well as abnormal electro-mechanical stress due to short circuit conditions. All covers and doors provided shall offer adequate safety to operating persons. Ventilating openings, if provided, shall be arranged such that the required ingress protection is not defeated.
- 3.32 Switchboards construction shall be compartmentalized and segregated for incomer, busbar, cable alley, each outgoing feeders and control and metering units unless otherwise specified.
- 3.33 The switchboards shall be designed for use in the local ambient temperature and humid tropical conditions.
- 3.34 Switchboard panels and cubicles shall be fabricated with CRCA Sheet Steel of thickness not less than 2.0 mm unless otherwise specified and shall be folded and braced as necessary to provide a rigid support for all components. The doors and covers shall be fabricated from CRCA sheet steel of thickness not less than 2 mm unless otherwise specified. Joints of any kind in sheet metal shall be seam welded and all welding slag ground off and welding pits wiped smooth with plumber metal. Switchboards shall be provided with "Danger Notice Plate" conforming to relevant Indian Standards.
- 3.35 Busbars shall be made of high conductivity, 99.9% purity, high strength Aluminum / Copper of ETP grade Busbars shall be of rectangular cross sections shall be provided in all LT panel boards. Busbar shall be suitable to withstand the stresses of fault level at the point of installation. Continuous earth bus sized for prospective fault current to be provided with arrangement for connecting to station earth at two points shall be provided in LT panel boards. Hinged doors / frames to be connected to earth through adequately sized flexible braids.
- 3.36 Copies of type tests carried out on MCCB at manufacturers works shall be furnished along with the delivery of the switchboards

- 3.37 The agency shall be responsible for providing minimum Internal EI requirement of VRDL as per the guidelines of ICMR or equivalent institutes.
- 3.38 It is the responsibility of the agency for the safe custody of LED fittings, CMS etc which are dismantled keep it in safe custody and refixing the same.

**ANNEXURE – X**

**UNDERTAKING LETTER FROM MANUFACTURERS OF LED LIGHT FITTINGS  
(To be submitted along with supply of fittings)**

**We hereby agree that:**

1. LED light fittings including driver supplied by us are guaranteed for five years from the date of handing over.
2. In case of manufacturing defect, discontinuation of model and non-availability of spares, we will replace the fittings with equivalent/ high end model during the warranty period of 5 years.
3. Before finalization of bill after completion of work, we agree to submit security deposit of 5% of the price quoted by the main contractor for SITC of LED fittings for the 5 years warranty period in acceptable form i.e. FDR/ Bank guarantee.

**For M/S .....,  
.....  
(Authorized signatory of manufacturer  
/ dealer of LED luminaries)**

**Counter**

**Signature of contractor**

**Note: To be furnished on a 'Non-Judicial' stamp paper worth Rs. 200/-**

**APPENDIX – II  
GUARANTEE PROFORMA**

**GUARANTEE FOR ELECTRICAL SYSTEM INSTALLATION**

We hereby guarantee the year-round Electrical System which we have installed in the Complex described below:

**Building/Area: CD Block, SCTIMST- BMT Wing**

**Location: Poojapura, Trivandrum**

**Client: SCTIMST**

For a period of 12 months from the date of acceptance of the installation in scope of work, WE AGREE TO repair or replace to the satisfaction of the Engineer-in-charge, any or all such work that may prove defective in workmanship, equipment or materials within that period, ordinary wear and tear and unusual abuse or neglect excluded, together with any other work which may be damaged or displaced in so doing. In the event of our failure to comply with the above-mentioned conditions within a reasonable time, after being notified in writing, we collectively and separately, do hereby authorize the Engineer-in-charge to proceed to have the defects repaired and made good at our expense, and we shall pay the cost and charges thereof, immediately upon demand.

WE ALSO HEREBY UNDERTAKE to test the entire installation upon completion and ensure that all units are functioning satisfactorily.

**SIGNATURE OF CONTRACTOR**

for ELECTRICAL INSTALLATION

**DATE:**

**SEAL**

**ADDITIONAL CONDITIONS AND PARTICULAR SPECIFICATIONS FOR FIRE FIGHTING WITH WET RISER AND SPRINKLER SYSTEM**

**1. GENERAL**

- 1.1. The work shall be generally carried out in accordance with schedule of quantities and the following specifications and conditions.
- 1.2. CPWD General Specifications for Electrical works Part V (Wet riser and sprinkler systems) – 2020, amended up to date.
- 1.3. CPWD General Specifications for Electrical work Part I Internal–2023, amended up to date.
- 1.4. CPWD General Specifications for Electrical work Part II External – 2023, amended up to date.
- 1.5. Commercial and technical conditions for this work.
- 1.6. The Indian Electricity Act, 2003 as amended up to date.
- 1.7. Indian Electricity Rules 1956 amended up to date.

**2. GUARANTEE AND DEFECT LIABILITY PERIOD**

All equipments shall be guaranteed for a period of 12 months from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

The tenderer shall guarantee among other things, the following vis-à-vis specifications.

- 2.1. Quality, strength and performance of the materials used.
- 2.2. Safe mechanical and electrical stress on all parts under all specified conditions of operation.
- 2.3. Satisfactory operation of the entire installation during the maintenance period.

**3. AFTER AWARD OF WORK**

The successful tenderer would be required to submit the following drawings

- 3.1. General arrangement drawing of the equipments.
- 3.2. Plumbing diagram including showing layout of entire piping, size and length of pipes, valves and drawing showing connections to various equipments.
- 3.3. Modified Sprinkler piping design with calculations as per standards.
- 3.4. Electrical wiring diagram for all electrical equipments, and controls and sizes and capacities of various cables and equipments.
- 3.5. Dimensional drawings of electrical and control panel boards.
- 3.6. Drawing showing details of support of pipes etc.
- 3.7. Any other drawings necessary for the job in addition to the details called for in general for approval before commencement of installation.

The successful tenderer should furnish well in advance three copies of detailed instructions and manuals of manufacturer's for all items of equipments regarding installation, adjustments operation and maintenance including preventive maintenance and trouble shooting together with all the relevant data sheets, spare parts catalogue and workshop procedure for repairs, assembly and adjustment etc. all in triplicate.

4. **EXTENT OF WORK**

- 4.1. The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning as may be required by the department.
- 4.2. The main agency shall be responsible for all acts of omissions and submissions of the Associate Contractor engaged by him, even with approval of department.
- 4.3. Approval of the Engineer-in-charge shall be taken well in advance for all the materials to be supplied and used in all the works by the contractor.
- 4.4. The contractor has to make his own arrangements for stores and watch and ward and no extra claim for this will be entertained.
- 4.5. The main contractor shall be responsible for coordinating the activities of all works and will ensure progress of works as per laid down programme.
- 4.6. The main contractor and / or his Associate agency or his representative is bound to sign the site order book as and when required by the Engineer-in-charge and will comply with the remarks therein.
- 4.7. The contractor shall make his own arrangement at his own cost for electrical / General Tools and plants required for the work.
- 4.8. Unless otherwise specified, the following shall be in scope of the work.
- 4.9. Foundation for all equipments as per OEM standards.
- 4.10. Minor building works necessary for installation of equipments, foundation, making of opening in walls or in floors and restoring them to their original condition/ finish and necessary grouting etc. as required.
- 4.11. All supports for cables and MS channels for erection of panels & foundation for pumpsets etc. as necessary.
- 4.12. Contractor shall be required to obtain post installation NOC from Kerala state Fire & Rescue services and the scope of work includes receiving NOC from Fire authority, local body(s). Statutory fee if any shall be reimbursed by department on production of proof of payment. Liasoning work / arranging inspection of local Fire & Rescue Authority shall be the responsibility of the contractor.
- 4.13. The contractor shall remove all the debris from the site as soon as each area taken for execution in phases is completed.
- 4.14. Firefighting works includes dismantling of existing sprinklers and refixing the same as per site conditions, modification of piping design as per the VRDL lab layout etc. as per the site conditions.
- 4.15. It is the responsibility of the agency to coordinate with client for getting any details of existing system.

5. ~~**EXCLUSION AND WORK TO BE DONE BY OTHER AGENCIES**~~

~~Major dismantling of any existing building work~~

6. **AFTER SALES SERVICES**

The contractor shall ensure adequate and prompt after sales service free of cost during guarantee period, and against payment after the guarantee period is over, in the form of maintenance, spares and personnel as and when required during normal life span of the equipments and shall minimize the breakdown period. The firm shall furnish a guarantee from the manufacturer for the same before the installation is taken over.

7. **TESTING, MANUFACTURER'S TESTS, PRE-COMMISSIONING TESTS AND COMMISSIONING**

The general intent of this specification is to mention the relevant tests to be done and furnished to the Engineer-in-Charge by the Contractor. However the Contractor shall carry out all such tests and complete all formalities as per relevant Indian Standard Specifications, fire insurance requirements and/or Electricity Rules and Regulations as per rules.

**8. PRE-COMMISSIONING TESTS**

All rules, regulations and requirements of Electrical, Government or Local Authorities and of Indian Standard Specifications and/or Rules and regulations stated in Indian Electricity Act shall be strictly complied.

On completion of erection, the contractor shall clean all the equipment thoroughly and inspect the entire installation for correctness and shall furnish a report of completion to the Engineer-in-Charge. Pre-commissioning tests shall commence only on approval of this report by the Engineer-in-Charge.

All tests and the certification thereof shall only be carried out by those authorized, skilled, experienced staff. No unauthorized personnel shall ever carry out any such tests as stated herein. The following pre-commissioning tests / activities shall be carried out before energizing the installation.

- 8.1. Mechanical operational tests for all parts of the system.
- 8.2. Ensuring proper slope of the drain pipes from sprinkler lines
- 8.3. Pressure testing the pipes in phases after each phase of installation in occupied areas.

**9. QUALITY OF MATERIALS AND WORKMANSHIP**

- 9.1. The components of installation shall be of such design so as to satisfactorily function under all conditions of operation.
- 9.2. The entire work of manufacture/ fabrication, assembly and installation shall conform to sound Engineering practice.
- 9.3. All equipments and materials to be used in work shall be manufactured in factories of good repute having excellent track record of equality, manufacturing, performance and proper after sales service.
- 9.4. Satisfactory operation during the maintenance period.
- 9.5. The contractor will make his own arrangements for transportation of his materials to the site of work, the security and watch and ward of the materials brought at site and the installation executed by him shall be his responsibility till the work as a whole is completed and handed over to the department.
- 9.6. Any damage done to the building or installation during the execution of work shall be made good by the contractor free of cost. In the event of his failure to do so, the same shall be got rectified through another agency at the contractor's risk and cost.
- 9.7. The contractor or his authorized representative will have to sign site order book to acknowledge the instruction issued by Engineer-in-Charge or his authorized representative for all matters relating to the execution of work. The instructions noted in the site order book shall have to be complied within reasonable time as decided by the Engineer-in-Charge.

**10. PAYMENT TERMS**

~~No advance payment shall be made.~~

On account payments for part work (after stipulated and statutory deductions) as assessed by the Engineer – in-charge for the applicable items shall be payable at part rates not exceeding the percentage indicated against the stages of work.

S.No	Stage of work	Machinery and equipments	All other items
1	After initial inspection & delivery at site in good condition on pro-rata basis	80%	70%
2	On completion of pro-rata installation	10 %	20 %
3	On testing, commissioning and handing over	10%	10 %

The payment to the contractor for supply of items will be made against genuineness of material and on production of all the test certificates. Engineer-in-charge has full power to verify the genuineness of the material.

The Engineer-in-Charge reserves the right to recover any part/item not executed, due to site requirements etc. The rates of such items shall be derived by the Department as per the provisions in the agreement or decided by the Engineer-in-Charge and shall be binding & acceptable to the contract

11. **COMPLETION & GUARANTEE PERIOD**

- 11.1. The completion of the work shall be certified by the competent authority of the department, the defects, if any, shall have to be rectified to the entire satisfaction of the competent authority.
- 11.2. The contractor shall stand guarantee/warranty for a period of at least 12 months from the date of completion of work or after taking over the installations by the department whichever is later, against any manufacturing defect in material, unsatisfactory performance/ working of system/ installation and / or breakdown due to defective design, workmanship.
- 11.3. The material / equipment / installation so found defective shall be replaced / repaired free of cost to the satisfaction of the Engineer-in-Charge. The delay in rectification/ replacement shall not be accepted. The department reserves the right to get it done at the risk and cost of the contractor. The decision of the Engineer-in-Charge, shall be final & binding to the contractor.
- 11.4. The contractor must carry out routine inspection/ testing as the manufacturer's recommendation or as per decision of the Engineer-in-Charge during the guarantee period and attend to the defects during this period. Sufficient number of trained and experienced staff shall be made available to meet any exigency/ emergency at site of work during the guarantee period.
- 11.5. The contractor shall provide the following drawings specifically for approval of Engineer-in-Charge before commencement of supply/ fabrication in addition to the details requested as per general terms and conditions for E&M components.
- 11.6. System plan for complete System
- 11.7. Technical submittals & GA drawings of all machineries and equipments
- 11.8. GA drawing for LT panel boards
- 11.9. floor wise layout-plan of the entire system, external layout plan etc.
- 11.10. Plumbing Drawings showing the layout of entire piping, dia. & length, valves & accessories, plumbing connections etc.
- 11.11. Any other drawing required as per general specifications.

12. **WORKS TO BE DONE BY THE CONTRACTOR**

Unless otherwise mentioned, the following works shall be done by the contractor and therefore their cost shall be deemed to be included in their tendered cost, whether specifically indicated in the schedule of work or not.

- 12.1. Foundation for equipments including foundation bolts and vibration isolation spring and pads.
- 12.2. Suspenders, brackets and floor / wall supports for suspending / supporting pipes / cable trays.
- 12.3. Excavation and refilling of trenches in soil wherever the pipes are to be laid directly in ground including a base treatment and supports.
- 12.4. Sealing of all floors / slabs / wall opening provided by the department or made by the contractor for pipes and cables from fire safety point of view, after laying of the same.
- 12.5. Painting of all exposed metal surfaces of equipments and components with appropriate colour and accepted makes.
- 12.6. Making openings in the walls / floors / slabs or modifications in the existing openings wherever provided for carrying pipeline, cables etc.
- 12.7. All electrical works including cables / wires, earthing etc. beyond the point of power supply.
- 12.8. Making good all damages caused to the structure during installation and restoring the same to their original finish.

- 12.9. Approval from local bodies / fire authorities if required. The inspection fee of local bodies / fire authorities paid shall be reimbursed by the department.

**13. Drawings / Documents to be furnished on completion of installation**

- 13.1. Three sets of the following drawings shall be submitted by the contractor while handing over the installation to the Department. Out of these three, one set shall be laminated on the hard base for display.
- 13.2. Drawings giving complete details of all the equipments including their foundations.
- 13.3. Schematic diagram of plumbing, pipe laying plan with route etc.
- 13.4. Schematic diagram and layout of all electrical controls and sizes of cables.
- 13.5. Manufacturer's technical catalogues of all equipments and accessories.
- 13.6. Operation and maintenance manual of all major equipments, detailing all adjustments, operation and maintenance procedure.
- 13.7. Any other details as per general specification for the work .
- 13.8. It is the responsibility of the agency to execute the firefighting work as per the guidelines of ICMR and the VRDL /BSL-2 .

**14. ~~Inspection by Local Fire Authority~~**

~~After completion of the work to the entire satisfaction of Engineer-in-Charge, the installation shall be offered for inspection by Local Fire authority. Testing as desired by the Fire Officer shall be carried out. The contractor will extend all help including required manpower during testing. The observations of Local Fire Officer in the executed part of works of the agreement under the contract shall be attended by the contractor. Nothing extra is to be paid for testing as above. It shall be the responsibility of the Contractor to get the System / Installations approved / cleared by Local Fire Authority before finalizing the bill.~~

**15. ADDITIONAL TECHNICAL SPECIFICATIONS**

- 15.1. Testing of pipe line shall be carried out in sections as per specifications.
- 15.2. All sluice and reflux valves shall be ISI marked PN 1.6 rating. These shall in all respects comply with the ISI specifications IS 780 and IS 778. The fixing of valves shall be done by means of bolts, nuts, and 3mm rubber insertions with flanges of pipes.
- 15.3. Contractor shall submit his detailed shop drawings showing the exact location, details of installation of the valve and alarm in all its respects.
- 15.4. All accessories necessary and required for full and satisfactory performance of the system shall be provided by the agency.
- 15.5. All pipes lines laid underground for firefighting system including risers /down take pipes in block shall be flushed out before these are joined/ connected together. This will ensure that any foreign material entered the pipe during laying the same is fully removed. The flushing operation shall be continued until clear water comes out at the open end. Flushing of the pipes shall be done at the flow rate not less than 450 liters per minute. Pumping arrangement for flushing and water for the flushing shall be arranged by the contractor. The cost shall be deemed to be included in the rates quoted against laying of pipes stipulated in schedule of Quantities. Contractor shall also make suitable arrangement for disposal of water during flushing.
- 15.6. Testing the system: After the fire fighting system is completed, it shall be tested for proper functioning. Following function tests shall be carried out in the presence of Engineer-in-charge. After satisfactory completion the test report shall be signed by the agency. Such a report shall not relieve him from the responsibility of satisfying the Local Fire Authorities requirements/norms with further tests as required by them.
- 15.7. Pumps shall be installed true to level on suitable concrete foundation; base plate shall be firmly fixed by foundation bolts property grouted in the concrete foundation.
- 15.8. Pumps and motors shall be truly aligned by suitable instruments.
- 15.9. Sprinkler Piping shall be given adequate slope so that draining arrangement is effective.
- 15.10. Required number of supports shall be provided for the sprinkler piping.

- 15.11. All pump connections shall be standard flanged type with appropriate number of bolts. In case of non-standard flanges, companion flanges shall be provided with the pumps.
- 15.12. Manufacturer's instructions regarding installation, connections and commissioning shall be followed with respect to all pumps and accessories. Provide vibration eliminating pads and connectors for each pump.

## **ADDITIONAL CONDITIONS AND PARTICULAR SPECIFICATIONS FOR FIRE ALARM & PA System**

### **1. GENERAL**

- 1.1. The work shall be generally carried out in accordance with schedule of quantities and the following specifications and conditions.
- 1.2. CPWD General Specifications for Electrical works Part VI Fire detection and alarm system – 2018, amended up to date.
- 1.3. CPWD General Specifications for Electrical work Part I internal – 2023, amended up to date.
- 1.4. Commercial and technical conditions for this work.
- 1.5. The Indian Electricity Act, 2003 as amended up to date.
- 1.6. Indian Electricity Rules 1956 amended up to date.

### **2. GUARANTEE AND DEFECT LIABILITY PERIOD**

All equipments shall be guaranteed for a period of 12 months from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be forthwith repaired or replaced free of cost, to the satisfaction of the Engineer-in Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

The tenderer shall guarantee among other things, the following vis-à-vis specifications.

- 2.1. Quality, strength and performance of the materials used.
- 2.2. Safe mechanical and electrical stress on all parts under all specified conditions of operation.
- 2.3. Satisfactory operation of the entire installation during the maintenance period.

### **3. AFTER AWARD OF WORK**

The successful tenderer would be required to submit the following drawings for approval by the department

- 3.1. Layout of FA panel, ~~PA system~~, detectors, ~~manual call boxes, speakers, hooters~~ and all accessories
- 3.2. Circuit diagram of fire alarm panels, detectors and P.A. System.
- 3.3. Constructional details of the various control and indicating panels and mimic diagram(s).
- 3.4. Any other drawings necessary for the job in addition to the details called for in general for approval before commencement of installation.

The successful tenderer should furnish well in advance three copies of detailed instructions and manuals of manufactures for all items of equipments regarding installation, adjustments operation and maintenance including preventive maintenance and trouble shooting together with all the relevant data sheets, spare parts catalogue and workshop procedure for repairs, assembly and adjustment etc.

### **4. EXTENT OF WORK**

- 4.1. The work shall comprise of entire labour including supervision and all materials necessary to make a complete installation and such tests and adjustments and commissioning as required.
- 4.2. The main agency shall be responsible for all acts of omissions and submissions of the associate Contractor engaged by him, even with approval of department.
- 4.3. Approval of the Engineer-in-charge shall be taken well in advance for all the materials to be supplied and used in all the works by the contractor.
- 4.4. The contractor has to make his own arrangements for stores and watch and ward and no extra claim for this will be entertained.
- 4.5. The main contractor shall be responsible for coordinating the activities of all works and will ensure progress of works as per laid down programme.

- 4.6. The main contractor and / or his Associate Contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-charge and will comply with the remarks therein.
- 4.7. The contractor shall make his own arrangement at his own cost for electrical / General Tools and plants required for the work.
- 4.8. The work is in an occupied hospital building and the agency shall ensure that the work is executed with minimum interference to the functioning of the hospital.
- 4.9. Final testing of the completed work shall be done as prescribed in the relevant CPWD specification under the relevant section, recording all results as specified and furnished to the department in the prescribed manner and format.
- 4.10. Software reprogramming of the existing Fire alarm system for operation shall be deemed to be included in the scope of work without extra costing.
- 4.11. Unless otherwise specified, the following shall be in scope of the work.
  - a) Minor building works necessary for installation of equipments, making of opening in walls or in floors and restoring them to their original condition/ finish and necessary grouting etc. as required.
  - b) All supports and accessories etc. as necessary.
- 4.12. The Contractor shall be required to obtain post installation NOC from Kerala Fire & Rescue services and the work shall be deemed to be completed only after receiving NOC from Fire authority & rectifications if any. Statutory fee if any shall be paid by department. Liasoning work / arranging inspection of Fire & Rescue Authority shall be the responsibility of contractor.
- 4.13. Fire alarm works includes dismantling of existing detectors, response indicators and refixing the same as per site conditions, modification of wiring as per the VRDL lab layout etc. as per the site conditions. The reprogramming of the existing Notifier make FACP is also included in the scope of work.
- 4.14. It shall be the responsibility of the agency to coordinate with the client for getting any details of the existing system.

5. **EXCLUSION AND WORK TO BE DONE BY OTHER AGENCIES**

Major dismantling of any existing building work

6. **INSPECTION AND TESTING**

The material and equipments shall be offered for initial inspection at manufacturer's works. The contractor will intimate the date of testing of equipments at the manufacturer's work before dispatch. The successful tenderer shall give advance notice of minimum two weeks regarding the dates proposed for such test to the department representative to facilitate his presence during testing. The Engineer-in-charge may witness such testing. The cost of the Engineer visit to the factory will be borne by the Department. Equipments will be inspected at the manufacturer/ Authorized Dealers premises before dispatch to the site by the contractor. Nothing extra shall be paid for initial inspection/testing at Manufacture Works Copies of all documents of routine and type test certificates of the equipment, carried out at the manufacturers premises shall be furnished to the Engineer-in-Charge and consignee.

Copies of all documents of routine and type test certificates of the equipment carried out at the manufactures premises shall be furnished to the Engineer-in charge and consignee.

7. **Drawings/Documents to be furnished on completion of Installation**

- 7.1. Three sets of following laminated drawings shall be submitted by the contractor while handing over the installations to the Department. Out of this one of the sets shall be laminated on a hard base for display in the fire control room. In addition one soft copy shall also be furnished.
- 7.2. Installation drawings giving complete details of all the components/items such as detectors, call boxes, PA system and allied components etc.
- 7.3. Line diagram and layout of fire alarm & PA system.
- 7.4. Control wiring drawings including all control components connected to fire alarm system and sequence of operation to explain the operation of control circuits.

8. **AFTER SALES SERVICES**

The contractor shall ensure adequate and prompt after sales service free of cost during guarantee period, and against payment after the guarantee period is over, in the form of maintenance, spares and personnel as and when required during normal life span of the equipments and shall minimize the breakdown period. **In case of equipment supplied by other manufacturers the firm shall furnish a guarantee from the manufacturer for the same before the DG Set installation is taken over.**

9. **PAYMENT TERMS**

The following percentage of contract rates for various items included in the contract shall be payable against the stage of work shown herein.

S.No	Terms of payment	Percentage of payment
1	After initial inspection & delivery at site in good condition on pro-rata basis	80.00%
2	On completion of pro-rata installation	10.00%
3	On testing, commissioning and handing over to the department for beneficial use	10.00%

10. **TECHNICAL SPECIFICATIONS FOR FIRE ALARM SYSTEM**

- 10.1. The Fire Alarm Control Panel shall be micro processor based fully Analogue Addressable. Analogue Control Unit shall control all Analogue Addressable Detectors, Manual Call Stations and Switching Systems (for disconnecting fresh air fans and power supply etc.) connected to it. All addressable units shall be connected to the FACP through the loop Cards and shall be addressed through individual numbers. The FACP shall be able to obtain analogue value for all detectors in the circuit through a pulsed digitized current data. The FACP shall be able to analyse all analogue inputs from all addressable units, and through its own software and ambient level screening the FACP shall be able to identify fire, possible fire or fault conditions. The unit supervision shall be dynamic and continuous.
- 10.2. The FACP shall also give adequate warning signal whenever there is dust accumulation in detectors, and up to the point of its replacement it should be possible to change the level of ambient alarm calibration condition either by the use of software program operable by the owner or by resetting the detector.
- 10.3. Short / Open circuit units shall also be reported at the FACP. In such cases, the system through the use of fault isolators shall be able to isolate that segment between the two fault isolators. The missing Detectors/Devices shall also be reported at the FACP with identification of the location. The FACP shall have the facility to set sensitivity of each smoke sensor remotely.
- 10.4. When an alarm condition is sensed at the FACP from a smoke or heat detector, a delay time/ alarm verification period shall be stated. If the sensor is still in alarm after the delay time expires, an alarm condition is reported. The delay time shall be adjustable from 0 to 990 sec's.
- 10.5. The FACP shall have its own Battery Backup of a minimum of 48 hours in normal condition and then half an hour in alarm condition. The back up time calculation for battery supply shall be done as per relevant IS standards and furnished for approval by the Engineer-in-charge.
- 10.6. The mutisensor or multitech smoke detector which will have both photoelectric as well as thermal detection elements shall have inbuilt microprocessor, not micro controller, and shall be capable of taking an independent alarm decision. The detector shall be capable of being addressed electronically or manually by dip, rotary or decade switches. Each intelligent addressable smoke detector's sensitivity shall be capable of being programmed electronically as: most sensitive, more sensitive, normal, less sensitive or least sensitive. The detector should continue to give TRUE alarms even if the loop controller on the main panel fails. Alarm condition shall be based upon the combined input from the photoelectric and thermal detection elements. Each detector shall be capable of transmitting pre alarm and alarm signals in addition to the normal, trouble and need cleaning information. It shall be possible to program control panel activity to each level. Each detector microprocessor shall contain an environmental compensation algorithm that identifies and sets ambient "environmental thresholds approximately six times an hour. The micropro-

cessor shall monitor the environmental compensation value and alert the system operator when the detector approaches 75% and 100% of the allowable environmental compensation value.

10.7. Manual call point:

The manual station shall be a press to break type. The device shall be red in color and suitable for surface or flush mounting. Manual stations shall be interface to an addressable input module that can be accommodated within the device. The manual station shall have normally open fire alarm and annunciator contacts and these contacts shall close on activation. Contacts shall remain closed until station is manually reset. The Manual Call Station shall be fully addressable with its own addressable module and operated by digitized signals from the FACP. The voltage range shall be from 15V to 32V. It shall have protection as per IP24. The operating temperature range shall be from -10 degree C to 50 degree C. Relative Humidity (non condensing) range of performance parameters shall be between 10 to 95%.

10.8. Sounder/hooter:

The sounder shall be electronic type and shall give discontinuous/ intermittent audible alarm whenever any detector or MCP operates. The sound output from the Hooter should be as per IS:2189. The sounder/Hooter shall be powered from either 2 wire detector loop. The horn/strobe shall be listed to UL 1971/ UL 464/LPCB and shall be Approved as fire protective service. The horn/strobe shall be wired as a primary-signalling notification appliance and comply with relevant standards for visible signalling appliances, flashing at 1 Hz over the strobe's entire operating voltage range. The strobe light shall consist of a xenon flash tube and associated lens/reflector system. The horn shall have three audibility options and an option to switch between a Temporal 3 pattern and a Non-Temporal (continuous) pattern. These options are set by a multiple position switch. On four-wire products, the strobe shall be powered independently of the sounder. The horn on horn/strobe models shall operate on a coded or non-coded power supply.

10.9. Addressable monitor module: The monitor module shall provide an addressable input for N.O. or N.C. Contact devices such as manual stations, Water flow switches, sprinkler Supervisory devices etc.

**11. TECHNICAL SPECIFICATIONS FOR EMERGENCY EVACUATION PA SYSTEM**

**11.1. Digital Voice Command Center**

- a) ~~The Digital Voice Command Center located with the FACP, shall contain all equipment required for all audio control, emergency telephone system control, signaling and supervisory functions. This shall include speaker zone indication and control, telephone circuit indication and control, digital voice units, microphone and main telephone handset.~~
- b) ~~Function: The Voice Command Center equipment shall perform the following functions:~~
- c) ~~Operate as a supervised multi-channel emergency voice communication system.~~
- d) ~~Operate as a two-way emergency telephone system control centre.~~
- e) ~~Audibly and visually annunciate the active or trouble condition of every speaker circuit and emergency telephone circuit.~~
- f) ~~Audibly and visually annunciate any trouble condition for digital tone and voice units required for normal operation of the system.~~
- g) ~~Provide all-call Emergency Paging activities through activation of a single control switch.~~
- h) ~~As required, provide vectored paging control to specific audio zones via dedicated control switches.~~
- i) ~~Provide a factory recorded "library" of voice messages and tones in standard WAV. File format, which may be edited and saved on a PC running a current Windows® operating system.~~
- j) ~~Provide a software utility capable of off-line programming for the VCC operation and the audio message files. This utility shall support the creation of new programs as well as editing and saving existing program files. Uploading or downloading the VCC shall not inhibit the emergency operation of other nodes on the fire alarm network.~~

**11.2. Audio Message Generator (Pre recorded Voice)/ Speaker Control:**

Support an optional mode of operation with four analog audio outputs capable of being used with UL-864 fire-listed analog audio amplifiers and SCL-controlled switching.

The Digital Voice Command shall be modular in construction, and shall be capable of being field programmable without requiring the return of any components to the manufacturer and without requiring use of any external computers or other programming equipment. The Digital Voice Command and associated equipment shall be protected against unusually high voltage surges or line transients.

#### 12. ~~Addressable Digital Audio Amplifiers~~

~~The Digital Audio Amplifiers will provide Audio Power for distribution to speaker circuits. Multiple audio amplifiers may be mounted in a single enclosure, either to supply incremental audio power, or to function as an automatically switched backup amplifier(s). The audio amplifier shall include an integral power supply, and shall provide built-in LED indicators for the following conditions:~~

~~The audio amplifier shall provide the following built-in controls:~~

- ~~a) Amplifier Address Selection Switches~~
- ~~b) Signal Silence of communication loss annunciation Reset~~
- ~~c) Level adjustment for background music~~
- ~~d) Enable/Disable for Earth Fault detection~~
- ~~e) Switch for 2-wire/4-wire FFT riser~~
- ~~f) Adjustment of the correct audio level for the amplifier shall not require any special tools or test equipment.~~
- ~~g) Includes audio input and amplified output supervision, back-up input, and automatic switch over function, (if primary amplifier should fail).~~
- ~~h) System shall be capable of backing up digital amplifiers.~~
- ~~i) Each initiating zone or intelligent device shall interface with an emergency voice communication system capable of transmitting a pre-recorded voice message to all speakers in the building.~~
- ~~j) Actuation of any alarm initiating device shall cause a pre-recorded message to sound over the speakers. The message shall be repeated. Pre- and post-message tones shall be supported.~~
- ~~k) A built-in microphone shall be provided to allow paging through speaker circuits.~~
- ~~l) System paging from emergency telephone circuits shall be supported.~~
- ~~m) The audio message generator shall have the following indicators and controls to allow for proper operator understanding and control:~~

#### 12.2. ~~Fire Fighters' Telephone System:~~

~~The Fire Alarm system shall provide a fully integrated Fire Fighters' Emergency Telephone and Communications System. A Master Telephone handset shall be provided which will provide a totally independent 2-way communication between the Fire Alarm Control Panel and any of the Fire Fighters' Telephone Stations for the building. The Fire Fighters' Telephone System shall include individual LEDs and switches per telephone station. The user shall connect a call by pressing the 'connect' switch. To terminate a call, the operator shall press the 'disconnect' switch.~~

#### 12.3. ~~Programmable Electronic Sounders:~~

~~Electronic sounders shall operate on 24 VDC nominal. Electronic sounders shall be field programmable without the use of special tools, at a sound level of at least 90 dBA measured at 10 feet from the device. Shall be flush or surface mounted as shown on plans.~~

#### 12.4. ~~Speaker~~

~~Fire alarm addressable speaker should operate from 24V D.C. and should have a facility to be selected for steady tone and voice output. A movable jumper provided should have a choice for high (84 dbA) or low (70 dbA) outputs. Speaker cum hooter will be dual transformer speaker capable of operating at 25 and 70.7 V rms and will have a frequency range of 400 to 4000 Hz. The~~

synchronized speaker should be supplied with "FIRE" (wall orientation) as the standard marking. It should be suitable for indoor installation.

**12.5. Fire Fighters Telephone Jack**

~~The fire fighter's telephone jack would be a standard receptacle for hooking up the fire fighter's telephone handset. The fire fighter's telephone jack will be complete with an ABS plastic cover plate and would be suitable for flush / surface mounting.~~

### **Additional Conditions for HVAC System.**

1. **General:**

1.1. **Location-:**

The work has to be carried out at CD Block, SCTIMST-BMT Wing, Poojappura, Trivandrum. The contractor is advised to visit the site before submission of their tender to assess the space availability and other constraints.

2. **Scope of work**

Existing 3×150 TR Screw Chiller HVAC plant is running at Lower Ground 2 level of Combination Devices Block building. The proposed VRDL lab area presently have 17TR/6800CFM (Make: Citizen) AHU. The scope of work includes modification of existing AHU as per the schedule of quantity and GA drawing and related ducting works and other equipments for achieving the parameters of VRDL/BSL-2 lab as per the Room Data Sheet(Annexure-A) attached. It will be the responsibility of the agency to achieve the parameters mentioned in the Room Data Sheet(Annexure-A) of HVAC attached below. The guidelines for BSL-2 Lab shall be followed in the BSL-2 Sample Processing Room.

The general character and the scope of work to be carried out under this contract may be ascertained from the available drawings, specifications and the schedule of quantities etc. The contractor shall carry out and complete the said work under this contract complete in every respect in conformity with the contract documents and with the direction and to the satisfaction of the owner's site representative including supply, installation, testing and commissioning of the entire system. The contractor shall furnish all labour, materials and equipment, transportation and incidentals necessary for supply, installation, testing and commissioning of the complete air conditioning system as described in the specifications. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the drawings/documents as being furnished or installed but are necessary to be performed under this contract.

3. **Project Execution and management:**

- 3.1. The contractor shall ensure that senior planning and execution personnel from the agency are assigned exclusively for this project.
- 3.2. For quality control & monitoring of workmanship, contractor shall assign at least one full time Engineer who would be exclusively responsible for ensuring strict quality control, adherence to the specifications and ensuring top class workmanship for the air-conditioning installation.
- 3.3. The contractor shall arrange to have mechanized and modern facilities for transportation of materials to the place of installation for speedy execution of work.

4. **Performance Guarantee:**

The Contractor shall carry out the works in accordance with the approved drawings & design, specifications, schedule of the quantities and other documents forming part of the contract. The contractor shall be fully responsible for the performance of equipments at the specified parameters and for the efficiency of the installations to deliver the required end results. The contractor shall guarantee that the air-conditioning system as installed shall maintain the indoor design conditions in the air-conditioning spaces at the described Basis of Design in the specifications. The guarantee shall be submitted in the proforma sheet.

5. **By-Laws and Regulations:**

The installations shall be in conformity with the by-laws and regulations and standards of the local authorities such as Kerala State Energy Conservation Building code-2017 and their up-to-date amendments, in so far as these become applicable to the installations. But if these specifications call for a higher standard of material and /or workmanship than those required by any of the above regulations and standards then these drawings and specifications shall take precedence over the said regulations and standards. However if the specifications require something other than or which contravene the bye-laws and regulations, then the bye-laws and regulations shall govern the requirement of the installation.

6. **Fees and permits :**

The contractor shall obtain all permits/licenses and pay for any or all fees required for inspection, approvals and commissioning of their installations. However, the actual fee paid to the government departments in this respect will be reimbursed to the contractor on production of proof of payment of fee.

7. **Drawings & Design:**

7.1. As the VRDL HVAC is of specialized work and the agency has to fulfill the parameters mentioned in the Room Data Sheet(Annexure-A) mentioned below, the HVAC design shall be vetted by experienced BSL-2 consultant. The design of the HVAC system based on the specification and norms and preparation of drawings, getting the same approved from the Engineer-in-Charge is also covered in the contract. These drawings shall be complete in all respects indicating both the high side, low side details, the points of supply and termination of services and the routes to be followed. The design and drawings shall be made after close and thorough examination of the available site conditions and the responsibility of the same shall rest with the agency. The tentative layouts shown below is only for reference purpose.

Actual design shall be submitted by the agency .

7.2. The contractor shall based on the approved design drawings make the shop drawings and for subsequent installation work. He shall check the drawings of other trades/services to verify spaces in which HVAC and allied works shall be installed. Any liaisoning with the existing agencies/department shall be the responsibility of the agency.

7.3. Maximum headroom and space conditions shall be maintained at all points. Where head room appears inadequate, the contractor shall notify Engineer-in-charge before proceeding with the installations. In case installation is carried out without notifying the works shall be rejected and the contractor shall rectify the same at his own cost. The contractor shall examine all the architectural, structural, plumbing, electrical and other services drawings available at site and check the as -built works before starting the work. The as-built plant for the existing set up is only indicative and does not empower the agency to design the system without considering the actual site constraints.

7.4. Any changes found essential to co-ordinate his work with other services and trades, shall be made with prior approval of Engineer-in-charge/SCTIMST without additional cost to the owner. The data given in the drawings and specifications is a tentative proposal, but its accuracy is not guaranteed.

8. **Technical Data**

Tenderer shall submit within three weeks of association of the agency, the technical data for all items listed in the indicated format.

9. **Shop Drawings**

9.1. All the shop drawings shall be prepared on computer through latest CAD system based on the architectural drawings, site measurements and interior designers drawings. All heat load calculation shall be done followed by furnishing the design details and drawings for approval of the Engineer-in-charge followed by two set of detailed shop drawing of all equipment and material including the layouts of the plant rooms, AHU rooms, Fan rooms, Cooling Towers, fan coil units, ventilation fans. Detailed ducting drawing showing exact location of supports, flanges, bends, tee connections, reducers, guide vanes, silencers, distribution grids, Volume control dampers, collars, grilles, diffusers, detailed piping drawing showing exact location and type of supports, valves, fittings etc. acoustic lining and external insulation details for ducts, pipe insulation etc for approval. Electrical panels inside/outside views, power and control wiring schematics, cable trays, supports and terminations. These shop drawings shall contain all information and shall contain all the information required to complete the project as per specifications and as required by the Engineer-in-charge or their authorised representative. These drawings shall contain details of constructions, size arrangement, operating clearances, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors.

9.2. Each shop drawing shall contain tabulation of all measurable items of equipment/material/works and progressive cumulative totals from other related drawings to arrive at a variation in quantity statement at the completion of all shop drawings. Minimum 5 sets of drawings shall be submitted after final approval along with their CDs(soft copies).

9.3. Each item of equipment/material proposed shall be a standard catalogue product of an established

manufacturer strictly from the manufactures listed in list of acceptable makes and quoted by tenderer in technical data part of this document.

- 9.4. Shop drawings shall be submitted for approval four weeks in advance of planned delivery and installation of any material to allow Engineer-in-charge to have ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in works due to his failure to produce shop drawings at the right time in accordance with the approved programme.
- 9.5. Manufacturers drawings, catalogues, pamphlets and other documents submitted for approval shall be in four sets. Each item in each set shall be properly labelled, indicating the specific services for which the material /equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data for general nature shall not be accepted.
- 9.6. Samples of all materials like grilles, diffusers, controls, insulation, pre-moulded pipe section, control wires etc. shall be submitted to the owners site representative prior to procurement. These will be submitted in 2 sets of approval and retention by owners site representative and shall be kept in their site office for reference and verification till the completion of the project. Wherever directed a mock up or sample installation shall be carried out for approval before proceeding for further Installations.
- 9.7. Approval of shop drawings shall not be considered as a guarantee of measurement or that of a building dimension. Wherever drawings are approved, the said approval doesn't mean that the drawings supersede the contract requirements, nor does it in any way relieve the contractor of the responsibility or requirements to furnish material and perform as per the requirement of this contract.
- 9.8. Wherever contractor propose to use an item or equipment other than that specified or detailed on the drawing which requires any redesign of the structure, partitions , foundations, piping, wiring or any other apart of the mechanical, electrical and architectural layouts ,all such redesign and all new drawings and detailing required therefore shall be prepared by the contractor at his own expenses and shall be got approved by the Engineer-in-charge site representative. Any delay on such account shall be at the cost and consequences to the contractor.
- 9.9. HVAC/IBMS contractor shall prepare coordinated service shop drawings based on the drawings prepared by electrical, plumbing & low voltage contractors to ensure adequate clearances are available for installation of service for each trade.
- 9.10. Where the work of the contractor has to be installed in close proximity to or will interfere with the work of other trade he shall assist in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer-in-charge, the contractor shall prepare composite working drawings and sections at a suitable scale, not less than 1:50 clearly showing how his work is to be installed in relation to work of the other trades. If the contractor installs his works before coordinating with other trades or so causes any interference with work of other trades, he shall be responsible for the same and shall make necessary changes required without extra cost.
- 9.11. Within four weeks of the approval of the relevant shop drawings the contractor shall submit four copies of a comprehensive variation in quantity statement and itemized price list of recommended (by manufacturer) imported and local spare parts and tools covering all the materials/equipment in the contract. The Engineer-in-charge shall make recommendation to the owner to initiate action for procurement of spare parts and tools at the completion of project.
10. **Quite Operation and Vibration Isolation:**
- 10.1. All equipment shall operate under all conditions of designed load without any objectionable sound and vibration in the opinion of the owner's site representative and shall operate within permissible noise levels
- 10.2. In case of rotating machinery sound or vibration noticeable outside the room in which it is installed or annoyingly noticeable inside its own room shall be considered objectionable. Such condition shall be corrected by the contractor at his own expenses. The contractor shall guarantee that the equipment installed shall maintain the specified NC levels.
11. **Accessibility:**  
The contractor shall verify the sufficiency of the size of the shaft openings, clearances in cavity walls and suspended ceiling for proper installation of his ducting and piping, his failure to communicate insufficiency of the same. The contractor shall locate all equipment which must be serviced ,operated

or maintained in fully accessible positions. The exact location and size of all access panels required for each concealed damper, valves or other devices requiring attendance shall be finalized and communicated in sufficient time to be provided in the normal course of work. Failing this the contractor shall make all necessary changes and repairs at his own expenses. Access panel shall be standardized for each piece of equipment/device/accessory and shall be clearly nomenclatured / marked.

12. **Materials and equipment:**

All materials and equipment shall conform to the relevant Indian standards and shall be of the approved make and design. Makes shall be strictly in conformity with the list of approved manufacturers.

13. **Manufactures Instructions:**

Where manufacturer has furnished specific instructions relating to the material/equipment used in this project which is covering points specially not mentioned in these documents, such instructions shall be followed in all cases.

14. **Electrical Installations:**

14.1. The electrical work related to air-conditioning services, shall be carried out in full knowledge of, and with complete coordination of contractor. The electrical installation shall be in total conformity with the control wiring drawings prepared by the contractor and approved by the Engineer-in-charge. All air-conditioning equipments shall be connected and tested in the presence of an authorized representative of the contractor.

14.2. The air-conditioning system shall be commissioned only after the contractor has certified in writing that the electrical installation work for air-conditioning services has been thoroughly checked, tested and found to be totally satisfactory and in full conformity with the approved drawings, specifications and manufacturers instructions. It is to be clearly understood that the final responsibility for the sufficiency, adequacy and conformity to the contract requirements of the electrical installation work for air-conditioning services lies solely with the contractor.

15. **COMPLETION CERTIFICATE:**

15.1. On completion of the electrical installation for air-conditioning, a certificate shall be furnished by the contractor, counter signed by the licensed supervisor, under whose direct supervision the installation was carried out. This certificate shall be in the prescribed form as required by the local authority.

15.2. The contractor shall be responsible for getting the entire electrical installation for air-conditioning system duly approved by the local authorities concerned and shall bear expenses, if any in connection with the same. However, the actual fee paid to the government departments in this respect will be reimbursed to the contractor on production of proof of payment of fee.

16. **BALANCING, TESTING AND COMMISSIONING**

16.1. Balancing of all air and water systems and all tests as called for the specifications shall be carried out by the contractor through a specialist group, in accordance with the specifications and ASHRAE guidelines and standards. Performance test shall consist of three days of 10 hrs each operation of each season. Witness testing of major equipment at factory with two personnel from owners/ department shall be included.

16.2. The test results for summer, monsoon and winter air conditioning in quadruplicate, shall be submitted for scrutiny. Four copies of the certified manufacturers performance curves for each piece of equipment, highlighting operational parameters for the project, shall be submitted along with the test certificates.

16.3. Contractors shall also provide four copies of record of all safety and automatic control settings for entire installation.

16.4. The installation shall be tested again after removal of defects and shall be commissioned only after approval by the Engineer-in-charge/ his site Representative. All tests shall be carried out in presence of the representatives of the Engineer-in-charge and their authorised representative.

17. **COMPLETION DRAWINGS**

Contractor shall periodically submit completion drawings as and when work in all respects. These drawings shall be submitted in the form of two sets of CD's and four portfolios (300×450mm) each containing complete set of drawings on approved scale indicating the work as installed. These

drawings shall clearly indicate complete plant room layouts, location of wiring and sequencing of automatic controls, locations of all concealed piping, valves, controls, dampers, wiring and other services. Each portfolio shall also contain consolidated control diagrams and technical literature on all controls. The contractor shall prepare frame in glass front, in the air-conditioning plant room , one set of these consolidated control diagrams.

18. **OPERATING INSTRUCTIONS & MAINTENANCE MANUAL :**

Upon completion and commissioning of part HVAC system the contractor shall submit a draft copy of operating instructions, maintenance schedules and log sheets for all system and equipment included in this contract. This shall be supplementary to manufacturers operating and maintenance manual. Upon approval of the draft, the contractor shall submit four complete bound set of typewritten operating instructions and maintenance manuals. One each for retention by CPWD and clients representative and two for owners operating personnel. These manuals shall also include basis of design ,detailed technical data for each piece of equipment as installed ,spare parts manual and recommended spares for 5 years period of maintenance of each equipment after defect liability period

19. **GUARANTEE AND DEFECT LIABILITY PERIOD:**

The Entire installation shall be guaranteed for a period of 12 months from the date of taking over the installation by the department, against unsatisfactory performance and/or break down due to defective design, workmanship or material. The equipments or components, or any part thereof, so found defective during guarantee period shall be repaired or replaced free of cost, to the satisfaction of the Engineer-in Charge. In case it is felt by the department that undue delay is being caused by the contractor in doing this, the same will be got done by the department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding on the contractor.

20. **Terms of Payment:**

The terms of payment shall be as per clause 1.17 of CPWD General Specifications for HVAC -2024 amended up-to-date.

21. **AIR HANDLING UNITS**

21.1. **SCOPE**

The Scope of this section comprises supply, erection, testing and commissioning of double skin Air Handling Units conforming to the Specifications and in accordance as per Schedule of Quantities, considering the architectural drawings and site conditions.

The Pressurization unit and Exhaust unit shall be of ceiling mount type .It is the responsibility of the agency to install the units in the ceiling /truss work as per the site conditions.

22. **SHEET METAL WORK & AIR DISTRIBUTION**

22.1. **Scope:**

- a) The scope of work shall include supply, fabrication and installation of factory/site fabricated GSS sheet metal duct. It shall be complete with accessories, grilles, diffusers, dampers, louvres etc. as per the drawing got approved from the Engineer-in-charge including testing at site for pressure leakages as applicable, delivery and handling at site, and shifting the G.I. sheets and other hardware from site stores to exact location in the campus. The packing shall be suitable for marine transportation purpose and all other natural disasters and the same shall be transported to respective office warehouses to achieve a guaranteed commercial operation of the same to the entire satisfaction.
- b) Except or otherwise specified, all duct works and related items shall be in accordance with these specifications. Duct work shall mean all ducts, casings, dampers, access doors, joints, stiffeners, and hangers.
- c) A careful attention is required to avoid wastage of ducting, Fire dampers, Aluminium Volume control dampers, Terminal Modules and Return air ducts. Ducting fabricators needs to provide matching flanges and required accessories. All AHU outlets shall have Fire dampers, VCDs.
- d) The existing ducting system shall be carefully dismantled and handed over to the client department.

23. **Duct Insulation**

- Ductwork shall be insulated as per the below specified guidelines.
24. **Painting**  
Angle iron Flanges, Stiffeners, hangers and supports shall be painted with 2 coats of anti-rust primer and remaining uncovered duct shall be further painted with 2 coats of synthetic enamel paints of black color.
25. **Testing and Balancing**
- 25.1. After completion of ducting work, system shall be tested for air leakage. Leakage if any shall be plugged and all the adjustments and balancing are completed. The air quantity readings shall be recorded. All dampers shall be set and locked in position after the final adjustments. All readings made shall be submitted to the Engineer-in-charge for approval.
- 25.2. Duct Thermal Insulation:
- 25.3. Material technical specifications:
- 25.4. For Duct thermal insulation - Nitrile rubber with antibacterial property as follows shall be used.
26. **Closed Cell Elastomeric Nitrile Rubber.**
- 26.1. Thermal conductivity of elastomeric Nitrile rubber shall not exceed 0.034 Kcal/Hr.deg.C/ m at mean temperature of 10 Deg. C and of minimum density of 55 Kg per cu.m .
- 26.2. Insulation material shall have anti-microbial product as an integral part of insulation which cannot be washed off or worn off.
- 26.3. It shall give enhanced level of protection against harmful Microbes such as bacteria, mold, mildew and fungi and shall conform to following standards:
- 26.4. Fungi Resistance – ASTM G21 and Bacterial resistance – ASTM G 22 / ASTM 2180.
- 26.5. The insulation shall have fire performance such that it passes Class 1 as per BS476 Part 7 for surface spread of flame as per BS 476 and also pass Fire Propagation requirement as per BS476 Part 6 to meet the Class 'O'.
- 26.6. Material shall be FM (Factory Mutual), USA approved.
- 26.7. Moisture Diffusion Resistance Factor or 'μ' value shall be minimum 10,000.
27. **Adhesive for Duct Thermal Insulation:** The adhesive shall be formulated for the Duct insulation application and supplied by insulation (Nitrile) manufacturer. The adhesive shall be rubber based, solvent based contact adhesive, free from benzene. The adhesive shall have minimum tear strength resistance of > 20 N / 25 mm when tested as per AFERA – 4001. The adhesive shall be quick drying characteristics for tropical conditions and shall have service temperature of 0 deg to +85 deg C.
28. **Duct Thermal Insulation for Round Duct- Application:**
- 28.1. Insulation for Round or capsule duct should be carried out from inside of the duct applied with good quality adhesive. Contents of adhesive shall be as described above. Suggested thicknesses are as follows:
- 28.2. Specifications for cloth – Manufacturer bonded Treated Woven Glass Fibre Technical Details: Temperature Range: 0°C to + 105°C Overall (irrespective of the base product) Colour: Black /white
- 28.3. Treatment: Shall be treated Water Based Acrylic binder to give crisp and non-piling property to the fabric, to help in easy installation, minimize fiber erosion, good aesthetics and resistance to abrasion. Fibre spillage / Thread raveling should be minimum.
- 28.4. Density: 200 +/- 20 Gsm
- 28.5. Tensile Strength: 275 +/- 25 Kg / 50 mm (minimum)
- 28.6. Thickness: 0.18 mm / 7 mill
- 28.7. Pressure sensitive self adhesive tape (PSA) Tape: 50 mm width (with glass cloth only).
- 28.8. Type: Solvent based Acrylic Adhesive
- 28.9. Peel Strength: 1000 gm / 25 mm (minimum) - (Adhesive to steel)
- 28.10. Release Liner: Polyester
- 29 **Static pass box:** Design & SITC of Static pass box shall be provided. Pass Box (Aluminum & Static) 2/3 way of Size 450x 450x450 (Internal) having the following specification i/c connection testing commissioning etc complete as required. The Pass-Box wings are made of the same anodized Aluminium profile with glass and doors with an Aluminium handle, floor air-stops, a 45mm thick sandwich panel interior and perimeter tight seal gaskets. The interior of the static Pass Box is made

of GI Powder coated skin(sides) and SS 304 stainless steel with a scotch-brite finish base. The corners inside the Pass Box chamber shall be covered for easy cleaning.

a. Dimension of the pass box shall be as per site conditions

30 **Dynamic pass box:** 2/3 way having the following specification i/c connection testing commissioning etc complete as required.

- i. Specifications:
- ii. Air Cleanliness- Class 100
- iii. Velocity-90 FPM  $\pm$  20%
- iv. Material of Construction- SS 304
- v. Main Filter- Minipleat HEPA, Class: H14
- vi. Pre Filter- Pre Filter, Class: F7
- vii. Filter Efficiency- HEPA 99.997% at 0.3  $\mu$ m, Pre Filter 90% at 5  $\mu$ m
- viii. Noise (dB)- 67  $\pm$  2
- ix. Lighting (Lux)- >500
- x. Doors-Two Way / Three Way Doors with Glass view windows
- xi. Mechanical / Electromagnetic interlocking system.\* ISO 9001 : 2015
- xii. \* ISO CLASS 5, CLASS 100
- xiii. \* MOC: SS-304, STAINLESS STEEL JINDAL, matt finish
- xiv. \* WALL MOUNTED
- xv. \* FLOOR MOUNTED – BOTTOM HAVE 1.5-2MM THICKNESS SS SHEET
- xvi. \* Dynamic pass box made of 20 Gauge (1.0 mm) thickness
- xvii. \* PARTICLE RETENTION: 0.3 MICRON & ABOVE
- xviii. \* AIR PRESSURE IN GAUGE – 15+-5 MMWC
- xix. \* AIR VELOCITY – 90+-20FPM
- xx. \* Fully protected and glass cased LED and UV lights
- xxi. \* SS PANEL DOOR WITH GLASS VIEW, SS Hinges, SS handle,
- xxii. \* DOOR INTERLOCKING SYSTEM -
- xxiii. \* DOOR OPENING WITH SOLID STATE ELECTRONIC -
- xxiv. \* Door Position -As per approved drawing
- xxv. \* Pass box to be provided timer controlled door opening
- xxvi. \* hepa protect by SS perforated grill
- xxvii. Dimension of the pass box shall be as per site requirement.

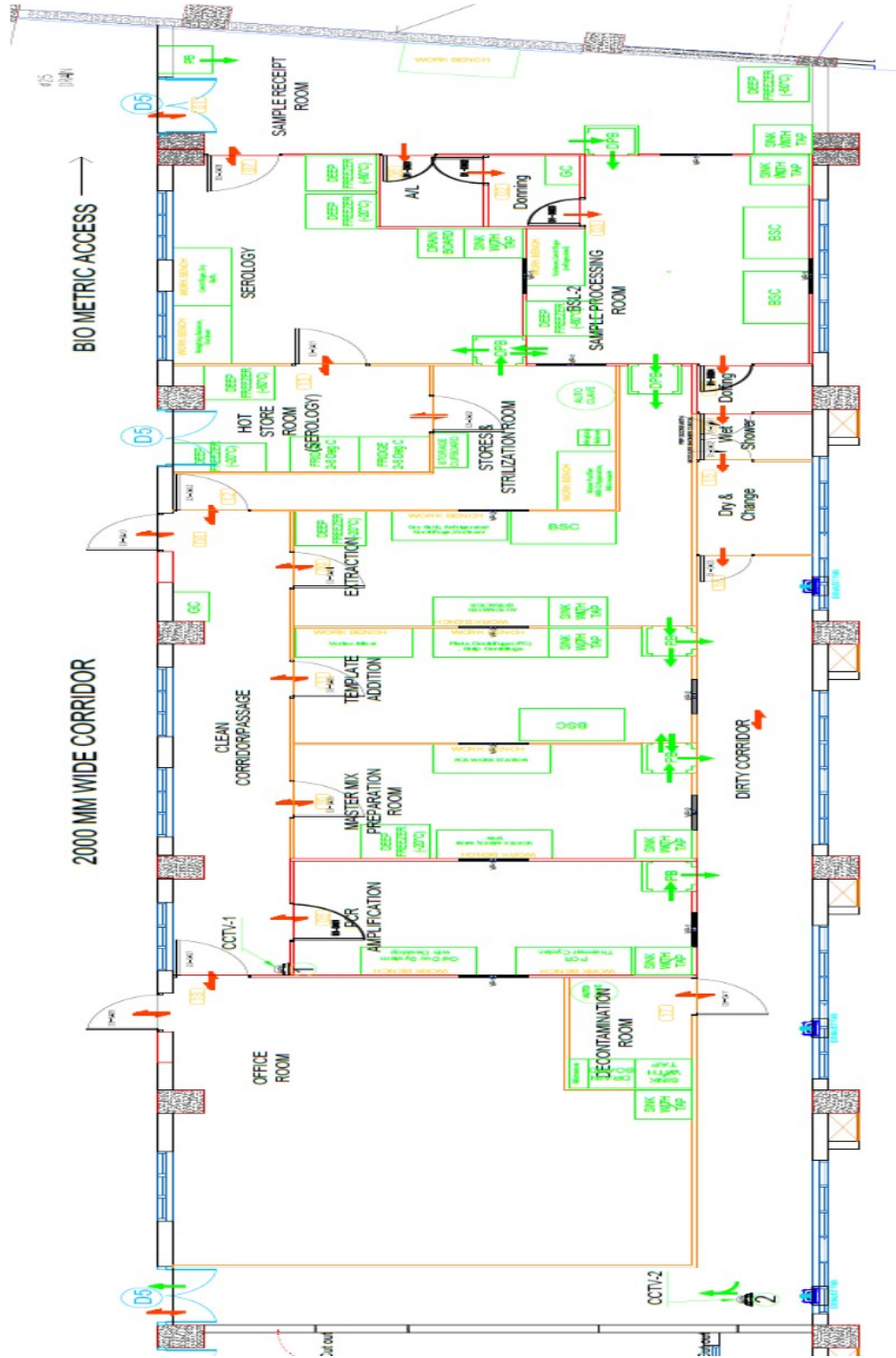
### 31 **Testing and commissioning**

The system shall be tested and commissioned as per the guidelines VRDL lab and as per the parameters mentioned in the Room Data Sheet(Annexure-A) for HVAC below. The entire HVAC system shall be commissioned and tested accordingly to fulfill the functionality of VRDL/BSL-2. The system shall be suitable for integrating with the existing HVAC system. It shall be properly air balanced to achieve the parameters mentioned in Room Data sheet(Annexure-A) of HVAC. The HVAC system shall fulfill the general criteria of VRDL standard & guidelines. It shall be the responsibility of agency to check all the factors for the validation of VRDL as per ICMR/competent authority guidelines.





**TENTATIVE EQUIPMENT LIST**

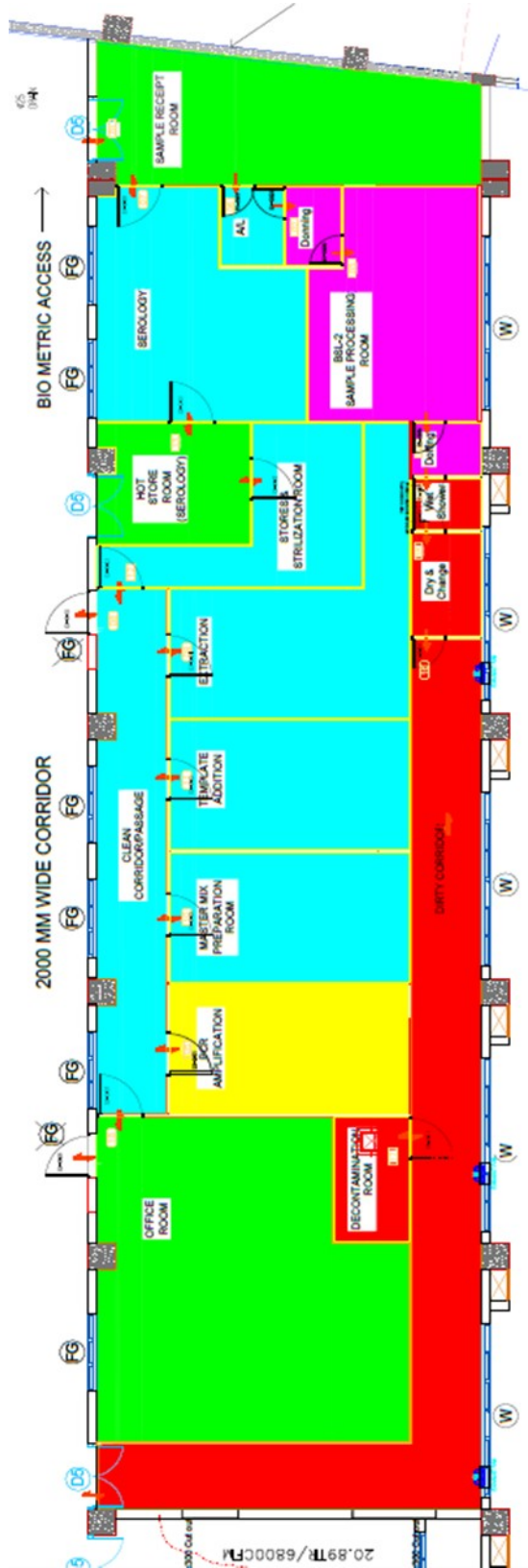
Sr No	Room No		Room category	Equipment	Power Supply			
	F	R No			1P (Raw) Kw	1P (UPS) Kw	3-Phase Kw	Total Kw
1	UB	01	OFFICE ROOM	Split AC 1.5Ton	1.5			
2	UB	01	OFFICE ROOM	Split AC 1.5Ton	1.5			3
3	UB	02	Decontamination Room	Microwave	1			
4	UB	02	Decontamination Room	Autoclave			6	7
5	UB	03	PCR Amplification	PCR thermal cycler with Laptop		0.85		
6	UB	03	PCR Amplification	Gel doc system with Desktop and CPU		0.6		
7	UB	03	PCR Amplification	Pass Box	0.75			2.2
8	UB	05	Master mix preparation room	PCR work station		0.3		
9	UB	05	Master mix preparation room	-20 Deg Deep Freezer	0.8			
10	UB	05	Master mix preparation room	Vortexer	0.05			
11	UB	05	Master mix preparation room	Mini spin (small centrifuge)	0.2			
12	UB	05	Master mix preparation room	Pass Box	0.75			2.1
13	UB	06	Template Addition Room	Biosafety cabinet		0.3		
14	UB	06	Template Addition Room	Plate Centrifuge(4 degree Celsius)	0.25			
15	UB	06	Template Addition Room	Strip centrifuge	0.25			
16	UB	06	Template Addition Room	Vortexer	0.05			
17	UB	06	Template Addition Room	Pass Box	0.75			1.6
18	UB	07	Extraction room	Biosafety cabinet		0.3		
19	UB	07	Extraction room	Dry bath	0.2			
20	UB	07	Extraction room	Vortexer	0.05			
21	UB	07	Extraction room	Automated extractor	0.25			
22	UB	07	Extraction room	Refrigerated centrifuge		1.5		
23	UB	07	Extraction room	-20 Deg Deep Freezer	0.8			
24	UB	07	Extraction room	D Pass Box	0.75			3.85
25	UB	08	Stores & Sterilization Room	Microwave	1			
26	UB	08	Stores & Sterilization Room	Weighing balance	0.02			
27	UB	08	Stores & Sterilization Room	Autoclave (100 Liters)			6	
28	UB	08	Stores & Sterilization Room	Water Purifier		0.1		7.12
29	UB	11	Hot Store Room (Serology)	-20 Deg Deep Freezer	1			
30	UB	11	Hot Store Room (Serology)	-80 Deg Deep Freezer	1.7			
31	UB	11	Hot Store Room (Serology)	Split AC 1.5Ton	1.5			
32	UB	11	Hot Store Room (Serology)	Split AC 1.5Ton	1.5			
33	UB	11	Hot Store Room (Serology)	Refrigerator (2 -8 Deg C)	0.4			
34	UB	11	Hot Store Room (Serology)	Refrigerator (2 -8 Deg C)	0.4			6.5
35	UB	12	Serology	Centrifuge	0.3			
36	UB	12	Serology	D Pass Box	0.75			
37	UB	12	Serology	Dry bath	0.2			
38	UB	12	Serology	Weighing balance	0.02			
39	UB	12	Serology	Vortexer	0.05			
40	UB	12	Serology	-80 Deg Deep Freezer	1.7			
41	UB	12	Serology	Refrigerator (2 -8 Deg C)	0.4			3.42
42	UB	13	Sample Receipt Room	Pass Box	0.75			
43	UB	13	Sample Receipt Room	D Pass Box	0.75			
44	UB	13	Sample Receipt Room	Split AC 1.5Ton	1.5			
45	UB	13	Sample Receipt Room	Split AC 1.5Ton	1.5			
46	UB	13	Sample Receipt Room	-80 Deg Deep Freezer	1.7			6.2
47	UB	16	Sample Processing Room	Biosafety cabinet		0.3		
48	UB	16	Sample Processing Room	Biosafety cabinet		0.3		
49	UB	16	Sample Processing Room	-80 Deg Deep Freezer	1.7			
50	UB	16	Sample Processing Room	Vortexer	0.05			2.35
51	UB		AHU Room	AHU			3	
52	UB		AHU Room	Exhaust Unit			1.1	
53	UB		AHU Room	Pressurizing Unit			1.1	5.2

### Tentative Equipment Layout

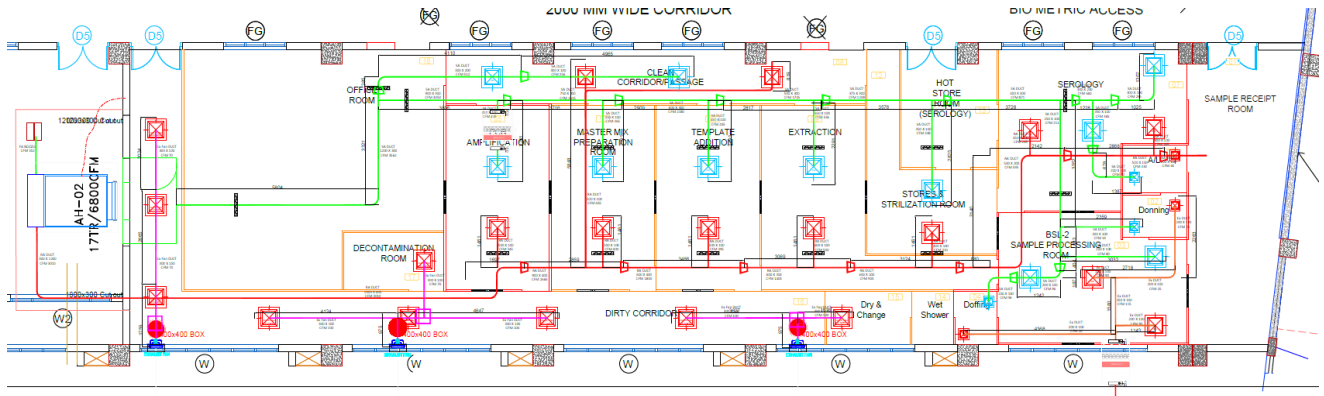


### Tentative HVAC Zoning

SYMBOL	LEGEND	SYMBOL	LEGEND
	CLEAN ROOM PARTITION-50mm		AHU-1
	ROOM NUMBERS		AHU-1 +Ex UNIT WITH HEPA
	EXHAUST FAN		
	SPLIT AC		
	AHU-1+ INLINE SUPPLY FAN		



## TENTATIVE HVAC DUCTING LAYOUT (Actual designing shall be in the scope of agency)



SYMBOL	LEGEND	SYMBOL	LEGEND
	SUPPLY DUCT-AHU		SUPPLY AIR GRILLS
	RETURN DUCT-AHU		RETURN AIR GRILLS
	RETURN DUCT-EXHAUST FAN		
	RETURN DUCT Ex UNIT WITH HEPA		
	VOLUME CONTROL DAMPER-VCD		

Annexure-A

**ROOM DATA SHEET- HVAC (The agency shall fulfill the parameters mentioned below for HVAC system of proposed VRDL)**

Sr. No.	Room No.	Ventilation System	Room Name/Description	Length	Width	Area	Area	Height	Height	Room Condition		
				(mm)	(mm)	(sqm)	(sqft)	(mm)	(ft)	Temp.	RH	Pressure in Pa
1	01	Split AC	SAMPLE RECEIPT ROOM	2834	8260	23.41	252	2400	7.87	23 +/- 2 Deg C	NA	NA
2	02	AHU-1 +Ex Unit with HEPA	DOWNING	1833	1200	2.20	24	2400	7.87	23 +/- 2 Deg C	LT 60%	-20±5
3	03	AHU-1 +Ex Unit with HEPA	BSL2 SAMPLE PROCESSING ROOM	3439	5400	18.57	200	2400	7.87	23 +/- 2 Deg C	LT 60%	-40±5
4	04	AHU-1 +Ex Unit with HEPA	DOFFING	1200	1500	1.80	19	2400	7.87	23 +/- 2 Deg C	LT 60%	-20±5
5	05	AHU-1+ Inline supply Fan	PCR AMPLIFICATION	2980	5160	15.38	165	2400	7.87	23 +/- 2 Deg C	LT 60%	+15±5
6	06	AHU-1	AIU	1833	1350	2.47	27	2400	7.87	23 +/- 2 Deg C	LT 60%	+5±5
7	07	AHU-1	SEROLGY	5400	3848	20.78	224	2400	7.87	23 +/- 2 Deg C	LT 60%	+5±5
8	08	AHU-1	CLEAN CORRIDOR/PASSAGE	12070	1500	18.11	195	2400	7.87	23 +/- 2 Deg C	LT 60%	+5±5
9	09	AHU-1	EXTRACTION	3678	5160	18.98	204	2400	7.87	23 +/- 2 Deg C	LT 60%	+5±5
10	10	AHU-1	MASTER MIX PREPARATION ROOM	2980	5160	15.38	165	2400	7.87	23 +/- 2 Deg C	LT 60%	+5±5
11	11	AHU-1	TEMP. ADDITION	2980	5160	15.38	165	2400	7.87	23 +/- 2 Deg C	LT 60%	+5±5
12	12	AHU-1	STORES & STERILIZATION ROOM	3192	3741	11.94	128	2400	7.87	23 +/- 2 Deg C	LT 60%	+5±5
13	13	Split AC	HOT STORE ROOM (SEROLGY)	2761	3300	9.11	98	2400	7.87	23 +/- 2 Deg C	NA	NA
14	14	Exhaust Fan	WET SHOWER	1200	1500	1.80	19	2400	7.87	RT	NA	(-15)±5
15	15	Exhaust Fan	DW & CHANGE	2400	1500	3.60	39	2400	7.87	RT	NA	(-15)±5
16	16	Exhaust Fan	DIRTY CORRIDOR	26753	1500	40.13	432	2400	7.87	RT	NA	(-15)±5
17	17	Exhaust Fan	DECONTAMINATION ROOM	2878	1600	4.60	50	2400	7.87	RT	NA	(-15)±5
18	18	Split AC	OFFICE ROOM	6064	7485	45.39	488	2400	7.87	23 +/- 2 Deg C	NA	NA

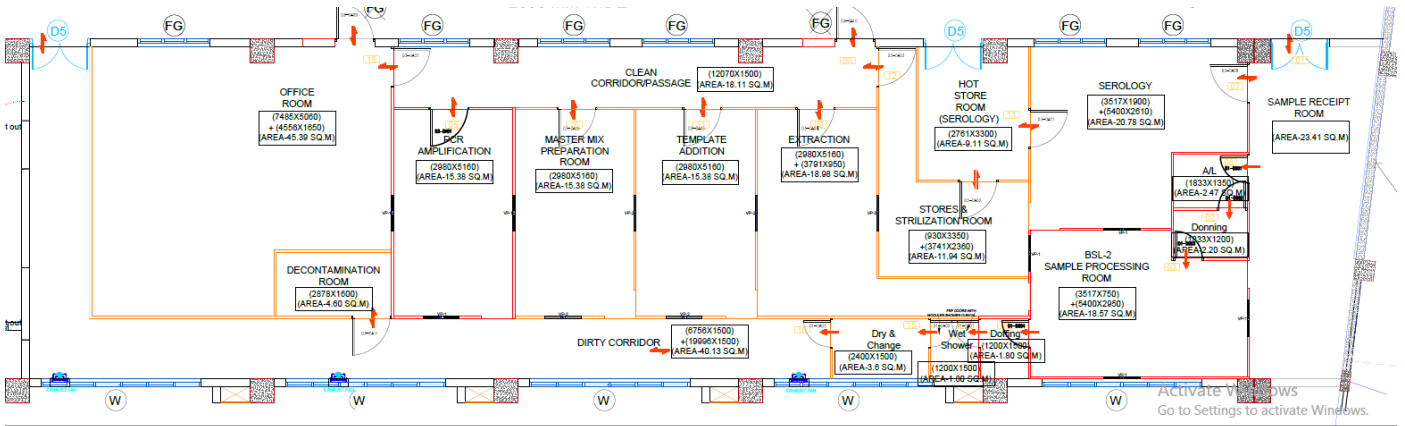
  

Room Classification	Occupancy	Electrical Light fittings	Total Connected Load	ACH REGRUL ATION	ACH FA
NC	2	2W/Sft	6.2	NA	
NC		2W/Sft			6
NC	2	2W/Sft	2.4		6
NC		2W/Sft			6
100000	2	2W/Sft	2.2	20	2
NC		2W/Sft		20	2
NC	2	2W/Sft	3.4	20	2
NC		2W/Sft		20	2
NC	2	2W/Sft	3.9	20	2
NC	2	2W/Sft	2.1	20	2
NC	2	2W/Sft	1.6	20	2
NC	2	2W/Sft	7.1	20	2
NC		2W/Sft	6.5	NA	
NC		2W/Sft			10
NC		2W/Sft			5
NC	1	2W/Sft	7.0		5
NC	6	2W/Sft		NA	

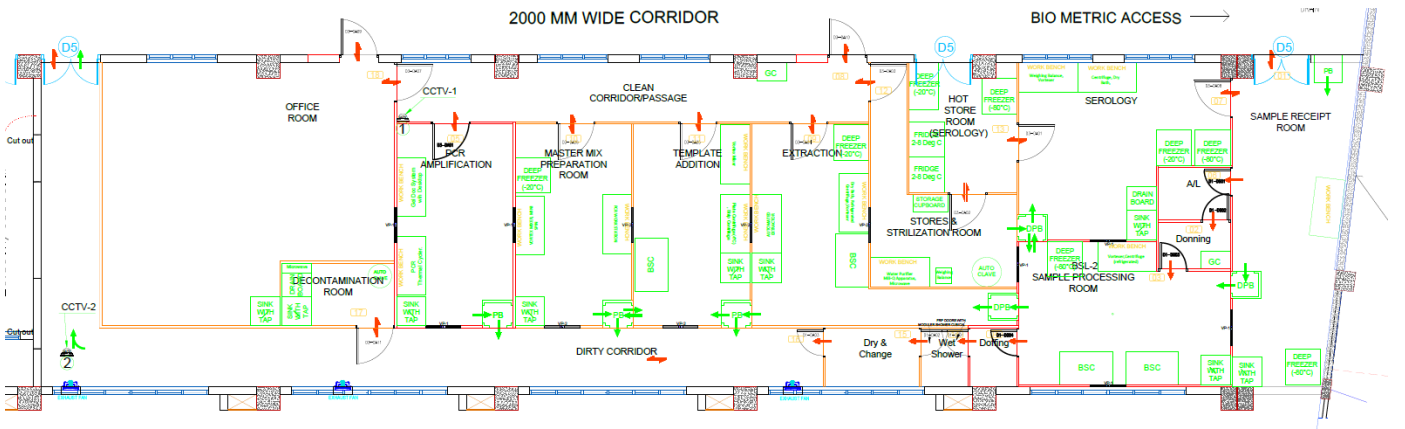
## TENTATIVE ELECTRICAL INVENTORY

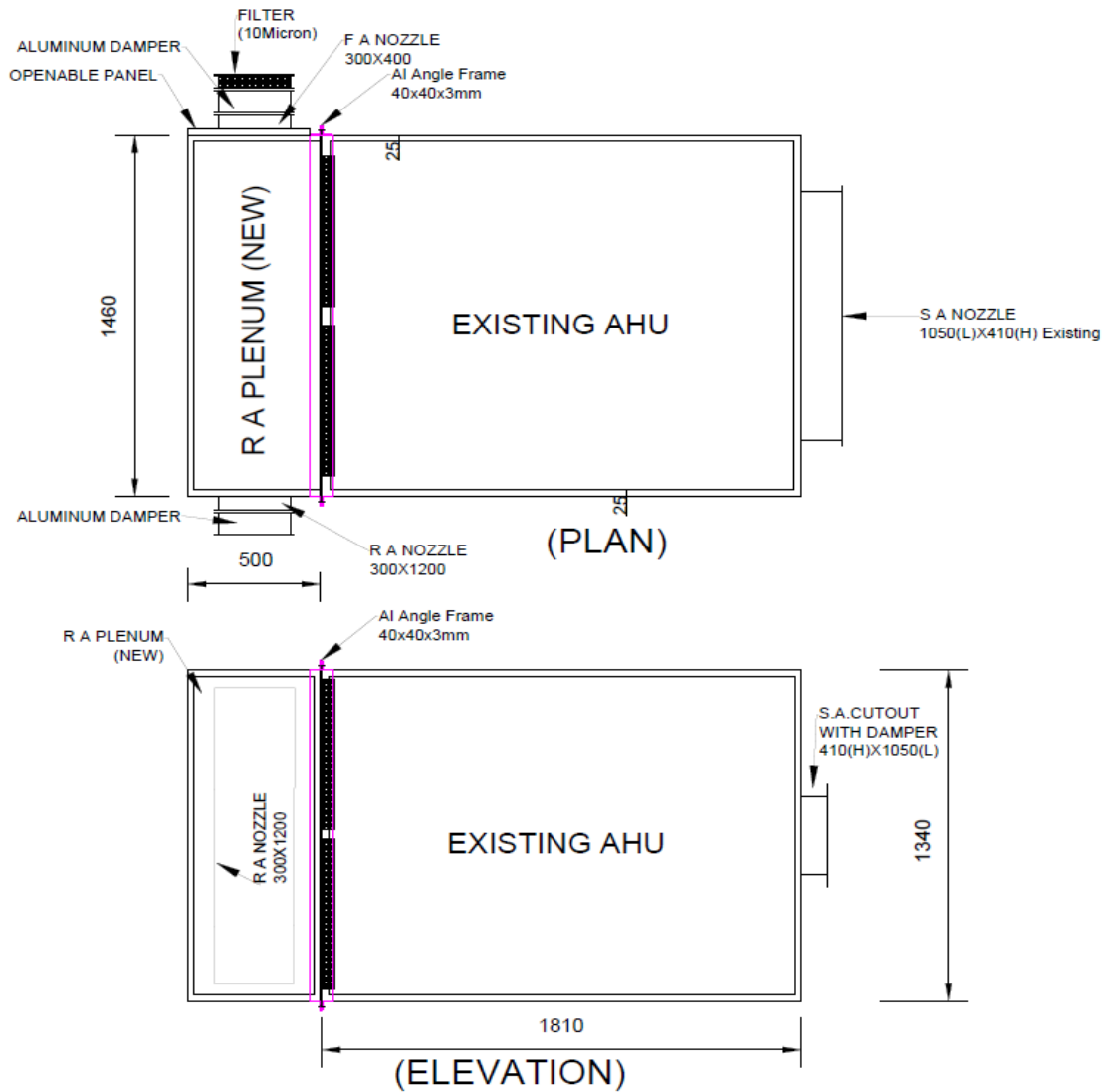
Sr. No.	Room No.	Ventilation System	Room Name/Description	ELECTRICAL							
				LAN POINTS	CCTV	Smoke/Heat Detectors	Speakers (PA System)	6A	16A	3 Phase	Sq Lights
1	01	Split AC	SAMPLE RECEIPT ROOM						3		4
2	02	AHU-1 +EX Unit with HEPA	DONNING								1
3	03	AHU-1 +EX Unit with HEPA	BSL-2 SAMPLE PROCESSING ROOM	2		1	1	1	5		5
4	04	AHU-1 +EX Unit with HEPA	DOFFING								1
5	05	AHU-1+ Inline Supply Fan	PCR AMPLIFICATION	2		1	1	2	9		3
6	06	AHU-1	A/L			1					1
7	07	AHU-1	SEROLOGY	2		1	1	4	5		5
8	08	AHU-1	CLEAN CORRIDOR/PASSAGE		1	1			1		4
9	09	AHU-1	EXTRACTION	2		1		4	7		4
10	10	AHU-1	MASTER MIX PREPARATION ROO	2		1		2	6		3
11	11	AHU-1	TEMP. ADDITION	2		1		2	9		3
12	12	AHU-1	STORES & STERILIZATION ROOM	2		1	1		4	1	5
13	13	Split AC	HOT STORE ROOM (SEROLOGY)	2		1			4		2
14	14	Exhaust Fan	WET SHOWER								
15	15	Exhaust Fan	DRY & CHANGE			1					1
16	16	Exhaust Fan	DIRTY CORRIDOR		1		1		2		8
17	17	Exhaust Fan	DECONTAMINATION ROOM	2		1			2	1	1
18	18	Split AC	OFFICE ROOM	2					9		8

### CIVIL LAYOUT



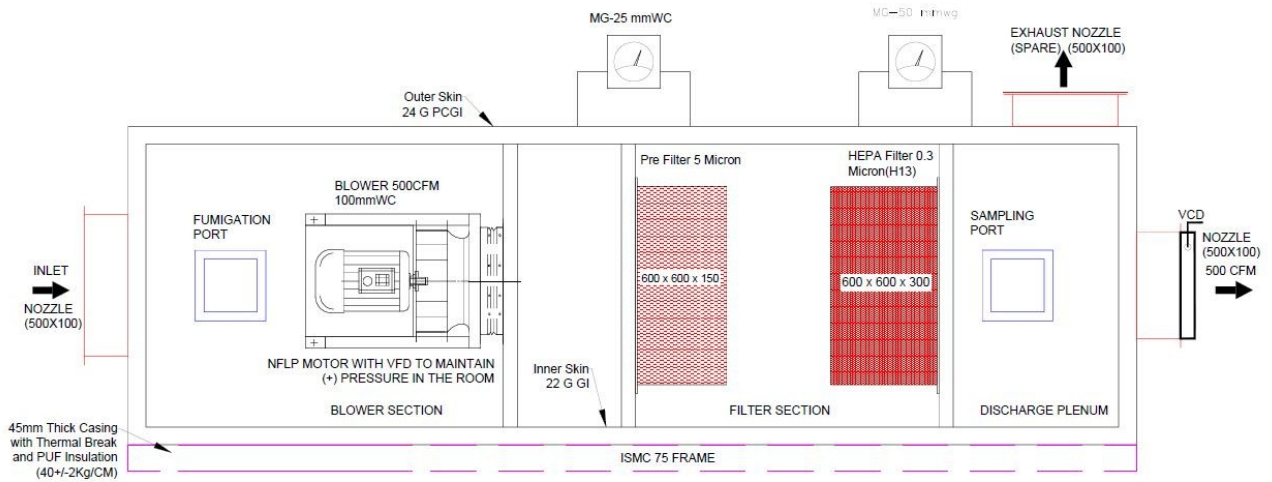
### MAN & MATERIAL MOVEMENT LAYOUT



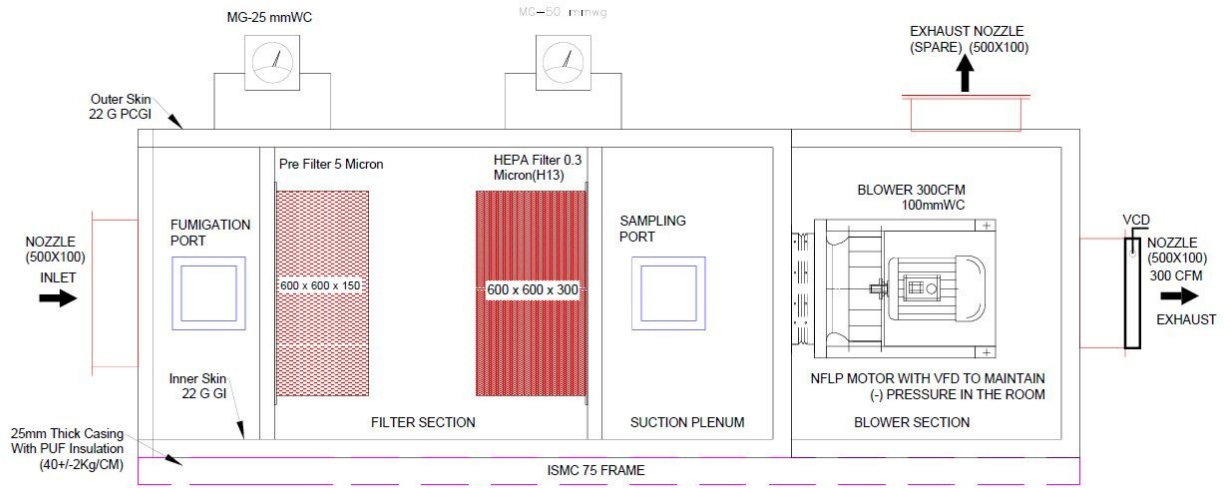


**Modification of AHU GA drawing as per the BOQ No 3.9 for reference.(This GA drawing is only for reference. Actual modification shall be as per BOQ and site requirement. It shall be the responsibility of agency to achieve required parameters as per the Room Data Sheet(Annexure-A) attached above)**

**Horizontal Double Skin Pressurizing unit GA drawing as per the BOQ No 3.10 for reference.(This GA drawing is only for reference)**



**Horizontal Double Skin Exhaust Unit GA drawing as per the BOQ No 3.11 for reference.(This GA drawing is only for reference)**



### List of Preferred Makes

A list of preferred brand names of various materials/products are shown below for usage in execution of work. However, in case it is established that the brands specified below are not available in the market, approved equivalent material of any other specialized companies/firms may also be used, subject to approval of the alternate brand by the Engineer in Charge.

It must be ensured, in general, that all materials to be used in the works shall bear BIS certification mark. In cases where for a particular material/product, BIS certification mark is not available, then the material proposed to be procured can be used subject to the condition that it should conform to CPWD Specifications and relevant BIS codes. In such cases written approval of the Engineer-in-Charge shall be obtained before use of such material in their works.

The list given below does not absolve the executing agency from their responsibility for using quality products. It is only after, they are satisfied about the quality and performance, the products shall be used. To achieve this, proper check on the quality of the product, actually to be used, should be exercised.

Internal Electrical Installations		
1.	PVC insulated copper conductor cable / Telephone cable / Co-axial TV Cable/submersible cable.	Finolex/ Havells/ Anchor/ L & T / Polycab/ V-Guard/ RR Kabel (All wires shall be FRLS with " ISI" marked ).
2.	PVC conduit and accessories	Avonplast / Bajaj Plast/ Precision / Atul/ Balco /Konseal " ISI" marked.
3.	Modular plate type switch, Socket, other modular items, modular Box, inner & outer plate and accessories	MK Blenze/ Legrand Arteor or Myrius/ Crabtree Thames with platinum plate/ Schneider Zencilo "ISI" marked
4.	Cable management / Floor trunking	MK / Legrand/ Schneider/ Siemens
5.	MCB DBs	Siemens: Beta guard/ ABB: Elegance / Legrand: Ekinox / Schneider: Acti9 /L&T
6.	MCBs	Legrand:DX <sup>3</sup> / ABB:S200M/ Schneider: Acti9/ Siemens: Beta guard /L&T
7.	RCCB/RCBO	Legrand:DX <sup>3</sup> / ABB:F200, DS200M, DDA200/ Schneider: Acti 9/ Siemens: Beta guard /L&T
8.	MCCB's	Siemens/ L&T /Schneider/ABB
9.	Panel board mounting Switches	L & T / Siemens / Schneider/ABB
10.	Industrial sockets	Siemens/ Legrand / Schneider / Hager
11.	Timer	L&T / Schneider / Siemens/ Legrand/BCH/ GE
12.	Contactors	L&T / Schneider / Siemens/ABB
13.	LED light fittings	Philips/Crompton/Wipro/Havells
14.	Lamps	GE/ Osram/ Philips/ Bajaj/Wipro
15.	Angle/batten holder	Kinjal/ Emperor/ Anchor, all ISI marked.
16.	CAT6A UTP cables	Belden/ Panduit /AMP/ Commscope/Siemon
17.	Meters ( Digital type )	Conzerv / AE / Krykard/ Schneider/ Mecon/

		L&T/ Cadel/ C&S/ ABB
18.	Telephone/ TV cable/Tag Block	Delton/ Finolex/ L& T/Legrand/Polycab
19.	CT's	AE / BCH/ L&T/ ABB/ siemens/ GE/ MECO/ Rishab
20.	Ceiling rose	Anchor / Lisha / Leader "ISI" marked.
21.	BLDC Ceiling Fan	Atomberg/Orient/ Havells/Usha/ equivalent model of Crompton
22.	Exhaust fan – Heavy duty	Usha / Almonard / Crompton/Havells
23.	Wall fan	CG/Havells/Orient
24.	MS/GI pipe	Zenith/ Jindal / TATA
25.	Phenolic laminated sheet	Hylam/ Green lam / Formica ( minimum 3 mm thick, ISI Marked)
26.	Octagonal Street light poles	Philips / Bajaj / Crompton/ Wipro/Gammon India/ Valmont
27.	XLPE/ PVC insulated PVC sheathed aluminum /copper conductor UG cable.	Universal / Finolex/ CCI/ Gloster/ Grandlay/ Havells / Polycab/KEI, " ISI" marked
28.	HDPE Pipe & accessories	Duraline/ Supreme/Times Technoplast/ Hasti/ National Plastic/Finolex
29.	HDPE DWC Pipe & accessories	Duraline/Supreme/Times Technoplast/ Hasti/ National Plastic/Finolex /Rex/jain Irrigation/ Gemini
30.	Energy Meters for KSEB metering	As per approved list of KSEB Ltd.
31.	Call bell/Buzzer	Anchor/ Leader/Rider/GM
32.	HRC fuses	L&T/ GE/ Siemens/Havells
33.	Indicating Lamps, Selector Switches	Kaycee / BCH / L & T Salzer / Siemens/C&S
34.	Cable glands	Jainson/ Comet/ Dowells/ Cosmos
35.	Cable Lugs	Comet/Cosmos/Dowells/Hax Brass(Copper Alloy India)
36.	Fasteners	Hilti / Fischer / Bosch
37.	Surge protectors	Legrand/ Siemens /Schneider/ ABB/ Obo Bettermann/L&T
38.	Fire Extinguishers	Flameguard / Padmini / Newage / Fire Shield / Swastik / Cease fire / Minimax /Safex / Kanex
39.	MCCB incomer and MCCB outgoing distribution boards	Legrand/Siemens/Schnieder/ABB/L&T/Hager
40.	DB mounting MCCBs	Same make as of MCCB incomer DBs.

41.	Water supply pumpsets	Kirloskar/Texmo/Wilo/ Grundfoss/KSB/ Xylem
42.	NRV/ Butterfly Valve	Intervalve / Audco / Kalpana / Zoloto / Kartar/Sant/Leader
43.	Gate valve	Intervalve / Audco / Kalpana / Zoloto / Kartar/Sant/Leader
44.	CPVC pipe & accessories	Ashirwad/Astral/Supreme/Duraline
45.	Single Phase/ Dry Running Preventor	L&T/ Minilec / H&H
46.	Inverter unit	Hykon/ SuKam Power Systems/Microtek/V-Guard/ Luminous Power Technologies Pvt Ltd.
47.	Sealed maintenance free battery	Amaron/Panasonic/Exide
48.	On Line UPS	Eaton/APC/Socomec/Emerson Vertiv
49.	Telephone/ TV cable/Tag Block	Delton/ Finolex/ L& T/Legrand/Polycab
50.	Server rack/network rack	Valrack/ Netrack/ Rittal
51.	Offline UPS	APC / Emerson / Numeric
52.	Single mode OFC cable	Commscope/ Belden/ Panduit /Siemon
53.	LIU unit	Commscope/ Belden/ Panduit /Siemon
54.	SM SC pigtails	Commscope/ Belden/ Panduit /Siemon
55.	SC duplex adaptors	Commscope/ Belden/ Panduit /Siemon
56.	SM duplex SC-LC patch cords	Commscope/ Belden/ Panduit /Siemon
57.	CAT6A fully loaded patch panel	Belden/ Amp/ CISCO/Commscope
58.	Unmangable Gigabit switch	Cisco SG95-24-AS or equivalent model of EXTREME/HP/ Juniper
59.	CAT6A UTP patch cord	Belden/ Panduit /AMP/ Commscope
60.	CAT6A UTP cable	Belden/ Panduit /AMP/ Commscope/Siemon
61.	CAT6A data socket outlet	Legrand/Panduit/siemon/Commscope/ Belden/AMP
62.	<b>Fire Fighting with Wet riser system</b>	
63.	PUMP	Kirloskar/ Mather& Platt/ Grundfos/ CRI / Crompton Greaves
64.	MOTOR	Kirloskar/ Crompton Greaves/ Siemens/ Grundfos/ NGEF/ABB
65.	GI / MS 'C' class pipes duly ISI marked	TATA/ JINDAL Hissar / ZENITH
66.	LT electrical Panel boards	CPRI Approved Manufacturer

67.	PIPE SUPPORTS	HITECH/ HILTI
68.	Pipe protection pipe coat	IWL/ Taxa/ Mac-polycoat
69.	Enamel Paint	Asian /Nerolac /Dulux /Berger /ICI
70.	Paint Primer	Asian/Jenson Nicholson /Berger /Dulux /ICI
71.	Sluice Valve	Kalpana /Upadhaya / Kartar/ Kirloskar/Sant/ Intervalve
72.	Gun Metal Valve	Zoloto/Audco/Honeywell/Sant/Intervalve
73.	NRV/ Butterfly Valve/Y-Strainer	Intervalve / Audco / Kalpana / Zoloto / Kartar/Sant
74.	Mechanical Seal	BURGMANN/ SEALOL/ equivalent
75.	Anti vibration mounting and flexible connection	DUNLOP/ KANWAL INDUSTRIES/ RESIST- OFLEX
76.	Pressure Switch	Waree / Indfos/ Danfos/Honeywell
77.	Pressure Gauge	H Guru / Fiebig
78.	Water Level Controller	V Guard/ Honeywell/ Minilec
79.	Flow Switch	HD / System Sensor/ Indfos / Danfos
80.	Hose Reel 20 Mm Dia	Jyothi/ Padmini /Polyhose / Minimax
81.	Fire Brigade Inlet /Connection	Winco / New Age / Arihant/ Padmini / Min- imax/ Kalpana/ Kartar
82.	Installation control valve	Winco / New Age / Arihant/ Padmini / Min- imax/ Kalpana/ Kartar
83.	First Aid Hose Reel Drum	New Age / Omex / Vilas/ Minimax / Padmini
84.	RRL hose	Flameguard/Padmini/Newage/Fireshield/ Swasthik/CRC
85.	Hydrant valves	Flameguard/Padmini/Newage/Fireshield/Min- imax/Winco/Arihant
86.	Power Cables	Universal / Finolex/ CCI/ Gloster/ Grandlay/ Havells / Polycab/KEI " ISI" marked
87.	Control Cables	Havells/Finolex/ L&T / Anchor/ Standard / Polycab
88.	Single Phase/ Dry Running Preventor	L&T/ Minilec / H&H
89.	SDFU/SFU With HRC Fuses	L&T / Siemens / Schneider/ABB
90.	MCCBs	Legrand/Siemens / Schneider / L&T
91.	Sprinkler	HD/Flameguard/Padmini/Newage/Fireshield/ Minimax/Winco/Arihant / Life Guard
92.	Portable Fire Extinguishers	Cease Fire/ Minimax/ Safex/ Safeguard/

		Padmini
93.	Air Release Valve	Giacomini/ AIP valve/ Jaison Industries
94.	Weld Rods	Advani /Ador /Victor
95.	Pressure switch	H Guru/Fiebig/Emerald
96.	Fasteners	Hilti/Fischer/Bosch
97.	Welding rod	Advani/Ador/Victor
98.	Ball valve	Zoloto/Castle/Audco
99.	Fire Sealant	Birla /3M/Hilti
100.	<b>Addressable Fire Detection and Alarm System</b>	
101.	Main Fire Alarm Control Panel	Notifier / any equivalent make matching the existing infrastructure in CD Block
102.	Sealed Maintenance free battery	Exide/Panasonic/Amaron
103.	Addressable photo thermal detector	Notifier /Honeywell/Bosch/Siemens/ any equivalent make matching the existing infrastructure in CD Block
104.	Addressable manual call point	Notifier /Honeywell/Bosch/Siemens
105.	Addressable fire control module	Notifier /Honeywell/Bosch/Siemens
106.	Addressable programmable strobe	Notifier /Honeywell/Bosch/Siemens
107.	Addressable duct detector	Notifier /Honeywell/Bosch/Siemens
108.	Response Indicator	System sensor/Agni/Bosch/Siemens
109.	Speaker Cable	Finolex/KEI/Polycab/Havells
110.	Fire Survival cables	Bonton/Rellison/ Paramount /Beldon/ HeluKabel/Lapp/Polycab
111.	Cable glands	Jainson/ Comet/ Dowells/ Cosmos
112.	Cable Lugs	Comet/Cosmos/Dowells/Hax Brass(Copper Alloy India)
113.	<b>HVAC system</b>	
114.	Air Handling units/Exhaust Unit/Pressurization Unit	Citizen/ Zeco /Edgetech/VTS/System air/ Flaktwood
115.	Existing AHU in the Proposed VRDL	Citizen
116.	UVGI for AHUs	Aeropure/AlfaUV/ Philips
117.	G.I/Steel pipes	Jindal /Zenith/Tata
118.	UPVC pipes	Astral/Duraline/Supreme/Finolex
119.	Motorized Butterfly Valve	Belimo /Honeywell/ Johnson Control /Kitz/

		Sauter /Schneider /Siemens/ Danfoss
120.	Butterfly valve	Belimo /Honeywell/ Invensys Johnson Control /Kitz/ Sauter /Schneider /Siemens/ Danfoss/Zoloto/Advance/Kirloskar
121.	Balancing Valve	Danfoss/ Flowcon/ TA Auto Flow / Honeywell /Siemens/Advance valves
122.	3 way modulating valve	Honeywell/Siemens/Danfoss/Tour & Andersson
123.	Ball valve (upto 32 mm)	Danfoss/ RB /Zoloto
124.	Check valve	Advance Valve/ Honeywell Kirloskar/ Zoloto
125.	Pressure Gauge	Emerald/ Fiebig /H Guru/Danfoss
126.	Thermometer	Emerald /H Guru/ Taylor/Danfoss
127.	Auto Air Vent Valve	Rapid/Control/RB
128.	G.I sheet	ESSAR/Jindal/TATA/SAIL/Lloyd
129.	Factory Made Duct	Alpha duct/ Ductofab /Radiant air systems/ Rolastar /Techno Aircon /Zeco/Ecoduct
130.	Grille/diffuser	Air Master /Caryaire /Cosmos/ Dynacraft / Ravistar /Air Product /Mapro /OPELLA/ Tanus /System air
131.	Volume Control Damper/Smoke / Fire Damper	Airmaster / Caryaire/ Conaire George/ Rao Ravistar/ Gryfit/ Ruskin/System Air
132.	Anchor Fastener	Mungo/Fischer/Hilti
133.	Sound Attenuator	Trox/ UNIFLAIR /Caryaire/ George Rao /Ravistar
134.	Fire Wrap/Board/Paint	Birla 3 M /Hilti /Promat/ Flamebar
135.	Closed Cell Elastomeric along with adhesive Cross link polyethylene foam with adhesive	Armacell – Armaflex/ Trocellen/K-Flex/A-Flex Owens Corning/ UP Twiga
136.	Expanded Polystyrene (TF Quality)	Beardsell /Coolite /DEBS Products Styrene Packaging/ Tosiba
137.	Premoulded PUF section for pipe support	Lloyd / Malanpur/PunjStar/Epac
138.	Protective Coating over Closed Cell Elastomeric – Fibreglass Woven Cloth	Armacell/Armachek Paramount UP /Twiga
139.	UV Protective coating	Armacell/Armachek Amicol/ Paramount/ Polybond
140.	Fire Sealant	BTHM Engineering /Birla 3 M/ Hilti /Promat
141.	Dial Thermometer Capillary Type, Safety thermostat for heater	Penn Tadington/ Anergy Controls/Wika

142.	Flow Switch	Rapid Control /Danfoss/HD/ system sensor
143.	Ultrasonic BTU Meter	Schenitech / Honeywell / Kampstrup
144.	HEPA filters	Puromatic/ ARW/ Athelete/ Spectam/ Klenz- zaid
145.	Static/Dynamic pass box	Esco/I-clean/Airomax/ Klenzaid/ MK Preci- sion
146.	Centrifugal blowers/exhaust fans	Kruger/ Nicotra/Maico/ Nadi/Systemair/ Caryaire
147.	Velocity Sensor	Greystone / Sontay/Belimo
148.	PH Sensor / TDS Sensor	Honeywell / Hach / Greisinger
149.	Variable Frequency Drives	Schneider / Honeywell / Siemens/ Danfoss / L&T
150.	Any other item in any sub head	As per approval of the Engineer-in-charge
151.	Split air conditioners	Carrier/ O General/ Toshiba/Mitsubishi/Hitachi/ Daikin
152.	Copper pipes	Nippon/ Mandev/ Rajco/ Mexflow
153.	Stabilizer	V Guard/ Everest/ Microtek
154.	Any other item any sub head	As approved by the Engineer-in-charge

**Note:** If acceptable makes for any item required in a sub head of work is not stipulated, the makes stipulated in other sub heads for the same item may be used.

## **PART-C**

### **MINOR COMPONENT**

**Proforma of Schedule for minor component of the work,  
General/specific conditions, specifications  
applicable to minor component(s) of the work**

**PROFORMA OF SCHEDULES**  
**(Composite Tender- Minor component – Civil)**

**SCHEDULE 'A'**

Schedule of quantities (as per PWD-3): As per schedule attached

**SCHEDULE 'D'**

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

**SCHEDULE 'E'**

Reference to General Conditions of contract: As per major component

Name of work: **Setting up of VRDL Facility at Basement Level 1 of CD block, SCTIMST- BMT Wing, Poojappura, Trivandrum.**

Estimated cost of work : **Rs. 70,97,840/- (E&M – Rs. 40,22,746/- + Civil – Rs.30,75,094/-)**

(i) Earnest Money : As per major component

(ii) Performance Guarantee : 5% of tendered value

(iii) Security Deposit : 2.5% of tendered value

**SCHEDULE 'F'**

**GENERAL RULES & DIRECTIONS:**

Officer inviting tender : As per major component

**Definitions:**

2(vi) Engineer-in-Charge : **Executive Engineer-Trivandrum CPWD, Trivandrum**

2(viii) Accepting Authority : As per major component

2(x) Percentage on cost of materials and labour to cover all overheads and profits: **15%**

2(x)(b) Standard Schedule of Rates: **Delhi Schedule of Rates 2023**

2(xi) Department : **Central Public Works Department**

9(ii) Standard CPWD Contract Form: As per major component

**Clause 1**

- (i) Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance : As per major component
- (ii) Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above : As per major component

**Clause 2**

Authority for fixing compensation under clause 2 : As per major component

**Clause 2A**

: As per major component

**Clause 5**

Number of days from the date of issue of letter of acceptance for reckoning date of start : As per major component

Mile stone(s) as per table given below.

Sl. No.	Description of Milestone (Physical)	Time allowed in days/ months (from date of start)	Amount to be withheld in case of non-achievement of milestone
As per major component			

Time allowed for execution of work : As per major component

**Authority to decide:**

- i. Authority to convey the decision of shifting of milestone and extension of time : **Engineer-in-charge of Major Component**
- ii. Authority to decide rescheduling of milestone and extension of time : As per major component
- iii. Shifting of date of start in case of delay in handing over of site : As per major component

## PROFORMA OF SCHEDULES Clause 5 Schedule of handing over of site.

Part	Portion of site	Description	Time Period for handing over/reckoned from date of issue of letter of intent.
As per major component			

**Clause 6**

Computerised Measure Book (CMB)/Electronic Measurement Book (EMB)

Mode of measurement : ERP Electronic Measurement Book (e-MB)  
(As per DG/SOP 2022/16/ dated 13.09.2023)

**Clause 7**

Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment

: **Rs. 5.12 Lakhs only**  
**(Rupees Five lakhs Twelve Thousand only)**

**Clause 7A**

**Whether Clause 7A shall be applicable**

: As per major component

Whether Clause 7B shall be applicable

: Yes ( As per DG/SOP-2022/02 dated. 30.08.2022) (Affidavit as per annexure-III to be furnished for effecting 3<sup>rd</sup> party payments)

**Clause 8A**

Authority to decide compensation on account if Contractor fails to submit completion plans

: As per major component

List of testing equipment to be provided by the contractor at site lab.

: As per major component

**Clause 10B (ii)**

Whether Clause 10 B (ii) shall be applicable : As per major component

**Clause 10C** : **Not Applicable****Clause 10CC** : Not Applicable

<b>S No.</b>	<b>Relevant component of Material / Labour for price escalation</b>	<b>Percentage of total value of work</b>
<b>1</b>	<b>Cement component</b>	<b>Nil</b>
<b>2</b>	<b>Labour component</b>	<b>Nil</b>
<b>3</b>	<b>Civil Component of other Construction Materials</b>	<b>Nil</b>
<b>4</b>	<b>E &amp; M ( Electrical and Mechanical ) Component of Construction Materials</b>	<b>Nil</b>
<b>5</b>	<b>POL ( Diesel ) Component</b>	<b>Nil</b>
<b>6</b>	<b>Reinforcement steel bars / TMT bars /structural steels ( including strands and cables ) component</b>	<b>Nil</b>
<b>7</b>	<b>Bitumen component</b>	<b>Nil</b>
	<b>Total</b>	

**Clause 11**Specifications to be followed  
for execution of work} : **C.P.W.D Specification 2019 Vol. I & II.  
with upto date correction Slip.****Clause 12****Type of work** : **Construction work****12.2 (c)**Deviation Limit beyond which clauses  
12.2 (c) shall apply for building work : 100%

## 12.4

(i) Deviation Limit beyond which clauses  
12.2 ( c) shall apply for foundation work : 100%  
(except items mentioned in earth work  
Subhead in DSR and related items(ii) Deviation Limit for items mentioned in  
earth work subhead of DSR and related : 100%  
items

**Clause 16**

Competent Authority for }  
deciding reduced rates } As per major component

**Clause 18**

**List of mandatory machinery, tools & plants  
to be deployed by the contractor at site:-**

**Not Applicable****Clause 19 C: Engineer-in - charge to decide penalty for each default****Clause 19 D: Engineer-in - charge to decide penalty for each default****Clause 19 G: Engineer-in - charge to decide penalty for each default****Clause 19 K: Engineer-in - charge to decide penalty for each default****Clause 25**

- (i) Conciliator : Additional Director General, Kochi, CPWD, Chennai -  
As per SOP No. 5/31, para 2 Sl.No.(i)
- (ii) Arbitrator : Appointing Authority : Chief Engineer, CPWD, Trivandrum
- (iii) Place of Arbitration : Trivandrum/Decided by Arbitrator in consultation with both the Parties.

**Clause 32****Requirement of Technical Representative(s) and recovery Rate**

Sl. No	Minimum qualification of Technical Representative		Minimum experience in Years	Designation (Principal Technical / Technical representative)	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 32(i)	
	Qualification	Number (of major)			Figures	Words
1	Graduate Engineer or Diploma Engineer	1 (One) No.	2 or 5 respectively	Project Manager cum planning/quantity/site/billing Engineer	Rs.15,000/- Per month per person	Rupees Fifteen thousand only per month per person

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

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

### Clause 38

(i)	(a)	Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates	<b>Delhi Schedule of Rates 2023</b>
(ii)		Variations permissible on theoretical	
	(a)	Cement	
		(i) For works with estimated cost put to tender not more than Rs. 25	<b>± (plus / minus) 3 % (Three percent)</b>
		(ii) For works with estimated cost put to tender more than Rs. 25 lakh	<b>± (plus / minus) 2 % (Two percent)</b>
	(b)	Bitumen for all works	<b>+ (plus ) 2.5% (Two point five percent) only and nil on – (minus) side.</b>
	(c)	Steel Reinforcement and structural steel sections for each diameter, section and category	<b>± (plus / minus) 2% (Two percent) only.</b>
	(d)	All other materials.	<b>Nil</b>

**Form 'F'**

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

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

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

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

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

Signature of  
notary with seal

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

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

**AFFIDAVIT FOR EFFECTING THIRD PARTY PAYMENTS**

I /We authorize the Executive Engineer, ..... Division, CPWD to pay directly on my/our behalf to ..... (Name of the third party) an amount of Rs..... (Rupees ..... in words) for the work done or supplies made by ..... (Name of the third party). I /we shall be responsible for the quality and quantity of the same under the provisions of the agreement number.....

**Signature of the Contractor**

**(To be furnished by the contractor in non-judicial stamp paper worth Rs. 100/-)**

**[ Note:**

1. The total payment to third party (or parties) shall not exceed 10% of the agreement amount for the work.

**SPECIFICATION FOR LABS–MINOR COMPONENT**

The following specifications are proposed for setup of facilities.

S.No	Proposed Scope of work & specifications
1.	<p><b>Flooring: Design and SITC of epoxy flooring over existing RCC slab after dismantling the finishes as follows:</b></p> <p><b>Epoxy flooring:</b> Design and SITC of epoxy flooring over existing Tiled surface after CC mortar (1:4) filling in hollow portion below tiles, grinding, applying special epoxy for proper bond with the finishes as follows:</p> <p>Epoxy flooring: The jointless Epoxy flooring consists of Epoxy resin based jointless flooring over concrete surface including preparing the surface as required, application of epoxy primer of 100 microns thickness, 2-3 mm or more in thickness epoxy screed and self leveling 1 mm minimum epoxy topping in required approved shades. The entire job is to be undertaken by the manufacturer's trained and skilled technicians to lay the Epoxy based floor.</p> <p>Surface preparation: Applicators for the works should check out the moisture content in the existing CC/repared tiled surface after hollow cavity fillings and if the percentage of moisture content is high the same to be removed by using a hot compressed air machine and the surface irregularities shall be removed by using floor scarifier. The tiled floors shall be roughened using hand grinders to provide a mechanical key for the epoxy screed to bond well the substrate. Presence of dust, laitence etc. should be completely cleaned before commencing the application. Moisture testing should be done to ensure moisture limit not exceeding 5%.</p> <p>Epoxy Primer:On the prepared floor surface epoxy primer with high penetrating properties shall be applied, as per manufacturer's recommendations.</p> <p>Self leveling Epoxy topping:The self leveling top coat mixture shall be spread evenly by means of rollers and serrated trowels. The floor should be rolled by a spike roller to remove trapped air to uniform level and smoothness.</p> <p><b>Epoxy Coving:</b> Epoxy primer shall be applied at the junctions of the wall corner. Epoxy coving of size 50 mm on either side shall be applied to the junctions between wall &amp; floor. It is to be made with solventless epoxy screed/resin incorporating very high abrasion resistant aggregates. Screed mortar shall be applied by trowel. The material should be compacted and finished with a round trowel to a smooth concave finish as per manufacturer's specifications. Sealing of screed surface shall be made with sealer coat to ensure that a smooth finish is obtained in desired colour matching that of the floor finish as per manufacturer's specifications.</p> <p>Performance properties shall meet or exceed the following: Finish- Gloss/ Semi Gloss (as approved) Compressive strength (ASTM C 579)- &gt; 60 Mpa Tensile strength (ASTM C 307)- &gt; 30 Mpa Hardness ( ASTM D 2240) 80 Taber Abrasion Loss/1000 cycles (ASTM D 4060) -45 mg Suggested Areas</p>

	<p>proposed to be covered:</p> <p>1) Donning, Sample Processing Room, Doffing</p> <p>2) PCR Amplification Room. Rest of the Area- Present Flooring is to be left as it is.</p>
2.	<p>The panels will be prefabricated with non-particle shredding powder coating finish. The prefabricated wall and ceiling panels shall provide impervious and monolithic construction and surface finish. .</p> <p>The modular wall panels 50mm thick shall be constructed in minimum 0.5 mm (24G) thick GSS sheet on both sides, in-filled with PUF insulation (density approx. 40 kg/m<sup>3</sup>), finished with powder coating, oven lacquered smooth to 60 to 80 micron thickness. All the joints between panels, cut outs and openings shall be sealed with silicon sealant.</p> <p>The Calcium Silicate Ceiling shall be adequately supported with suspension and hanger system. Proper access to be provided to carry out work above the False Ceiling. Wherever necessary, Trap doors to be provided.</p> <p>The conduits for providing wires and cables for light, power, data, voice and other services shall be factory inserted in the wall panels.</p> <p>Areas to be covered:</p> <p>All rooms in VRDL except Donning, Doffing, Sample Processing and PCR amplification Rooms.</p> <p>Clean Room Partitions (0.8mm skin) Al Channel base:</p> <p>The panels will be prefabricated with non-particle shredding powder coating finish. The prefabricated wall and ceiling panels shall provide impervious and monolithic construction and surface finish The modular wall panels 50mm thick shall be constructed in minimum 0.8 mm (24 G) thick GSS sheet on both sides, and ceiling panels 50 mm thick shall be constructed in minimum 0.5 mm (24 G) thick GSS sheet on both sides, in-filled with PUF insulation (density approx. 40 kg/m<sup>3</sup>), finished with powder coating, oven lacquered smooth to 60 to 80 micron thickness. All the joints between panels, cut outs and openings shall be sealed with silicon sealant. The overall thickness of the wall and ceiling panels shall be as indicated in the layout plan drawing, with minimal tolerance. The wall and ceiling panels shall be supported on heavy duty aluminium profile. The Ceiling should be supported by anchoring using minimum 42mm (R-42) aluminium coving on the wall and ceiling corners. The color of the coving shall be same as of the wall/ceiling colour, corners shall be rounded at turn from X-Y direction, milled solid aluminium spheres shall be provided in same color at the 3-D (wall/ceiling/wall junction) and 2-D (wall/ceiling junction). The ceiling shall be adequately supported with suspension and hanger system. Proper access to be provided to carry out work above the False Ceiling. Wherever necessary, Trap doors to be provided. The conduits for providing wires and cables for light, power, data, voice and other services shall be factory inserted in the wall panels.</p> <p>Areas to be covered:</p> <p>Donning, Doffing, Sample Processing and PCR amplification Rooms</p>
3.	<p><b>Doors:</b></p> <p>Doors are designed to fit flush into the wall panel system on both sides and are</p>

supplied in different dimensions. Doors are fabricated from galvanized iron sheets duly powder coated. Shutter has sheet thickness of 0.8mm and the frame of 1.2mm. Standard 50 mm panel has frame width of 45 mm and shutter width of 38mm. The frame should be with suitable infill and 38mm thick flush shutters with double skin using 0.6 mm thick GSS, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper or PUF. Access control panel mounting arrangement on the door and frame as required shall be made by the agency. The following accessories are a part of the door:

- a) Shutter Thickness: 38 mm thick
- b) SS 304 , Ball Bearing hinges, 100mmx 3mm ---3 Nos
- c) SS304 'D' type of handles on pull side
- d) Stainless steel push plates on push side.---JSW
- e) Standard arm door closure
- f) Double Glass View panel (300mm x 450mm) along with self-adhesive tape and silicon sealant---Saint Gobain
- g) Both side key operated locking arrangement
- h) Filler material: PUF
- i) SS 304 Foot guard size 1mm etc. and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. Access control panel mounting arrangement on the door and frame as required shall be made by the agency.

Location proposed: Donning, Doffing, Sample Processing and PCR Amplification Rooms

AI/CR Doors of Size 750MMX2100MM (1.575 SqM)

Pressed steel door frame Profile B section 50 X45 mm with 1.2 mm galvano steel sheet with suitable infill and 38mm thick flush shutters, with double skin using 0.6 mm thick galvano steel sheet, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper/PUF insulation and fitted with necessary SS fittings and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. The size of glass view panels on doors shall be: 300x450 mm with a double/single glazing thickness of 38mm with radius finish angles. Suggested areas/ Location proposed: Airlock , Dry and Change Room.

AI/CR Doors of Size 1000MMX2100MM(2.1 SqM)

Doors are designed to fit flush into the wall panel system on both sides and are supplied in different dimensions. Doors are fabricated from galvanized iron sheets duly powder coated. Shutter has sheet thickness of minimum 0.5 mm (24 G) and the frame of 1.2mm. Standard 50 mm panel has frame width of 50 mm and shutter width of 38mm. The frame should be with suitable infill and 38mm thick flush shutters with double skin using 0.8 mm thick GSS, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper or PUF. The following accessories are a part of the

- a) Shutter Thickness: 38 mm thick
- b) Heavy duty aluminium anodized hinges, 100mmx 3mm ---3 Nos

	<p>c) Anodized Aluminum 'D' type of handles on pull side  d) Stainless steel push plates on push side.---JSW  e) Standard arm door closure  f) View panel (300mm x 450mm) along with self-adhesive tape and silicon sealant----Saint Gobain  g) Both side key operated locking arrangement  h) Filler material: PUf i) Foot guard size 1mm etc. and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. Access control panel mounting arrangement on the door and frame as required shall be made by the agency.  Location proposed: All rooms in VRDL except Donning, Doffing, Sample Processing and PCR Amplification Rooms.  Aluminium coving:  R50/42 mm size Aluminium powder coated coving of colour matching to ceiling &amp; partitions, at the junction of ceiling &amp; partition, partition &amp; partition rate including press fit arrangement with &amp; over aluminium base member, staging, ladder &amp; scaffolding, etc. all inclusive.</p>
4.	<p><b>Glass view panels:</b>  The size of glass view panels in partition wall shall be: 900x600 mm with a double/single glazing thickness of 50mm with radius finish angles. It shall be of 5mm thick tempered glass. Rectangle double / single glazed view panels with jambs using 5 mm toughened glass with Curved black bordered, double side adhesive 3M tape and the edges sealed with silicon sealant, Frame with GI powder coated 1mm thick sheets inside with curved corners (Panel area will not be deducted) other features: Natural silver colour structural raceway containing anti- condensation salts Satin finish to block vision whilst ensuring the diffusion of light.</p>
5.	<p><b>Wet shower:</b>  Design &amp; SITC of the Modular Wet Air shower system for VRDL shall be provided. It shall comprise of prefabricated cubicles and doors constructed in PVC/FRP of suitable size (1200mmx1500mm x2200mm) as per approved design layout. The shower cubicle shall be provided with exhaust fan, return air diffusers and light fixture. The exhaust duct should be connected to Exhaust Unit (HEPA Unit) with Non-return Damper. The shower cubicle door shall be in PVC/FRP of approximately 750 mm x 2100 mm size. The shower floor shall be anti skid with proper slope and drain point to allow connection with the effluent drain line by making opening or puncturing the existing RCC floor slab. The shower doors shall have latch and lock fittings.  The shower system shall be complete with a separate exhaust fan, air passage/GI duct, nozzles, doors, illumination system, LCD display with status etc. complete as required.</p>

### **SPECIAL CONDITIONS**

1. **The civil component of this work shall be executed through eligible CPWD contractor only.**
2. The contractor shall execute the whole work in the most substantial and workman like manner in strict accordance with the specifications, approved design, drawings, particular specifications, special conditions, additional conditions and instructions of the Engineer-in-Charge.
3. The contractor shall at his own expense and risk arrange land for accommodation of labour, setting up of office, storage of materials, erection of temporary workshops, and construction of approach roads to the site of work, including land required for carrying out of all jobs connected with the completion of the work. However, the departmental land to the extent available may be allowed to be used for these purposes free of rent without accepting any responsibility for the delay, if any, on this account. The contractor shall have to abide by the regulations of the authorities concerned and the directions of the Engineer-in-Charge for use of land available at the site of work. If it becomes necessary during construction to remove or shift the stored materials, shed, workshop, access roads, etc, to facilitate execution of the work included in this agreement or any other work by any other agency, the contractor shall remove or shift these facilities as directed by the Engineer-in-Charge and no claim whatsoever shall be entertained on this account.
4. The contractor shall carry out true and proper setting out of the work in co-ordination with the Engineer-in-Charge or his authorized representatives and shall be responsible for the correctness of the positions, levels, dimensions and alignments of all parts of the structure. If at any time during the progress of the work any error appears or arises in the position, level, dimensions or alignment of any part of the work, the contractor on being asked to do so by the Engineer-in-Charge, shall rectify such error to the entire satisfaction of Engineer-in-charge. The checking by the Engineer-in-Charge or his authorized representatives shall not relieve the contractor of his responsibility for the correctness of any setting out of any line or level. The contractor shall carefully protect and preserve all bench marks, pegs and pillars provided for setting out of works.
5. All setting out activities concerning establishment of bench marks, instrument stations, centre line pillars, etc. including all material, tools, plants, equipments and all other instruments, labour, etc. required for performing all the functions necessary and ancillary thereto at the commencement of the work, during the progress of the work and till the completion of the work shall be carried out by the contractor and nothing extra shall be paid on this account.
6. **Compliance with Local Bye-Laws/Control of state Pollutions as per Pollution Control Board –Rules and regulations.**

The work shall be carried out in the manner complying in all respects with the requirement of relevant bye-laws of the local bodies under the jurisdiction of which the work is to be executed/**Pollution Control Board issued till the completion of work** or as directed by the Engineer-in-charge and nothing extra shall be paid on this

account. The Contractor shall give due notices to the Municipality, Gram Panchayat, Police and /or other authorities as may be required under the law/rules under force and obtain all requisite licenses/permissions to carry out the work and pay all charges which may be leviable on account of his execution of the work under the agreement. Nothing extra shall be payable in this account. In the event of any restrictions being imposed by security and traffic agencies or any other authority having jurisdiction in the area on the working or movement of labour/material, the contractor shall strictly follow such restrictions and nothing extra shall be payable to the contractor on this account. The loss of time on this account, if any, shall have to be made up by generating additional resources etc

7. For completing the work in time, the contractor may have to work in two or more shifts and no claims whatsoever shall be entertained on this account, notwithstanding the fact that the contractor will have to pay to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and/or extra amount for any other reasons.
8. The contractor shall make his own arrangements for water and for obtaining electric connections if required and make necessary payments directly to the State / Central Govt. departments concerned. Contractor shall get the water tested from laboratory approved by the Engineer-in-charge at regular interval as per the CPWD Specifications 2009. All expenses towards collection of samples, packing, transportation etc. shall be borne by the contractor.
9. The drawings for the work issued by the Engineer-in-Charge during execution of work shall at all times be properly correlated before executing any work and no claim whatsoever shall be entertained for discrepancies in the drawings.
10. The works to be governed by this contract shall cover delivery and transportation up to destination, safe custody at site, insurance, erection, testing and commissioning of the entire works.  
The works to be undertaken by the contractor shall inter-alia include the following:
  - (i) Preparation of detailed SHOP drawings and AS BUILT drawings wherever applicable.
  - (ii) Obtaining of Statutory permissions wherever applicable and required.
  - (iii) Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
  - (iv) Warranty obligation for the equipments and / or fittings/fixtures supplied by the contractor. Contractor shall provide all the shop drawings or layout drawings for all the co-ordinated services before starting any work or placing any order of any of the services etc. These shop drawings /layout drawings shall be got approved from Engineer-in-charge before implementation and this shall be binding on the

contractor. The contractor shall submit material submittals along with material sample for approval of Engineer-in-charge prior to delivery of material at site.

11. No payment shall be made to the contractor for damage caused by rain, whatsoever during the execution of works and any damage to the work on this account shall have to be made good by the contractor at his own cost.
12. Unless otherwise provided in the Schedule of quantities, the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building and nothing extra shall be payable to him on this account. Payment for centering, shuttering, however, if required to be done for floor heights greater than 3.5m shall be admissible at rates arrived in accordance with clause 12 of the agreement if not already specified.
13. No claim whatsoever for idle labour, additional establishments, costs of hire and labour charges for tools and plants, scaffolding etc, would be entertained under any circumstances.
14. The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night. In case of any accident of labours/ contractual staffs the entire responsibility will rest on the part of the contractor and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor.
15. Contractor shall within two weeks of award of work, submit to the Engineer-in-Charge for his approval, list of measures for maintaining safety of manpower deployed for construction and avoidance of accidents.
16. For the safety of all labour directly or indirectly employed in the work the contractors shall, in addition to the provision of CPWD safety code and directions of the Engineer-in-Charge, make all arrangements to provide and nothing extra shall be paid on this account.
  - i) IS 3696 Part I Safety Code for scaffolds and ladders.
  - ii) IS 3696 Part II Safety Code for scaffolds and ladders Part II ladders.
  - iii) IS 764 Safety Code for excavation work.
  - iv) IS 4138 Safety Code for working in compressed air.
  - v) IS 7293 Safety Code for working with construction machinery.
  - vi) IS 7969 Safety Code for storage and handling of building materials.
  - vii) IS 4130 Safety code for demolition of buildings.
17. **Scaffolding** : Wherever required for the execution of work, all the scaffolding shall be provided and suitably fixed, by the Contractor. **It shall be provided strictly with steel**

**double scaffolding system, suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection.** It shall be designed to take all incidental loads. It should cater to the safety features for workmen. It shall be ensured that no damage is caused to any structure due to the scaffolding.

18. Royalty if any payable and all other incidental expenditure shall have to be paid by the contractor on all the boulders, metal shingle, earth, sand bajri, etc. collected by him for the execution of the work, direct to the concerned Revenue Authority of the State or Central Govt. and the amount paid shall not be reimbursed in any form whatsoever.
19. Other agencies working at site will also simultaneously execute the works entrusted to them and to facilitate their working, the contractor shall make necessary provisions e.g. holes, openings, etc. for laying/burying pipes, cables, conduits, clamps, hooks, etc. as may be required from time to time. The contractor shall extend full co-operation to other agencies for smooth execution of works by other agencies. The final finishing of the work is to be executed in co-ordination with other agencies as directed by the Engineer-in-Charge.
20. On account of security considerations, there could be some restrictions on the working hours, movement of vehicles for transportation of materials and location of labour camp. The contractor shall be bound to follow all such restrictions and adjust the programme for execution of work accordingly. Nothing extra shall be paid on this account.
21. Stacking of materials and excavated earth shall be done as per the directions of the Engineer-in-Charge. Double handling of materials or excavated earth if required shall have to be done by the contractor at his own cost.
22. In case of construction joints, the cost of applying cement slurry over the concrete surface before fresh concrete is laid as per para 5.4.4.4. of CPWD Specification 2009 is included in the relevant items of the schedule of quantities and nothing extra shall be paid on this account.
23. Unless otherwise specified in the Schedule of Quantities the rates for all items of work shall be considered as inclusive of working in or under water and/or liquid mud and/or foul conditions including pumping or bailing out liquid mud or water accumulated in excavations during the progress of the work from springs, tidal or river seepage, rain, broken water mains or drains and seepage from subsoil aquifer.
24. Water supply pipe lines shall not be embedded in floor. PVC pipe casing of next bigger diameter shall be provided in full width of wall (including finishing) when GI pipe line crosses the wall, to protect it from corrosion. The gap between the PVC and GI pipes shall be sealed at the ends with poly-sulphide or other suitable sealant. Nothing extra shall be paid on this account.

25. The holes of required shape and size shall be drilled in the single piece stone slabs of treads for fixing balustrades wherever necessary. Pattern of stone slabs for landings of staircase shall be decided by the Engineer-in-Charge. Nothing extra is payable on this account.
26. Stone slabs used for treads of staircase shall be provided with three machine cut grooves of size 3mm wide x 2mm deep, 25 mm apart near the nosing of the steps. Nothing extra is payable on this account.
27. To protect the flooring and steps of staircases during construction and until the completion of the work, finished/semi-finished surface of flooring shall be covered with a thick layer of plaster of Paris and this layer shall be maintained in good condition till its removal. The removal of the layer of plaster of Paris and cleaning the surface shall be done as and when decided by the Engineer-in-Charge. After the removal of plaster of Paris and cleaning of the surface, damage, if any, shall have to be made good by the contractor. No extra payment shall be made for protection with plaster of Paris, removal of plaster of Paris, cleaning and making good the damages.
28. The contractor shall give a performance test of the entire installation (s) as per standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.
29. The steel work in railing includes fish tailing of the section to be embedded in concrete and fixing the same.
30. In RCC work, to avoid displacement of reinforcement bars in any direction and to ensure proper cover, only factory made round / square type cover blocks should be used.
31. Nothing extra will be paid for centering, shuttering, reinforcement and RCC work for sloped slabs and beams, unless otherwise specified in the item.
32. Steel bars shall be stored about 30 to 45 cm above ground and where the storage is for more than 3 months, a coat of cement wash shall be given to the bars. Nothing extra shall be paid towards cost of application of cement wash.
33. The contractor shall give **five years guarantee** in the prescribed proforma for water proofing items specified in the schedule of quantities. In addition to this 10% of the quoted cost of items shall be retained as fixed deposit or in the form of bank guarantee, which shall be released after the expiry of **five years** from the date of completion if no defects are found in water proofing or the defects are made good. This amount shall be adjusted against the expenses incurred on making good the defects if the contractor commits breach of guarantee.
34. In case of any difference in the Hindi version and English version in any of the condition of contract, English version shall prevail.
35. To facilitate gas connection, holes (if required by the Engineer-in-Charge) including suitable rubber gasket shall be provided in the kitchen platform of RCC slab/granite

/marble/ other stone slab etc. Nothing extra will be paid on the account and rates quoted for relevant items are inclusive of making such provision.

36. Concrete mixers to be used on the work shall have arrangement for weighing water and controlling water cement ratio.
37. Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been in built in the items and nothing extra shall be payable no extra cement considered in consumption on this account.
38. If the actual weight of reinforcement and structural steel to be used in the work differs from standard weight given in table 5.4 of CPWD Specification, the following procedure shall be followed for arriving at the quantity for payment.
- (a) If the actual weight is more than standard weight only standard weight shall be considered for payment.
  - (b) If the actual weight is less than standard weight but within the permissible variation, only actual weight shall be considered for payment.
39. The contractor shall arrange to keep the premises neat and clean. The rubbish/malba and unserviceable materials shall be removed on day to day basis.
40. Time and Programme Chart.  
The contractor shall give scientifically analyzed detailed programme chart for all the activities of the work within 7 days of award of work. The programme chart shall be prepared covering the physical milestones as envisaged in the tender documents. Nothing extra shall be paid for preparation/ modification of programme chart, CPM and PERT chart. The contractor shall submit the time and programme and project report using the mutually agreed software or in other format decided by the Engineer-in-charge.
- (i) While preparing the above detailed programme chart, effort shall be made to take all possible items of work simultaneously.
  - (ii) Separate programme chart should be prepared exclusively for procurement of materials. The detailed bar chart should distinctly bifurcate the items of work and of materials required for the execution of that item. Both should not be clubbed together. For example, for internal plumbing work the bar chart should show the procurement of pipe and other fittings with start and finish dates and items of work with start and finish dates separately. Both items should be interlinked preceding and succeeding activity. The programme chart not indicating procurement items separately will not be accepted.
  - (iii) Similarly programme chart should be prepared separately for arrangement of labour.

- (iv) The programme chart so finalized and accepted by department should be got reviewed by the department, once in a month regularly. Modified / revised programme chart shall be prepared in the event of not adhering to the targets mentioned in the earlier programme chart. The contractor shall augment additional resources, materials and man power for achieving the targets, so submitted in the revised Programme chart.
- (v) He shall furnish the details both in hard copies as well as soft copies. Nothing extra shall be paid on this account.
- (vi) In case the monthly progress report for the work done during previous month is not furnished on or before 5<sup>th</sup> day of each month a recovery @ Rs. 2500/- per day basis will be imposed till its receipt by Engineer-in-Charge.

41.

### QUALITY ASSURANCE

- (i) The proposed work is project work and quality of work is of paramount importance. Contractor shall have to engage well-experienced skilled labour and deploy modern T&Ps and other equipment in the execution of the work.

Many items like flooring work, factory made door- window shutters, proper slope maintaining in toilet units, sanitary- water supply installation, water proofing treatment, will specially require engagement of skilled workers having experience particularly in execution of such items.

- (ii) The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material / work beyond the set out tolerance limit shall be summarily rejected by the Engineer-in-charge and the contractor shall be bound to replace / remove such sub-standard / defective work immediately. If any material, even though approved by Engineer-In-Charge is found defective or not conforming to specifications shall be replaced / removed by the contractor at his own risk & cost
- (iii) In addition to the supervision of work by CPWD engineers, Special attention should be paid towards quality of materials, workmanship of execution of required standard and finish, lines and levels internal and external plastering, finish of exposed **smooth surface of RCC members by providing fresh shuttering plates, rubberized linings to all the shuttering joints**, accurate joinery work in wooden doors and windows, accurate joints in stone/ tiling / cladding work, non-hollowness in floor and dado tiles work, protection of scratches over flooring by providing layer of plaster of Paris, water tight pipe linings, proper compaction of joints in brick masonry, proper compaction of filled up earth etc. as per specification to achieve prescribed standards, Quality assurance for the project shall be of paramount importance.
- (iv) All the materials to be used in the work, to make the finished work complete in all respects, shall comply with the requirements of the specifications and shall pass all the tests required as per specifications as applicable or such specifications / standards as directed by the Engineer-in- Charge. However, keeping the Quality Assurance in mind, the Contractor shall submit, on request from the Engineer-in- Charge, his own Quality Assurance procedures for basic materials and such items, to be followed during the

execution of the work, for approval of the Engineer-in-Charge.

- (v) All materials and fittings brought by the contractor to the site for use shall conform to the specification and the samples approved by the Engineer-in-charge. The contractor should get the samples of all the materials got approved from the Engineer in charge before bringing the bulk quantity, which shall be preserved at site of execution till the completion of the work. If a particular brand of material is specified in the item of work in Schedule of Quantity, the same shall be used after getting the same approved from Engineer-In-Charge. Wherever brand / quality of material is not specified in the item of work, the contractor shall submit the samples as per approved list of brand names given in the tender document / particular specifications for approval of Engineer-In-Charge. For all other items, materials and fittings of ISI Marked shall be used with the approval of Engineer-In-Charge. Wherever ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant specifications or IS codes and use the same only after getting the approval of Engineer-In-Charge.
- (vi) The Contractor shall procure and provide all the materials from the manufacturers / suppliers approved by Engineer-in-charge, as per the item description and particular specifications for the work. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Also, the material shall be procured only after written approval of the Engineer-in-Charge.
- (vii) All materials whether obtained from Govt. stores or otherwise shall be got checked by the Engineer-in-Charge or his authorized supervisory staff on receipt of the same at site before use.
- (viii) To avoid delay, contractor should submit all samples well in advance so as to give timely orders for procurement.
- (ix) The contractor has to establish field laboratory at site including all necessary equipment for field tests as given in Annexure – I
- (x) All the relevant and applicable standards and specifications shall be made available by the contractor at his cost in the field laboratory. The contractor shall designate one of his technical representatives possessing required qualification and experience specified in the Schedule F as Quality Assurance Engineer, who shall be responsible for carrying out all mandatory field/laboratory tests. The contractor shall also provide adequate supporting staff at his cost for carrying out field tests, packaging and forwarding of samples for outside laboratory tests and for maintaining test records.
- (xi) All the registers of tests carried out at Construction Site or in outside laboratories and all material at site (MAS) registers including cement register shall be maintained by the contractor which shall be issued to the contractor by Engineer-in-charge. All the entries in the registers will be made by the designated Engineering Staff of the contractor and same should be regularly reviewed by JE/AE/AEE/EE. Contractor shall be responsible for safe custody of all the registers.
- (xii) The contractor shall at his own cost submit samples of all materials sufficiently in advance and obtain approval of Engineer-in-Charge. The materials to be used in actual

execution of the work shall strictly conform to the quality of samples approved by the Engineer-in-Charge and nothing extra shall be paid on this account. The acceptance of any sample or material on inspection shall not be a bar to its subsequent rejection, if found defective.

- (xiii) The contractor shall at his cost, make all arrangements and shall provide necessary facilities as the Engineer-in-Charge may require for collecting, preparing, packing, forwarding and transportation of the required number of samples for tests and for analysis at such time and to such places as directed by the Engineer-in-Charge. Nothing extra shall be paid for the above operations including the cost of materials required for tests and analysis. Testing charges shall be borne by the contractor.
  
- (xiv) The necessary tests shall be conducted in the laboratory approved by the Engineer-in-Charge. The samples for carrying out all or any of the tests shall be collected by the Engineer-in-charge or on his behalf by any other officer of CPWD. The contractor or his authorized representative shall associate himself in collection, preparation, packing and forwarding of such samples for the prescribed tests and analysis. In case the contractor or his authorized representative is not present or does not associate him in the aforesaid operation the results of such tests and consequences thereon shall be binding on the contractor.
  
- (xv) Materials used on work without prior inspection and testing (where testing is necessary) and without approval of the Engineer-in-Charge are liable to be considered unauthorized, defective and not acceptable. The Engineer-in-Charge shall have full powers to require the removal of any or all of the materials brought to site by contractor which are not in accordance with the contract specifications or do not conform, in character or quality to the samples approved by the Engineer-in-Charge. In case of default on the part of the contractor in removing rejected materials, the Engineer-in-Charge shall be at liberty to have them removed at the risk and cost of the contractor.
  
- (xvi) The contractor shall make his own arrangement of water required for execution of work and get the water tested at his own cost with regard to its suitability for use in the works and get written approval from the Engineer-in-Charge before he proceeds with the use of same for execution of work and thereafter it is got tested at he prescribed interval as per specification.
  
- (xvii) All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions before covering and their measurements in computerized measurement book duly test checked shall be deposited with Engineer in charge or his authorized representative, prior to hiding these items.
  
- (xviii) Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to local bye-laws rules and specification of municipal / corporation, If CPWD Specifications are not available for the same. The contractor should engage

licensed plumbers for the work and get the materials (fixtures/fittings) tested by the Municipal Body/Corporation authorities wherever required at his own cost.

42. The contractor shall not store/dump construction material or debris on metalled road.
43. The contractor shall get prior approval from Engineer-in-charge for the area where the construction material or debris can be stored beyond the metalled road, This area shall not cause any obstruction to the free flow of traffic/inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.
44. The Contractor shall take appropriate measures like raising wind breakers of appropriate height on all sides of the plot/area using CGI sheets or plastic and /or other similar material to ensure that no construction material dust fly outside the plot area.
45. The contractor shall ensure that all the trucks or vehicles of any kind which are used for construction purposes/or are carrying construction material like cement, sand and other allied material are fully covered. The contractor shall take every necessary precautions that the vehicles are properly cleaned and dust free to ensure that enroute their destination, the dust, sand or any other particles are not released in air/contaminate air.
46. The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.
47. The Contractor shall provide all medical help, investigation and treatment to the workers involved in the construction of building and carry of construction material and debris relatable to dust emission.
48. The contractor shall ensure that C&D waste is transported to the C&D Waste site only and due record shall be maintained by the contractor.
49. The contractor shall compulsory use of wet jet in grinding and stone cutting.
50. The contractor shall comply all the preventive and protective environmental steps as stated in the MoEF guidelines,2010 and amended up- to- date
51. The contractor shall carry out on-Road-Inspection for black smoke generating machinery. The contractor shall use cleaner fuel.
52. The contractor shall ensure that all DG sets comply emission norms notified by MoEF ,amended up-to-date.
53. The contractor shall use vehicles having pollution under control certificate. The emissions can be reduced by a large extent by reducing the speed of a vehicle to 20 kmph. Speed bumps shall be used to ensure speed reduction. In cases where speed reduction cannot effectively reduce fugitive dust, the contractor shall divert traffic to nearby paved areas.
54. The contractor shall ensure that the construction material is covered by tarpaulin. The contractor shall take all other precaution to ensure that no dust particles are permitted to pollute air quality as a result of such storage.
55. The contractor shall make arrangement for helmet and safety shoes (meant for construction works at site). For all field staff of the department, during the entire period

of construction for safety reasons, one helmet and two pairs of shoes per staff member (maximum 10 members) of the department(s) per year shall be arranged by the contractor.

56. Contractor shall submit invoices for all the materials procured along with Incoming Material Inspection Report as per the format provided by the Engineer-in-charge at the time of entry of material on site.
57. Contractor shall submit invoices for charges paid towards testing of materials within 7 days of issuance of letter for testing of materials or else the material shall be got tested at contractors' risk and cost. In such case, all liabilities/ charges towards testing of materials including those necessary for preparation, collection and deposition of samples at the concerned laboratory shall be deducted from the running account bills of the contractor without any notice. The rate and amount so derived by the Engineer-in-charge shall be final and binding.

## **SPECIAL CONDITIONS FOR CEMENT AND STEEL BROUGHT BY THE CONTRACTOR**

### **1. CEMENT**

1.1. The contractor shall procure 43 grade ordinary Portland cement conforming to IS:8112/ Portland Pozzolana Cement conforming to IS:1489 (Part-I) as required in the work, from reputed manufacturers of cement such as **Ramco, Maha Cement, Chettinad Cement, Birla shakti Cement** or from any other reputed cement Manufacturer having a production capacity not less than one million tonnes per annum as approved by the Chief Engineer of Kerala Zone.

The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacturer(s) which the tenderer proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufacturers, given by the tenderer, fully or partially. Supply of cement shall be taken in 50 kg bags bearing manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of relevant BIS codes. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS codes, the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so. Every fresh cement batch should be brought to site at least 30 days before they are to be used / consumed in the work.

1.2. The cement shall be brought at site in bulk supply of approximately 100 tonnes or as decided by the Engineer-in-Charge.

1.3. The cement go-down of the capacity to store a minimum of 2 months requirement shall be constructed by the contractor at site of work for which no extra payment shall be made. Double lock provision shall be made to the door of cement go-down. The keys of one lock shall remain with Engineer-in-Charge or his authorized representative and keys of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of the cement go-down. The contractor shall facilitate the inspection of the cement go-down by the Engineer-in-Charge or his authorized representatives.

1.4. The cement shall be got tested by the Engineer-in-Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The frequency and details of the tests shall be decided by the Engineer-in-Charge depending on the quantum of supply in each batch. The cost of tests shall be borne by the contractor / Department in the manner indicated below:

- a. By the contractor, if the results show that the cement does not conform to the relevant BIS codes.
- b. By the Department, if the results show that the cement conforms to relevant BIS codes.

- 1.5. The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by the conditions laid therein. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at rate so prescribed shall be made. In case of excess consumption no adjustment shall be made.
- 1.6. Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-charge.
- 1.7. Damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-charge. If he does not do so within 3 days of receipt of such notice, the Engineer-in-charge shall get it at the cost of the contractor.
- 1.8. The cement bags shall be stacked on proper floors consisting of two layers of dry bricks laid on well consolidated earth at a level of at least one foot above ground. The stacks shall be in rows of 2 and 10 bags high with minimum of 0.6m clear. Bags should be placed horizontally continuous in each line. Actual size / shape of go down shall be as per site requirement and nothing extra shall be paid on this account. The decision of Engineer-in-charge regarding capacity shall be final.
- 1.9. Cement register for the cement shall be maintained at site. The account of daily receipts and issues of cement shall be maintained in the register in the proforma prescribed and signed daily by contractor or his authorized agent.

## **2. STEEL**

- (a) The CPWD/Contractor shall procure IS marked TMT bars of various grades from the steel manufacturers or their authorized dealers having valid BIS license for IS.1786-2008.

The procured steel should have following qualities.

- i) Excellent ductility, bend ability and elongation of finished product due to possible refining technology.
  - i) Consumption of steel should be accurate as per design.
  - iii) Steel should have no brittleness problem in finished product.
  - iv) Steel should carry the quality of corrosion and earthquake resistance.
  - v) Quality steel with achievement of proper level of sulphur and phosphorus as per IS:1786-2008.
- 2.1 The contractor shall have to obtain and furnish test certificates to the Engineer-in-charge in respect of all supplies of steel brought by him to the site of work.
  - 2.2 Samples shall also be taken and got tested by the Engineer-in-charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the

steel arranged by the contractor does not conform to the specifications as defined under Para 2.1 above, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week's time of written orders from the Engineer-in-charge to do so.

- 2.3 The steel reinforcement bars shall be brought to the site in bulk supply of 10 tonnes or more or as decided by the Engineer-in-Charge.
- 2.4 The steel reinforcement shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.
- 2.5 FOR CHECKING NOMINAL MASS, TENSILE STRENGTH, BEND TEST, RE-BEND TEST, ELONGATION ETC. SPECIMEN OF SUFFICIENT LENGTH SHALL BE CUT FROM EACH SIZE OF THE BAR AT RANDOM, AND AT FREQUENCY NOT LESS THAN THAT SPECIFIED BELOW:-

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

- 2.6 The contractor shall supply free of charge the steel required for testing including its transportation to testing laboratories. The cost of tests shall be borne by the contractor.
- 2.7 The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment need to be made.
- 2.8 The steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge.
- 2.9 The contractor should submit pre measurement of existing exposed reinforcement to the Engineer-in-charge before taking up any further reinforcement work on the portion and nothing extra shall be paid on this account.

- 2.10 The standard section weight referred to as standard tables in Para 5.3.3. in CPWD specifications 1996 Volume –II to be considered for conversion of length of various sizes of MS bars and High yield strength deformed bars into weight are as under.

Size (Diameter MM)	Weight in Kg/ Meter
6	0.222
8	0.395
10	0.617
12	0.888
16	1.579
18	1.999
20	2.467
22	2.985
25	3.855
28	4.836
32	6.316
36	7.994
40	9.869
45	12.490
50	15.424

For steel, measurement will be regulated on sectional weight basis, weight being calculated with help of the above tables. The weight shall be taken as per actual weight if it is found lower than the standard weight but within tolerance limit as per relevant IS codes. Nothing extra shall be paid for extra weight of steel sections more than that given in the table.

**The Contractor has to produce the cash bills to the JE/AE as and when he brings the cement and steel to the site.**

**ANNEXURE-I**

**(TABLE-1)**  
**Equipments for Testing of Materials & Concrete at Site Laboratory**

All necessary equipment for conducting all necessary tests shall be provided at the site in the well furnished site laboratory of minimum size 25 feet X 15 feet by the contractor at his own cost. The following minimum laboratory equipment shall be set up at site office laboratory:-

<b>Sl.No</b>	<b>Equipment</b>	<b>Numbers(Minimum)</b>
1	Slump cone, steel plate, tamping rod, steel scale, scoop	2
2	Graduated glass measuring cylinder	As per requirement
3	Sets of sieves of 450mm internal dia for coarse aggregate [100mm, 80mm, 40mm; 20mm; 12.5mm, 10mm; 4.75mm complete with lid and pan]	1
4	Sets of sieves of 200mm internal dia for fine aggregate [4.75mm; 2.36mm; 1.18mm; 600 microns; 300 microns & 150micron , with lid and pan]	1
5	Sieve Brushes and sieve shaker capable of 200mm and 300mm dia sieves , manually operated with timing switch assembly	1
6	Cube moulds size 150mmx150mmx150mm	30
7	Electronic balance 600gx0.1g., 10kg and 50kg	1
8	Physical balance weight upto 5 kg	1
9	Measuring jars 100ml, 200ml, 500ml	3 nos each size
10	Spatula 100mm & 200mm with long blade wooden Handle	2 set
11	Vernier calipers 12" & 6" size	3 each
12	Screw gauge 0.1mm-10mm, least count 0.05	2
13	Water testing kit	1
14	Counter scale capacity 1kg and 10kg	1
15	Iron Weight of 5kg, 2kg, 1kg, 500gm, 200gm, 100gm	1 each
16	Brass Weight of 50gm, 20gm, 10gm, 5gm, 2gm, 1gm	1 each
17	Wheel Barrow	1

**LIST OF APPROVED MAKE OF MATERIALS  
(FOR CIVIL WORKS)**

- NOTE: - 1) A list of Preferred Brand names of various Materials/Products are shown below for usage in execution of work. However, Approved equivalent material of any other specialized Companies/Firms may also be used in case it is established that the Brands specified below are not available in the market and subject to Approval of the alternate Brand by the Engineer in Charge.
- 2) It must be ensured, in general, that all materials to be used in the works shall bear BIS Certification mark. In cases where for a particular material/product, BIS Certification Mark is not available, then the material proposed to be procured can be used subject to the condition that it should conform to CPWD Specifications and relevant BIS codes. In such cases written approval of the Engineer-in-Charge shall be obtained before use of such material in their works.
- 3) The list given below does not absolve the Executing Agency from their responsibility for using these products. It is only after, they are satisfied about the quality and performance, the products shall be used. To achieve this, proper check on the quality of the product, actually to be used, should be exercised.

LIST OF PREFERRED MAKE OF MATERIALS (FOR CIVIL WORK)

SL NO	MATERIALS	PREFERRED MAKE/BRAND
1	WHITE CEMENT	J.K. WHITE, BIRLA WHITE, ASIAN PAINTS
2	CHEMICAL ADMIXTURES	ARDEX ENDURA, FOSROC, MC BAUCHEMIE, SIKA, BASF, PIDILITE, CHOKSEY CHEMICALS, BOSTIK, ULTRA FINE, STP LIMITED, CERACHEM
3	EXPANSION JOINT BOARD	SUPREME INDUSTRIES, SIL FILL OR EQUIVALENT, STP LTD
4	DAMP PROOF MATERIAL	ASIAN PAINTS, ARDEX ENDURA, IMPERMO, DURASEAL, ACCO-PROOF
5	NON METALIC SURFACE HARDNER	ARDEX ENDURA, FOSROC, SIKA, PIDLITE,
6	INJECTION GROUTING	ARDEX ENDURA, FOSROC, SIKA, BASF, CICCO
7	CHLOROPHYRIPHOS	UDRSBANTCT, PREMISE AGENDA, PIRAMID, NOBAN, HILBAN, SARUPUS PEST CONTROL.
8	RMC / DMC	ULTRATECH, LAFARGE, ACC, RMC INDIA, NEPTUNE, POABSONS
9	BITUMEN	INDIAN OIL, HINDUSTAN PETROLEUM, MANGALORE REFINERIES, BHARAT PETROLIUM
10	STEEL WORK / TMT BARS	IS MARKED TMT BARS OF TATA, JSPL, JSW, RINL, VSP OR THEIR AUTHORIZED DEALERS:

11	STEEL	IS MARKED TATA, JSPL, JSW, RINL OR THEIR AUTHORIZED DEALERS:
12	AAC BLOCKS	XTRALITE FROM ULTRATECH, AEROCON FROM HIL, SIPOREX INDIA LIMITED, NCL, RENACON.
13	ADHESIVE FOR ACC BLOCK	ASIAN PAINTS, ULTRATECH, ARDEX ENDURA, FERROUS CRETE, SMART CARE TILE ADHESIVE, TILE ADHESIVE PLUS
14	EPOXY MORTAR	ARDEX ENDURA, FOSROC, SIKA, BASF, ULTRATECH, BOSTIK, PIDILITE
15	CC BLOCKS/ FLYASH BLOCKS	SIPOREX, SUNVIK, HIL
16	FRP DOOR FRAME	MEENA, RAWJI, FIBERTECH, ASTRALWIN DOORS
17	FRP DOOR SHUTTERS	MEENA, RAWJI, FIBERTECH, ASTRALWIN DOORS
18	PVC DOOR SHUTTER AND FRAME	RAJASHREE, SINTEX, DUROPLAST
19	WOODEN FLUSH DOORS	KITPLY, CENTURY, GREENPLY, ARCHID PLY, KUTTY
20	WATER PROOF PLY WOOD	DURO, KITPLY, CENTURY, ARCHID PLY, GREENPLY
21	COMMERCIAL PLY.	DURO, KITPLY, CENTURY, ARCHID PLY, GREENPLY
22	LAMINATE	FORMICA, DECOLAM, CENTURY, ROYAL TOUCH, GREENLAM , HERITAGE
23	HIGH PRESSURE LAMINATES	MERINO, GREENLAM, DECOLAM, CENTURY, ROYAL TOUCHE, HERITAGE
24	PRELAMINATED PARTICLE BOARD	KITLAM, ARCHID PLY, CENTURY
25	NATURAL WOOD VENEER	ARCHID, ANCHOR, DURAIN, KITPLY, NATIONAL ACTION TESA
26	POLYSTER POWDER COATED SHADES	NEROLAC, BERGER, AKZONOBEL, ASIAN
27	GYPSON BOARD	SAINT GOBAIN, LAFARGE, BORAL BOARD, ARMSTRONG
28	FALSE CEILING CALCIUM SILICATE	ARMSTRONG, AEROLITE, RAMCO, HILUX
29	FALSE CEILING MINERAL FIBRE	SAINT GOBAIN, ARMSTRONG, ANUTONE, AEROLITE

30	MELAMINE POLISH	ASIAN PAINTS, MALAMYNE GOLD WUDFIN OF PIDILITE INDUSTRIES TIMBERTONE OF ICI DULUX
31	DOOR HARDWARE	DORMA, HAFELE, KICH, OZONE, DORSET, BACKERS FS, GODREJ
32	HYDRAULIC DOOR CLOSERS / FLOOR SPRINGS	DORMA, KICH, GODREJ, HARDWYN, DORSET
33	LOCKS / LATCHES	GODREJ, HARRISON, LINK, DORSET, DORMA
34	FIRE CHECK DOOR	BANGALORE PROTECH, SHAKTI, NAVAIR, KENWOOD, VEROTECH, SHAKTI HARMON
35	SMOKE SEAL STRIP	IMPROTED PROMAT / ASTRO FLAME
36	FIRE RATED HARDWARE	DORMA, INGERSOL RAND, GEZE, DORSET BACKERS FS
37	STAINLESS STEEL SCREWS FOR FABRICATION AND FIXING OF WINDOWS.	KUNDAN, PUJA, ATUL, GRIPWELL, NAKODA
38	BUTT / BALL BEARING HINGES	HAFFLE, DORMA, DORSET, GODREJ
39	PIANO HINGES	JOLLY, GARG, AMIT, JYOTI, SLEEK
40	NUTS BOLTS/ SCREWS	KUNDAN, PUJA, ATUL, IT, BOLT MASTER, GRIPWELL, NAKODA
41	ACOUSTIC INSULATION	U.P. TWIGA LTD, LLOYD INSULATION, SAINT GOBAIN, ARMSTRONG
42	GLASS/ REFLECTIVE GLASS	MODI FLOAT, SAINT GOBAIN, ASAHI, GLAVERBEL
43	UPVC WINDOWS / VENTILATION	FENESTA, REHAU, ENCRAFT, DUROPLAST WINTECH, NCL VEKA, MADHU INDUSTRIES, LG, QUTE, APARNA ENTERPRISES
44	SOURCE FOR TEMPERING REFL. GLASS / CLEAR	FUSO, SAINT GOBAIN, GURIND, IMPACT SAFETY, ASAHI
45	FIRE RATED GLASS	PYOSWISS OF SAINT GOBAIN, PYRAN OF SCHOTT, PILKINGTON

46	VITRIFIED TILES	KAJARIA, JOHNSON, RAK CERAMICS, NITCO, AGL, SIMPOLO VITRIFIED PVT LTD, APARNA ENTERPRISES
47	GLAZED CERAMIC TILES	JOHNSON, KAJARIA, NITCO, AGL, RAK, SIMPOLO VITRIFIED PVT LTD., APARNA ENTERPRISES
48	FALSE FLOOR	HEWETSON, UNIFLOOR, UNITILE, KEBAO, PINNACLE
49	ENGINEERED WOOD/LAMINATE FLOORING	ARMSTRONG, WERNEL, PERGO, ACTION TESA, WELSPUN
50	CEMENT CONCRETE PARKING TILES	NITCO, NTC, HINDUSTAN, PODDAR EUROCON, DAZZLE ULTRA.
51	INTERLOCKING CONCRETE BLOCKS	NITCO-(ROCKARD), BHARAT- (NILSAN) REGENCY, BESANT BEATONS
52	CLAY TILES ON ROOF	KENJAI, JOHNSON, COMMON WEALTH TRUST (IND) LTD
53	TILE ADHESIVE	ARDEX ENDURA, CICO, PIDILITE, PERROUS, FOSROC, SIKA
54	CHEQUERED TERRAZO TILES	NITCO, BHARAT, PODDAR
55	SYNTHETIC CARPET TILES	TOLI, HOLLITEX, STANDARD CARPETS, WELSPUN
56	GLASS MOSAIC TILES	ITALIA, PALLADIO, BISAZZA
57	PAINT/PRIMER/OIL BOUND DISTEMPER ACRYLIC PAINT	ASIAN PAINTS, ICI DULUX, NEROLAC, BERGER
58	WATER PROOF CEMENT PAINT	SNOWCEM INDIA LTD, ASIAN PAINTS, ICI DULUX, NIPPON PAINTS
59	SYNTHETIC ENAMEL PAINT	BERGER, NEROLAC, ASIAN, ICI DULUX
60	ACRYLIC TEXTURED PLASTER	ASIAN PAINTS, ICI DULUX, NEROLAC, BERGER
61	FIRE RETARDANT PAINT	JOTUN, HILTI, AKZONOBEL, NIPPON
62	MIRROR GLASS	MODI GUARD, SAINT GOBAIN, ASAHI, ATUL
63	ANTI CORROSIVE BITUMASTIC PAINT	ASIAN / BERGER / SHALIMAR
64	EPOXY PAINT	BERGER PAINTS, ASIAN PAINTS, MRF, ARDEX ENDURA
65	EPOXY COATING	ARDEX ENDURA, BASF, FORSOC, LATICRETE, MRF

66	STRUCTURAL SILICON/ WEATHER SILICON	DOW CORNING / WACKER / GE
67	ACRYLIC EXTERIOR PAINT	ASIAN PAINTS, ICI DULUX, BERGER, NEROLAC
68	STAINLESS STEEL FITTINGS	DORSET, GODREJ, DORMA, OZONE, KICH
69	ALUMINIUM SECTIONS	JINDAL, HINDALCO, INDAL
70	FRICTION STAY HINGES	EBCO, HAFELE, SEVAX
71	ALUMINIUM COMPOSITE PANEL (ACP)	ALUCOBOND, EUROBOND, DURABUILD, CITY BOND
72	E.P.D.M. GASKETS	ANAND / ROOP / BOHRA / HANU / AMEE RUBBER
73	WATER PROOFING COMPOUND	ASIAN PAINTS, SIKA, ACCOPROOF, IMPERMO, FOSROC, PIDILITE, ARDEX ENDURA, BOSTIK, BERGER, STP LIMITED, KRYTON
74	MEMBRANE WATERPROOFING SYSTEM	ASIAN PAINTS, BASF, TEXSA, WR GRACE, PIDILITE, HYDRO TECH LTD. ARDEX ENDURA, BOSTIK, FOSROCK
75	POLYMER BASED CONTENTIOUS WATER PROOF COATINGS	ARDEX ENDURA, BASF, MC-BAUCHEMIE, SIKA, FORSOLOC, PIDILITE, BERGER
76	WATER STOPS	ASIAN PAINTS, ARDEX ENDURA, HYDROTITE, BASF, HYDROSWELL, PIDILITE, BOSTIK
77	PVC PERFORATED PIPES	REX POLYEXTRUSION LTD, AKASH ENTERPRISES, ZENPLAS PIPES PVT. LTD
78	MS PIPES	TATA, JINDAL, APOLLO, SAIL, TISCO
79	POLYSULPHIDE SEALANT	ASIAN PAINTS, PIDILITE, CHEMETALL-RAJ, FOSROC, CHOKSEY CHEMICALS, TUFF SEAL
80	BITUMEN IMPREGNATED BOARD	SHALITEX OR EQUIVALENT
81	POLYETHYLENE BACKER ROD	SUPREME IND. LTD. OR EQUIVALENT
82	FALSE CEILING MEMBERS (PERIMETER, CEILING SECTION,	ARMSTRONG, GYP. ROCK (SAINT GOBAIN)

	INTERMEDIATES, ANGLES ETC.)	
83	WELDING ROD	ADVANI, ESAB
84	METAL DECK SHEET	TATA, JINDAL, ALFA, KAILASH ROOFIN
85	SHEAR STUD / CONNECTOR	KOCO OR EQUIVALENT
86	CLAMP. REBAR, CHEMICAL FASTENER	HILTI, FISCHER, WURTH, AXEL
87	ANCHOR FASTENERS / BOLTS	HILTI, FISHER, CANON, BOSCH, AXEL
88	MASKING TAPES	3M, SUN CONTROL, WONDER POLYMER
89	DASH FASTENERS	HILTI, FISHER, CANON, BOSCH, AXEL
90	STAINLESS STEEL BOLTS, WASHERS AND NUTS	ATUL / HILTI / GRIPWELL / NAKODA
91	GRC JALI	TERRAFIRMA, ECOVISION, BIRLA WHITE GRC, EVEREST GRC
92	STAINLESS STEEL	SALEM, JINDAL, SAIL, KINGSTON
93	POLYCARBONATE SHEET	DANPALON, ALCOX, POLYGAL, V.A. CORPORATION, ALFA, GE, LEXON, TUFLITE
94	PT STRANDS	DP WIRES, TATA, USHA MARTIN
95	ADHESIVE (MANUFACTURE SPECS)	ARDEX ENDURA, DUNLOP, VAMORGANIC, SIKA, FOSROC, PIDLITE, BOSTIK
96	GROUTS	KERAKOLL, WEBER, ARDEX ENDURA, BOSTIK, FOSROCK, PIDILITE
97	SOLAR STUDS / MEDIAN MARKERS	3M, AVERY DENNISON, NIKKALITE
98	POLYCARBONATE CONVEX MIRRORS, RUBBERISED ROAD HUMP	UNIQUE SAFETY SOLUTIONS
99	AIR TRANSFER GRILLS	COOL GRILLS PUNE, SYSTEMAIR INDIA
100	THERMAL INSULATION TREATMENT	PIDILITE, BASF, BERGER, ARDEX ENDURA

101	VITREOUS WC / WASH BASIN	PARRYWARE, HINDWARE, CERA, JAQUAR, BATHSENSE, TCTE/BATHSENSE
102	GULLYTRAPS	PERFECT, PARRY
103	STAINLESS STEEL SINKS	NILKANTH, AMC, COBRA, NIRALI, DIAMOND, HINDWARE, CERA
104	C. P. BRASS FITTINGS	JAQUAR, PARKO, MARC, HINDWARE, PARRYWARE, KINGSTON, ESSESS/BATHSENSE/ROYALE
105	GI PIPES	TATA, JINDAL, HISSAR, APOLLO, ZENITH
106	GI PIPE FITTINGS	ZOLOTO,ITAPS, UNIK, HB, ICS
107	RCC PIPES	INDIAN HUME PIPE, MOHAN HUME PIPE, BANGALORE CEMENT PIPES
108	SPUN CAST IRON COVERS & GRATINGS	NECO, SKF/ BENGAL IRON CORPORATION
109	SPUN CAST IRON PIPES	NECO, SKF/ BENGAL IRON CORPORATION
110	SPUN CAST IRON FITTINGS	NECO, SKF/ BENGAL IRON ORPORATION
111	SWR PVC PIPES AND FITTINGS	SUPREME, FINOLEX, PRINCE, ASTRAL
112	CPVC PIPE AND FITTINGS	SUPREME, ASHRIVAD, FINOLEX, PRINCE, FLOWGARD, ASTRAL
113	UPVC PIPES	SUPREME, PRINCE, FINOLEX, ASTRAL
114	WATER SUPPLY VALVES	ZOLOTO,ITAPS, LEADER, ARCO
115	CI MANHOLE COVER	NECO, BIC
116	SFRC COVER AND GRATING	TULSHI CONCRETE, KK, ADVENT, NEWTECH
117	AIR RELEASE VALVES	KIRLOSKAR, RBM, KARTAR
118	FLOAT VALVES	PRAYAG, LEADER, ZOLOTO, ITAPS, ARCO

119	CI DOUBLE FLANGE SLUICE VALVE	KIRLOSKAR, RBM, KARTAR
120	PLASTIC ENCAPSULATED FOOT REST	KK INDIA, KGM, ACCURATE BUILDCON
121	GUN METAL VALVES	ZOLOTO, ITAPS, LEADER, SANT, ANDCO INDIA
122	CI DOUBLE F LANGED SLUICE VALVES	KIRLOSKAR, IVS, BURN, ZOLOTO,ITAPS, LEADER
123	CI DOUBLE FLANGED NON-RETURN VALVES	KIRLOSKAR, FLUIDTEH, ZOLOTO, ITAPS
124	SANDWICH PU PANELLED ROOFING SHEETS	LLOYD INSULATION (INDIA) LTD., JINDAL, MECTEC PVT LTD., TATA
125	GALVALUME SHEET	LLOYD (INDIA) LTD., JSW, TATA BLUESCOPE
126	CRYSTALLINE WATER PROOFING ADMIXTURE AND COMPOUND	PENETRON, KRYTON, PIDILITE, FOSROC.
127	STAINLESS STEEL WATER SUPPLY PIPES & FITTINGS	JINDAL, SWASTIK, RAMPPART, J-PRESS.
128	HERMETICALLY SEALED PERFORMANCE GLASS, TOUGHENED, DGU, SGU, TOUGHENED LAMINATED GLASS	AUTHORISED TOUGHENERS OF (MODI GUARD, SAINT GOBAIN, ASAHI, AIS/GLAVERBEL, PILKINGTON
129	ORDINARY PORTLAND CEMENT (43 GRADE)AND PORTLAND POZZOLONA CEMENT	ACC CEMENT,ULTRATEC CEMENT, COROMANDAL CEMENT, BIRLA CEMENT,CHETTINADU CEMENT, BHARATI CEMENT , DALMIA CEMENT.ZUARI CEMENT, JAYPEE CEMENT ,MAHA CEMENT, J.K.CEMENT ,AMBUJA CEMENT , CENTURY CEMENT, PENNA CEMENT , RAMCO CEMENT, INDIA CEMENTS
130	PLASTICISER AND	AS PER CEMENT MANUFACTURER'S

	SUPER PLASTICISER	RECOMMONDATION
131	EXPANSION JOINT BITUMEN BOARD	DURA BOARD HD100, DURAFILL
132	HIGH DENSITY PRELAMINATEDEBOA RD	PERGO, GREEN PLY INDUSTRIES LTD, HIDEX
133	SS BUTT HINGES	OZONE , DORMA, GEZE
134	REFLECTIVE GLASS	SAINT GOBAIN , ASAHI , PILKINGTON,MODI FLOAT, GLAVERBEL
135	PREMIER ACRYLIC SMOOTH EXTERIOR PAINT WITH SILICON ADDITIVES	ASIAN PAINT, ICI DULUX, NEROLOC  BERGER
136	CEMENT BASED WALL PUTTY	JK WALL PUTTY, BIRLA WALLCARE, ASIAN PAINT
137	FLUSHING CISTERN	KOHLER, GROHE, JAQUAR , CERA, BATHSENSE TECE/BATHSENSE, PARRYWARE, HINDWARE
138	URINAL	CERA, HINDWARE, PARRYWARE, JAQUAR, BATHSENSE TECE/BATHSENSE
139	PE-AL-PE COMPOSITE PIPES	KITECH, VECTUS, JINDAL
140	PVC /HDPE WATER STORAGE TANKS	VECTUS, SYNTEX, SUPREME
142	WATER SUPPLY FIXTURES, (CP BRASS)	JAQUAR, HINDWARE, PARRYWARE, METRO, SEIKO
142	ANODISED A LUMINIUM FITTINGS FOR DOORS AND WINDOWS	DEFNE, SCHUECO, BHORUKA, KAWANEER, HARDIMA, EVERITE, JYOTHI, SIGMA, DORMA
143	STRUCTURAL GLAZING	MODI, SAINTGOBAIN, ASAHI, GLAVERBEL
144	MULTI WALLED POLYCARBONATE	DANPALON, LEXAN GE, DPI DAYLIGHT, PALRAM

	ROOFING SHEETS	
145	EPOXY FLOORING	STP LIMITED, ASIAN, FOSROC
146	PVC/WPC BOARD	SMP IMPEX, A1 STONE, ECOSTE, ECHON, RAJASREE, QUTE
147	DRY WALL PARTITION	GYPROC (SAINT GOBAIN), HILUX, BISON, AEROCON

NOTE:If any item is not available in the preferred make list, the Engineer-in-Charge shall accord the approval of such item.

Executive Engineer- Trivandrum  
CPWD, Trivandrum

**PART -D  
SCHEDULE OF QUANTITIES  
(CIVIL & ELECTRICAL)**

### Schedule of Quantities – Major Component – E&M

**Name of Work:** Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement level-1, BMT Wing, SCTIMST, Poojappura, Trivandrum.

SI No	Description of Item	Qty	Unit	Rate	Amount
1	<b>Sub Head: I – Internal Electrical Installations</b>				
1.1	Wiring for light point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.				
1.1.1	Group C	26	Point	2,250.00	58,500.00
1.2	Wiring for twin control light point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, 2 way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required.	8	Point	2,381.00	19,048.00
1.3	Wiring for group controlled (looped) light point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required.	30	Point	1,312.00	39,360.00
1.4	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required.				
1.4.1	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	200	Metre	353.00	70,600.00
1.4.2	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	300	Metre	493.00	1,47,900.00
1.4.3	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	100	Metre	636.00	63,600.00
1.4.4	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	50	Metre	1,073.00	53,650.00
1.4.5	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	50	Metre	1,423.00	71,150.00
1.5	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit/wall, floor trunking etc complete as required.				
1.5.1	3 X 1.5 sq. mm	50	Metre	137.00	6,850.00
1.5.2	3 X 4 sq. mm	600	Metre	293.00	1,75,800.00
1.6	Supplying and drawing following pair 0.5 mm dia FRLS/HFFR PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.				
1.6.1	1 pair	50	Metre	44.00	2,200.00
1.6.2	2 pair	50	Metre	51.00	2,550.00
1.7	Supplying and fixing of following sizes of				

EE(E)/Contr

SI No	Description of Item	Qty	Unit	Rate	Amount
	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.				
1.7.1	20 mm	200	Metre	199.00	39,800.00
1.7.2	25 mm	100	Metre	222.00	22,200.00
1.7.3	32 mm	50	Metre	276.00	13,800.00
1.8	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
1.8.1	5/6 amps switch	7	Each	160.00	1,120.00
1.8.2	3 pin 5/6 amp socket outlet	7	Each	180.00	1,260.00
1.8.3	15/16 amps switch	30	Each	232.00	6,960.00
1.8.4	20A DP switch with indicator	4	Each	717.00	2,868.00
1.8.5	6 pin 15/16 amp socket outlet	34	Each	289.00	9,826.00
1.8.6	Telephone socket outlet	4	Each	222.00	888.00
1.8.7	CAT 6A Data socket outlet	22	Each	912.00	20,064.00
1.9	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required.				
1.9.1	1 or 2 Module (75mm X 75mm)	34	Each	467.00	15,878.00
1.9.2	3 Module (100mm X 75mm)	21	Each	507.00	10,647.00
1.9.3	6 Module (200mm X 75mm)	8	Each	610.00	4,880.00
1.10	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	8	Each	720.00	5,760.00
1.11	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	36	Each	870.00	31,320.00
1.12	Supplying, drawing, Testing and commissioning of CAT 6A UTP 4 pair, 23 AWG solid copper cable in existing conduit/ on surface, U/FTP, LSZH, Non Plenum, Horizontal (solid) Cable suitable for high speed data networking application supporting upto 10Gbps over a 100 meter channel. The 4 Unshielded Twisted Pairs (UTP) cable with color coded insulation for easy identification should have FLAME PROPERTIES i.e. Flammability Test – IEC 60332-1, Smoke Density – IEC 61034, LSZH standards compliance: ANSI/TIA-568 C.2, ISO/IEC 11801, IEEE 802.3an, RoHS. Delay Skew should be < 45NS. The outer Cable Diameter should be 7.5 + 2 mm. Cable should have been tested and verified by UL/ ETL etc. complete as required.				
1.12.1	1 run of cable	150	Metre	82.00	12,300.00

SI No	Description of Item	Qty	Unit	Rate	Amount
1.12.2	2 run of cable	100	Metre	131.00	13,100.00
1.12.3	3 run of cable	50	Metre	181.00	9,050.00
1.13	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 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).				
1.13.1	12 Way, double door	4	Each	3,791.00	15,164.00
1.14	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 volts, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
1.14.1	8 way (8 + 24), Double door	2	Each	8,367.00	16,734.00
1.15	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.)				
1.15.1	8 Way (4 + 24), double door	1	Each	14,160.00	14,160.00
1.16	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.				
1.16.1	Single pole	70	Each	376.00	26,320.00
1.16.2	Triple pole	8	Each	1,413.00	11,304.00
1.17	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	10	Each	18.00	180.00
1.18	Supplying and fixing following rating, double pole, 240 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
1.18.1	40 A	4	Each	623.00	2,492.00
1.19	Supplying and fixing following rating, four pole, 415 volts, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
1.19.1	63 A	2	Each	1,472.00	2,944.00
1.20	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections,				

SI No	Description of Item	Qty	Unit	Rate	Amount
	testing and commissioning etc. as required				
1.20.1	40 A	4	Each	3,317.00	13,268.00
1.21	Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
1.21.1	63 A	2	Each	4,749.00	9,498.00
1.22	Supplying and fixing 100A rating, four pole, 16 KA, 415 volts, MCCB with thermal magnetic protection in the existing Vertical DB complete with connections, testing and commissioning etc. as required.	1	Each	11,918.00	11,918.00
1.23	Supplying and fixing 32 A, 415 V, TPN Industrial type socket outlet, with 4 pole and earth, metal enclosed plug top along with 32 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.	2	Each	5,754.00	11,508.00
1.24	Dismantling of existing Recess mounted Square (2' X 2') LED fittings installed at the VRDL Lab area i/c taking in the custody of contractor and safe keeping etc complete as required.	43	Job	128.00	5,504.00
1.25	Refixing of Dismantled Recess mounted Square (2' X 2') LED fittings at suitable locations as per revised design and drawing, i/c connection testing commissioning etc complete as required.	43	Job	205.00	8,815.00
1.26	Supply, installation, testing and commissioning of following surface/ recess mounting type LED light fittings complete with all accessories and lamp etc. directly on the ceiling/wall (All ceiling mounted fittings shall be fixed with 2 Nos anchor fasteners. Extra chain shall be provided for suspension of recess fittings) including connections using 1.5 sq.mm FRLS PVC insulated copper conductor single core cable as required. (All LED fittings shall have 5 years warranty)				
1.26.1	Recess mounted Square (2' X 2') LED Clean Room type Light Fittings(Top opening/bottom opening), including all required accessories having system lumen output not less than 4000 lumen and system wattage not more than 40 watts, complete with CRCA powder coated housing, bottom opening type i/c connection testing commissioning etc complete as required. etc complete as required. (Make: Crompton LCBOR-40-CDL/ Equivalent in Wipro/Philips/Havells)	16	Each	9,055.00	1,44,880.00
1.26.2	Surface mounted LED Outdoor fitting /	1	Each	1,918.00	1,918.00

SI No	Description of Item	Qty	Unit	Rate	Amount
	Bulkhead fitting having system lumen output not less than 600 and system wattage not more than 10 watts, IP 66, complete with Die Cast Alu. housing, diffuser etc complete as required. (Make: Crompton CIS-306-10-57-SL-DP-NBK/ Equivalent in Wipro/Philips/Havells)				
1.27	Dismantling of existing 100mm X 50mm UPVC cable management system (wall trunking) carefully along with all accessories including wires, sockets and front plates from the proposed VRDL Lab area, i/c taking in the custody of contractor and safe keeping etc complete as required.	1	Job	3,853.00	3,853.00
1.28	Refixing of Dismantled 100mm X 50mm UPVC cable management system (wall trunking) on surface alongwith all accessories at suitable locations i/c connection etc complete as required.	75	Metre	103.00	7,725.00
1.29	Supply of XLPE insulated, PVC sheathed, armoured, aluminium conductor power cable of 1.1 KV grade conforming to IS:7098 (Part-1) with latest amendments of following size as required.				
1.29.1	4 X 25 Sqmm	50	Metre	549.00	27,450.00
1.29.2	4 X 10 Sqmm	100	Metre	392.00	39,200.00
1.30	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
1.30.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	145	Metre	85.00	12,325.00
1.31	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
1.31.1	4 X 10 sq. mm (25 mm)	6	Each	429.00	2,574.00
1.31.2	4 X 25 sq. mm (28 mm)	2	Each	493.00	986.00
1.32	Providing and fixing 4.00 mm dia copper wire on surface or in recess for loop earthing as required.	300	Metre	228.00	68,400.00
1.33	Dismantling of existing Indoor 4MP IP IR WDR type Dome CCTV Camera from the proposed VRDL Lab area, i/c taking in the custody of contractor and safe keeping etc complete as required.	2	Job	205.00	410.00
1.34	Reinstallation of existing dismantled Indoor 4MP IP IR WDR type Dome CCTV Camera at suitable locations i/c connecting the same to existing System as per revised design and drawing, i/c connection testing commissioning etc complete as required.	2	Job	514.00	1,028.00
1.35	Supplying, drawing, Installation, Testing and commissioning of CAT6 UTP LSZH 23AWG Twisted Pair Cable in existing conduit/ on surface, Category 6 Unshielded Twisted				

SI No	Description of Item	Qty	Unit	Rate	Amount
	Pair, 4 pair should be complied as per UL/ETL verification program for compliance with ANSI/TIA-568.2-D standard. Outer diameter should be in the range of 6.1mm nominal with Operating Temperature Range: -5° to +60°C, Bending Radius: < 4 X Cable Diameter at -5°C ± 1°C and Pulling Force: 11.5Kg etc. complete as required.				
1.35.1	1 run of cable	50	Metre	79.00	3,950.00
1.36	Dismantling of existing wiring, switches, sockets , conduits etc from the proposed VRDL site i/c handing over to client as per the direction of Engineer -in-Charge.	1	Job	3,791.00	3,791.00
	<b>Total of Sub Head-I</b>				<b>14,01,228.00</b>
2	<b>Sub Head: II – Fire Fighting &amp; Fire Alarm System</b>				
2.1	Dismantling of existing sprinklers from the proposed VRDL Lab area, i/c taking in the custody of contractor and safe keeping etc complete as required.	36	Job	472.00	16,992.00
2.2	Refixing of existing dismantled sprinklers at suitable locations i/c connecting the same to the existing Fire Fighting System as per revised design and drawing, i/c connection testing commissioning etc complete as required.	12	Job	332.00	3,984.00
2.3	Providing, laying, testing & commissioning of 'B' class medium duty G.I. pipe conforming to IS 1239 including welding, fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required				
2.3.1	25 mm dia	30	Metre	939.00	28,170.00
2.3.2	32 mm dia	20	Metre	1,037.00	20,740.00
2.4	Dismantling of existing Smoke Detectors from the proposed VRDL Lab area, i/c taking in the custody of contractor and safe keeping etc complete as required.	24	Job	128.00	3,072.00
2.5	Refixing of Existing Smoke Detectors at suitable locations i/c connecting the same to the existing Fire Alarm System as per revised design and drawing, i/c connection testing commissioning etc complete as required.	24	Job	128.00	3,072.00
2.6	Supplying, installation, testing & commissioning of smoke detector with builtin LED and mounting base complete with all connections etc. as required.	8	Each	1,615.00	12,920.00
2.7	Supplying & laying of 2 X 1.5 sqmm fire alarm armoured cable, 600/1000V rated with annealed copper conductor having XLPE insulation, steel wire armouring & FRLS/HFFR outer sheath complete as required.	50	Metre	254.00	12,700.00

SI No	Description of Item	Qty	Unit	Rate	Amount
2.8	Dismantling of existing Response indicator from the proposed VRDL Lab area, i/c taking in the custody of contractor and safe keeping etc complete as required.	12	Job	128.00	1,536.00
2.9	Refixing of existing dismantled Response indicator at suitable locations i/c connecting the same to the existing Fire Alarm System as per revised design and drawing, i/c connection testing commissioning etc complete as required.	12	Job	128.00	1,536.00
2.10	Supplying, installation, testing & commissioning response indicator on surface/recess MS box having two LEDs metallic cover complete with all connections etc. as required.	4	Each	293.00	1,172.00
2.11	Supplying and fixing of Stored pressure ISI 15683 marked fire extinguishers of ABC Dry Chemical powder type 4 Kg capacity made of high pressure steel cylinder complete with wheel type valve, internal discharge tube, 1 M long high pressure wire braided discharge hose, pressure guage and fully charged with MAP 90 powder.	1	Each	5,877.00	5,877.00
2.12	Supplying and fixing of 9 litres water type fire extinguisher IS 15683 marked deep drawn cylinder with internal water proof lining and 60 gms CO2 cartridge, siphon tube, plunger (spring operated) and discharge tube	1	Each	5,104.00	5,104.00
2.13	Dismantling of existing 6W ceiling mount speakers (for PA System) from the proposed VRDL Lab area, i/c taking in the custody of contractor and safe keeping etc complete as required.	5	Job	205.00	1,025.00
2.14	Reinstallation of existing dismantled 6W ceiling mount speakers (for PA System) at suitable locations i/c connecting the same to existing System as per revised design and drawing, i/c connection testing commissioning etc complete as required.	5	Job	514.00	2,570.00
2.15	Supplying and drawing of cable Fire Retardant PVC insulated copper conductor cable in the existing surface / recessed steel conduit of following pairs, cores and size including connections and interconnections etc. as required.				
2.15.1	Speaker cable Single pair, 2-core, 1.5 sqmm	60	Metre	81.00	4,860.00
	<b>Total of Sub Head-II</b>				<b>1,25,330.00</b>
3	<b>Sub Head: III - HVAC SYSTEM</b>				
3.1	SITC of Dynamic pass box 2 Way having the following specification i/c connection testing commissioning etc complete as required.				
	Specifications:				
	Air Cleanliness- Class 100				

SI No	Description of Item	Qty	Unit	Rate	Amount
	Velocity-90 FPM $\pm$ 20%				
	Material of Construction- SS 304				
	Main Filter- Minipleat HEPA, Class: H14				
	Pre Filter- Pre Filter, Class: F7				
	Filter Efficiency- HEPA 99.997% at 0.3 $\mu$ m, Pre Filter 90% at 5 $\mu$ m				
	Noise (dB)- 67 $\pm$ 2				
	Lighting (Lux)- >500				
	Doors-Two Way / Three Way Doors with Glass view windows				
	Mechanical / Electromagnetic interlocking system.* ISO 9001: 2015				
	ISO CLASS 5, CLASS 100				
	MOC: SS-304, STAINLESS STEEL JINDAL, matt finish				
	WALL MOUNTED				
	FLOOR MOUNTED – BOTTOM HAVE 1.5- 2MM THICKNESS SS SHEET, Mimimum size 600mm x 600mm x 600 mm				
	Dynamic pass box made of 20 Gauge (1.0 mm) thickness				
	PARTICLE RETENTION: 0.3 MICRON & ABOVE				
	AIR PRESSURE IN GAUGE – 15+5 MMWC				
	AIR VELOCITY – 90+-20FPM				
	Fully protected and glass cased LED and UV lights				
	SS PANEL DOOR WITH GLASS VIEW, SS Hanges, SS handle,				
	DOOR INTERLOCKING SYSTEM -				
	DOOR OPENING WITH SOLID STATE ELECTRONIC -				
	Door Position -As per approved drawing				
	Pass box to be provided timer controlled door opening				
	hepa protect by ss perforated grill				
	SUPPLY BOX TYPE Mini pleat HEPA FILTER, EFFICIENCY 99.99%, 0.3mic				
	UV & FL LIGHTS Make PHILLIPS -				
	RETURN -Box type PRE FILTER -5 mic				
	Fresh air filter 5 micron				
	CONTROL SYSTEM SINGLE PHASE – 230vac – MAKE – INSTEC INDIA-				
	BUZZER & INDICATORS IN DISPLAY -				
	FRONT & BACK SIDE LED DISPLAY-				
	blower make NATIONAL PRODUCT & ROTECH				
	Control System make Instec India -				
	DOP Port FOR POA TEST				
	NEXTECH BRAND :MAGNELIC GAUGE(0- 50),ELECTRIC control panel.	2	Each	77,027.00	1,54,054.00

SI No	Description of Item	Qty	Unit	Rate	Amount
3.2	SITC of Dynamic Pass Box 3 way having the following specification i/c connection testing commissioning etc complete as required.				
	Specifications:				
	Air Cleanliness- Class 100				
	Velocity-90 FPM $\pm$ 20%				
	Material of Construction- SS 304				
	Main Filter- Minipleat HEPA, Class: H14				
	Pre Filter- Pre Filter, Class: F7				
	Filter Efficiency- HEPA 99.997% at 0.3 $\mu$ m, Pre Filter 90% at 5 $\mu$ m				
	Noise (dB)- 67 $\pm$ 2				
	Lighting (Lux)- >500				
	Doors-Two Way / Three Way Doors with Glass view windows				
	Mechanical / Electromagnetic interlocking system.* ISO 9001: 2015				
	ISO CLASS 5, CLASS 100				
	MOC: SS-304, STAINLESS STEEL JINDAL, matt finish				
	WALL MOUNTED				
	FLOOR MOUNTED – BOTTOM HAVE 1.5-2MM THICKNESS SS SHEET, Mimimum size 600mm x 600mm x 600 mm				
	Dynamic pass box made of 20 Gauge (1.0 mm) thickness				
	PARTICLE RETENTION: 0.3 MICRON & ABOVE				
	AIR PRESSURE IN GAUGE – 15+-5 MMWC				
	AIR VELOCITY – 90+-20FPM				
	Fully protected and glass cased LED and UV lights				
	SS PANEL DOOR WITH GLASS VIEW ,SS Hanges, SS handle,				
	DOOR INTERLOCKING SYSTEM -				
	DOOR OPENING WITH SOLID STATE ELECTRONIC -				
	Door Position -As per approved drawing				
	Pass box to be provided timer controlled door opening				
	hepa protect by ss perforated grill				
	SUPPLY BOX TYPE Mini pleat HEPA FILTER, EFFICIENCY 99.99%, 0.3mic				
	UV & FL LIGHTS Make PHILLIPS -				
	RETURN -Box type PRE FILTER -5 mic				
	Fresh air filter 5 micron				
	CONTROL SYSTEM SINGLE PHASE – 230vac – MAKE – INSTEC INDIA-				
	BUZZER & INDICATORS IN DISPLAY -				
	FRONT & BACK SIDE LED DISPLAY-				
	blower make NATIONAL PRODUCT & ROTECH				

SI No	Description of Item	Qty	Unit	Rate	Amount
	Control System make Instec India - DOP Port FOR POA TEST				
	NEXTECH BRAND: MAGNELIC GAUGE(0-50),ELECTRIC control panel.	1	Each	99,709.00	99,709.00
3.3	SITC of Static pass box- Pass Box (Aluminum & Static) 2/3 way of Size 450x450×450 (Internal) having the following specification i/c connection testing commissioning etc complete as required.				
	The Pass-Box wings are made of the same anodized Aluminium profile with glass and doors with an Aluminium handle, floor air-stops, a 45mm thick sandwich panel interior and perimeter tight seal gaskets.				
	The interior of the static Pass Box is made of GI Powder coated skin(sides) and SS 304 stainless steel with a scotch-brite finish base.				
	The corners inside the Pass Box chamber shall be covered for easy cleaning.				
	Toughened Glass on both front and back door.				
	Dimensions: L x H x W: 450mm x 450mm x 450mm (Internal)				
	INTERLOCK: Version with complete mechanical and/or electrical and/or electronic interlock system				
	2/3 WAY DOOR,				
	Indicator is provided for door interlocking signal				
	5mm Plain toughned Glass				
	Aluminum Panel DOOR WITH GLASS VIEW -				
	AI HINGES, AL D- HANDLE				
	FRONT & BACK SIDE SINGLE DOOR				
	ONE TIME ONE DOOR OPENING				
	DOOR INTERLOCKING SYSTEMS				
	DOOR OPENING WITH SOLID STATE ELECTRONIC				
	FL LIGHTS -MAKE SYSCKA				
	Both door side display				
	POWER SUPPLY PHASE: 220-230 V AC/ single phase / 50Hz -				
	BOTH DOOR SIDE MAGNET PROVIDE-INTELOCKING YSTEM				
	electro-magnetic interlocking – make instec india				
	ONE TIME ONE DOOR OPENING				
	ONE SIDE DOOR OPEN FL LIGHT ON				
	LIGHT MANUALY & AUTOMATACALLY OPERATE				
	Static Pass box enabling material transfer from the Lab				
	Rooms to clean/dirty corridor	4	Each	26,639.00	1,06,556.00

SI No	Description of Item	Qty	Unit	Rate	Amount
3.4	Dismantling of existing Diffusers from the proposed VRDL Lab area, i/c taking in the custody of contractor and handing over to client department as required.	22	Job	103.00	2,266.00
3.5	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.				
3.5.1	Thickness 0.63 mm sheet	200	Sq.m	1,602.00	3,20,400.00
3.5.2	Thickness 0.80 mm sheet	125	Sq.m	1,868.00	2,33,500.00
3.6	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.				
3.6.1	19mm	100.00	Sq.m	1,070.00	1,07,000.00
3.6.2	25mm	125.00	Sq.m	1,364.00	1,70,500.00
3.7	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.	3.20	Sq.m	10,009.00	32,029.00
3.8	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.	12.60	Sq.m	12,706.00	1,60,096.00
3.9	Modification in the existing AHU (6800 CFM, Total Static Pressure:50mm, Make: Citizen)by providing Return Air Plenum Aluminum profile, 22 G inside GI sheet and 22 G GI outside sheet with pre-coating (Puff Density:-- 38 – 40 kg/cu.m) Plenum frame work shall be of Anodized Aluminum construction (25 mm thick Double skin with PUF insulation having desity of 40Kg/CuM) Pebble Grey (RAL 7032) with Nozzle for R A and F A. Extruded Aluminium Hollow profile without thermal breakRA Nozzle should be provided with Fire Damper and VCD. F A Nozzle should be provided with Damper (All VCDs should be Opposed blade type low leakage	1	Job	1,07,023.00	1,07,023.00

SI No	Description of Item	Qty	Unit	Rate	Amount
	<p>Aerofoil design with concealed gears) and Prefilter of 20 Micron. There should be a Door/openable panel to remove / refit filters.Modification in existing AHU including SITC of Return Air Plenum with matching flanges, double skin in 25± 2 mm thick puff insulation complete with without thermal break profile Fresh air port with 10µ Efficiency washable filter and AI damper Return Air Port(without Damper), Pressure Gauge across Filter etc. Complete Existing AHU GA drawing is attached with the detailed specification. (This rate includes dismantling of above AHU, modify as per above &amp; refixing of AHU)</p> <p>Note: The system shall be suitable for integrating with the existing HVAC system. It shall be properly air balanced to achieve the parameters mentioned in Room Data sheet(Annexure-A) of HVAC. The HVAC system shall fulfill the general criteria of VRDL standard &amp; guidelines. It shall be the responsibility of agency to check all the factors for the validation of VRDL as per ICMR/competent authority guidelines.</p>				
3.10	<p>SITC of Horizontal Double skin Pressurizing Unit in 43± 2 mm thick puff (Puff Density:-- 38 – 40 kg/cu.m)insulation complete with Aluminum profile, 22 G inside GI sheet and 22 G PCGI outside sheet with pre-coating, with Blower Section(suitable DIDW blower of Kruger/Nicotra), Filter Section (Prefilter and HEPA Filter), Discharge Plenum. AHU frame work shall be of Anodized Aluminum construction with thermal break profile, Inlet Air Port, Outlet Air Port and Exhaust Port will be provide without Dampers), Pressure gauges across the filters Fresh air port with Fumiogation and Sampling Nozzles etc. complete as per GA Drawing. DIDW BACKWARD CURVE FAN -(single or twin blower shall be selected for 500 CFM, 100mm WC), Motor will be Eff – 2, motor compatible with VFD. Marine light with limit switch across fan section door shall be provided with switch for marine light on / off outside the unit. Filter section – Fine filter 5µ (EU-7) 95% efficiency, washable filter rating and PVC ports for pressure drop measurement as per specifications and HEPA Filter 0.3µ (H13) filter rating and PVC ports for pressure drop measurement as per specifications. (Both the Fitters will be 600mmx600mm) Hepa filter section – 0.3µ-99.997 % Efficiency filter</p>	1	Job	3,37,162.00	3,37,162.00

SI No	Description of Item	Qty	Unit	Rate	Amount
	rating and PVC ports for pressure drop measurement as per specifications				
3.11	<p>SITC of Horizontal Double skin Exhaust Unit in 25± 2 mm thick puff (Puff Density :- 38 - 40 kg/cu.m)insulation complete with Aluminum profile, 22 G inside GI sheet and 22 G PCGI outside sheet with pre-coating, with Filter Section (Prefilter and HEPA Filter) , Blower Section (suitable Plug Fan of Kruger/Nicotra ), Discharge Plenum. AHU frame work shall be of Anodized Aluminum construction without thermal break profile, Inlet Air Port, Outlet Air Port and Exhaust Port will be provided without Dampers), Pressure gauges across the filters, with Fumiogation and Sampling Nozzles etc. complete as per GA Drawing.</p> <p>Filter section – Fine filter 5µ (EU-7) 95% efficiency, washable filter rating and PVC ports for pressure drop measurement as per specifications and HEPA Filter 0.3µ (H13) filter rating and PVC ports for pressure drop measurement as per specifications. (Both the Filters will be 600mmx600mm) PLUG BACKWARD CURVE FAN -(single or twin blower shall be selected for 300 CFM, 100mm WC ), Motor will be Eff - 2 , motor compatible with VFD. Marine light with limit switch across fan section door shall be provided with switch for marine light on / off outside the unit. Hepa filter section - 0.3µ-99.997 % Efficiency filter rating and PVC ports for pressure drop measurement as per specifications.</p>	1	Each	3,37,162.00	3,37,162.00
3.12	SITC of Exhaust Propeller fan upto 300 CFM, static minimum 20mm WC Axial Flow with Round/square casing for connecting plenum box Size 450mm, Motor single phase, Noise level less than 70 db	3	Each	8,638.00	25,914.00
3.13	Dismantling of existing HVAC ducting from the proposed VRDL Lab area, i/c taking in the custody of contractor and handing over to client department store as required.	1	Job	6,544.00	6,544.00
3.14	Supplying, installation, testing and commissioning of following nominal cooling capacity and ISEER value rated inverter hi-wall split air conditioner unit complying to IS: 1391: 1992 (Part-I & II) with up-to-date amendments complete with indoor unit, outdoor unit (condenser and evaporator coil shall be of copper) etc. and operating on R410a / R32 refrigerent gas, 230V,50 Hz, single phase a.c supply, capable of performing a) cooling b) air circulating c) filtering including providing wireless remote control unit, upto 3 metre copper refrigerent				

SI No	Description of Item	Qty	Unit	Rate	Amount
	pipng, electrical wiring, drain piping for condensate drain water, nitrile tubings from indoor unit, connections, interconnections complete with supplying and fixing factory fabricated outdoor unit with mounting bracket and fixing heavy duty stand for fixing out door unit etc complete as required.				
3.14.1	1.5 TR, 3 star inverter type, rated cooling capacity not less than 5000 W, ISEER value: not less than 3.9, Make: Carrier CAI19PL3R35F0, Equivalent in Mitsubishi/Daikin/Bluestar	1	Each	56,451.00	56,451.00
3.14.2	2 TR, 3 star inverter type, rated cooling capacity not less than 6000 W, ISEER value: not less than 3.9 Make: Carrier CAI24PL3R35F0, Equivalent in Mitsubishi/Daikin/Bluestar	3	Each	66,870.00	2,00,610.00
3.15	SITC of 230V single phase, 50Hz, wall mounted type electronic voltage stabilizer suitable for split air conditioners upto 1.5 TR capacity (wall mounted type) having time delay, high and low voltage cut off etc. as required. (Make: V Guard iD4 Prima 2040/Everest/Microtek)	1	Each	3,841.00	3,841.00
3.16	SITC of 230V single phase, 50Hz, wall mounted type electronic voltage stabilizer suitable for split air conditioners upto 2 TR capacity (wall mounted type) having time delay, high and low voltage cut off etc. as required. (Make: V Guard iD5 Ace 5540/Everest/Microtek)	3	Each	6,847.00	20,541.00
3.17	Providing extra liquid and gas refrigerant copper piping as per standards for the above split AC units from indoor unit to outdoor unit complete with providing nitrile rubber insulation, electrical cabling, overall insulation etc. as required	10	Metre	1,483.00	14,830.00
	<b>Total of Sub Head-III</b>				<b>24,96,188.00</b>
	Total of Sub Head-I				14,01,228.00
	Total of Sub Head-II				1,25,330.00
	Total of Sub Head-III				24,96,188.00
	<b>Total of E&amp;M</b>				<b>40,22,746.00</b>

**Executive Engineer (E)**  
**Trivandrum, CPWD**

### Schedule of Quantities – Minor Component – Civil

**Name of Work:** Setting up of Virus Research and Diagnostic Lab (VRDL) at CD Block Basement level-1, BMT Wing, SCTIMST, Poojappura, Trivandrum.

SI No.	Description	Qty	Unit	Rate	Amount
1	Providing and fixing tiled false ceiling of specified materials of size 595x595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanized steel sections ( galvanized @ 120 grams/ sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to center and cross "T" of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanised butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T-sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge.				
1.1	GI Metal Ceiling Lay in plain Tegular edge Global white color tiles of size 595x595 mm, and 0.5 mm thick with 8 mm drop; made of G I sheet having galvanizing of 100 gms/sqm (both sides inclusive) and electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending.	208.00	Sqm	2517.20	523,578
2	15 mm cement plaster:				
2.1	1:4 (1 cement : 4 fine sand)	8.00	Sqm	528.60	4,229
3	Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound ) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour.				
3.1	One coat	310.00	Sqm	121.75	37,743

SI No.	Description	Qty	Unit	Rate	Amount
4	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge.				
4.1	in cement mortar	1.00	Cum	2726.20	2,726.
5	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete and stacking within 50 metres lead :	3	Each	485.90	1,458
6	Dismantling of aluminium/ Gypsum partitions, doors, windows, fixed glazing and false ceiling and same to be reused for refixing including disposal of unserviceable material and stacking of serviceable material with in 50 meters lead as directed by Engineerin- charge.	270.00	Sqm	74.55	20,129
7	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings and fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed work, including cutting chases and making good the walls etc.				
7.1	25 mm dia	45.00	metre	830.05	37,352
8	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge.				
	External work				
8.1	50 mm nominal dia Pipes	60.00	metre	1051.00	63,060
9	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931				
9.1	15 mm nominal bore	11	Each	759.95	8,359
10	Providing and fixing 16G SS304 tube with Argon welding (preferably Orbital welding) as per IS : 6911:2017 and conforming to EN-10312 standards complete with press type fitting (fitting shall be paid for separately) including fixing of the pipe with clamps at 1.00 m spacing including cutting and making good the walls including testing of joints complete as per direction of Engineer-in-charge. (The pipe length inserted in the fitting shall not be measured for payment				
	Concealed work				
10.1	19/25 OD	25.00	metre	1356.70	33,918
11	Providing and laying factory made Precast concrete solid blocks of 200 mm thickness of				

SI No.	Description	Qty	Unit	Rate	Amount
	grade M10 made of C&D waste from approved manufacturer in foundation and plinth in:				
11.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	1.00	Cum	9775.40	9,775
12	Providing and fixing Clean Room Partitions (0.6mm skin) with Al Channel base				
12.1	The panels will be prefabricated with non-particle shredding powder coating finish. The prefabricated wall and ceiling panels shall provide impervious and monolithic construction and surface finish. The modular wall panels 50mm thick shall be constructed in minimum 0.5 mm (24G) thick GSS sheet on both sides, in-filled with PUF insulation (density approx. 40 kg/m <sup>3</sup> ), finished with powder coating, oven lacquered smooth to 60 to 80 micron thickness. All the joints between panels, cut outs and openings shall be sealed with silicon sealant. The Calcium Silicate Ceiling shall be adequately supported with suspension and hanger system. Proper access to be provided to carry out work above the False Ceiling. Wherever necessary, Trap doors to be provided. The conduits for providing wires and cables for light, power, data, voice and other services shall be factory inserted in the wall panels. Areas to be covered: All rooms in VRDL except Donning, Doffing, Sample Processing and PCR amplification Rooms.	150.00	sqm	3,773.53	566,037
13	Providing and fixing Clean Room Partitions (0.8mm skin) Al Channel base				
13.1	The panels will be prefabricated with non-particle shredding powder coating finish. The prefabricated wall and ceiling panels shall provide impervious and monolithic construction and surface finish The modular wall panels 50mm thick shall be constructed in minimum 0.8 mm (24 G) thick GSS sheet on both sides, and ceiling panels 50 mm thick shall be constructed in minimum 0.5 mm (24 G) thick GSS sheet on both sides, in-filled with PUF insulation (density approx. 40 kg/m <sup>3</sup> ), finished with powder coating, oven lacquered smooth to 60 to 80 micron thickness. All the joints between panels, cut outs and openings shall be sealed with silicon sealant. The overall thickness of the wall and ceiling panels shall be as indicated in the layout plan drawing, with minimal tolerance. The wall and ceiling panels shall be supported on heavy duty aluminium profile. The Ceiling should be supported by anchoring using minimum 42mm (R-42) aluminium coving on the wall and ceiling corners. The color of the coving shall be same as of the wall/ceiling colour, corners shall be rounded at turn from X-Y direction, milled solid aluminium spheres shall	113.00	sqm	4,745.30	536,241

SI No.	Description	Qty	Unit	Rate	Amount
	be provided in same color at the 3-D (wall/ceiling/wall junction) and 2-D (wall/ceiling junction). The ceiling shall be adequately supported with suspension and hanger system. Proper access to be provided to carry out work above the False Ceiling. Wherever necessary, Trap doors to be provided. The conduits for providing wires and cables for light, power, data, voice and other services shall be factory inserted in the wall panels. Areas to be covered: Donning, Doffing, Sample Processing and PCR amplification Rooms				
14	Providing and fixing Clean Room Partitions (0.8mm skin) Al Channel base				
14.1	The panels will be prefabricated with non-particle shredding powder coating finish. The prefabricated wall and ceiling panels shall provide impervious and monolithic construction and surface finish. The modular wall panels 50mm thick shall be constructed in minimum 0.8 mm (24 G) thick GSS sheet on both sides, and ceiling panels 50 mm thick shall be constructed in minimum 0.5 mm (24 G) thick GSS sheet on both sides, in-filled with PUF insulation (density approx. 40 kg/m <sup>3</sup> ), finished with powder coating, oven lacquered smooth to 60 to 80 micron thickness. All the joints between panels, cut outs and openings shall be sealed with silicon sealant. The overall thickness of the wall and ceiling panels shall be as indicated in the layout plan drawing, with minimal tolerance. The wall and ceiling panels shall be supported on heavy duty aluminium profile. The Ceiling should be supported by anchoring using minimum 42mm (R-42) aluminium coving on the wall and ceiling corners. The color of the coving shall be same as of the wall/ceiling colour, corners shall be rounded at turn from X-Y direction, milled solid aluminium spheres shall be provided in same color at the 3-D (wall/ceiling/wall junction) and 2-D (wall/ceiling junction). The ceiling shall be adequately supported with suspension and hanger system. Proper access to be provided to carry out work above the False Ceiling. Wherever necessary, Trap doors to be provided. The conduits for providing wires and cables for light, power, data, voice and other services shall be factory inserted in the wall panels. Areas to be covered: Donning, Doffing, Sample Processing and PCR amplification Rooms.	62.00	SqM	3,315.34	205,551
15	Providing and fixing Clean Room Walkable False Ceiling (0.5mm skin) 50 thick				
15.1	The panels will be prefabricated with non-particle shredding powder coating finish. The prefabricated wall and ceiling panels shall provide impervious and monolithic construction	2.70	Sqm	4,880.87	13,178

SI No.	Description	Qty	Unit	Rate	Amount
	and surface finish. The modular wall panels 50mm thick shall be constructed in minimum 0.8 mm (24 G) thick GSS sheet on both sides, and ceiling panels 50 mm thick shall be constructed in minimum 0.5 mm (24 G) thick GSS sheet on both sides, in-filled with PUF insulation (density approx. 40 kg/m <sup>3</sup> ), finished with powder coating, oven lacquered smooth to 60 to 80 micron thickness. All the joints between panels, cut outs and openings shall be sealed with silicon sealant.. The overall thickness of the wall and ceiling panels shall be as indicated in the layout plan drawing, with minimal tolerance. The wall and ceiling panels shall be supported on heavy duty aluminium profile. The Ceiling should be supported by anchoring using minimum 42mm (R-42) aluminium coving on the wall and ceiling corners. The color of the coving shall be same as of the wall/ceiling colour, corners shall be rounded at turn from X-Y direction, milled solid aluminium spheres shall be provided in same color at the 3-D (wall/ceiling/wall junction) and 2-D (wall/ceiling junction). The ceiling shall be adequately supported with suspension and hanger system. Proper access to be provided to carry out work above the False Ceiling. Wherever necessary, Trap doors to be provided. The conduits for providing wires and cables for light, power, data, voice and other services shall be factory inserted in the wall panels. Areas to be covered: Donning, Doffing, Sample Processing and PCR amplification Rooms				
16	Providing and fixing View Panel with Double Glass Size 900mmx600mm				
16.1	The size of glass view panels in partition wall shall be: 900x600 mm with a double/single glazing thickness of 50mm with radius finish angles.It shall be of 5mm thick tempered glass. Rectangle double / single glazed view panels with jambs using 5 mm toughened glass with Curved black bordered, double side adhesive 3M tape and the edges sealed with silicon sealant, Frame with GI powder coated 1mm thick sheets inside with curved corners (Panel area will not be deducted) other features:Natural silver colour structural raceway containing anti- condensation salts Satin finish to block vision whilst ensuring the diffusion of light Qty: 5 Nos.	3.78	sqm	2,692.87	10,179
17	Providing and fixing Cleanroom Doors of Size 750MMX2100MM(1.575 SqM)4 Nos				
17.1	Doors are designed to fit flush into the wall panel system on both sides and are supplied in different dimensions. Doors are fabricated from	6.31	sqm	17,320.59	109,293

SI No.	Description	Qty	Unit	Rate	Amount
	galvanized iron sheets duly powder coated. Shutter has sheet thickness of 0.8mm and the frame of 1.2mm. Standard 50 mm panel has frame width of 45 mm and shutter width of 38mm. The frame should be with suitable infill and 38mm thick flush shutters with double skin using 0.6 mm thick GSS, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper or PUF. Access control panel mounting arrangement on the door and frame as required shall be made by the agency. The following accessories are a part of the door: a) Shutter Thickness: 38 mm thick b) SS 304 , Ball Bearing hinges, 100mmx 3mm --- 3 Nos c) SS304 'D' type of handles on pull sided) Stainless steel push plates on push side.---JSWe) Standard arm door closure f) Double Glass View panel (300mm x 450mm) along with self-adhesive tape and silicon sealant----Saint Gobaing) Both side key operated locking arrangement h) Filler material: PUFi) SS 304 Foot guard size 1mm etc. and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. Access control panel mounting arrangement on the door and frame as required shall be made by the agency. Location proposed: Donning, Doffing, Sample Processing and PCR Amplification Rooms				
18	Providing and fixing Cleanroom Doors of Size 1000MMX2100MM(2.1qM) 1 No.				
18.1	Doors are designed to fit flush into the wall panel system on both sides and are supplied in different dimensions. Doors are fabricated from galvanized iron sheets duly powder coated. Shutter has sheet thickness of 0.8mm and the frame of 1.2mm. Standard 50 mm panel has frame width of 45 mm and shutter width of 38mm. The frame should be with suitable infill and 38mm thick flush shutters with double skin using 0.6 mm thick GSS, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper or PUF. Access control panel mounting arrangement on the door and frame as required shall be made by the agency. The following accessories are a part of the door: a) Shutter Thickness: 38 mm thick b) SS 304 , Ball Bearing hinges, 100mmx 3mm ---3 Nos c) SS304 'D' type of handles on pull side d) Stainless steel push plates on push side.---JSW e) Standard arm door closure	2.10	sqm	19,919.73	41,831

SI No.	Description	Qty	Unit	Rate	Amount
	f) Double Glass View panel (300mm x 450mm) along with self-adhesive tape and silicon sealant---Saint Gobain g) Both side key operated locking arrangement h) Filler material: PUF i) SS 304 Foot guard size 1mm etc. and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. Access control panel mounting arrangement on the door and frame as required shall be made by the agency. Location proposed: Donning, Doffing, Sample Processing and PCR Amplification Rooms				
19	Providing and fixing AI/CR Doors of Size 750MMX2100MM (1.575 SqM) 3 Nos.				
19.1	Pressed steel door frame Profile B section 50 X45 mm with 1.2 mm galvano steel sheet with suitable infill and 38mm thick flush shutters, with double skin using 0.6 mm thick galvano steel sheet, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper/PUF insulation and fitted with necessary SS fittings and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. The size of glass view panels on doors shall be: 300x450 mm with a double/single glazing thickness of 38mm with radius finish angles. Suggested areas/ Location proposed: Airlock , Dry and Change Room	4.74	sqm	14,523.04	68,839
20	Providing and fixing AI/CR Doors of Size 1000MMX2100MM(2.1 SqM) 11 Nos.				
20.1	Providing and fixing AI/CR Doors of Size 1000MMX2100MM(2.1 SqM) Doors are designed to fit flush into the wall panel system on both sides and are supplied in different dimensions. Doors are fabricated from galvanized iron sheets duly powder coated. Shutter has sheet thickness of minimum 0.5 mm (24 G) and the frame of 1.2mm. Standard 50 mm panel has frame width of 50 mm and shutter width of 38mm. The frame should be with suitable infill and 38mm thick flush shutters with double skin using 0.8 mm thick GSS, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper or PUF. The following accessories are a part of the door:a) Shutter Thickness: 38 mm thick b) Heavy duty aluminium anodized hinges, 100mmx 3mm ---3 Nos c) Anodized Aluminum 'D' type of handles on pull side d) Stainless steel push plates on push side.---JSW e) Standard arm door closure f) View panel	23.10	sqm	14,523.03	335,482

SI No.	Description	Qty	Unit	Rate	Amount
	(300mm x 450mm) along with self-adhesive tape and silicon sealant---Saint Gobain g) Both side key operated locking arrangement h) Filler material: PUf i) Foot guard size 1mm etc. and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. Access control panel mounting arrangement on the door and frame as required shall be made by the agency. Location proposed: All rooms in VRDL except Donning, Doffing, Sample Processing and PCR Amplification Rooms.				
21	Existing Al/CR Doors of Size 1500MMX2100MM(3.15 Sqm) 3 Nos.				
21.1	Existing Al/CR Doors of Size 1500MMX2100MM(3.15 Sqm) Doors are designed to fit flush into the wall panel system on both sides and are supplied in different dimensions. Doors are fabricated from galvanized iron sheets duly powder coated. Shutter has sheet thickness of minimum 0.5 mm (24 G) and the frame of 1.2mm. Standard 50 mm panel has frame width of 50 mm and shutter width of 38mm. The frame should be with suitable infill and 38mm thick flush shutters with double skin using 0.8 mm thick GSS, stiffened inside with C channels at 500 mm spacing and filled with honey comb craft paper or PUF. The following accessories are a part of the door:a) Shutter Thickness: 38 mm thick b) Heavy duty aluminium anodized hinges, 100mmx 3mm ---3 Nos c) Anodized Aluminium 'D' type of handles on pull side d) Stainless steel push plates on push side.---JSW e) Standard arm door closure f) View panel (300mm x 450mm) along with self-adhesive tape and silicon sealant---Saint Gobain g) Both side key operated locking arrangement h) Filler material: PUf i) Foot guard size 1mm etc. and finally powder coated to required colour and shade. Also the doors should be air sealed and should have sealed vision glass panels as per the functional requirement which shall be in scope of the work. Access control panel mounting arrangement on the door and frame as required shall be made by the agency. Location proposed: All rooms in VRDL except Donning, Doffing, Sample Processing and PCR Amplification Rooms. To be checked for all fittings including door closures etc. complete, repaired(if necessary) and serviced.	3.15	sqm	14,523.03	45,748
22	Providing and fixing Al Coving in Rooms (Room Nos. 2,3,4,5)				
22.1	Supply & Installation of R50/42 mm size Aluminium powder coated coving of colour	135.00	metre	514.95	69,519

SI No.	Description	Qty	Unit	Rate	Amount
	matching to ceiling & partitions, at the junction of ceiling & partition, partition & partition rate including press fit arrangement with & over aluminium base member, staging, ladder & scaffolding, etc. all inclusive.				
23	Providing Epoxy flooring				
23.1	Design and SITC of epoxy flooring over existing Tiled surface after CC mortar (1:4) filling in hollow portion below tiles, grinding, applying special epoxy for proper bond with the finishes as follows:Epoxy flooring:The jointless Epoxy flooring consists of Epoxy resin based jointless flooring over concrete surface including preparing the surface as required, application of epoxy primer of 100 microns thickness, 2-3 mm or more in thickness epoxy screed and self leveling 1 mm minimum epoxy topping in required approved shades. The entire job is to be undertaken by the manufacturer's trained and skilled technicians to lay the Epoxy based floor.Surface preparation:Applicators for the works should check out the moisture content in the existing CC/repared tiled surface after hollow cavity fillings and if the percentage of moisture content is high the same to be removed by using a hot compressed air machine and the surface irregularities shall be removed by using floor scarifier. The tiled floors shall be roughened using hand grinders to provide a mechanical key for the epoxy screed to bond well the substrate. Presence of dust, laitence etc. should be completely cleaned before commencing the application. Moisture testing should be done to ensure moisture limit not exceeding 5%. Epoxy Primer:On the prepared floor surface epoxy primer with high penetrating properties shall be applied, as per manufacturer's recommendations.Self leveling Epoxy topping:The self leveling top coat mixture shall be spread evenly by means of rollers and serrated trowels. The floor should be rolled by a spike roller to remove trapped air to uniform level and smoothness.	22.57	sqm	2,938.54	66,323
24	Providing Epoxy coving				
24.1	Epoxy Coving:  Epoxy primer shall be applied at the junctions of the wall corner. Epoxy coving of size 50 mm on either side shall be applied to the junctions between wall & floor. It is to be made with solventless epoxy screed/resin incorporating very high abrasion resistant aggregates. Screed mortar shall be applied by trowel. The material should be compacted and finished with a round trowel to a smooth concave finish as per manufacturer's specifications. Sealing of screed surface shall be made with sealer coat to	31.00	metre	1,156.14	35,840

SI No.	Description	Qty	Unit	Rate	Amount
	ensure that a smooth finish is obtained in desired colour matching that of the floor finish as per manufacturer's specifications. Performance properties shall meet or exceed the following: Finish- Gloss/ Semi Gloss (as approved) Compressive strength (ASTM C 579)- > 60 Mpa Tensile strength (ASTM C 307)- > 30 Mpa Hardness (ASTM D 2240) 80 Taber Abrasion Loss/1000 cycles (ASTM D 4060) -45 mg Suggested Areas proposed to be covered: 1) Donning, Sample Processing Room, Doffing 2) PCR Amplification Room. Rest of the Area- Present Flooring is to be left as it is.				
25	Providing and fixing wet shower with all the required items as per the direction of Engineer in Charge.				
25.1	Design & SITC of the Modular Wet Air shower system for VRDL shall be provided. It shall comprise of prefabricated cubicles and doors constructed in PVC/FRP of suitable size (1200mmx1500mm x2200mm) as per approved design layout. The shower cubicle shall be provided with exhaust fan, return air diffusers and light fixture. The exhaust duct should be connected to Exhaust Unit (HEPA Unit) with Non-return Damper. The shower cubicle door shall be in PVC/FRP of approximately 750 mm x 2100 mm size. The shower floor shall be anti skid with proper slope and drain point to allow connection with the effluent drain line by making opening or puncturing the existing RCC floor slab. The shower doors shall have latch and lock fittings. The shower system shall be complete with a separate exhaust fan, air passage/GI duct, nozzles, doors, illumination system, LCD display with status etc. complete as required.	1	Each	228,705.89	228,706
	<b>Grand Total</b>				<b>3,075,094</b>

**Executive Engineer  
Trivandrum, CPWD**