



**GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT**



Notice Inviting Bid

Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi

Volume- I

NIT No: 06/CE/CVPZ-2/CVP/NIT/2026-27

**Chief Engineer
Central Vista Project Zone-2,
Adjacent to Bungalow No.9, Sunehri Bagh Road,
New Delhi-110011.**

**GOVERNMENT OF INDIA
CENTRAL VISTA PROJECT DIVISION-14
CENTRAL PUBLIC WORKS DEPARTMENT
NEW DELHI - 110023**

TENDER DOCUMENT

NIT No.	06/CE/CVPZ2/CVP/NIT/2026-27
Name of Work:	Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi
Estimated Cost:	A. Construction work component i. Civil: Rs. 280,05,44,676/- ii. E&M: Rs. 192,62,92,896/- B. Operation & Maintenance component i. E&M: Rs. 8,26,91,364/- Total: Rs. 408,95,28,936/-
Pre-Bid Meeting Date:	15.09.2026 at 11:00 Hrs.
Last date and time of Online submission of bid:	01.10.2026 up to 15:00 Hrs.

**Executive Engineer,
Central Vista Project Division –14,
CPWD, New Delhi**

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Name of work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.

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**Executive Engineer,
Central Vista Project Division -14,
CPWD, New Delhi**

PART-A

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT

NOTICE INVITING e-BIDS

The Executive Engineer, Central Vista Project Division-14, CPWD, New Delhi-110001. (email: delee-cvdpd14@cpwd.gov.in, Mob: 9582833521) on behalf of the President of India invites online Percentage Rate bids on Contract from eligible firms/agencies satisfying the eligibility criteria, in two bid system for the following work:

NIT No:	06/CE/CVPZ-2/CVP/NIT/2026-27
Name of work:	Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi
Estimated cost:	A. Construction work component iii. Civil: Rs. 280,05,44,676/- iv. E&M: Rs. 192,62,92,896/- B. Operation & Maintenance component i. E&M: Rs. 8,26,91,364/- Total: Rs. 408,95,28,936/-
Earnest Money:	Rs. 4,18,95,290/-
Period of Completion:	12 Months – Construction work 36 Months - O&M of E&M component
Pre-bid Meeting:	15/09/2026 at 11:00 Hrs.
Date & time of online submission of Bid:	01/10/2026 up to 15:00 Hrs

The bid forms and other details can be obtained from the website <https://etender.cpwd.gov.in>. All corrigendum/ addendums shall only be available on this website and shall not be published anywhere else.

Executive Engineer,
Central Vista Project Division – 14,
CPWD, New Delhi.

PART-I

GENERAL INFORMATION

INFORMATION & INSTRUCTIONS FOR BIDDERS FOR E-TENDRING FORMING PART OF BID DOCUMENT

1. The Executive Engineer, Central Vista Project Division-14, CPWD New Delhi-110023. (email: delee-cvpd14@cpwd.gov.in, Mob: 9582833521) on behalf of the President of India invites online Percentage Rate bids on Contract from eligible firms/agencies satisfying the eligibility criteria, in two bid system for the following work:

NIT No.	06/CE/CVPZ-2/CVP/NIT/2026-27
Name of Work	Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi
Location	GPOA Block 1 ,Netaji Nagar, New Delhi
Estimated cost of work put to bid	A. Construction work component i. Civil: Rs. 280,05,44,676/- ii. E&M: Rs. 192,62,92,896/- B. Operation & Maintenance component i. E&M: Rs. 8,26,91,364/- Total: Rs. 408,95,28,936/-
Earnest Money	Rs. 4,18,95,290/-
Stipulated Period of Completion	12 Months – Construction work 36 Months - O&M of E&M component
Last date & time of online submission of "Bid", copy of deposition of original EMD and other documents as specified in the bid document.	Up to 15:00 Hrs. on 01/10/2026
Time and date of opening of eligibility documents	15:30 Hrs. on 01/10/2026
Pre-Bid Conference	Pre-bid conference to be held with all the intending bidders in the O/o CVPZ-2, Conference Hall, adjacent to Bungalow No.9 Sunehari bagh, CPWD, New Delhi-110011 at 11:00 Hrs. on 15/09/2026

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

- (i) (a) Past experience:** Bidder should have satisfactorily completed the similar work/s as mentioned below during the last seven years ending last day of month previous to the one in which bids 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 Executive Engineer or equivalent.

Three similar works each costing not less than 160 crore

or

Two similar works each costing not less than 240 crore

or

One similar work costing not less than 321 crore

Similar work shall mean:-

“Non-Residential Building work mandatorily including internal finishing, internal water supply, sanitary installations, internal electric installation, HVAC and firefighting executed under one agreement in India.” (to be read with Note below)

Or

“Internal Finishing work in Non-residential building mandatorily including flooring, false ceiling, partitions, internal water supply, sanitary installations, internal electric installation, HVAC and firefighting executed under a single agreement in India.” (to be read with Note below)

Note:

1. HVAC, firefighting if executed under separate contracts may also be considered for the purpose of assessing the technical competence only without adding its monetary value for determining the eligibility criteria.

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

2. In case, the eligible work has been executed by a Joint Venture through one or more individual firms, then cost of completed work shall be distributed among the individual firm(s) in proportion to their share in Joint Venture and that will be considered as work experience for individual firm(s) for pre-qualification in bidding.
3. In case, the eligible work has been executed by a Joint Venture through one or more individual firms, then cost of completed work shall be distributed among

the individual firm(s) in proportion to their share in Joint Venture and that will be considered as work experience for individual firm(s) for pre-qualification in bidding.

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

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

- (ii) Average monthly turnover/progress:** The agency should have achieved average monthly financial turnover/progress of at least **Rs. 26.71 Crore** per month in single construction work under one agreement costing not less than **Rs. 160 Crore** (Not necessarily similar work) completed during the last 7 (seven) years ending last day of previous month of date of call of tender. 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 Executive Engineer or equivalent. The value of average monthly financial progress shall be worked out as completion cost of above work divided by actual duration of completion of work. The value of average monthly financial progress shall be brought to current costing level by enhancing the actual value of monthly turnover of single work at simple rate of 7% per annum calculated from the date of completion to previous day of last day of submission of bid including extended date, if any.

Note:- Extra time granted due to Force Majeure period due to COVID in the year 2020, here applicable to that extent shall be adjusted accordingly vide ministry of finance O.M F.18/4/2020-PPD dt 03.05.2020 while calculating average monthly financial turnover.

- (iii)** Should have **Average Annual Financial Turnover** of atleast **Rs. 123 Cr** on construction works during the immediate last three (03) consecutive financial years ending on **31st March 2025 or 2026**. This should be duly audited by Certified Chartered Accountants with UDIN number mentioned. Year in which no turnover is shown would also be considered for working out the average.

The value of Annual Financial Turnover figures shall be brought to current value by enhancing the actual turnover figures at simple rate of 7% per annum.

- (iv)** Should not have incurred any loss (**profit after tax should be positive**) in more than two years during last five consecutive balance sheets (financial years ending **31st March 2025 or 2026**) duly audited and certified by the Chartered Accountant with UDIN number mentioned.

- (v)** Should have a Banker's certificate from a commercial bank of **Rs. 164 Cr.**

Or

Should have a net-worth certificate of **minimum Rs. 41 Cr** issued by certified Chartered Accountant with UDIN.

(vi) The bidding capacity of the agency should be equal to or more than the estimated cost of the work put to bid for construction work. The bidding capacity shall be worked out by the following formula:

$$\text{Bidding Capacity} = \{[AxNx1.5] - B\}$$

Where,

A= Maximum turnover in construction works executed in any one year during the last seven years ending on 31.03.2025 or 2026 taking into account the completed as well as works in progress. The value of annual turnover shall be brought to current costing level by enhancing at a simple rate of 7% per annum (calculated from the date of completion to previous day of last date of submission of bids, including extended date, if any).

N= Number of years prescribed for completion of work for which bids has been invited.

B= Value of existing commitments of ongoing works during the period of execution of work for which bids have been invited as on last date of submission of bid including extended date, if any.

Note:

- i) The bidder should submit bidding capacity as per Form C-3.
- ii) Bidding capacity is applicable for all the bidders including CPWD enlisted contractors.
- iii) The bidder shall submit the calculation sheet of bidding capacity as per above formula along with Bid documents and submit an undertaking that all works in progress or awarded to him have been included in the list submitted by him in the Form C-1 and no ongoing work has been left out. In case, it is found that bidder has concealed any information, suitable legal as well as criminal action shall be taken against bidder for concealing such information.
- iv) Bidding capacity formula, for CPWD contractors who are enlisted based on rule 6.1.7 of Enlistment Rules -2024 i.e., government retired engineer/architect for three years from the date of issue of enlistment order is as follows:

$$\text{Bidding Capacity} = \{[AxNx1.5] - B\}$$

Where,

A = Banker certificate figure as submitted by applicant (i.e. government retired engineer/ architect) at the time of enlistment for first year of enlistment and

subsequent fresh bankers' certificate for second and third year respectively. Value of A for first year will be mentioned in the enlistment order by the member secretary of advisory committee for enlisting authority.

N = Number of years prescribed for completion of work for which bids have been invited.

B = Value of existing commitments and on-going works to be completed during the period of completion of work for which bids have been invited. This value is for newly enlisted entity.

Within three years from the date of issue of enlistment order, the newly enlisted entity has to develop its own bidding capacity and thereafter the general bidding capacity formula used for other entities shall be applicable to it for calculation of bidding capacity.

Newly enlisted entity may like to follow general bidding capacity formula even before period of three years if it so chooses.

- v) Bidding capacity, for CPWD contractors who are enlisted based on rules 9.6.3 & 9.6.4 of Enlistment Rules-2024 i.e. new entity based on previously enlisted entity for three years from date of issue of enlistment order, is as follows:

Annual turnover of newly enlisted entity shall be in proportion to the shareholding of partners/directions in the original enlisted entity at the time of enlistment of the newly enlisted entity.

Within three years from the date of issue of enlistment order, the newly enlisted entity has to develop its own bidding capacity and thereafter the general bidding capacity formula being used for other entities shall be applicable to it for calculation of bidding capacity. Newly enlisted entity may like to follow general bidding capacity formula even before period of three years, if it so chooses.

- vi) Bidding Capacity for newly enlisted entity based on rules 9.6.3 & 9.6.4 enlistment rules -2024 shall be as follows:

$$=[A' \times N \times 1.5] - B \text{ Where,}$$

A' = Proportionate share of newly enlisted director/partner in originally enlisted company/firm multiplied by the factor A, as given below.

Value of A' will be mentioned in the enlistment order by member secretary of Advisory committee for Enlistment Authority, it will remain same for three years.

A = Maximum turnover in construction works executed in any one year during the last seven years taking into account the completed as well as works in progress. The value of completed works shall be brought to current costing level by enhancing at a simple rate of 7 % per annum. This value is of originally enlisted entity at the time of enlistment of newly enlisted entity.

N = Number of years prescribed for completion of work for which bids have been invited.

B = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited. This value is for newly enlisted entity.

Enlisted entities based on rules 6.1.7, 9.6.3 or 9.6.4 of enlistment rules 2024 can submit MoU from agency having requisite experience for structural system technology if the enlisted entity does not have required experience.

- vii) 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.
- viii) Information and instructions for bidders posted on website shall form part of bid document.

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

(vii) 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 copy of receipt of documents such as Insurance Surety Bonds, Account Payee Demand Draft of a commercial bank, Fixed Deposit Receipt (FDR) of a commercial bank, Banker's cheque of a commercial bank or Bank Guarantee including e-Bank Guarantee (for balance amount as prescribed) from any of the commercial banks towards EMD in favour of Executive Engineer as mentioned in NIT (as per Form "H" in this bid document), receipt for deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE/ AE), CPWD and other documents as specified.

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

The bank guarantee including e-Bank Guarantee submitted as a part of Earnest Money shall be valid for a period of **180 days** or more from the last day of submission of bid.

Details of Beneficiary
Beneficiary Name: Executive Engineer, Central Vista Project Division-5, CPWD

Name of Bank: State Bank of India, Nirman Bhawan, New Delhi
Beneficiary Account No.: 41151598603 (Receipt)
IFSC Code: SBIN0000583
MICR Code: 110002092

3. Those Bidders, not registered or have not updated their profile on the website mentioned below, are required to get registered / update their profile themselves beforehand. The necessary training material including the videos with step-to- step process is available on download section of the website <https://etender.cpwd.gov.in>.
4. The intending bidder must have valid class-III digital signature certificate with encryption key (combo type) to perform any operation/ transaction on the e- tendering portal/ website and the bidder should download and install the **emSigner** on their system as per instructions available on download section of <https://etender.cpwd.gov.in>. **Only e-bid shall be accepted.**
5. On opening date, the Bidder can login and see the bid opening process. After opening of bids, he will receive the competitor bid sheets.
6. Bidder can upload documents in the form of JPG format or/and PDF format.
7. **Certificate of Financial Turn over:** At the time of submission of bid, bidder may upload affidavit/certificate from CA mentioning Financial Turn Over of last seven years ending 31.03.2025 or 2026 duly certified by the chartered accountant with UDIN number mentioned. There is no need to upload entire voluminous balance sheet.
8. Bidder 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 cells left blank, the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (**Zero**).
However, If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
9. The Technical 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 technical bid shall be communicated to them at a later date.
The decision of rejection of technical bid alongwith reasons of rejections shall be uploaded on ERP portal by tender inviting authority. The aggrieved bidder can make appeal against the decision, on ERP portal within 48 hours of uploading of decision of rejection of technical bid.

After receipt of appeal from the aggrieved bidder, the tender inviting authority shall

Correction –Nil

Insertion –Nil

Deletion –Nil

Overwriting –Nil

upload the decision on the appeal preferably within 3 working days and in no case the financial bid shall be opened without disposal of appeal and uploading the same on ERP portal.

10. The intending bidders are advised to visit the site before attending the pre-bid meeting to have more clarity about the site conditions and availability of space for execution of the work.

Pre-bid conference has already been held with all the intending bidders in the office of CE, CVPZ-2, Conference Hall, CPWD, Sunehri bagh, New Delhi-110011 at **11:00 Hrs. on 15/09/2026 to** clear the doubts of intending **bidders**.

Because of pre-bid conference, certain modifications may be issued to all eligible bidders by the Engineer-in-Charge by e-mail, if felt necessary by him. If further pre-bid conferences are required for complete and effective interactions, the date and time of same will be communicated.

All modifications/amendments/corrigendum issued regarding this bidding process & bid documents, shall be uploaded on website only and shall not be published in any Newspaper and shall form part of the Agreement.

11. 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.
12. 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.
13. The department reserves the right to reject any prospective application without assigning any reason thereof and to restrict the list of qualified bidders to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.
14. GST registration certificate, if already obtained by the bidder.

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

- I. Letter of transmittal. (Annexure-I)
- II. Insurance Surety Bonds / Account Payee Demand Draft / **Fixed Deposit Receipt** / Banker's cheque and Bank Guarantee including e-Bank Guarantee of any Commercial Bank if being made part of EMD.
- III. Certificates of Work Experience
- IV. Undertaking for site inspection.
- V. Certificate of Financial Turnover from CA in **Form 'A'**.
- VI. Average monthly financial turnover/progress **Form-A-1**
- VII. Banker's certificate in **Form 'B'** or Net worth certificate in **Form 'B-1'**.
- VIII. List of eligible similar nature of works completed during last seven years ending last day of month previous to the one in which bids are invited, in **Form 'C'**. If private works shown in support of eligibility, then certified copy of Tax Deducted at Source (TDS) certificate (Form 16A & 26A) shall be submitted along with experience certificate and the TDS amount shall tally with the actual amount of work done. Otherwise, the amount that tally with the TDS shall only be considered for eligibility.
- IX. Details of all projects under execution by bidder, if any, in **Form 'C-1'**.
- X. Bidding capacity in **Form 'C-3'**.
- XI. Assessment Certificate for completed as well as ongoing works in **Form 'D-1'**.
- XII. Structure and Organization of the bidder in **Form 'E'**.
- XIII. Undertaking on structural stability and soundness as per prescribed format in **Form 'F'**
- XIV. Performance report of completed works (submitted in Form 'C') in **Form 'G'**.
- XV. **Receipt for deposition of original EMD (Form H)** to division office of any Executive Engineer, CPWD (including NIT issuing EE) as Insurance Surety Bonds / Account Payee Demand Draft / Fixed Deposit Receipt / Banker's cheque and Bank Guarantee including e-Bank Guarantee of any Commercial Bank if being made part of EMD.
- XVI. Certificate under rule 144(XI) GFR in **Form-'I'**
- XVII. Undertaking Integrity in **Form-'J'**
- XVIII. Affidavit (**Form 'K'**)
- XIX. 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 account of the work executed and/or for any action taken by CPWD or GST department in this regard". **(Form M).**

- XX. Certificate to be furnished by Agency and their specialized Agency in **Form-'N'**
- XXI. Integrity Pact signed by the bidder in the presence of a witness.
- XXII. Any other Document as specified in the NIT.

**Executive Engineer,
Central Vista Project Division-14, CPWD
(For and on behalf of President of India)**

GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT
CPWD-6 FOR e-BIDDING

1. The Executive Engineer, Central Vista Project Division-14, CPWD, New Delhi-110011. (email: delee-cvdp14@cpwd.gov.in, Mob: 9582833521) on behalf of the President of India invites online Percentage Rate bids on EPC Contract from eligible firms/agencies satisfying the eligibility criteria, in two bid system for the following work:

NAME OF WORK: - Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi

- 1.1** The work is estimated to cost. **Rs. 408,95,28,936/-** (Civil: Rs. 280,05,44,676/- and E&M: Rs. 192,62,92,896/- +O&M of E&M: Rs. 8,26,91,364/-) However, this estimate cost is merely for rough guide.

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

The methodology and rate analysis used in deriving the ECPT are for the Department's reference and shall not be provided to bidders. No claims, disputes, or representations shall be entertained at any stage in this regard.

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.

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

Criteria of eligibility for submission of bid documents

- (i) (a) Past experience:** Bidder should have satisfactorily completed the similar work/s as mentioned below during the last seven years ending last day of month previous to the one in which bids 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 Executive Engineer or equivalent

Three similar works each costing not less than 160 crore

or

Two similar works each costing not less than 240 crore

or

One similar work costing not less than 321 crore

Similar work shall mean:-

“Non-Residential Building work mandatorily including internal finishing, internal water supply, sanitary installations, internal electric installation, HVAC and firefighting executed under one agreement in India.” (to be read with Note below)

Or

“Internal Finishing work in Non residential building mandatorily including flooring, false ceiling, partitions, internal water supply, sanitary installations, internal electric installation, HVAC and firefighting executed under a single agreement in India.” (to be read with Note below)

Note:

1. HVAC, firefighting if executed under separate contracts may also be considered for the purpose of assessing the technical competence only without adding its monetary value for determining the eligibility criteria.

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

2. In case, the eligible work has been executed by a Joint Venture through one or more individual firms, then cost of completed work shall be distributed among the individual firm(s) in proportion to their share in Joint Venture and that will be considered as work experience for individual firm(s) for pre-qualification in bidding.

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

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

amount of Earnest Money Deposit/Performance Guarantee. (Scanned copy to be uploaded at the time of submission of bid)

ii) Average monthly turnover/Progress:

The agency should have achieved average monthly financial turnover/progress of at least **Rs. 26.71 Crore** per month in single construction work under one agreement costing not less than **Rs. 160 Crore** (Not necessarily similar work) completed during the last 7 (seven) years ending last day of previous month of date of call of tender. 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 Executive Engineer or equivalent. The value of average monthly financial progress shall be worked out as completion cost of above work divided by actual duration of completion of work. The value of average monthly financial progress shall be brought to current costing level by enhancing the actual value of monthly turnover of single work at simple rate of 7% per annum calculated from the date of completion to previous day of last day of submission of bid including extended date, if any.

Note:- Extra time granted due to Force Majeure period due to COVID in the year 2020, here applicable to that extent shall be adjusted accordingly vide ministry of finance O.M F.18/4/2020-PPD dt 03.05.2020 while calculating average monthly financial turnover.

(iii) Should have **Average Annual Financial Turnover** of at least **Rs. 123 Cr** on construction works during the immediate last three (03) consecutive financial years ending on **31st March 2025 or 2026**. This should be duly audited by Certified Chartered Accountants with UDIN number mentioned. Year in which no turnover is shown would also be considered for working out the average.

The value of Annual Financial Turnover figures shall be brought to current value by enhancing the actual turnover figures at simple rate of 7% per annum

(iv) Should not have incurred any loss (**profit after tax should be positive**) in more than two years during last five consecutive balance sheets (financial years ending **March 2025 or 2026**) duly audited and certified by the Chartered Accountant with UDIN number mentioned.

(v) Should have a Banker's certificate from a commercial bank of **Rs. 164 Cr.**

Or

Should have a net-worth certificate of **minimum Rs. 41 Cr.** issued by certified Chartered Accountant with UDIN.

- (vi) The bidding capacity of the agency should be equal to or more than the estimated cost of the work put to bid for construction work. The bidding capacity shall be worked out by the following formula:

$$\text{Bidding Capacity} = \{[A \times N \times 1.5] - B\}$$

Where,

A= Maximum turnover in construction works executed in any one year during the last seven years ending on 31.03.2025 or 2026 taking into account the completed as well as works in progress. The value of annual turnover shall be brought to current costing level by enhancing at a simple rate of 7% per annum (calculated from the date of completion to previous day of last date of submission of bids, including extended date, if any).

N= Number of years prescribed for completion of work for which bids has been invited.

B= Value of existing commitments of ongoing works during the period of execution of work for which bids have been invited as on last date of submission of bid including extended date, if any.

Note:

- i. The bidder should submit bidding capacity as per Form C-3.
- ii. Bidding capacity is applicable for all the bidders including CPWD enlisted contractors.
- iii. The bidder shall submit the calculation sheet of bidding capacity as per above formula along with Bid documents and submit an undertaking that all works in progress or awarded to him have been included in the list submitted by him in the Form C-1 and no ongoing work has been left out. In case, it is found that bidder has concealed any information, suitable legal as well as criminal action shall be taken against bidder for concealing such information.
- iv. Bidding capacity formula, for CPWD contractors who are enlisted based on rule 6.1.7 of Enlistment Rules -2024 i.e., government retired engineer/architect for three years from the date of issue of enlistment order is as follows:

$$\text{Bidding Capacity} = \{[A \times N \times 1.5] - B\}$$

Where,

A = Banker certificate figure as submitted by applicant (i.e. government retired engineer/ architect) at the time of enlistment for first year of

enlistment and subsequent fresh bankers' certificate for second and third year respectively. Value of A for first year will be mentioned in the enlistment order by the member secretary of advisory committee for enlisting authority.

N = Number of years prescribed for completion of work for which bids have been invited.

B = Value of existing commitments and on-going works to be completed during the period of completion of work for which bids have been invited. This value is for newly enlisted entity.

Within three years from the date of issue of enlistment order, the newly enlisted entity has to develop its own bidding capacity and thereafter the general bidding capacity formula used for other entities shall be applicable to it for calculation of bidding capacity.

Newly enlisted entity may like to follow general bidding capacity formula even before period of three years if it so chooses.

- v. Bidding capacity, for CPWD contractors who are enlisted based on rules 9.6.3 & 9.6.4 of Enlistment Rules-2024 i.e. new entity based on previously enlisted entity for three years from date of issue of enlistment order, is as follows:

Annual turnover of newly enlisted entity shall be in proportion to the shareholding of partners/directions in the original enlisted entity at the time of enlistment of the newly enlisted entity.

Within three years from the date of issue of enlistment order, the newly enlisted entity has to develop its own bidding capacity and thereafter the general bidding capacity formula being used for other entities shall be applicable to it for calculation of bidding capacity. Newly enlisted entity may like to follow general bidding capacity formula even before period of three years, if it so chooses.

- vi. Bidding Capacity for newly enlisted entity based on rules 9.6.3 & 9.6.4 enlistment rules -2024 shall be as follows:

$$= \{[A' \times N \times 1.5] - B\} \text{ Where,}$$

A' = Proportionate share of newly enlisted director/partner in originally enlisted company/firm multiplied by the factor A, as given below.

Value of A' will be mentioned in the enlistment order by member secretary of Advisory committee for Enlistment Authority, it will remain same for three years.

A = Maximum turnover in construction works executed in any one year during the last seven years taking into account the completed as well as works in progress. The value of completed works shall be brought to current costing level by enhancing at a simple rate of 7 % per annum. This value is of originally enlisted entity at the time of enlistment of newly enlisted entity.

N = Number of years prescribed for completion of work for which bids have been invited.

B = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited. This value is for newly enlisted entity.

Enlisted entities based on rules 6.1.7, 9.6.3 or 9.6.4 of enlistment rules 2024 can submit MoU from agency having requisite experience for structural system technology if the enlisted entity does not have required experience.

2. Agreement shall be drawn with the successful bidders on prescribed **Standard C.P.W.D. 7 Percentage Rate Tender Form and General Conditions of Contract 2023 Construction** as amended up to the last date of submission of bid, including extended date, if any, which is available as a Govt. of India Publication, and available on website www.cpwd.gov.in. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
3. The time allowed for carrying out the work will be 12 Months from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
 - 2.1 The site for the work shall be made available in phases or floor wise manner.
 - 2.2 The architectural drawings shall be made available in phased manner, as per requirement of the same as per approved programme of completion of work submitted by the contractor after award of work.
4. The proposed work is of very prestigious nature and is required to be completed strictly within the prescribed time limit of 12 months with the highest standards of quality and workmanship.
5. The bid document consisting of plans, specifications, the schedule of quantities of items to be executed and the set of terms & conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen and downloaded from website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.-
6. After submission of the bid the contractor can resubmit revised bid any number of times or withdraw it before last date and time of submission of bid as notified. No post-tender modification is allowed by the tenderers except through negotiations, if required. In case, any tenderer does so, the tender will 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. The Earnest money in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's cheque or Bank Guarantee including e-Bank Guarantee (for balance amount as prescribed) from any of the commercial banks (**drawn in favour Executive Engineer, Central Vista Project Division-5, CPWD**) shall be scanned and uploaded on the e-tendering website within the period of bid submission.

The original EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD within the period of bid submission. The EMD receiving Executive Engineer (including NIT issuing EE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (Form 'H') uploaded by bid inviting Executive Engineer in the NIT. This receipt shall be scanned and uploaded to the e-bidding website within the period of bid submission.

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 lakhs, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee including e-Bank Guarantee of any Commercial bank having **validity for 180 days** or more from the last date of receipt of bids and which is to be scanned and uploaded by the intending bidders.

The earnest money given by all the bidders except the lowest bidder shall be refunded immediately after the expiry of stipulated bid validity period or immediately after the acceptance of the successful bidder, whichever is earlier. However, 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 certificate of work experience and other documents as specified in the notice inviting e-tender 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 e-tender notice shall have to be submitted physically by the lowest bidder within a week after opening of financial bid in the office of bid opening authority. Online bid documents submitted by intending bidders shall be opened only of those bidders, who has deposited EMD with any division of CPWD and other documents scanned and uploaded are found in order.

The bid submitted shall be opened after 15:30 on 01.10.2026.

8. The bid submitted shall become invalid and e-bid processing fees (if applicable) shall not be refunded if:

- 8.1. The bidder is found ineligible.

- 8.2. The bidder does not upload scanned copy of all the documents stipulated in this bid document.
- 8.3. 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 bid opening authority.
- 8.4. 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.
9. The bidder whose bid is finally accepted will be required to furnish a Performance guarantee of 5% of the Estimated cost put to tender (ECPT) or contract amount whichever is higher as mentioned in schedule E and within the period specified in schedule F. This guarantee shall be in the form of insurance surety bonds or Account Payee Demand Draft or Fixed Deposit Receipt or Bank Guarantee from any of the commercial banks in accordance with the prescribed form as provided in the bid. In case, the Bidder fails to deposit the said performance guarantee within the period as indicated in schedule 'F' including the extended period, if any, the Earnest Money deposited by the Bidder shall be forfeited automatically without any notice to the Bidder. The earnest money deposited along with the bid shall be returned after receiving the aforesaid performance guarantee. The agency 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-agencies, if any engaged by the agency for the said work with in the period specified in Schedule-F.

Where the tendered amount is less than eighty percent (80%) of the Estimated Cost Put to Tender (ECPT), the Performance Guarantee, in addition to the requirement under point 10 above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount.

The description of the work is as follows:

Name of work: Internal finishing, furniture, furnishing and related E&M works for office space in GPOA Block No. 1 at Netaji Nagar, New Delhi .

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 claims / payments/ charges consequent on any misunderstanding or otherwise shall be allowed. The

bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity, access facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of 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 local conditions (i/c local body bye-laws, statutory authority regulations etc) and other factors having a bearing on the execution of the work. In case of reduction of scope of work or no work is possible to carry out or delay in work on account of such issues, no compensation shall be payable for same on account of loss of Profit and Overheads to the bidder.

10. 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 assigning any reason. All bids in which any of the prescribed conditions is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
11. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the bidders who resort to canvassing will be liable to rejection.
12. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
13. The bidder shall not be permitted to bid for works in the CPWD Circle (Division in case of Bidders of Horticulture / Nursery category) responsible for award and execution of contracts, in which his near relative is posted as Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Central Public Works Department or in the Ministry of Housing & Urban Affairs. Any breach of this condition by the bidder would render him liable to be removed from the approved list of Bidders of this Department in case of CPWD registered Bidders and this breach by other Bidders i.e. non-CPWD registered shall be treated as concealing of information and penal.
14. 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 Bidder 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 Bidder or any of his employees is found any time to be such a person who has not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the Bidder's service.
15. The bids for the work shall remain open for acceptance for a period of Seventy- Five

(75) days from the date of opening of technical bids (eligibility bid). Further,

- i) 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.
- ii) If any tenderer withdraws his tender after expiry of 7 days after last date and time (24-hour basis) of submission of bids, the Government shall without prejudice to any right or remedy, be at liberty to forfeit 100% of the earnest money absolutely irrespective of letter of acceptance for the work is issued or not.
- iii) Withdrawal of the tender by the tenderer, shall only be made through e-tender portal. Any other method i.e. through letter /e-mail etc. shall not be considered.
- iv) In case of forfeiture of earnest money as prescribed in para (I) and (II) above, the bidders shall not be allowed to participate in the rebidding process of the same work

16. This notice inviting bid shall form a part of the contract document. The successful bidder, on acceptance of his bid by the Accepting Authority shall within 15 days from the letter of acceptance, sign the agreement consisting of:

- a) The Notice Inviting Bid, all the documents including special conditions, additional conditions, particular specifications and Conceptual Drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
- b) Standard **C.P.W.D. Percentage Rate Tender** and **General Conditions of Contract 2023 Construction** as modified up to last date of submission of Bid.

17. For Composite Bids:

17.1. The Executive Engineer, Central Vista Project Division-14, 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 (ECPT) for the composite bid.

17.2. The bid document will include following components:
Volume I - Part A , B, C ,D, E & F

17.3. The bidders must associate himself, with agencies, if any, as per NIT conditions.

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

17.5. After acceptance of the bid by competent authority, the Executive Engineer-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 Executive Engineer-in-Charge of major component and has also to sign two or more copies of agreement depending upon number of EE's/DDH in-Charge of minor components. One such signed set of agreement shall be handed over to EE/DDH in-Charge of minor component(s).

- 17.6. Entire work under the scope of composite bid including major and all minor components shall be executed under one agreement.
- 17.7. Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works
- 17.8. The main contractor has to associate agencies for specialized component(s) conforming to eligibility criteria as defined in the bid document and has to submit detail of such agency(s) to Engineer-in-Charge of relevant component(s) within prescribed time. Name of the agency(s) to be associated shall be approved by Engineer-in-Charge of relevant component(s).
- 17.9. In case the main contractor intends to change any of the above agency/ agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-Charge of relevant specialized component(s).
- 17.10. The new agency/ agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-Charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.
- 17.11. The main contractor has to enter into MoU with agency(s) associated by him. Copy of such MoU shall be submitted to EE / DDH in-Charge of each relevant component as well as to EE in-charge of major component. In case of change of associate contractor, the main agency(s) has to enter into MoU/Agreement with the new contractor associated by him.
- 17.12. Running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor components shall be made by the Engineer-in-Charge of the discipline of minor component directly to the main contractor. The CMB shall be maintained independently by the Engineer-in-Charge of major and minor components.
 - a. 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.
 - b. Final bill of whole work shall be finalized and paid by the EE of major component. Engineer(s) in-Charge of minor component(s) will prepare and pass the final bill for their component of work and pass on the same to the EE of major component for including in the final bill for composite contract.

17.13. 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.

17.14. It will be obligatory on the part of the tenderer to sign the Agreement for all components before the first payment is released.

17.15. 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 or ERP helpline no. 18001803286 or e-mail Id cpwd.support@techmahindra.com. The e- tendering bidder are also advised not to wait to raise any issues till the last date of submission of bid in their own interest.

18. Challenges/constraints:

a) The work is to be executed within a premises currently under construction by another agency, engaged by NBCC. Effective coordination between all involved parties is of utmost importance to ensure smooth progress of the work.

The bidder shall bear full responsibility for liasoning and coordinating with the other agency to avoid conflicts and disruptions. The bidder must ensure the protection of their own materials and activities, as well as take necessary precautions to prevent any interference with the ongoing work of the other agency.

In case of any theft, damage, or complaints related to the other agency, it shall be the bidder's responsibility to address and resolve the issue. While CPWD will extend support in facilitating coordination between the agencies, the primary responsibility lies with the bidder.

b) The existing services of unfiltered water supply, water supply, drainage line, Sewerage line, E&M power Cables if any passing through plot & feeding to nearby buildings, shall be got shifted as directed by Engineer-in-Charge and shall be payable to contractor as per clause 12 of the agreement. The necessary administrative approval from various authorities for such shifting shall be taken by the department. .

c) The contractor has to establish labour camp, laboratory, storage yard, etc within Delhi NCR area and therefore suitable land needs to be identified & may be hired/leased by contractor after award of work. The contractor shall make his own arrangement for transportation of labour from labour camp to site and site to camp for working in three shifts, as required. For any hindrance in making three shifts or any loss of time due to partial closure of work in view of restrictions on permissible limit of noise in night, security checking, VVIP Movements etc., contractor is not entitled to make any claim. The bidder shall submit a plan indicating establishment of facilities for labour, laboratory, storage

yards, etc and mobilisation of T&P, within 15 days from the date of award of work.

- d) Site shall be made available in phased manner. In case, other agencies are also working at site, the agency has to coordinate with the other agencies working simultaneously in the premises and no hindrance can be claimed on this account.
- e) CPWD, NBCC & other civic agencies are also carrying out the work in the vicinity of project site, which may have restriction in the working space. The bidder shall keep this in mind while planning & quoting rates for this work. Nothing extra shall be paid on this account.

19. Adherence to completion time and quality:

- a) The bidder shall submit a tentative plan indicating the manpower requirement of various categories/activities to complete the work within 12 months, how they will be mobilized and also indicate how required strength of the work force will be maintained during the entire period of execution, after award of the work.
- b) The contractor may have to execute the work in three shifts with large man power of skilled, semi-skilled and un-skilled workers, experienced supervisors and professional engineers as well as materials and machinery. Highly experienced and skilled may also be required. The contractor shall also make arrangement for special tools for above works.
- c) Adequate health and safety measures shall be taken by the contractor in view of the COVID-19 pandemic like situation, if arises. The Necessary safety audits shall be conducted periodically as prescribed by the government.
- d) The bidder shall follow green construction practices and guidelines issued by CPCB and CPWD.
- e) Adequate health and safety measures shall be taken by the contractor. Necessary safety audits shall be conducted periodically as prescribed by the government,
- f) Specialized agencies/firms, meeting prescribed eligibility criteria, are required to be engaged for specialized items of works.
- g) The bidder shall submit a plan indicating the manpower requirement of various categories to complete the work within 12 Months, how they will be mobilized and also indicate how the required strength of the work force will be maintained during the entire period of execution, within 30 days from the date of award of work
- h) The Technical bid submitted shall be opened at 15:30 on 01.10.2026. The time and date of opening of financial bid of contractors qualifying the technical bid shall be communicated to them at a later date.

- i) The bidder should have sufficient number of Technical and Administrative employees for the proper execution of the contract. The bidder shall have to submit within 15 days of award of work, a list of these employees stating clearly how these would be involved in this work.

Executive Engineer,
CVPD-14, CPWD,
New Delhi.

(For and on behalf of President of India)

PART-II

ELIGIBILITY BID

Section-I
Brief particulars of the Work

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

NIT No.	06/CE/CVPZ-2/CPWD/2025-26
Name of the work and Location	Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi .
Estimated cost put to tender (ECPT) (Rs.)	A. Construction work component i. Civil: Rs. 280,05,44,676/- ii. E&M: Rs. 192,62,92,896/- B. Operation & Maintenance component i. E&M: Rs. 8,26,91,364/- Total: Rs. 408,95,28,936/-
Period of Completion of Construction Work	12 months – Construction work 36 Months – O&M of E&M component

2. The work is situated at Netaji Nagar, New Delhi (GPOA Block 1 building under construction with NBCC).
3. The proposed work is of very prestigious nature and is required to be completed strictly within the prescribed time limit with the highest standards of quality and workmanship.
4. The drawings uploaded with the tender are for reference purpose only and are intended to give preliminary understanding of the project and are liable to modifications/alterations during issue of GFC drawings.
5. The particulars of the work given below are provisional. They are liable to change and must be considered only as advance information to assist the bidder.
6. The broad particulars of the work are as under:
- A. NBCC is constructing this Block/Towers at Netaji Nagar. Block No. 1 is having Building Configuration (3B+G+8) of height 35.65 mtr.
- B. Office space inside the building is to be furnished. Accordingly, specifications of flooring, false ceiling, wall finishing, doors/windows etc. was adopted according to the intended use of building.

- C. Office space in each of the 9 floors (G+8) is to be furnished along with the E&M services as detailed in respective part. The common toilets and corridors have been finished by the NBCC i.e., out of the total superstructure area 88,347 sqm of the building, CPWD has to finish approx. 60,817 sqm area.
- D. Attached toilet with the office are also to be made as per the drawings. Work is to be executed as per the approved drawings and specifications.
- E. Civil Works: It shall broadly include following items of work
 - 1. Wall
 - a) Paint
 - b) Short Height modular partition (straight as well as curved)
 - c) 103 mm drywall partition (straight as well as curved) with insulation and finished with paint
 - d) Acoustic Panels
 - e) Veneer/bamboo wood wall panelling
 - f) Demountable Aluminium Partition
 - g) Masonry etc.
 - 2. Flooring
 - a) Full body homogeneous unglazed vitrified tiles
 - b) Ceramic tiles
 - c) Carpet tiles
 - d) 10-14 mm thick bamboo wood flooring
 - e) Screeding
 - f) Granite etc.
 - 3. Ceiling
 - a) Exposed Ceiling with paint
 - b) Acoustic baffle false ceiling
 - c) Bamboo wood Baffles
 - d) Gypsum false ceiling
 - e) Calcium Silicate false ceiling
 - f) Veneered False Ceiling etc.
 - 4. Misc: Toilet – Granite on floor & Wall, Mirror, over counter Basin, Vanity with Corian top
 - 5. Furniture works- As per tender document
- F. E& M Works: It shall broadly include following items of work

1. EI & Fans , Electric Panels, UPS, Lighting Fixture
 2. Fire Alarms System
 3. Fire Protection System
 4. HVAC
 5. Audio-Video System and public address system
 6. CCTV
 7. IBMS
 8. ICT
 9. Gas Suppression System for FNR/BNR/UPS/IBMS
7. All works have to be executed as per Approved Architectural Drawings, User requirements, Detailed Specifications provided in the bid document, CPWD Specifications, and National Building Construction Standard 2026 (in case of difference, the stringent / higher specification of the two shall be followed). Nothing extra shall be paid on this account.
 8. Wherever the bid document specifies that the work shall be executed as per relevant CPWD specifications or other specified standards, it refers strictly to the technical work specifications outlined in the manuals or codes during execution. However, the mode of measurement of executed items, or any other details beyond the scope of these specifications, shall not be considered for payment or measurement purposes.
 9. The contractor shall take all necessary precautionary measures to prevent accidents involving their employees, construction workers, the public, and supervisory staff of CPWD. This responsibility encompasses providing necessary safety equipment such as temporary roofs or canopies at entry and exit points of buildings under construction, as well as personal protective equipment like helmets and safety shoes required at the worksite. These safety measures are to be implemented by the contractor at no additional cost to the project.
 10. It shall be deemed that the Contractor has satisfied himself with the nature and location of the work, general and local conditions, and particularly those pertaining to transport including restriction of movement of traffic / vehicles being VIP area, heavy restrictions during VIP Movement, handling, availability and storage of materials, availability of labour, weather conditions at site, and general ground / sub-soil conditions. Agencies are expected to quote their rates accordingly and nothing extra shall be payable for any reason/s whatsoever. CPWD shall bear no responsibility for the lack of such knowledge and also the consequences thereof to the contractor. The information and site data shown in the drawings and mentioned in the tender documents are furnished for general information and guidance only. The Engineer in charge in no case shall be held responsible for the accuracy thereof or/and deductions, interpretations, or conclusions drawn therefrom by the contractor and no claim shall be entertained whatsoever on this account, if the site conditions / information is different or

otherwise incorrect. It will be presumed that the contractor has satisfied himself for all possible contingencies, situations, bottlenecks, and acts of coordination which may be required between the different associate agencies by the main contractor.

11. The scope of work outlined here includes all costs associated with materials, manpower, equipment, tools and plants (T&P), fixtures, accessories, royalties, taxes, watch & ward, and all other essential elements necessary for the satisfactory completion and maintenance of the works as described. This comprehensive coverage extends to any changes, modifications, or revisions required in the drawings by Client, CPWD, local bodies, proof-checking consultants, etc., in accordance with applicable standards, which shall be executed by the contractor at their own cost without any additional payment.
12. This work is to be executed within the strict timeline without any fail, hence agencies shall mobilise all their resources to achieve the target. Agency shall increase their efforts to compensate if any hindrance/s occurred during the execution of work. However, nothing extra shall be paid in this regard.

13. Commuting:

The contractor shall make arrangement for 3 nos Inspection vehicles (min. 1400 CC engine with 180 mm ground clearance or equivalent. Model of vehicles shall not be older than 2025), from start date of work, at disposal of Employer to facilitate work inspection, quality control, coordination with multiple agencies and liaising. This facility will be provided till Three months after the actual date of completion of work or the completion of final bill, whichever is the earliest. The average mileage of an inspection vehicle shall be approx. 2500 Km/month. The inspection vehicle shall be made available round the clock on daily basis including holidays as per the direction of Employer. All expenses of this inspection vehicle including running and maintenance, fuel charges, driver's salary, toll tax, parking charges etc. shall be borne by the contractor. In case the vehicle is required to be taken outside the state for official purposes, the expenditure will be borne by the contractor for any toll, parking etc. Recovery @ Rs. 3000/- per day per Inspection vehicles shall be made, if contractor fails to provide Inspection vehicles within 15 days of letter of award/acceptance. Recovery @ Rs. 3000/- per day per Inspection vehicles shall be made, in case of occurrence of a default i.e., non-availability of vehicle due to any reason including breakdown of vehicle

14. Construction of CPWD Site Office

The agency is required to construct a site office spanning 300 sqm or Modify, Rehabilitate & furnish existing building of around 300 sqm for CPWD site office, involving the design, supply, installation, testing, and commissioning of Site office spanning 300 sqm to serve as the operational base. This scope includes modern amenities, 20-seater conference room with presentation and video conferencing

facility, utilities, and structural features designed for durability throughout the project's duration. The scope includes IT infrastructure, office furnishings, electrical and plumbing installations, and compliance with safety and environmental standards. Site office shall have fully furnished office rooms, one mini conference room, toilets, pantry etc. having all facilities viz E&M facilities, drinking water, split ACs, fans, internal connection, conferencing facility i/c one medium-size refrigerator etc. all complete as per Direction of Engineer in charge. Maintenance of site office as well as all AMC charges, electricity bill, water supply bills, drinking water bills etc. shall be done/borne by the contractor at his own cost, till the completion of work or the final payment of bill whichever is later.

The agency is required to provide 05 Nos. of Desktop/Laptop with latest specification as specified along with colour laser jet printers to the department till the completion of the work all complete as per Direction of Engineer in charge.

No additional payments or claims will be entertained on this account. Hence, the contractor is advised to quote accordingly, factoring in all associated costs for the setup, operation, and maintenance of the site office and its facilities throughout the project's lifecycle. After completion of construction work of the project, all furniture, furnishings, electrical equipment's, software's etc shall be property of the contractor.

15.INSURANCE POLICIES:

Before commencing the execution of work, and without in any way limiting his obligations and liabilities under the contract, the Contractor shall, at his own cost, insure against any damage, loss or injury which may be caused to any person or property at or in the vicinity of the site, and shall indemnify the Department against all liability arising during the execution of the work. For this purpose, the Contractor shall obtain and submit to the Engineer-in-Charge a Contractor's All Risk (CAR) Insurance Policy for an amount equivalent to the contract amount; and a third-party insurance policy, if such cover is not included in the CAR Policy, for a maximum of Rs. 20 lakh for each accident; all policies shall be obtained in the joint names of the Engineer-in-Charge (first beneficiary) and the Contractor (second beneficiary). The Contractor shall also ensure comprehensive group insurance cover for all workers and supervisory staff deployed at site, including those of his associate/specialised agencies. All policies shall be kept valid till the actual date of completion of the work, including extensions of time, if any; documentary evidence of payment of premium shall be furnished from time to time, and in case of default, an amount equal to twice the premium payable for the uncovered period shall be recovered from the next bill of the Contractor. The details of insurance cover shall be submitted within 30 days from the date of issue of Letter of Acceptance, and thereafter a quarterly report giving details of the policies, together with certificates of their validity and documentary evidence as required by the Engineer-in-Charge, shall be submitted. No work shall be commenced unless the above policies are obtained; nothing extra shall be payable on this account, and no claim of hindrance or any other claim whatsoever shall be entertained.

Section-II

INFORMATION AND GUIDE-LINES FOR BIDDERS

1. General:

- 1.1 Letter of transmittal and forms for deciding eligibility are given in this document.
- 1.2 All information requested on 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. Bid made by telegram or telex and those received late will not be entertained.
- 1.3 References, information and certificate 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 envisaged work. He is, however advised not to furnish superfluous information.
- 1.5 No information/documents shall be entertained after submission of bid unless it is required to clarify the query raised by employer. No fresh/revised mandatory document is permitted at this stage

2. Definitions:

- 2.1 In this document the following words and expressions have their meaning here by assigned to them.
- 2.2 EMPLOYER means the President of India, acting through the Executive Engineer, Central Vista Project Division-14, CPWD or successor thereof.
- 2.3 Contractor / bidder /Firm / Agency/ Tenderer /Applicant means the individual, proprietary firm, firm in partnership, limited company, private or public or corporation.
- 2.4 "YEAR" means "Financial year" unless stated otherwise.
- 2.5 The terms 'Notice Inviting Tender (NIT)', 'Bid', and 'Tender' shall be considered synonymous and interchangeable wherever mentioned in this document. Likewise, the terms 'Tenderer', 'Bidder', and 'Contractor' shall refer to the same entity submitting the bid. Any reference to these terms, whether in singular or

plural form, shall be interpreted consistently to ensure uniformity in understanding and application throughout the tender process.

- 2.6 "Electrical Work" and "E&M Work" are used interchangeably and shall be construed to have the same meaning.

3. Method of Application:

- 3.1 If the bidder is an individual, the application shall be signed by him above his/her full type written name and current address.
- 3.2 If the bidder is a proprietary firm; the application shall be signed by the proprietor above his/her full type written name and the full name of his firm with its current address.
- 3.3 If the bidder is a firm in partnership, the application shall be signed by all the partners of the firm above their full type written 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 application. In both the cases, a certified copy of the partnership deed and current address of all the partners of the firm should accompany the application.
- 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 application and certified copy of such power of attorney shall also be furnished. The bidder should also furnish a copy of 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. Assistance to visit the site can be made by the department as the site is situated in the highly sensitive area.

7. Initial Criteria for Eligibility:

- (i) **Past experience:** Bidder should have satisfactorily completed the similar work/s as mentioned below during the last seven years ending last day of month previous to the one in which bids 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 Executive Engineer or equivalent.

Three similar works each costing not less than 160 crore

or

Two similar works each costing not less than 240 crore

or

One similar work costing not less than 321 crore

"Similar work shall mean:-

"Non-Residential Building work mandatorily including internal finishing, internal water supply, sanitary installations, internal electric installation, HVAC and firefighting executed under one agreement in India." (to be read with Note below)

Or

"Internal Finishing work in Non residential building mandatorily including flooring, false ceiling, partitions, internal water supply, sanitary installations, internal electric installation, HVAC and firefighting executed under a single agreement in India." (to be read with Note below)

Note:

- 1.** HVAC, firefighting if executed under separate contracts may also be considered for the purpose of assessing the technical competence only without adding its monetary value for determining the eligibility criteria.

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

- 3** In case, the eligible work has been executed by a Joint Venture through one or more individual firms, then cost of completed work shall be distributed among the individual firm(s) in proportion to their share in Joint Venture and that will be considered as work experience for individual firm(s) for pre-qualification in bidding.

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

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

(ii) Average monthly turnover/progress:

The agency should have achieved average monthly financial turnover/progress of at least **Rs. 26.71 Crore** per month in single construction work under one agreement costing not less than **Rs. 160 Crore** (Not necessarily similar work) completed during the last 7 (seven) years ending last day of previous month of date of call of tender. 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 Executive Engineer or equivalent. The value of average monthly financial progress shall be worked out as completion cost of above work divided by actual duration of completion of work. The value of average monthly financial progress shall be brought to current costing level by enhancing the actual value of monthly turnover of single work at simple rate of 7% per annum calculated from the date of completion to previous day of last day of submission of bid including extended date, if any.

Note:- Extra time granted due to Force Majeure period due to COVID in the year 2020, here applicable to that extent shall be adjusted accordingly vide ministry of finance O.M F.18/4/2020-PPD dt 03.05.2020 while calculating average monthly financial turnover.

- (iii)** Should have **Average Annual Financial Turnover** of atleast **Rs. 123 Cr** on construction works during the immediate last three (03) consecutive financial years ending on **31st March 2025 or 2026**. This should be duly audited by Certified Chartered Accountants with UDIN number mentioned. Year in which no turnover is shown would also be considered for working out the average. The value of Annual Financial Turnover figures shall be brought to current value by enhancing the actual turnover figures at simple rate of 7% per annum.
- (iv)** Should not have incurred any loss (**profit after tax should be positive**) in more than two years during last five consecutive balance sheets (financial years ending 31st **March 2025 or 2026**) duly audited and certified by the Chartered Accountant.
- (v)** Should have a Banker's certificate from a commercial bank of **Rs. 164 Cr.**

Or

Should have a net-worth certificate of **minimum Rs. 41 Cr.** issued by certified Chartered Accountant with UDIN.

- (vi) The bidding capacity of the agency should be equal to or more than the estimated cost of the work put to bid for construction work. The bidding capacity shall be worked out by the following formula:

$$\text{Bidding Capacity} = \{[A \times N \times 1.5] - B\}$$

Where,

A= Maximum turnover in construction works executed in any one year during the last seven years ending on 31.03.2025 or 2026 taking into account the completed as well as works in progress. The value of annual turnover shall be brought to current costing level by enhancing at a simple rate of 7% per annum (calculated from the date of completion to previous day of last date of submission of bids, including extended date, if any).

N= Number of years prescribed for completion of work for which bids has been invited.

B= Value of existing commitments of ongoing works during the period of execution of work for which bids have been invited as on last date of submission of bid including extended date, if any.

Note:

- i) The bidder should submit bidding capacity as per Form C-3.
- ii) Bidding capacity is applicable for all the bidders including CPWD enlisted contractors.
- iii) The bidder shall submit the calculation sheet of bidding capacity as per above formula along with Bid documents and submit an undertaking that all works in progress or awarded to him have been included in the list submitted by him in the Form C-1 and no ongoing work has been left out. In case, it is found that bidder has concealed any information, suitable legal as well as criminal action shall be taken against bidder for concealing such information.
- iv) Bidding capacity formula, for CPWD contractors who are enlisted based on rule 6.1.7 of Enlistment Rules -2024 i.e., government retired engineer/architect for three years from the date of issue of enlistment order is as follows:

$$\text{Bidding Capacity} = \{[A \times N \times 1.5] - B\}$$

Where,

A = Banker certificate figure as submitted by applicant (i.e. government retired engineer/ architect) at the time of enlistment for first year of enlistment and subsequent fresh bankers' certificate for second and third year respectively.

Correction –Nil

Insertion –Nil

Deletion –Nil

Overwriting –Nil

Value of A for first year will be mentioned in the enlistment order by the member secretary of advisory committee for enlisting authority.

N = Number of years prescribed for completion of work for which bids have been invited.

B = Value of existing commitments and on-going works to be completed during the period of completion of work for which bids have been invited. This value is for newly enlisted entity.

Within three years from the date of issue of enlistment order, the newly enlisted entity has to develop its own bidding capacity and thereafter the general bidding capacity formula used for other entities shall be applicable to it for calculation of bidding capacity.

Newly enlisted entity may like to follow general bidding capacity formula even before period of three years if it so chooses.

v) Bidding capacity, for CPWD contractors who are enlisted based on rules 9.6.3 & 9.6.4 of Enlistment Rules-2024 i.e. new entity based on previously enlisted entity for three years from date of issue of enlistment order, is as follows:

Annual turnover of newly enlisted entity shall be in proportion to the shareholding of partners/directions in the original enlisted entity at the time of enlistment of the newly enlisted entity.

Within three years from the date of issue of enlistment order, the newly enlisted entity has to develop its own bidding capacity and thereafter the general bidding capacity formula being used for other entities shall be applicable to it for calculation of bidding capacity. Newly enlisted entity may like to follow general bidding capacity formula even before period of three years, if it so chooses.

vi) Bidding Capacity for newly enlisted entity based on rules 9.6.3 & 9.6.4 enlistment rules -2024 shall be as follows:

$= \{[A' \times N \times 1.5] - B\}$ Where,

A' = Proportionate share of newly enlisted director/partner in originally enlisted company/firm multiplied by the factor A, as given below.

Value of A' will be mentioned in the enlistment order by member secretary of Advisory committee for Enlistment Authority, it will remain same for three years.

A = Maximum turnover in construction works executed in any one year during the last seven years taking into account the completed as well as works in progress. The value of completed works shall be brought to current costing level by enhancing at a simple rate of 7 % per annum. This value is of originally enlisted entity at the time of enlistment of newly enlisted entity.

N = Number of years prescribed for completion of work for which bids have been invited.

B = Value of existing commitments and ongoing works to be completed during the period of completion of work for which bids have been invited. This value is for newly enlisted entity.

Enlisted entities based on rules 6.1.7, 9.6.3 or 9.6.4 of enlistment rules 2024 can submit MoU from agency having requisite experience for structural system technology if the enlisted entity does not have required experience.

- (i) 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.

(ii) Evaluation Criteria:

- a. The details submitted by the bidder will be evaluated in the following manner.
- The initial criteria for eligibility prescribed in para 7 above in respect of experience of eligible similar class of works completed, loss, Net worth or solvency, Average Monthly Turnover, financial turn over and bidding capacity etc. will first be scrutinized and the bidder's eligibility for the work is determined.
 - The bidders qualifying the initial criteria as set out in Para 7 above Evaluation of the performance of contractors for eligibility shall be done by NIT approving authority or a Committee constituted by him. All the eligible similar works executed and submitted by the bidders in support of eligibility and any one of the ongoing works, shall be got inspected by committee of officers nominated by NIT approving authority. The marks for the quality shall be given based on this inspection.
 - Scoring method of evaluation: - The scoring for evaluation shall be done as **per Annexure – I.**

Summary of the proforma is given below.

(a)	Financial strength- (Form "A","A-1" and "B"/"B-1") (i) Annual Turnover 8 marks, (ii) Average Monthly Turnover 8 marks (iii) Bankers Certificate or net worth 4 marks	Maximum Marks	20
(b)	Experience in similar nature of work during last Seven years (Form "C")	Maximum Marks	20
(c)	Performance on work (Form "G")- Time over run	Maximum Marks	20
(d)	Performance on completed similar works and on-going works (Form D-1)- Quality	Maximum Marks	40
Total			100 Marks

- b. To become eligible for short listing, the bidder must secure at least 60% (Sixty percent) marks in each (section a, b, c, d) and 75% (Seventy five percent)

marks in aggregate.

- c. The department, however, reserves the right to restrict the list of such qualified bidders to any number deemed suitable by it.

Note:

- 1- The average value of performance of works for time over run and quality shall be taken on the basis of performance report and eligible similar works.
- 2- In case of eligible completed works being more than one the average marks assigned for eligible completed works shall be considered for marking purpose. Only one ongoing work to be assessed.
- 3- Evaluation of the performance of contractors for eligibility shall be done by NIT approving authority or a Committee constituted by him.

ANNEXURE – I**Criteria for Evaluation of the performance of bidder for Eligibility**

S. No.	Attributes		Marks	Evaluation			
(a)	Financial Strength (Maximum 20 Marks)			(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more. (iii) In between (i) & (ii)- on pro-rata basis			
	(i) Average annual turnover		8 Marks				
	(ii) Average Monthly Turnover		8 Marks				
	(iii) Banker's marks		4 Marks				
	Bankers Certificate or net work						
(b)	Experience in similar class of work		20 marks	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more. (iii) In between (i) & (ii)- on pro-rata basis			
(c)	Performance on works [Time Over Run (TOR)]: Maximum 20 marks						
	Parameter	Calculation for points	Score				Maximum Marks
	If TOR =		≤1.00	2	3	> 3.5	20
	(i) Without levy of compensation		20	15	12	10	
	(ii) With levy of compensation		20	5	0	-5	
	(iii) Levy of compensation		20	10	0	0	
	not decided						
	TOR = AT/ ST, where AT= Actual Time; ST= Stipulated time in the agreement + Justified period of extension of time						
	Note: Marks for value in between the stages indicated above is to be determined by straight line variation basis.						
(d)	Performance of works (Quality) to be assigned after inspection by committee of officers/ experts nominated by NIT approving authority Form-D 1: Maximum 40 Marks						
	Completed work		Ongoing Work				
	(Max. 25 Marks)		(Max. 15 Marks)			Total Marks assessed	

(iii) Financial Information:

Bidder should furnish the Annual financial statement for the last five years in (Form "A"). Monthly turnover/progress (Form "A-1"), Banker's Certificate in (Form "B") or Net worth Certificate in (Form "B-1").

(iv) Experiences in Works Highlighting Experience in Similar Works:

- a. Bidder should furnish the List of eligible similar nature of works successfully completed during the last seven years in (Form "C") and ongoing works as well (Form C-1).
- b. Works executed outside India shall not be considered as eligible works.

(v) Organization Information:

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

(vi) Letter of Transmittal:

The Bidder should submit the letter of transmittal attached with the document.

(vii) Opening of Price Bid:

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

(viii) Award criteria:

- a. The employer reserves the right, without being liable for any damages or obligation to inform the bidder to:
 - i. Amend the scope of work and value of contract.
 - ii. Reject any or all the applications without assigning any reason.
- b. 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.

(ix) Integrity Pact

The bidder 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. In the event of his failure to sign and upload the Integrity Pact along with other bid documents, his bid shall be rejected. The agency should co-operate/co-ordinate/attend the inspections of the IEMs for implementation of Integrity Pact.

SECTION III

INFORMATION REGARDING ELIGIBILITY

Annexure-I**LETTER OF TRANSMITTAL**

To

The Executive Engineer (Civil)
Central Vista Project Division-14
CPWD, New Delhi – 110011.

Name of Work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi

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 statements made, and information supplied in the enclosed Forms, Appendices, Annexures, undertakings, Affidavits, etc. and accompanying statements 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 and authorize the Executive Engineer, CVPD-4, New Delhi to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/we also authorize Executive Engineer, CVPD-4, to approach individuals, employers, firms and corporation to verify our competence and general reputation.
4. I/we submit the following certificates in support of our suitability, technical knowledge, and capability for having successfully completed the following work mentioned.

Sl. No.	Name of work	Certificate from

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 financial 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:
with Seal

Signature(s) of Bidder(s)

Correction –Nil

Insertion –Nil

Deletion –Nil

Overwriting –Nil

FORMAT FOR UNDERTAKING FOR SITE INSPECTION

To

The Executive Engineer (Civil)

Central Vista Project Division-14

CPWD, New Delhi – 110011

I/we hereby give an undertaking for the given work as follows :-

NIT No.: - 06/CE/CVPZ-2/CPWD/2025-26

Name of Work : Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi

I/we have inspected and examined the site and its surroundings is / are satisfied before submitting our bid 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 I/we may require and in general shall myself / ourselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid. I/we shall be deemed to have full knowledge of the site whether I/we inspect it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. I/we shall be responsible for arranging and maintaining at our 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 I/we implicate(s) that I/we have read this notice and all other contract documents and has made myself / ourself 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 us by the Government and local conditions and other factors having a bearing on the execution of the work.

Place:

Date:

Yours faithfully

[Signature of Bidder(s)]

FORM-A**CERTIFICATE OF FINANCIAL TURNOVER**

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

Fig in lakhs Rs.

Sl. No.	Particulars	Financial Year							
		2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
1.	Gross Turn-Over on construction works								
2.	Profit/loss after Taxes(consolidated)								
3.	Profit/loss after Taxes (standalone)								

The bidder should give information strictly in above format.

2. Financial arrangements for carrying out the proposed work.

Signature Of Chartered Accountant with Seal

UDIN Number

Signature (S) Of Bidder(S)

Membership No. of ICAI.....

Format for Average Monthly Turnover

The agency should have achieved average monthly financial turnover/progress of at least **Rs. 6.71 crore** per month in building work under single contract agreement costing not less than **Rs.160 Cr** (not necessarily similar work), completed during the last seven years as on last date of submission of bid including extended date, if any.

Sl. No	Name of work	Owner or sponsoring organization	Completion Cost of work (in Cr.)	Date of commencement as per contract	Stipulated date of completion	Actual date of completion	Time taken (in months)	Completion cost excluding any award/ amount through litigation / arbitration)	Average monthly Financial Progress	Average monthly Financial Progress enhanced from the date of completion to previous day of last day of submission of bids.(Enhanced @7% per annum)	Name and address (Postal & e- mail)/ telephone No. of office to whom reference may be made
A	B	C	D	E	F	G	H	I	J = I/H	K	L

Signature of Bidder(s) (With stamp)**Note :**

Bidder shall submit self-certified copy of supporting documents which can establish above facts and figures, such as:

1. Final Bill, Or
2. Completion Certificate from the owner organization, Or
3. Details filled in above format by Manager / Officer not below the rank of Executive Engineer from Owner / Sponsoring Organization.

Note:- Extra time granted due to Force Majeure period due to COVID in the year 2020, here applicable to that extent shall be adjusted accordingly vide ministry of finance O.M F.18/4/2020-PPD dt 13.05.2020 while calculating average monthly financial turnover.

BANKER'S CERTIFICATE FROM A COMMERCIAL BANK

Name of Work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi

This is to certify that to the best of our knowledge and information that M/s./Shri having marginally noted address as a customer of our bank are / is respectable and can be treated as good for any engagement up to a limit of Rs).

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

(Signature) For the Bank

NOTE: (1) Banker's certificate should be on letter head of the Bank, addressed to **Executive Engineer, Central Vista Project Division- 14, CPWD, New Delhi-110011.**

(2) In case of partnership firm, certificate should include names of all partners as recorded with the Bank.

CERTIFICATE OF NETWORTH FROM CHARTERED ACCOUNTANT**NIT No: 06/CE/CVPZ2/CVP/NIT/2026-27****Name of Work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi**

"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 & 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 Chartered Accountant.....

Name of Chartered Accountant.....

Membership No. of ICAI.....

Date and Seal.....

FORM- 'C'**DETAILS OF SIMILAR WORKS COMPLETED DURING THE LAST SEVEN YEARS
ENDING PREVIOUS DAY OF LAST DAY OF SUBMISSION OF TENDERS**

1	Name of work/project and Location	
2	Owner or sponsoring Organization	
3	Cost of work (in Cr.)	
4	Date of commencement as per contract	
5	Stipulated date of completion	
6	Actual date of completion	
7	Litigation/arbitration cases pending /in progress with details*	
8	Name, address, email & telephone no. of officer to whom reference may be made	
9	Whether the work was done on back-to-back basis -Yes/ No	

***Indicate gross Amount Claimed and Amount Awarded by the Arbitrator.**

SIGNATURE (S) OF BIDDER(S)
WITH STAMP

Note: The contractor should give list of all similar works executed

PROJECTS UNDER EXECUTION**NIT No: 06/CE/CVPZ2/CVP/NIT/2026-27****Name of Work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi**

Name of the firm / Bidder.....

S. No.	Name of work / project and location	Owner or sponsoring organization	Cost of work in Rs. in Crores	Date of commencement as per contract	Stipulated date of completion	Up to date percentage progress of work	Slow progress if any and reasons thereof	Name and Address (Postal & E-mail) / telephone number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10

SIGNATURE OF BIDDER(S)

FORM C – 3

Calculation of bidding capacity
Details of existing commitments and ongoing works

NIT No: 06/CE/CVPZ2/CVP/NIT/2026-27

Name of Work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi

Name of the firm / Bidder.....

S . N o .	Name of work/project and location	Owner or sponsoring organization	Contract value in crore of rupees	Date of commencement as per contract	Stipulated date of completion	Upto date percentage progress of work	Remaining work in percentage (100-column 7)*	Existing commitment during the period of execution of work for which bids have been invited. <u>Col.4 x(Col.8 /100)</u>	Name and address/telephone number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10	11
								Total (B)=		

Correction –Nil

Insertion –Nil

Deletion –Nil

Overwriting –Nil

Note: Existing commitment (Column 9) shall be calculated on prorated basis.

Total (B) =

(Value of existing commitments of ongoing works during the period of execution of work for which bids have been invited as on last date of submission of bid including extended date, if any)

A= Maximum turnover in construction works executed in any one year during the last seven years ending on 31.03.2025 or 2026 taking into account the completed as well as works in progress. The value of annual turnover shall be brought to current costing level by enhancing at a simple rate of 7% per annum (calculated from the date of completion to previous day of last date of submission of bids, including extended date, if any)

Updated value of turnover (A) = Rs.....

No. of years (N) =

Bidding Capacity= {[AxNx1.5]-B} =

***Note:-**

It is certified that all works in progress or awarded to me/us have been included in the list submitted by me/us in the Form C-1 and no ongoing work has been left out. Further that, if any violation by hiding information or submission of incorrect information, comes to the notice of Department, then I/we shall be debarred for bidding in CPWD in future forever.

Certificate:

I certify that all the awarded and ongoing works have been included in the above list.

(Signature of Bidder(s))

Form 'D-1'**Assessment of Quality for Completed as well as ongoing works**

Name of Work:-

Date of Inspection:

Date of submission of report: -

A. General Observation & Operational Aspects	Yes/ No
1. Availability of approval from local bodies in case of Construction of Private Buildings	
2. Availability of approved Structural drawings	
3. Observation on seepage/ leakage in the Building	
4. Whether Line & level Maintained	
5. In case of basement, observation on seepage, if any	
6. Any Structural defects / distress observed. If yes give details	
7. Whether safety measures adopted at site as per CPWD Safety Code and or govt. guidelines are adequate or not	
8. Whether the Welfare facilities provided to labour as per Clause 19 H of GCC for CPWD Works/and or govt. guidelines are adequate or not	
9. Whether AHU getting automatically switched off and fire damps closed in case of fire signal?	
10. Whether thimbles used for termination of wires in DBs, EBDs & Panels?	
B. Quality of Work	Marks Assessed
1. Quality of plaster/ finishing	
2. Quality of RCC / CC Work	
3. Quality of Flooring	
4. Quality of Wood Work	
5. Quality of Steel Work / Aluminium Work	

Correction –Nil

Insertion –Nil

Deletion –Nil

Overwriting –Nil

6. Quality of Plumbing and Sanitary Installation	
7. Quality of Workmanship	
8. Quality of Waterproofing	
9. If cladding done, observation on efficiency/ quality of cladding / Brick work	
10. Quality of internal electrification work	
11. Quality of DBs, EBDs & Panels	
12. Quality of E&M equipments, panels & feeder pillar	
13. Quality of fire alarm system/ fire fighting system	
14. Quality of Air Conditioning work	
15. Quality of Sub-station based on complete live diagram, capacitor panel, power factor, insulating Mat, cleanliness, cable termination, earthing pits, earthing of transformer / DG sets	
16. Any Other aspect (To be elaborated)	
Total Marks	
Average Marks out of 100	

Average Marks (To be awarded out of 100 Marks based on average of marks assessed on each attribute mentioned at B above).

Note:-

All the above parameters may be considered for assessing the overall quality of work executed by the contractor. Each attribute shall be assessed on maximum marks of 10 under B above.

In case, any attribute is not applicable, the same may not be included in assessment and mentioned are not applicable (N/A)

The works as assessed above shall be converted on a scale of 25/15 for completed/ongoing works respectively.

In case of eligible completed works being more than one the average marks assigned for eligible completed works shall be considered for marking purpose. Only one ongoing work to be assessed.

STRUCTURE & ORGANIZATION**NIT No: 06/CE/CVPZ-2/CVP/NIT/2026-27****Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi**

1.	Name & Address of the bidder	
2.	Telephone No./Email ID/Telex No./ Fax No.	
3.	Legal status of the bidder (Scan & Upload copies of original document defining the legal status).	
a)	An Individual	
b)	A proprietary firm	
c)	A firm in partnership	
d)	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, 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/ joint venture, 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 of bidder(s) with stamp

Correction –Nil

Insertion –Nil

Deletion –Nil

Overwriting -Nil

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

**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)

Work experience/Performance Report certificate of Completed Works(s) mentioned in form- C

No.....

Date:

1.	Name of work		
2.	Location of work (mention city and state)		
3.	Name of contractor (same as mentioned in Award letter)		
4.	Agreement/work order number		
5.	Estimated Cost		
6.	Agreement/work order amount (Rs.)		
7.	Gross value of completed work (Rs.)		
8.	Amount of Gross value of last paid bill, (if final bill not paid).		
9.	Stipulated date of start (DD-MM-YYYY)		
10.	Date of completion:		
	(a) Stipulated date of completion (DD-MM-YYYY)		
	(b) Actual date of completion (DD-MM-YYYY)		
	(c) Justified extended date of completion, if decided (DD- MM-YYYY)		
11.	Details of work		
	(a) Nature of work (Building/Infrastructure/Road/ Horticulture)		
	(b) Type of structure (RCC framed load bearing / composite or any other)		
	(c) (i) Type of Technology used e.g. Cast-in-Situ Structural Systems, Monolithic concrete construction system, Precast RCC Systems, Steel Structure, Pre-stressed concrete system etc.		
	(ii) Technology used of his own or through Associated Agency.		
	(d) Type of Building / Infrastructure (Office/College/Hospital /School/ Hostel /Quarters / Flyover / Bridge / Road / Culvert etc.).		
	(e) In case of Road work, whether bituminous / CC or both		
12.	Name of electrical / specialized MEP items executed in the work (Please write the names of specialized services)	Executed by self	Executed by associated agency

	(a)	Internal Electrical installation, External Electrical installation, Lift, Scada, EPBAX, CCTV, LAN		
	(b)	Firefighting, Fire Alarm, HVAC		
	(c)	Electrical Substation, DG set, STP/ETP Plant		
	(d)	Solar Photo Voltaic Power Generation/ Solar Water Heating, Access Control, Baggage Scanner System, Conveyor Belt		
	(e)	Gas/Oxygen Supply Line, OT Room		
	(f)	Any other Specialized Services		
13.	Other information			
	(a)	If completed work is building construction, then number of storey(s) constructed without basement.		
	(b)	Number of basement(s).		
	(c)	If completed work is building construction, then approximate plinth area of the building.		
14.	(a)	Amount of Horticulture Work(s), (if executed)		
	(b)	Horticulture Work(s), whether executed by self or through associated agency		
15.	Details of extension of time for delayed completion.			
	(a)	Whether extension of time for delayed completion has been decided or not? Owner department officers are requested to only mention either "Yes or No" against this option. (Option of writing "Not applicable" is only acceptable where work is completed before stipulated date of completion).		
	(b)	If extension of time for delayed completion has been decided, then amount of compensation levied, if any?		
16.	Is there any Conciliation/Mediation/Arbitration/Court Case(s) (from start of work till issue of this certificate), Owner / department officers are requested to only mention either "Yes or No".			
17.	Status of owner / department Owner/ department officers are requested to only mention (Central/State Government /PSU/ Private)			

	(a) Name of Project Manager or Executive Engineer or Equivalent	
	(b) Address	
	(c) Phone	
	(d) e-mail	
18.	Remarks, if any	

The above work has been / was completed satisfactorily.

Signature with seal and designation

(Project Manager or Executive Engineer or Equivalent Officer of owner department)

RECEIPT OF DEPOSITION OF ORIGINAL EMD (Receipt No.....date.....)		
1	Name of Work*	Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi
2	NIT No.*	06/CE/CVPZ-2/CVP/NIT/2026-27
3	Estimated Cost*	Rs. 408,95,28,936/-
4	Amount of Earnest Money Deposit*	Rs. 4,18,95,290/-
5	Last date of submission of bid*	01/10/2026 up to 15:00 Hrs.
(*To be filled by Tender inviting authority/NIT approving authority at the time of issue of NIT and uploaded along with NIT)		
6	Name of contractor#	
7	Form of EMD#	
8	Amount of Earnest Money Deposit#	
9	Date of submission of EMD#	
Signature, Name and Designation of EMD Receiving officer (EE/AE(P)/AAO) alongwith Office stamp		
<i>(# to be filled by EMD receiving EE or NIT issuing EE/AE as the case may be)</i>		

**Certificate to be furnished by Agency and their Specialized agencies
under Rule 144 (xi), in the General Financial Rules (GFRs), 2017 (added
vide OM F. note 6/18/2019-PPD dated. 23rd July 2020)**

CERTIFICATE

"I have read the clauses regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub- contracting to contractors from such countries, I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all the requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]". It is also certify that Amendment to Rule 144(xi) of the General Financial Rules (GFRs), 2017 vide No.F.7/10/2021-PPD dtd 23/02/2023 with reads as "Rule 144 of the GFRs, 2017 titled 'Fundamental principles of public buying, had been amended by inserting sub-rule (xi) vide Department of Expenditure (DOE) OM No. F.6/18/2019-PPD dated 23.07.2020. It has now been decided to amend the Rule 144(xi) as under: Notwithstanding anything contained in these Rules, Department of Expenditure may, by order in writing, impose restrictions, including prior registration and/ or screening, on procurement from bidders from, or bidders having commercial arrangements with an entity from, a country or countries, or a class of countries, on grounds of defence of India, or matters directly or indirectly related thereto including national security; no procurement shall be made in violation of such restrictions." may also be abide by me.

[Note : similar certificate may also be obtained from the approved specialized agency for various works by Main agency.]

FORM-J**UNDERTAKING FOR INTEGRITY PACT****To,**

**The Executive Engineer (Civil)
Central Vista Project Division-14
CPWD, New Delhi – 110011**

**Sub: Internal finishing, furniture, furnishing and related E&M works for
office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi
NIT:- 06/CE/CVPZ2/CVP/NIT/2026-27**

Dear Sir,

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

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

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

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

Yours faithfully

(Duly authorized signatory of the Bidder)

Affidavit

I/We undertake and confirm that eligible category of 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 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 Performance Guarantee/ liable for action as per the Declaration signed. (Scanned copy to be uploaded at the time of submission of bid).

Signature of bidder(s) with stamp

Form-M**UNDERTAKING FOR GST REGISTRATION**

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

Signature of Bidder(s) with stamp

Note: The undertaking should be given on the letterhead of the bid.

MEMORANDUM OF UNDERSTANDING [M.O.U]

(To be submitted for each and every specialized agency)

- 1] M/S (Name of the firm with full address).
(henceforth called the main contractor)

And

- 2] M/S (Name of the firm with full address).
(henceforth called the specialized contractor)

Name of Work: **Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi**

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

We have agreed as under:

- 1 The associated contractor will execute the specialized work in the wholesome manner as per terms and conditions of the agreement
- 2 The associated contractor shall be liable for disciplinary action if he failed to discharge the action(s) and other legal action as per agreement.
- 3 All the material, machinery and equipment's, tools and tackles required for execution of the specialized works as per agreement shall be the responsibility of the associated contractor.
- 4 The technical staff required for the specialized works shall be arranged by the associated contractor as per terms and conditions of the agreement.

Signature of main contractor

Signature of specialized contractor

Date:

Date:

Place

Place :

Countersigned by executive Engineer

NOTE: Affidavit to be furnished on a "Non- Judicial" stamp paper worth Rs. 100/-

Form of Bank Guarantee
ON NON-JUDICIAL STAMP PAPER OF MINIMUM RS. 100

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

Form of Bank Guarantee for Earnest Money Deposit /Performance Guarantee/Security Deposit/Mobilization Advance/ Refund of milestone withheld amount

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

OR**

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

2. We, (indicate the name of the bank) (herein after referred to as "the Bank"), hereby undertake to pay to the Government an amount not exceeding Rs.... (Rupees..... only) on demand by the Government within 10 days of the demand.
3. We, (indicate the name of the Bank), do here by undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupees only).
4. We, (indicate the name of the Bank), further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge of

our liability for payment there under and the Contractor shall have no claim against us for making such payment.

5. We, (indicate the name of the Bank), further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.
6. We, (indicate the name of the Bank), further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.
7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.
8. We, (indicate the name of the Bank), undertake not to revoke this guarantee except with the consent of the Government in writing.
9. This Bank Guarantee shall be valid up to unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date:.....

Witnesses:.....

1. Signature.....

Name and address

(Authorized signatory)

Name

Designation

Staff code no.

Bank seal

2. Signature.....

Name and address

*Date to be worked out on the basis of validity period of 180 days.

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

INTEGRITY PACT

(Integrity Pact is applicable for all works of estimated cost put to tender equal to or more than the threshold value given in Schedule-F)

This Integrity Pact is made at on this day of..... 2026

BETWEEN

The President of India represented by the Engineer-in-Charge (hereinafter referred to as the Principal, which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assignees)

AND

.....

(Name and address of the bidder)

(Hereinafter referred to as the **Bidder/Contractor** and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assignees)

Preamble

WHEREAS the Principal has floated the tender (NIT No.. ,,) (hereinafter referred to as the Tender) and intends to award, under laid down organizational procedure, contract for

..... (Name of work)

hereinafter referred to as the Contract.

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

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

In order to achieve these goals, the Principal will appoint Independent External Monitors (IEMs) who will monitor the tender process and the execution of the contract for compliance with the principles mentioned hereunder.

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

Articles

Article 1: Commitment of the Principal

- (1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:
 - (a) No employee of the Principal, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - (b) The Principal will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
 - (c) The Principal shall endeavor to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- (2) If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

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

- (1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
- (2) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
 - (a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
 - (b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
 - (c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/ Contractor(s) will not use improperly, (for the purpose of competition

or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

- (d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly, Bidder(s)/Contractor(s) of Indian nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
- (e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- (3) Bidder(s) / Contractor(s) who have signed the Integrity Pact shall not approach the courts while representing the matter to IEMs and shall wait for their decision in the matter.

The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

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

Article 3: Consequences of Breach

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

1. If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in *any* other form, such as to put his reliability or credibility in question, the Principal after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined *by* the *severity* of transgression and determined by the Principal. Such exclusion may be forever or for a limited period as decided by the Principal.

2. Forfeiture of Earnest Money Deposit/Performance Guarantee/Security Deposit: If the Principal has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal apart from exercising any legal rights that may have accrued to the Principal, may in its considered opinion forfeit the entire amount of Earnest Money Deposit/Performance Guarantee and Security Deposit of the Bidder/Contractor.
3. Criminal Liability: If the Principal obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of PC Act, or if the Principal has *substantive* suspicion in this regard, the Principal will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last 3 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the tender process.
2. If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or action can be taken for banning of business dealings/holiday listing of the Bidder/Contractor as deemed fit by the Principal.
3. If the Bidder/Contractor can prove that he has resorted/recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal may, at its own discretion, revoke the exclusion prematurely.

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

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

Article 6- Duration of the Pact

This Integrity Pact begins when both the parties have legally signed it. It expires for the Contractor 12 months after the completion of work under the contract or expiry of defect liability period or last payment made under the contract, whichever is later and for all other bidders, 6 months after the Contract has been awarded.

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

Article 7- Other Provisions

1. This Integrity Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal, who has floated the tender.
2. Changes and supplements as well as termination notice need to be made in writing.
3. If the Contractor is a partnership or a consortium, this Integrity Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In case of a Company, the Integrity Pact must be signed by a representative duly authorized by board resolution.
4. Should one or several provisions of this Integrity Pact turn out to be invalid; the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
5. Issues like Warranty/Guarantee etc. shall be outside the purview of IEMs.
6. It is agreed term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Pact, any action taken by the Principal in accordance with this Integrity Pact or interpretation thereof shall not be subject to arbitration.
7. In view of the nature of integrity pact, the Integrity Pact is irrevocable and shall remain valid even if the main tender/contract is terminated till the currency of the integrity pact.
8. If any complaint regarding violation of I P is received directly by the Principal in respect of the contract, the same shall be referred to the IEM for comments/recommendations.

Article 8 -Independent External Monitor (IEM)

- (1)The Principal appoints competent and credible Independent External Monitor for this Pact after approval by Central Vigilance Commission (Names and address of IEMs are as mentioned in Schedule-F). The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- (2)The Monitor is not subject to instructions by the representatives of the parties and performs his/her functions neutrally and independently. The Monitor would have access to all contract documents, whenever required. It will be obligatory for him/her to treat the information and documents of the Bidders / Contractors as confidential.
- (3) The Bidder(s)/Contractor(s) accepts that the IEM has the right to access without restriction to all project documentation of the Principal including that provided by the Contractor, The Contractor will also grant the IEM, upon his/her request and demonstration of a valid interest, unrestricted and unconditional access to their project documentation. The same is applicable to sub- contractors.
- (4)The IEM is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/ Sub-contractor(s) with confidentiality. The IEM has also signed 'Non- Disclosure of Confidential Information' and 'Absence of Conflict of Interest'. In case if any conflict of interest arising at a later date, the IEM shall inform the Engineer-in-Charge and recuse himself / herself from that case.
- (5)As soon as the IEM notices, or believes to notice, a violation of this agreement, he/she will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The IEM can in this regard submit

non-binding recommendations. Beyond this, the IEM has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action

- (6) The IEM will submit a written report to the SDG/ADG concerned within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.
- (7) If the IEM has reported to the ADG/SDG concerned, a substantiated suspicion of an offence under relevant IPC/PC Act, and the ADG/SDG concerned has, within a reasonable time, not taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the IEM may also transmit this information directly to the Central Vigilance Commissioner.
- (8) The Principal will provide to the IEM sufficient information about all meetings among the parties related to the project provided such meetings could have impact on contractual relations between the Principal and the contractor. The parties will offer to the IEM the option to participate in such meetings.
- (9) The word IEM or monitor would include both singular and plural

Article 9- Legal and Prior Rights

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

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

(For and on behalf of Principal)

(For and on behalf of Bidder/Contractor)

WITNESSES:

1

(signature, name and address)

2

(signature, name and address)

Place:

Dated:

Note: To be signed by the Bidder and the Engineer-in-Charge.

CPWD- 7**GOVERNMENT OF INDIA****CENTRAL PUBLIC WORKS DEPARTMENT****Percentage Rate Tender & Contract for works****Tender for Work of:- Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi**

1. To be uploaded up to 15:00 Hrs. on 01/10/2026 on website: etender.cpwd.gov.in
2. To be opened in presence of tenderers who may be present at 15:30 Hrs. on 01/10/2026 in the office of the Executive Engineer, CVPD-14, CPWD, New Delhi.

I/We have read and examined the notice inviting tender, schedule A, D, E & F, Specifications, Tender **Drawings** & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, Special conditions, Schedule of Rates, other documents, regulations, Acts 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 planning, designing and execution of the work as per scope mentioned in this tender document 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 applicable municipal byelaws , regulations, Acts, NGT guidelines, 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 accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for **Seventy-Five (75)** days from the due date of its opening of eligibility bid and not to make any modification in its terms and conditions.

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

A copy of earnest money deposit receipt of prescribed amount **Rs 4,18,95,290/-** deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed) issued by a Commercial Bank, is scanned and uploaded (strike out as the case may be). If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the President of India or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely.

Further, if I/We fail to commence work as specified, I/We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said performance guarantee shall be a guarantee to execute all the works referred to in the bid 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 bid form. Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-bidding process of this 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 bidding in CPWD as per enlistment rules applicable. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee.

I/We hereby declare that I/We shall treat the bid 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: **.....

Signature of Bidder **

Witness: ** Address: **

Postal Address **

Occupation: **

[to be filled by Bidder]**

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned here under) is accepted by me for and 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: -

1.

2.

3.

for & on behalf of the President of India.

Signature

**Executive Engineer,
CVPD-4, CPWD, NEW DELHI.**

PROFORMA OF SCHEDULES: A TO F**(CIVIL Works)****SCHEDULE 'A'** (Schedule of work)

As per NIT page No. 167-253 Civil, page No.254-288 Furniture work & Page No. 511-629 (E&M) & Page no 680-683 (O&M of E&M).

Financial Quote for quoting combined rates for construction Civil Works and Electrical & Mechanical works as attached in Bid Document.

SCHEDULE 'D'

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

SCHEDULE 'E'

Reference to General Conditions of Contract: - General Conditions of Contract 2023 Construction as amended / modified up to the last date of submission of Bid.

Name of Work: - Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi

(i) Estimated cost of work	A. Construction work component i. Civil: Rs. 280,05,44,676/- ii. E&M: Rs. 192,62,92,896/- B. Operation & Maintenance component i. E&M: Rs. 8,26,91,364/- Total: Rs. 408,95,28,936/-
(ii) Earnest Money	Rs. 4,18,95,290/-
(iii) Performance Guarantee	(a) 5% of tendered value or Estimated Cost Put to Tender (ECPT) (whichever is higher). (b) Where the tendered amount is less than eighty percent (80%) of the Estimated Cost Put to Tender (ECPT), the Performance Guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount.
(iv) Security Deposit	2.5% of the tendered value

SCHEDULE 'F' (GENERAL RULES & DIRECTIONS)

Officer inviting bid:	Executive Engineer, CVPD-14, CPWD, New Delhi
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Definitions:

2(vi)	Engineer-in-Charge For Civil work	EE, CVPD-14, CPWD, NEW DELHI or his successor thereof
	Engineer-in-Charge For Electrical & Mechanical work	EE (E), CVPED-2, CPWD, NEW DELHI or his successor thereof
2(viii)	Accepting Authority	Chief Engineer, Central Vista Project Zone-2, CPWD, New Delhi or his success or thereof.
2(x)	Percentage on cost of materials and Labour to cover all overheads and profits.	15%
2(x)(b)	Standard Schedule of Rates (i) Civil work	DSR 2023 + Correction factor @ 0.973 + CI @ 4.03% & Market Rate. Delhi Schedule of Rates 2023 (Vol.-I & II) with amendments up to the last date of submission of bid & market rates.
2(xi)	Department	Central Public Works Department (CPWD)
9(ii)	Standard CPWD contract Form GCC 2024, CPWD Form EPC as modified & corrected upto	General Conditions of Contract 2023 Construction, modified & corrected up-to the last date of submission of Bid. (All above documents are available on www.cpwd.gov.in)
16	Price Preference to SC/ST individual contractor is valid upto	Not applicable

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	15 Days
(ii)	Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above.	07 days

Clause 2

(i)	Authority for fixing compensation under clause 2	Superintending Engineer, Central Vista Project Circle-7, CPWD or his successor thereof
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Clause 5

(i)	Authority to convey the decision of shifting of milestone and extension of time. (Engineer-in-Charge or Engineer-in-Charge of Major Component in case of Composite Contracts, as the case may be).	Executive Engineer, Central Vista Project Division-14, CPWD or successor thereof
(ii)	Authority to decide rescheduling of milestone and extension of time. (SE/SE&PD/ CE/ CE&ED).	Superintending Engineer, Central Vista Project Circle - 7, CPWD or his successor thereof
(iii)	Shifting of date of start in case of delay in handing over of site. (SE/SE&PD /CE/ CE&ED).	Superintending Engineer, Central Vista Project Circle - 7, CPWD or his successor thereof

Clause 5: Schedule of Handing over of site

Portion of site	Description	Time period for handing over to be reckoned from date of issue of letter of intent
Around 30% of site	Any 3 floors	22 days from date of issue of letter of intent/ acceptance Or Date of handing over of Site whichever is later (On as is where is basis)
Around 30% of site	Any 3 floors	After two (02) month of the date of start of work
Remaining site	Rest of the floors	After Four (04) month of the date of start of work

Schedule of issue of Design Drawings

Portion of Design	Description	Time Period for issue of design from date of start
Architectural Drawings	All floors	On the day of issue of letter of commencement of work by the Engineer-in-Charge.

Time allowed for execution of work	12 months – Construction work 36 Months - O&M of E&M component
Number of days from the date of issue of letter of acceptance for reckoning date of start	22 (Twenty-Two) days or Site handover Whichever is later.

[illegible]

	Achieving financial progress of 10% of civil tendered amount. <u>E&M</u> Finalisation of specialised agencies for E&M works and submission of Technical Data Sheets for major E&M equipment. Submission of drawings for E&M services & Placement of orders for equipment for major E&M equipment like AHUs, electronic equipment like switches, displays, CCTV cameras, controllers etc.		1.00% of E&M Construction tendered amount.
(iii)	Civil Completion of Brickwork, Plaster work, Tile work , granite flooring work , Single board dry wall partition system activities, water proofing work at all floor and Procurement of all remaining finishing items except furniture. Or Achieving financial progress of 30%. <u>E&M</u> Supply of Major E&M equipment for major E&M equipment like AHUs, electronic equipment like switches, LED walls, CCTV cameras, controllers etc. At least 50% of conduiting and wiring must be done.	5 months	1.00% of Civil construction tendered amount. & 1.00% of E&M Construction tendered amount.
(iv)	Civil Completion of false ceiling work dry wall partition work acoustic, wooden panelling and flooring works of any		1.00% of Civil construction tendered amount.

	4 floors and supply of all the furniture items from 1st to 3rd floor. Or Achieving financial progress of 50% of civil tendered amount. E&M Installation of HVAC equipment, Major AV, CCTV and IT equipment along with wiring.	8 months	& 1.5% of E&M Construction tendered amount.
(v)	Civil (a) Completion of any 5 floors in all respect w.r.t civil items. (b) Supply of all the furniture items from GF. to 8th floor. Or Achieving financial progress of 75% of civil tendered amount.	10 months	1.00% of Civil construction tendered amount.
(vi)	Civil Completion of total works including testing and commissioning of all the services and handing over of the building. E&M (a) Completion of all E&M works including testing and commissioning.	12 months	1.00% of Civil construction tendered amount. & 1.5% of E&M construction tendered amount.

NOTE:

1. Withheld amount shall be released if and when subsequent milestone is achieved within respective time specified. However, in case milestones are not achieved by the Bidder for the work, the amount shown against milestone shall be withheld.
2. The Agency shall prepare a programme chart (Time and Progress) for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfilment of the programme within the stipulated period and submit the same for approval of the Engineer-In-Charge within 30 days. However merely submission of integrated programme chart (Time and Progress) does not absolve the responsibility for completion by augmentation of resources

(manpower, equipment, and machinery) depending upon progress desired for completion of project in time.

3. One agency will be executing works in the area prior to this agency's engagement, and another will follow upon its completion. Each milestone is therefore critical, and the site shall be handed over in phases.

Clause 6

Computerized Measurement Books (CMB) / Electronic Measurement Book (EMB):

Mode of Measurement: CMB

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. 15 Crore or part thereof As per decision of Engineer-in-Charge based on the requirement of work.
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Clause 7A

Whether clause 7A shall be applicable

Yes

Clause 8

Detail of building/infrastructure project to be completed early for use:

The zones/areas of the work shall be physically completed and handed over in entirety or partly or floor wise to the client progressively, on the dates detailed in the Milestone Schedule under Clause 5. Handing over of an area on its milestone date shall not absolve the Contractor of his responsibilities under the contract, including rectification of defects in the handed-over area, safety and responsibility of his executed works, and coordination with the finishing agency; and no claim whatsoever shall be entertained on account of such progressive completion and handing over.

Clause 8A

(i)	Authority to decide the compensation on account if the agency fails to submit the completion plans.	Superintending Engineer, Central Vista Project Circle - 7, CPWD or his successor thereof
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Clause-10A: List of Testing equipment's to be provided by the agency at Site Lab: Equipment for conducting necessary Tests (as per CPWD Specifications 2019 Volume-I & II) & as per manufacturer specification under relevant IS Code procedures shall be provided and installed at site in the well-furnished Site Laboratory by the contractor at his own cost. **Engineer in charge may however, at his discretion, send samples of select materials for**

necessary testing at independent laboratories to be approved by the Engineer in charge.

Clause 10B (i)

Whether Clause 10 B (i) shall be applicable Yes Applicable

Clause 10B (ii)

Whether Clause 10 B (ii) shall be applicable Yes Applicable

Clause 10B (iii)

Whether Clause 10 B (iii) shall be applicable No

Clause 10 C: Applicable

Component of labour expressed as 20 %
percentage of value of work due to
Statutory Order(s) shall be applicable.

Clause 10CC – Not Applicable

Clause 11 Specifications to be followed for execution of work:

For Civil Items of work	CPWD Specifications 2019 with up-to-date correction slips issued by authority of Director General, CPWD upto the last date of receipt of bid unless otherwise specified in this document elsewhere.
For Electrical items of work	As defined in schedule F of Chapter C
Order of Preference	In case of any discrepancy within the tender document, following order of precedence shall be observed:
	a. Description of Schedule of quantities document read along with the scope of work. b. Particular specifications, special conditions for civil, electrical and horticulture works given in this NIT. c. Architectural Drawings d. CPWD Specifications, specification with up-to date correction slips till the last date of submission of bid, for civil, electrical and horticulture works as applicable. e. National Building Construction Standards-2026. f. Indian Standard Specifications of B.I.S g. Manufacturer's specifications h. Sound engineering practice. Note: NBCS 2026 shall be considered for the design & execution of the project. In case any required provision is not

	available in NBCS 2026 then NBC 2016 provisions shall govern the design and execution of the project.
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Building Information Model (BIM) is applicable	Not applicable
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Clause 12 Applicable

Clause-12.2(c)	Deviation Limit beyond which clauses 12.2 (c) shall apply for building work.	100%
	(i) 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%
	(ii) Deviation Limit for items mentioned in earth work subhead of DSR and related items	100%

Clause 16

Competent Authority for Deciding Reduced rates:	
For deciding reduced rates for items having value upto 5% of contract value for Civil works	Chief Engineer, CVPZ(C)-2, CPWD, New Delhi or his successor thereof
For deciding reduced rates for items having value more than 5% of contract value for Civil works	Chief Engineer, CVPZ(C)-2, CPWD, New Delhi or his successor thereof with in-principal approval of SDG (PRND), CPWD, New Delhi or his successor thereof

Clause 19 C	Penalty for each default:	Rs. 50,000
Clause 19 D	Penalty for each default:	Rs. 50,000
Clause 19 G	Penalty for each default:	Rs. 50,000
	Enhanced penalty per day for continuous default	Rs. 1,50,000
Clause 19 K	Penalty for each default:	Rs. 300 per tradesman per day

Clause 25

(i)	Conciliator	SDG (Project Region New Delhi) CPWD or Successor thereof
(ii)	Arbitrator Appointing Authority	Chief Engineer, Central Vista Project Zone-2, CPWD, or Successor thereof
(iii)	Place of Arbitration	New Delhi

Clause 32

(i) Requirement of Minimum Technical Representative(s) and Recovery Rates:

For Civil Portion Only

Sl.No	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical/ Technical Representative)	Minimum Experience	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 32 (i)	
						Figures	Words
1.	Graduate Engineer (Civil)	Civil	Project Manager with degree in major discipline of engineering	20 year (and having experience of one similar nature of work)	1 No	Rs. 1,00,000/- per Month per person	Rs. One Lakh per month per person
2.	Graduate (Civil) Engineer	Civil	Deputy Project Manager	12 year (and having experience of one similar nature of work)	2 Nos	Rs.40,000/- per Month per person	Rs. Forty Thousand per month per person
3.	Graduate Engineer or Diploma Engineer (Civil)	Civil	Project / site Engineer	5 or 10 respectively	4 No	Rs. 25,000/- per Month per person	Rs. Twenty Five Thousand per month per person
4.	Graduate Engineer (Civil)	Civil	Quality Control Engineer	8 year	1 No	Rs. 25,000/- per Month per person	Rs. Twenty Five Thousand per month per person

5.	Diploma Engineer (Civil)	Civil	Surveyor cum Site Supervisor	8 year	1 No	Rs. 15,000/- per Month per person	Rs. Fifteen Thousand per month per person
6.	Graduate Engineer (Civil)	Civil	Project Planning/ Billing Engineer	6 year	1 Nos	Rs.20,000/- per Month per person	Rs. Twenty Thousand per month per person
7.	Safety Engineer	Professional	Ensuring Safety measures for construction activities.	5 year	1 No	Rs.20,000/- per Month per person	Rs. Twenty Thousand per month per person
8.	Housekeeping Incharge	Professional	Ensuring housekeeping of site and peripheral roads, footpaths etc.	5 year	2 No	Rs. 20,000/- per Month per person	Rs. Twenty Thousand per month per person
9.	Fire Safety Officer	Professional	Ensuring Fire Safety measures at site	5 year	1 No	Rs.20,000/- per Month per person	Rs. Twenty Thousand per month per person

NOTE:

1. Engineer shall be deployed as per requirement and approval of Engineer in charge.
2. The qualification and experience of the technical staff proposed to be deployed by the contractor shall be got approved by the Engineer-in- Charge, before actual deployment.
3. The Contractor shall submit a time schedule of deployment of technical staff as specified above, along with and in conformity to the activity wise work programme, within 7 days of award of work. This deployment schedule shall be got approved by the Engineer-in-Charge and in case

- of failure to comply with the approved deployment schedule, without valid reasons, recovery at the rates specified in the above table, shall be affected from the payments due to the contractor.
4. Assistant Engineers retired from Government services that are holding diploma will be treated at par with Graduate Engineers. Diploma holder with minimum 5 years 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 Applicable as given below

(i)	Schedule/statement for determining theoretical quantity of cement & bitumen based on Delhi Schedule of Rates.	Delhi Schedule of Rates 2023 with amendments up to the date of submission
(ii)	Variations permissible on theoretical quantities.	
(a)	Cement	2% Plus/Minus
(b)	Bitumen for all works.	2.5% plus only and 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

Provision of Independent External Monitors

- Integrity Pact would be applicable for the work having estimated cost put to tender Rs.300 crore and above.
- Particulars of IEMs appointed by CVC are given below:

S. No.	Name	Address, Mobile and email ID
1	Sh. Vinayaka Rao Turaga IOFS (Retired)	Turaga House, Anne Baburao Colony Penamaluru, Vijaywada, Andhra Pradesh - 521139 Mobile:9007723414 email: tvrao56@gmail.com
2	Dr. Ravindra Kumar Srivastava IAS (Retired)	A6 Anand Niketan, New Delhi - 110021 Mobile: 9999985440 email: srivastava.rks@gmail.com
3	Sh. Vijay Kumar Singh Principal Chief Conservator of Forest HAG (Retired)	House no. 12 stellar Okas Golf View, Sector-H, Sushant Golf City, Lucknow Pin- 226030 email: ksingh_vijay@yahoo.com Mobile: 9717581113

Appendix-I

Establishing Site Laboratory and Testing of Materials

Equipment for conducting necessary tests (as per CPWD Specifications 2019 Volume-I & II) shall be provided and installed at site in the well-furnished site laboratory by the contractor at his own cost. The following laboratory equipment should be in general or as and when required to be set up at site laboratory:

Sl. No.	Equipment	Numbers
1.	Graduated glass measuring cylinder	As per requirement
2.	100 MT compression testing machine (Electrical cum manually operated)	1
3	Slump cone, steel plate, tamping rod, steel scale, scoop	2
4	Weighing scale platform type 100 kg capacity	1
5	Cube moulds 150mmx150mmx150mm	24
6	Counter scale capacity 1kg and 10kg	2
7	Electric distance measuring device	4
8	Measuring tape 30mt and 50 mt	2
9.	Measuring jars 100ml, 20ml, 500ml	4 Nos. each size
10	Vernier callipers 12" & 6" size	2 each
11	Digital PH meter least count 0.01mm	2 each
12	Digital Micro meter least count. 0.01mm	2 each
13	Digital paint thickness meter for steel/aluminum 500 microns range	2
14	Rebound hammer test digital rebound	1
15	Screw gauge 0.1mm-10mm, least count 0.05	1
16	Water testing kit	2
17	Wash Bottles capacity 500 ml	8
18	BIS and other codes	As per requirement
19	Elcometer	1
20	Multiline laser layout tool	1

Appendix-II

List of Minimum Requirements (but not limited to) of Plant and Equipment at site

Sl. No.	Equipment	Numbers
1.	DG set of minimum capacity of 125 KVA.	1
2	Concrete pump	1
3	Needle vibraators	2
4	Screed leveler	2
5	Welding machine 400 Ampere	2
6	Air compressor	2 Nos.
7	Floor grinding/polishing machines	2 Nos.
8	Granite/stone cutting machine	1
9	Tile cutting machine	6
10	Granite polishing machine	1
11	Granite hand polishing machine	1
12	High Definition DSLR Camera for taking photographs and video recording of major activities for record purpose and for quality assurance.	1
13	Any other machinery required for completion of the work as per decision of Engineer-in-charge.	As per Actual requirement

Note: The above list is only indicative and not exhaustive. The Contractor may be required to deploy more T&P as per requirement of work so that work may be completed on time.

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

PART-B

General Conditions, All Special Conditions, Scope of work, Particular Specifications & conditions for civil works and all technical specifications.

GENERAL CONDITIONS

1. The Contractor shall make his own arrangements for electricity required for the execution of the work and nothing extra shall be paid for the same. However, for electrical connection, Engineer-In-Charge shall recommend the application of the Contractor to concerned Local authorities, if so desired by the Contractor. Necessary fees and i/c consumption charges shall be paid by the contractor directly to the department concerned. In case the authorities fail to sanction the electric connection or delay the sanction of electric connection, the contractor shall make his own arrangements by providing diesel generators of adequate capacity at his own cost. He shall also make his own arrangement for obtaining telephone connections for his own use.
2. 1% (One percent) Water Charges shall be recovered, if water is supplied by the department/client department.
3. All the materials will be arranged by the Contractor himself. If any material is issued by the department, the Contractor shall bear all incidental charges for cartage, storage and safe custody of such material.
4. All materials shall only be brought at site as per programme finalized with the Engineer- in-Charge. Any pre-delivery of the material, not required for immediate consumption shall not be accepted and thus not paid for.
5. Except for the items, for which Particular Specifications are given or where it is specifically mentioned otherwise in the description of the items in the schedule of quantities, the work shall generally be carried out in accordance with the "CPWD Specifications 2019, Vol. I & II with up-to-date correction slips issued up to last day of online receipt of bids, Manufacturer's Specifications, and instructions of Engineer-In-Charge. Wherever CPWD Specifications are silent, the latest IS Codes / Manufacturer's Specifications shall be followed.
6. A reference made to any Indian Standard Specifications in these documents, shall imply to the latest version of that Standard, including such revisions / amendments as issued by the Bureau of Indian Standards up to last date of receipt of tenders. The Contractor shall keep at his own cost all such publications of relevant Indian Standards applicable to the work at site.
7. The rates for all items of work shall, unless clearly specified otherwise, include cost of all labour, material, tools and plants and other inputs involved in the execution of the item.
8. The contractor(s) shall quote all-inclusive rates against the items in the schedule of quantities and nothing extra shall be payable for any of the conditions and specifications mentioned in the tender documents unless specifically specified otherwise.
9. Unless otherwise specified in the Schedule of Quantities, the rates for all items shall be considered as inclusive of pumping / bailing out water, if necessary, for which no extra payment shall be made.
10. The rate for all items, in which the use of cement is involved, is inclusive of charges

for curing.

11. The work shall be executed and measured as per metric dimensions given in the Schedule of Quantities, drawings etc. (FPS units wherever indicated are for guidelines only).
12. Any legal or financial implications resulting out of disposal of earth shall be the sole responsibility of the Contractor. Nothing extra shall be paid on this account.
13. 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.
14. The contractor shall indemnify the Govt. against any claims or obligations arising out of any damage to adjacent property, structure or to building work done by him.
15. **Licenses:**
 - a. The Contractor shall pay to the Municipal, Police or other authorities all the fees etc. that may be required by law, obtain requisite licenses for temporary constructions, enclosures and pay all fees/taxes and charges which shall be leviable on account of his obligations in executions of the Contract. No claim will be entertained on this account.
 - b. All licensing fees, Royalty charges for property rights etc. shall be paid by the Contractor direct to the authorities concerned. No claim will be entertained on this account.
16. In the event of tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act 1932.
17. The Water Supply Installations, Internal Sanitary Installations and Drainage work etc. shall be carried out in the manner complying in all respects with the requirements of relevant byelaws of the Local body under the jurisdiction of which the work is to be executed or as directed by the Engineer in Charge and nothing extra shall be paid on this account.
18. Existing drains, Cables, Pipes, Overhead wires, Sewer lines, Water lines and similar Services encountered in the course of execution of work shall be protected against the damages by the Contractor at his own expense. The Contractor shall not store materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services.
19. Contractor shall take all precautionary measures to avoid any damage to adjoining property/ building. All necessary arrangements shall be made on his own cost by the Contractor.
20. The Contractor shall be responsible for the Watch and Ward / Guarding of the relevant provision of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage

and breakage during the period of installations and thereafter till the building part is physically handed over to the client department. No extra payment shall be made on this account.

21. The order of preference in case of any discrepancy as indicated in condition No. 8.1 under "Conditions of Contract" given in "General Conditions of Contract 2023 for Central P.W.D. Works may be read as the following:
22. The Contractor shall take all precautions to avoid accidents by exhibiting caution boards day and night. The contractor shall be responsible for all damages and accident due to negligence on his part and no claims shall be entertained in this regard.
23. If due to exigency of work, the work is required to be carried out in more than one shift or during night then Contractor will be bound to execute the work accordingly and arrange the T & P and labour etc. No extra claim on this account shall be entertained.
24. The Contractor shall be bound to follow the instructions and restrictions imposed by the local Administration/Police authorities on the working and/or movement of labour, materials etc. and if due to stated instructions and restrictions it lead to less/restricted working hours or suspension of work or any detours in movement of vehicles then nothing extra shall be payable.
25. The Contractor shall also be required to follow the rules & restrictions imposed on working /movement/stacking of materials by the local competent authority at all times. Nothing extra shall be payable on this account.
26. Any damage caused by the Contractor to the existing building/installations/roads/boundary walls shall be made good by him (the Contractor) at his own cost.
27. Site is located in sensitive area, where movement and routes are restricted. The Contractor shall have to apply for passes well in advance for carrying out the work. No claim whatsoever shall be entertained for any loss on this account. Some restrictions may be imposed by the Security staff/ Delhi police on the working and for movement of labour, materials etc.
 - a. The movement of trucks and vehicles shall be regulated in accordance with rules and regulations as approved by competent authority.
 - b. The contractor shall be bound to follow all such restrictions / instructions and nothing extra shall be payable on this account.
 - c. No claim whatsoever will be entertained by the department on account of any, restrictions (including temporary suspension of work) imposed by the security agencies in execution of work.
 - d. In respect of Original/Maintenance/repair or renovation works etc. where the labour have an easy access to the individual houses/Office Complex, the Contractor shall issue identity cards to the labourers, whether temporary or permanent and he shall be responsible for any untoward action on the part of such labour.

28. Before start of work, the Contractor keeping in view that the space available is limited, shall furnish details of cement and other storage, site laboratory, water tank, etc. and seek formal approval of the Engineer-in-charge. No space will be available at site of work for the fabrication of steel / aluminium work grating, railing, etc. The contractor should make his own arrangement for the same in his workshop. Nothing shall be paid for the carriage of such manufactured items from workshop to site of work. The Contractor shall not stack building material / malba on NDMC land or road or on the land owned by any other authority and in case of failure to do so, he shall face penal action as per the rules, regulation and bye-laws of the said body or authority. The Engineer-in-Charge shall be at liberty to recover the amount due but not paid to the concerned authorities on account of the above from any amount due to the Contractor including amount of the security deposit or retention money in respect of this Contractor or any other Contract.
29. No labour huts shall be kept at the site of work. Tenderers shall quote their rates accordingly and nothing extra shall be paid on this account.
30. The contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, marking, flags lights and flagman as necessary, at either end of the excavation / embankment and at such intermediate points, as directed by the Engineer-in-Charge for the proper identification of construction area. He shall be responsible for all damages and accidents caused due to negligence on his part. Nothing extra shall be paid on this account.
31. **Integrated Programme Chart:** The contractor shall prepare an integrated programme chart for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfilment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer-in-Charge **within 10 days** of the award of the Contract.
- 31.1. In such case, the Contractor will have to deploy the necessary T&P, labour and other resources accordingly and complete the work in Phased manner. No extra claim will be entertained in this regard.
- i. The programme chart should include the following:
 - ii. Descriptive note explaining sequence of various activities.
 - iii. Network (PERT/CPM/Bar Chart)
 - iv. Programme of procurement of materials by the Contractor.
 - v. Programme of procurement of machinery/ equipments having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the Contractor & Time schedule of the requirement of materials to be supplied by the department.
 - vi. Time schedule of the requirement of materials to be supplied by the Department.
- 31.2. If at any time, it appears to the Engineer-in-Charge that the actual progress of the work does not conform to the approved programme referred above, the Contractor shall produce a revised programme showing the modifications to the approved programme to ensure completion of the work within the stipulated time

for completion.

- 31.3. The submission for approval by the Engineer in Charge of such programmes or the furnishing of such particulars shall not relieve the Contractor of any or his duties or responsibilities under the Contract. This is without prejudice to the right of the Engineer in Charge to take action against the Contractor as per terms and conditions of the agreement.
- 31.4. In order to adhere to the Committed Program and requirement of allottees, the work shall be carried out in more than one shift and Contractor will deploy the resources accordingly. No extra claim on this account shall be entertained. Contractor should give advance notice in writing to Engineer-in-charge for doing any work in odd hours and arrange permission accordingly. Contractor shall arrange for transportation of CPWD site staff to their residences, in case the site staff is required to stay beyond office hours or during odd hours.
32. The agency shall comply with the Orders and Guidelines of NGT MoEF and instructions regarding Disposal of Waste, as applicable from time to time.
33. All malba / rubbish /silt / waste / garbage / etc. generated during execution shall be collected on daily basis by the Contractor / Agency to the specified common disposal point and nothing extra shall be paid on this account. After the accumulation of full Tractor load of the said malba the same shall be disposed of by the Contractor / Agency to the authorized municipal dhalao / dumping ground. In case malba/rubbish/silt/waste/garbage etc generated are not removed or disposed off within three days from the written instruction by the Engineer-in-Charge or his authorized representative staff/supervisory staff (JE/AE), a sum of Rs. Ten Thousand per day shall be recovered from the Contractor / Agency.
34. The Contractor will be required to pay GST, as applicable, to the Government and all other Applicable taxes. Nothing extra will be paid on this account.
35. The Agency shall stack all building material in proper way and at appropriate space so that there is no Hindrance for Occupants/Guests of Institute and movement of vehicles.
36. Agency shall provide proper safety Measures like Safety tape, Barricade and Red Lamp during night. Nothing extra is payable in this regard.
37. The Agency shall cover the existing structures/items in the work area with curtain/cloth for avoiding dust during execution of work. Nothing extra is payable in this regard.
38. The Agency shall provide Silent Generator, if required at site.
39. Work is to be executed in the premises of as mentioned in the name of work of the tender document. Proper and due care is to be taken for maintaining the proper decorum in the premises by the Manpower employed by the Contractor to have least disturbance to the allottees/occupant in the building & nearby building. Also, Contractor should erect/provide necessary Barricades/Screens as per direction of Engineer-in-Charge to protect the surroundings/premises from the Air pollution, by enclosing the work area. Nothing extra will be paid in this regard. The rates quoted by the Contractor are deemed to be inclusive of all leads and lifts. No extra

claim whatsoever will be entertained in this regard.

40. The agency may require to erect builder's hoist required for carrying out various operations/works. Nothing extra shall be payable on this account.
41. Work will be executed mostly in odd hours & round the clock as per the convenience of the client. In addition to that agency shall have to work round the clock on Saturdays, Sundays & Holidays, if needed. Nothing extra shall to paid to the agency in such situations.
42. Contractor shall give mobile no. of agency and their site Engineers and staffs to the CPWD officials for quick communication/directions for the work. Nothing extra shall be paid on this account.
43. The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, machinery, equipment, temporary structures and transport which may be required in preparation of and for the full and entire execution and completion of the works. The descriptions given in Schedule of Quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.
44. **DEVIATION FROM THE DRAWINGS, SPECIFICATIONS, STIPULATION, CONDITIONS**

The contractor is not to vary or deviate from the drawings, specifications, stipulation, conditions of tender document or instructions to execute any work of any kind whatsoever unless so authorized by the Engineer-in-Charge in writing. For any extra work involved in consequence of some breach of this contractor the part of the contractor(s), no extra payment will be admissible to the contractor.

45. **PROTECTION OF WORKS** All finished Works shall be protected from damage that could arise from other construction activities. Work shall be planned and executed in such a manner that work completed by others is not damaged. The compliance of these provisions is deemed to be included in the quoted amount and nothing extra shall be paid on this account. The contractor shall maintain in good condition all work till the completion of entire work allotted to him. Engineer-in-Charge shall not be held responsible for any claims for injuries to persons/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the contractor or of any other of his authorized representatives / Labour in his employment during the execution of the work. The compensation, if any, shall be paid directly to the department/authority/persons concerned, by the contractor at his own cost. **The contractor shall take adequate precautions for work in progress as well as completed works from flooding particularly during the rainy season.**
46. **RIGHT TO CARRY OUT THE WORK** The right to carry out the work either in conformity with or in a manner entirely different from the terms of this tender document that may be considered the most suitable before or subsequent to the receipt of tenders due to exigencies of work is reserved with the Engineer-in-

Charge.

47. **PROGRESS OF WORK** Contractor shall give the Engineer-in-Charge on the 10th day of each month, copy of progress report in the prescribed format of the work done during the previous month and program/ proposal for the next month. Such progress report will include the quantum of work done, important materials consumed, and materials available at site, materials proposed to be procured during the month & photographs of important activities as well as showing progress of the work.

Special Conditions

Specific Conditions for all components of work

- 1.0 The rate quoted by the agency shall be for all the provisions of the bid document. Nothing extra shall be paid for compliance of the provisions mentioned in the bid document. Extra payment for compliance of any provision shall be made only when it is specifically provided that it shall be paid extra.

The rates quoted by the bidder shall be for all the provisions of the bid document and are applicable for all lead, lift and height, irrespective of the fact whether "Nothing extra shall be paid" is specifically mentioned against any provision or not. This is applicable for all components of work.

- 2.0 No place is available at the site/plot for establishing of labour camp, establishing of Batching plant, stacking of materials , Yard for steel, setting up of office for staff of contractor, stacking of excavated soil etc. Contractor has to make his own arrangement for facilitation of all these activities required for execution of work at his own cost. Contractor shall make his own arrangement for transportation of Batch Mix Concrete from Batching Plant and other materials at his own cost. No claim of hindrance due to delay in setting up of these activities will be admissible on any account. All costs related to these are deemed to be included in the ECPT. Contractor have to quote accordingly by taking into account all these aspects.
- 3.0 Complete Water required for construction and other miscellaneous purposes shall be arranged at his own cost. Required RO plants shall be arranged at his own cost. Water quality shall be strictly as per the CPWD & BIS CODES.
- 4.0 Contractor will plan the construction work in such a manner so that minimum disturbance to public is caused. Contractor will prepare diversion plan during construction and will get it approved from the Delhi Traffic Police. Payment for diversion roads, if required during construction shall be the responsibility of the Agency only and deemed included in the quoted cost.
- 5.0 In case of reduction in scope of work, no claim on account of reduction in value of work, loss of expected profit, consequential overheads, etc., shall be entertained.
- 6.0 The contractor should make temporary arrangements for sewage disposal, water supply, electricity etc. for completed building to make them functional in case permanent arrangements are not ready for which nothing extra shall be payable.
- 7.0 The successful tenderer shall coordinate with other contractors and agencies engaged in other works in the building and shall freely exchange all technical information so as to ensure smooth execution of this work/contract. No remuneration shall be claimed from the department for such technical cooperation. If any unreasonable hindrance is caused to other agencies, or if any completed portion of the work has to be dismantled and redone for want of cooperation and coordination on the part of the successful tenderer during the course of the work, the tenderer shall restore the dismantled portion to its original condition and specification at his own cost. Failing this, the expenditure incurred by the department on such restoration shall be recovered from the successful tenderer. The decision of the Engineer-in-Charge as to whether hindrance was caused and the amount recoverable shall be final and binding

- 8.0 The statutory fees payable to statutory authorities for obtaining applicable local body approvals and various permanent service connections shall be reimbursed to the contractor unless specifically provided otherwise elsewhere in the tender document. The reimbursement shall be made only upon production of proof of payment. However, any penalty imposed for the above activities shall not be reimbursed and will have to be borne by the contractor.
- 9.0 All expenditure to be incurred for testing of samples e.g. collection, packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor.

The cost of material used for testing shall also be borne by the contractor.

- 10.0 **SIGN BOARDS:** The Contractor shall provide, erect and maintain till completion of work, a display board of size and shape as per directions of Engineer in charge and paint over it, in a legible and workman like manner, the details about the salient features of the project, as required by the Engineer-in-Charge. The Contractor shall fabricate and put up a sign board in an approved location and to an approved design indicating name of the project, Client/Owner, Engineer-in charges, Structural Consultants, Department etc. besides providing space for names of other Contractors, Sub-Contractors and specialized agencies within 30 days from issue of award letter. Nothing extra shall be payable on this account. In case of non-compliance/delay in compliance in this, a penalty @ Rs. 2000/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

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

- 11.0 **AS BUILT DRAWINGS:** On completion of work, the Contractor(s) shall submit at his own cost Six prints of "as built" drawings to the Engineer-in-Charge within 30 days of completion of their scope of work. These drawings shall have the following information amongst other information that may be directed by Engineer in charge.

11.1 Run off all piping and their diameters including soil waste pipes and vertical stacks.

11.2 Ground and invert levels of all drainage pipes, Water pipelines, Rain water pipelines etc together with locations of all manholes and connections, up to outfall.

11.3 Run off all water supply line with diameters, locations of control valves, access panels etc.

11.4 Lines include both internal & external alongwith concealed also and any other if any.

11.5 All literatures, manuals, warranty certificates etc. of various installed fittings, fixtures and equipment for the completed projects

11.6 All the interventions made in the building.

11.7 All the MEP services, support systems and relevant provisions provided in the building.

11.8 Any the additional structures made in the building.

- 14.0 The contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the CPWD, its officials & employees from any

and all damages and claims that may arise on any account. The Contractor shall indemnify the department CPWD against all claims in respect of patent rights, royalties, design, trademarks- of name or other protected rights, damages to adjacent buildings, roads or members of public, in course of execution of work or any other reasons whatsoever, and shall himself defend all actions arising from such claims and shall indemnify the department in all respect from such actions, costs and expenses. Nothing extra shall be payable on this account. In case of failure on part of the contractor in this respect, department shall be free to recover any such amount due to the contractor under this contract or any other contract under the government and the decision of the Engineer in charge in this regard shall be final and binding on the contractor.

- 15.0 The contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by Collector / Central/State Govt. and any other statutory bodies shall be adhered to, by the contractor, during the execution of work. The contractor shall also adhere to all traffic restrictions notified by the local authorities. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges) payable to such authorities for carrying out the work, shall be borne by the Contractor. The water charges (for municipal water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for the drinking purposes from the municipal authorities or any other statutory body, the consequent sewerage charges shall be borne by the contractor. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the Department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts.

16.0 **OTHER MISCELLANEOUS WORKS**

1. Internal water supply lines will be laid out according to a scheme prepared by the contractor and approved by the Engineer in charge. Scheme shall be in line with the applicable National Building Construction standards (NBCS-2026) and relevant standards. The path of the lines shall be such that they traverse through the shafts and subway/service tunnels provided in the basement. Any intervention in the building shall be made only where no alternate path is possible; in such cases, the path involving minimum intervention to the structure of the building shall be adopted, with the prior approval of the Engineer-in-Charge.
2. The contractor is responsible for all costs associated with the restoration of any services damaged during the execution of the project. This includes repairing or replacing any facilities impacted by construction activities.
5. The contractor is required to maintain a clean construction site at all times, removing all debris, rubbish, dirt, and surplus or waste materials. This responsibility extends to the maintenance, cleaning, and de-silting of drains and pipelines laid by the agency

for all services executed to the entire satisfaction of the Engineer in charge throughout the construction period.

6. Prior to the handover of the buildings, the contractor shall also undertake deep cleaning of all buildings, sweeping of roads, paths, landscapes, and desilting of sewer lines and stormwater drains. All necessary machines, equipment, and labour for these tasks will be arranged by the contractor at his own expense.
 - a. After completion, the contractor is required to prepare and submit all 'As Built' drawings of the buildings and services, along with other related documents in both hard and soft copies.
 - b. The scope of work includes all costs associated with labour, materials, tools, plants, and machinery necessary for the execution of the entire project as per the detailed design and drawings developed by the contractor in accordance with the tender conditions.
 - c. All copyrights and other proprietary rights in the works created under this contract will vest with and be assigned to CPWD. The department will exclusively own all property rights, title, and interest, including the right to modify or make alterations to the works. These rights do not lapse even if not exercised during the term of the copyright, and the contractor is required to execute any necessary documents to secure these rights for the department. The term "Works" includes all designs and documents prepared by the contractor throughout the project and any work created in fulfilling the contract obligations.
 - d. The contractor is prohibited from using or allowing the use of project-related drawings, designs, documents, and software without the prior written permission of the Department. Any unauthorized use constitutes a violation of Intellectual Property Rights.

17.0 Documentation, Instrumentation, etc.

1. All drawings related to the project shall be created using the latest version of AutoCAD/Revit. The contractor is responsible for providing soft copies of all approved and proof-checked drawings on DVD, pen drive, or CDs, along with six sets of hard copies or prints of "As Built" drawings. These shall be delivered to the Engineer-in-Charge without any additional costs, in accordance with the approved program and timelines.
2. Additionally, three copies of the "Operation and Maintenance Manual" need to be provided. This manual should detail access arrangements, essential safety precautions, and procedures for both minor and major repairs for each building component and layout, façade, skylight including periodic renewals of finishes and treatments. These manuals shall be supplied to the Engineer in charge at no additional cost.
3. Similarly, three copies of the "Construction Manual" shall be prepared and supplied. This manual will cover various construction methods, the challenges encountered during execution, and the solutions implemented. Like the other documents, these shall be provided without extra charges.
4. The contractor is responsible for installing any fixtures and installations required for housing instrumentation as provided by the Engineer in charge, bearing the cost themselves.

20.0 DEFECT LIABILITY PERIOD OF 1 YEARS

20.1 General Duration and Scope for CIVIL WORKS

20.1.1 The Defect Liability Period (DLP) for the project will be One (01) years, covering the entire scope of work executed by the contractor. The DLP will commence once the project has been completed in all respects and handed over for use.

20.2 Contractor's Responsibility for Defects

During the DLP, the contractor is fully responsible for rectifying any defects or deficiencies in both civil and E&M works of his scope, at their own cost. The scope of this responsibility includes:

- **Rectification of Defects:** Any issues related to structural elements, finishes, fixtures, drainage systems, water supply, and other related works completed by contractor shall be addressed immediately upon detection.
- **Written Notices:** If the contractor fails to rectify defects after receiving written notice from the Engineer in Charge, the department will carry out the repairs at the contractor's risk and cost.

20.3 Immediate Rectification of Serious Defects

Certain defects that cause serious inconvenience to building occupants shall be addressed immediately upon notification. These defects include:

- Leakages from bathrooms, walls, or water supply systems.
- Reverse floor slopes that cause ponding of water and affect proper drainage.
- Warping or opening of joints in doors, windows, or other elements affecting operational functionality.
- The contractor shall rectify such issues within one week of receiving the complaint. If not rectified within this period, the department will undertake the repair at the contractor's risk and cost.

20.4 Rectification Timeline for Other Defects

All other notified defects during the DLP shall be rectified to the satisfaction of the Engineer in Charge. The timelines are as follows:

- **Minor Defects:** Rectifications or replacements shall be completed as soon as possible but no later than one month from the notification.
- **Failure to Comply:** If the contractor fails to rectify defects within this period, the Engineer in charge will carry out the repairs at the contractor's cost after providing a final 10-day notice.
- The Engineer in Charge's decision regarding the severity of the defect (whether serious or otherwise) shall be final and binding.

20.5 On-Site Maintenance Personnel

To ensure smooth functioning of campus facilities and the prompt resolution of defects during the DLP, the contractor shall maintain efficient and trained personnel on-site, responsible for both CIVIL and E&M services. These personnel will:

- Address defects as they arise
- Ensure the smooth operation of all systems and services, including civil infrastructure, electrical installations, mechanical equipment, HVAC systems, and plumbing works.

20.6 Waterproofing Guarantee and Retention

For all waterproofing works, the contractor shall provide a 10-year guarantee ensuring no water ingress or leakage. Additionally, 5% of the waterproofing amount will be withheld from each RA (Running Account) bill as a security deposit during the guarantee period. If any waterproofing defects occur during this period, the contractor shall:

- Rectify the issue within 7 days of receiving notice from the Engineer in Charge.
- Failure to rectify the defect within this time will allow the department to carry out the repairs at the contractor's risk and cost, utilizing the withheld amount as necessary.

20.7 Scope of Civil Works During DLP

During the DLP, the contractor is responsible for maintaining and rectifying the following civil works:

- Rectify any water ingress issues, including leakages from bathrooms, ensuring waterproofing systems function correctly.
- All Furniture and fixture etc.
- **E & M Works:** As per Part -C E & M component

20.8 Compliance and Final Inspection

Throughout the DLP, all rectifications shall comply with relevant codes, including CPWD, IS, IEC, NBCS, and project-specific standards. The contractor is also responsible for providing all necessary documentation and reports related to the rectification work.

At the end of the DLP, a final inspection will be carried out by the Engineer in Charge. The Defect Liability Certificate will be issued only after all rectifications have been completed to the Engineer in Charge's satisfaction, officially marking the project's handover.

21.0 Third Party Quality Assurance (TPQA):

The project mandates strict Third-Party Quality Assurance (TPQA) measures, requiring the contractor's cooperation with an independently appointed CPWD agency.

22 Contract Document Interpretation, Order of Precedence, and Conflict Resolution:

22.1 Interpretation of Tender Documents

- The tender document is a unified and comprehensive document comprising Part-I, Part-II, Part-III & Part-IV and shall be read in its entirety as a single entity along with the attached drawings. All sections of the tender document are mutually complementary, and no part shall be interpreted in isolation. The details, conditions, scope of work, specifications, etc. provided in one section shall be read in conjunction with those given elsewhere in the document. Any information, specification, requirement etc. not explicitly mentioned in one part but available in another shall still be considered applicable, and its absence in a particular section shall not be construed as an omission. The contractor shall be responsible for ensuring compliance with all

provisions across the tender document and shall execute the work in accordance with the cumulative requirements specified therein.

- All documents forming part of the contract shall be considered mutually complementary. Any requirement in one document is deemed to be required across all documents unless explicitly excluded.
- The work shall be carried out in accordance with the true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/or described in the specifications, provided that the same can be reasonably inferred therefrom. There may be several incidental works which are not mentioned in the contract document/specifications but will be necessary to complete the item in all respects. Nothing extra shall be payable to the contractor on this account.
- All these incidental works/ costs which are not mentioned but are necessary to complete the work shall be deemed to have been included in the overall amount quoted by the contractor for various components of work. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation/change in actual working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such items in all respects) on account of the directions of Engineer-in-charge. Nothing extra shall be payable on this account.

23.1 Dimensions and Drawings

- In the case of discrepancies in dimensions (e.g., Length, Width, Height) mentioned in different contract documents, the dimensions shown on the drawings or as decided by the Engineer in charge will prevail.
- Detailed drawings shall take precedence over smaller-scale drawings.
- Figured dimensions shall take precedence over scaled dimensions.

23.2 Errors in Description or Quantities

- Any error in description, quantity, or rate in the Schedule of Quantities, or any omission from the same, shall not invalidate the contract or relieve the Contractor from executing the work as per the drawings, specifications, and the other contract documents.
- The Contractor remains obligated to complete the works, irrespective of such discrepancies.

23.3 Reference to Standards

- Any reference to Standard Specifications, Codes, Guidelines, Regulations, Recommendations or Norms shall mean the latest version thereof, including all revisions and amendments issued up to the day prior to the last date of submission/uploading of the bid.
- The Contractor shall ensure, at his own cost, that all relevant publications, including the IS Codes applicable to the work, are available at site (in hard or soft copy)
- Wherever the bid document specifies that the work shall be executed as per relevant CPWD specifications or other specifications, such reference shall be construed as applying strictly to the technical specifications for the work, and not to any contractual or administrative provisions contained therein.

- Where two or more standards apply to any design provision, the more stringent of them shall be followed.

23.4 **Reporting & Resolution of Discrepancies**

- If the Contractor finds any discrepancy, conflict or inconsistency in or between the contract documents, he shall immediately bring it to the notice of the Engineer-in-Charge, whose clarification shall be final, binding and conclusive. The Contractor shall execute the work in accordance with such decision, and no claim on this account shall be entertained at any point of time. If the Contractor fails to so notify and proceeds with the work (including on the basis of approved GFC drawings), no claim regarding such discrepancy shall be entertained after execution of that item of work, under any circumstances.
- The Contractor shall obtain prior written approval of the Engineer-in-Charge before executing any deviation, change in scope or additional work. Claims in respect of works executed without such prior notification and approval shall stand disallowed.
- In the event of any discrepancy, contradiction or inconsistency in any work (including but not limited to items, details, features, specifications and conditions) — whether between contract documents holding the same level in the order of precedence, or between different sections or locations of the same document — the richer/more stringent specification or detail, or as finalized by the Engineer-in-Charge, shall govern. Nothing extra shall be payable on this account.
- Any work shown or mentioned in any one contract document, even if not mentioned in any other document, shall be deemed included in the scope of the contract, irrespective of that document's position in the order of precedence. Nothing extra shall be payable on this account.
- Any work not explicitly shown or mentioned in any contract document or approved drawing, but required to meet functional or codal requirements, shall be deemed included in the scope of the contract and shall be executed as directed by the Engineer-in-Charge. Nothing extra shall be payable on this account.
- Any work missing from the approved Good for Construction (GFC) drawings but otherwise required as per the Scope of Work, specifications, industry standards, functional requirements or any other provision of the contract shall be deemed included in the scope, and the Contractor shall execute the same as directed by the Engineer-in-Charge, whose decision as to the essentiality of such work shall be final and binding. Nothing extra shall be payable on this account.
- Where any specification or detail (including but not limited to size, thickness, diameter, material or quantity) is found inadequate, improper or inconsistent with functional or codal requirements or the manufacturer's specifications, the work/item shall be provided as per the actual requirements or as directed by the Engineer-in-Charge. Nothing extra shall be payable on this account.
- Where more than one option is provided for any item, the decision of the Engineer-in-Charge shall be final and binding. Where any item, equipment or material is not available as per the prescribed specifications but is available in a

variant of better specifications, the same may be used only with the prior written approval of the Engineer-in-Charge. Nothing extra shall be payable on this account.

- On all other matters not specified in the bid document, the decision of the Engineer-in-Charge shall be final and binding on the Contractor. Nothing extra shall be payable on this account.

23.5 Finality of Engineer-in-Charge's Decision

- The Engineer-in-Charge's decisions regarding the interpretation of the contract, discrepancies, or any other ambiguities in the documents, specifications, or works will be final, binding, and conclusive on the Contractor.
- No claim by the Contractor will be entertained after the Engineer-in-Charge has clarified the issue. The Contractor shall not take advantage of clerical, grammatical, or typographical errors in the documents, including the Schedule of Quantities, Scope of Work, Specifications, or any other provisions.

A 1.1 Special Conditions: Project Monitoring, Reporting and Reviewing of progress

1. DOCUMENTATION

- 1.1 The Contractor shall render all help and assistance in documenting the total sequences of this project by way of arranging for photography, slides, audio / video recording & other records etc. Nothing extra shall be payable to the Contractor on this account. The original films shall be the property of the Department. No copy shall be prepared without the prior approval of the Engineer in Charge.
- 1.2 The contractor shall submit the photographs and videos of progress of work on weekly basis to make it possible to create a short film of the entire execution of the work to be kept in archive. Nothing extra shall be payable to the Contractor on this account. The original films shall be the property of the Department. No copy shall be prepared without the prior approval of the Engineer in Charge.
- 1.3 The Contractor Shall update status of progress of work along with uploading of latest photographs on PMIS website/any other portal weekly or as directed by Engineer in charge. Nothing extra shall be payable to the Contractor on this account.

2. PROGRAM CHART

- 2.1 The contractor shall submit a Time and Progress Chart for each milestone as per clause-5 of the GCC.
- 2.2 The contractor shall prepare the phase wise & activity wise (monthly) resource chart (materials, manpower and machinery) based on the project execution schedule as per clause 5.1 of GCC EPC Project-2024.
- 2.3 The Contractor shall prepare an integrated program chart within 15 days of award of work including civil as well as E & M activities & Horticultural activities for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfilment of the program within the stipulated period and submit the same for approval of the Engineer in charge within 15 days of award of work. These shall be submitted by the contractor through electronic media besides forwarding hard copies of the same. The integrated program chart so submitted should not have any discrepancy with the physical milestones attached in the contract agreement
- 2.4 The contractor shall stick to the construction schedule, if there is any hindrance or delay due to any reason the same shall be mitigated through engaging extra manpower, material and machinery.
- 2.5 Coordination meeting with the Consultant, CPWD officials, and Contractor shall be called at regular and frequent intervals for better coordination at site.
- 2.6 The program chart should include the following:
 - 2.6.1 Descriptive note explaining sequence of various activities.
 - 2.6.2 Construction Program shall be prepared on PRIMAVERA Software or any other software as decided by Engineer in charge which will indicate resources in financial terms, manpower and specialized equipment for every important stage.

- 2.6.3 Program for procurement of materials by the contractor. (With details of quantity and amounts thereof month wise)
- 2.6.4 Program for arranging and deployment of manpower both skilled and unskilled (Activity wise) so as to achieve targeted progress.
- 2.6.5 Program for procurement/ mobilization of machinery / equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.
- 2.6.6 Program for achieving fortnightly micro milestones and periodic milestones.
- 2.6.7 Program for approval of specialized agencies for specialized works.
- 2.6.8 Programme for submission and approval of detailed drawings (architectural drawings, structural drawings), shop drawings and Technical Data sheets.
- 2.6.9 Productivity of T&P and manpower of all categories to be employed based on which the activity wise program is being proposed.
- 2.6.10 If at any time, it appears to the Engineer in charge that the actual progress of work does not conform to the approved program referred above, the contractor shall produce a revised program showing the modifications to the approved program by deploying additional resources inputs to ensure completion of the work within the stipulated time.
- 2.6.11 The approval to the revised schedule resulting in a completion date beyond the stipulated date of completion shall not automatically amount to grant of extension of time to the Contractor without implication under clause 2.
- 2.6.12 The submission for approval by the Engineer in charge of such program or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of Engineer in charge to take action against the contractor as per terms and conditions of the agreement.
- 2.6.13 The PRIMAVERA program shall be updated on weekly basis and data shall be extracted in excel, pdf and .xer form and presented in .ppt form representing – Actual progress achieved against each activity, productivity of different type of labours assumed vis-à-vis achieved, projected completion date, all the activities which were supposed to be completed by that date and not completed alongwith planned and revised targeted date of completion, activities which were supposed to be completed by that date and completed alongwith planned and actual date of completion , activities planned to be started in next 15 days and 30 days and all other details as asked by Engineer-in-charge and in the format asked by him.
- 2.6.14 In case of non compliance/ delay in compliance in this, a penalty @ Rs. 20,000/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

3. PROGRESS AND MONITORING OF WORK

3.1 Submission of Progress Reports

- 3.1.1 The contractor shall submit a detailed weekly progress report to the Engineer-in-charge.

3.1.2 The Contractor should submit a monthly progress report to the Engineer in charge by 5th of every month in a computerized & hard copy form. The progress report shall contain the following, apart from whatever else may be required as specified above:

- a. Construction schedule of the various components of the work through a bar chart for the next two fortnights (or as may be specified), showing the micro- milestone / milestones, targeted tasks (including material and labour requirement) and up to date progress of each activity. At least 10 (ten) digital photographs showing all the parts of the construction site along with at least 5 (five) minutes video of executions of different items in soft copy must be submitted in every Month progress report.
- b. Progress chart of the various components of the work that are planned and achieved, for the fortnight as well as cumulative up to the fortnight under reckoning, with reason for deviations, if any in a tabular format.
- c. Schedule Variance.
- d. Plant and machinery statement, indicating those deployed in the work.
- e. Man-power statement indicating:
 - No. of skilled workers (trade wise) and total no. of unskilled workers deployed on the work and their location of deployment.
- f. Financial statement, indicating the broad details of all the running account payments received up to date, gross value of work done in month and cumulative upto date etc.
- g. In case of noncompliance / delay in compliance in submission of progress report, recovery @ Rs. 10,000 per day is applicable.
- h. Monthly log of all communications from the department and to the the department classified into different type of communications viz: contractual, drawings, RFIs, shop drawings, TDS etc.
- i. Monthly recovery for delay in submission of the monthly progress report within specified period - not exceeding Rs 1,00,000/- per month for each month of default.

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

3.1.4 The Contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the plot so as to achieve early completion. The agency may deploy adequate equipment, machinery and labour as required for the completion of the entire work within the stipulated period specified. Also, ancillary facilities shall be provided commensurate with requirements to complete the entire work within the stipulated period. Nothing extra shall be payable on this account. Adequate number / sets of equipment in working condition, along with adequate stand-by arrangements, shall be deployed during entire construction period. It shall be ensured by the Contractor that all the equipment, Tools & Plants,

machineries etc. provided by him are always maintained in proper working conditions during the progress of the work and till the completion of the work. Further, all the construction tools, plants, equipment and machineries provided by the Contractor, on site of work or his workshop for this work, shall be exclusively intended for use in the construction of this work and they shall not be shifted / removed from site without the permission of the Engineer in Charge.

3.1.5 The contractor shall submit Daily progress report in the format intimated by Engineer-in-charge and shall contain but not limited to:

1. Quantities of different material received at site – that day as well as cumulative received till date
2. Material consumption status – Different type of material – total received vis-à-vis total consumed, projected requirement for next 15 days.
3. Daily Labour report – Number of labour deployed area-wise & skill-wise vis-à-vis required.
4. Brief of different activities under progress in each area.

The format for this information can be updated by Engineer-in-charge from time to time as per the progress of activities at site. Non-submission of this will attract penalty @ Rs. 10,000 per day.

3.2 PROJECT REVIEW MEETINGS

3.2.1 The contractor, immediately on award of work, shall submit details of his key personnel to be engaged for the work at site. In addition, he shall furnish the Engineer in charge detailed organization involved with the work.

3.2.2 The contractor shall present the programme and status at various review meetings as required.

A 1.2 Special Conditions: Safety, Health & Environment

CPWD Safety, Health and Environment Handbook 2019 available at CPWD website shall be part of contract and the Contractor shall follow the provisions contained therein & all provisions of NBCS-2026, in its letter and spirit unless otherwise specified elsewhere in the Contract documents.

If the Contractor fails to comply with any of the provisions of this Hand book or any other provisions as mentioned below, penalty up to Rs 10,000/- shall be imposed per day. Decision of Engineer-in charge on imposing penalty amount is final and binding on contractor.

Information to be provided by Contractor:

Safety, Health, and Environment policy

A detailed Safety, Health and Environment plan.

Names of the safety personnel.

Employers' liability insurance policy.

Work method statements for critical operations such as lifting etc.

Test Certificates for lifting gear, lifting equipment and accessories.

Information related to hazardous materials used and corresponding MSDS (Materials Safety Data Sheets).

Daily labour returns

Copies of all Statutory Records.

Copies of the Contractor Safety's reports

Supervisor's reports of his findings on-site inspections.

Safety: CPWD Safety code detailed out in GCC EPC Project-2024, shall be followed by the Contractor.

Minimum one Safety, Health and Environmental Officer/ Manager is required to be available at site at all the times, when construction is in progress.

Qualifications of Safety Health and Environmental Officer/ Manager should not be less than those prescribed in local regulation in building and other construction workers (regulation of employment & conditions of service) central Rules,1998.

Contractor shall arrange for initial site orientation / induction of all Workmen / Supervising personnel on 'safety practices' before beginning of work at site. This shall include a briefing about project, safety policy, site safety rules and site facilities.

Contractor shall conduct a daily toolbox talk for all workers previous to starting to work. These tool box talks should include topics related to ongoing work activities and precautions to be taken on daily activities.

Contractor shall ensure participation of his site in-charge and the safety coordinator in the safety meetings arranged at intervals decided by the Engineer-in-Charge.

Contractor shall also submit a Safety, Health and Environment report on monthly basis or as directed to Engineer-in-Charge.

Contractor's Safety Engineer / Safety Officers shall:

Assist the Contractor's Construction Manager and coordinate with consultant's Safety Supervisor for the implementation of the SHE program within corresponding work groups.

Get familiarized with all government, and department's safety and health regulations, including reports and work permits procedures.

Inspect the construction area on a regular basis to verify appropriate corrective actions and prepare reports to their Construction Manager.

Review the SAP (Safety Action Plan) prepared by line supervisor.

Co-ordinate with supervisors and foremen periodical safety meetings and lead daily safety meetings.

Conduct safety training classes for all workers.

Participate in Tool Box Talks.

Suggest safety promotional activities.

PERSONAL PROTECTIVE EQUIPMENTS (PPEs):

The Contractor shall provide required PPEs to workmen to protect against safety and/or health hazards. Primarily PPEs are required for the following protection.

- i) Head Protection (Safety helmets)
- ii) Foot Protection (Safety footwear, Gumboot, etc.)
- iii) Body Protection (High visibility clothing (waistcoat/jacket, Apron, etc.)
- iv) Personal fall protection (Full body harness, Rope-grap fall arrester, etc.)
- v) Eye protection (Goggles, Welders glasses, etc)
- vi) Hand protection (Gloves, finger coats, etc.)
- vii) Respiratory Protection (Nose mask, SCBAs, etc.)
- viii) Hearing protection (Ear plugs, Ear muffs, etc)

The PPEs and safety appliances provided by the Contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS). If materials conforming to BIS standards are not available, the Contractor shall procure PPE and safety appliances, as approved by the Engineer-in-charge.

Safety Helmet Colour Code	Person to use
White	CPWD Officers, Engineers, staff
Grey	All designers, Architect, Consultants etc.
Violet	Main Contractor's (Engineers/Supervisors)

Blue	All Sub-Contractor's (Engineers/Supervisors)
Red	Electricians (both Contractor and sub-Contractor)
Green	Safety Professionals (Both Contractor and sub Agencies)
Orange	Security Guards/Traffic Marshals
Yellow	All workmen
White (with "Visitor" sticker)	Visitors

In addition to the above, any other PPE required for any specific jobs like, welding and cutting, working at height, basement etc. shall also be provided to all workmen and Contractor shall also ensure that all workmen use the PPEs properly while on the job. The Contractor shall not pay any cash amount in lieu to PPE to the workers/sub-Agencies and expect them to buy and use during work.

The Contractor shall at all-time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Engineer-in-charge during the inspections. It shall be the responsibility of the Contractor to provide required PPEs for all visitors & CPWD staff. Towards this required quantity of PPEs shall be kept always at the security post.

Notwithstanding the above, the Contractor shall at their expense arrange for the safety provision as per all relevant Indian Standard Safety Codes & local bye-laws. The Contractor shall provide all facilities in connection therewith and shall also issue the identity card to his labourer.

Details mentioned above are only indicative and not exhaustive. Costs related to safety procedures along with health & environment and also appointment of safety engineer and team from EPC contractor side are part of Estimated cost of the project. Nothing extra shall be paid to agency & No extra claim will be entertained for following all safety guidelines.

WORK AT HEIGHTS:

During construction of buildings/towers safety net (horizontal and vertical) shall be used by Contractor to check/control falling of any object. The Contractor/vendor shall also take the other safety measures used during construction, for e.g. Personal Protective Equipment (PPEs), safety during working at heights etc.

The Contractor shall provide proper scaffolding and working platforms with handrails to work at higher elevations and Tools and loose material should not be left on the scaffolding from where they are likely to fall. Persons should use safety belts while working near open edge where it is not possible to provide hand rails.

Things should not be thrown from heights and should be brought down or taken up with the help of ropes. While work is being carried on at higher elevations, warning notices should be placed below or the area to be barricaded so as to draw the attention of persons and prevent them from coming under the falling objects.

Defective scaffoldings, damaged ladders, insufficient working platforms etc. shall not be permitted. Wherever necessary, light weight mobile tower scaffolds or hydraulic platforms should be used.

Proper access should be available to the work spot. Nobody should jump over open area between equipment, pipes and rails etc. from where they may slip. Walking over beams, narrow pipes etc. should be prohibited.

The area from where the materials are pulled up with ropes etc. should have hand railings and the person should be kept on firm footing. They should not lean over the handrails and should use safety belts to protect themselves from fall due to body imbalance.

The Contractor should reduce the hazards associated with falls first through engineering controls and have a formal fall protection program in accordance with Factories Act requirements. Contractor should install personal fall arrest systems, administrative controls and training when engineering controls are not feasible.

The Contractor shall have the necessary fall protection equipment to safely perform the job and properly train workers in the use of fall protection equipment and supervisors (or competent personnel) shall ensure the use of fall protection equipment as required. Contractor shall obtain work permit from the Engineer-in-charge prior to starting of activities requiring fall protection.

Should use powered access safely and protect holes and leading edges, e.g. with hand rails and toe boards

The construction waste from the height should be transferred through closed chutes.

All other measures to be taken for the safety at project shall be ensured by the Contractor.

It shall be deemed that rates quoted by the Contractor are inclusive of all the expenditures incurred in the safety procedures. No extra payment on this account shall be payable to Contractor.

Lighting:

The contractor shall provide sufficient lighting at project site, of the right type and at the right place / location for it to be properly effective to enable the workers to effectively work during nighttime if any.

Lighting ought not to introduce the risk of electric shock. Therefore, 230V supplies should be used for those fittings, which are robustly installed, and well out of reach e.g. flood lighting or high-pressure discharge lamps. The contractor shall ensure that luminaries should always be so placed that no person is required to work in their own shadow and that the local light for one person is not a source of glare for the others. Strongly made clamps should be available for attaching luminaries to poles and other convenient supports.

Luminaries shall be robust, resistant to corrosion and rain proof especially at the point of the cable entry. The correct type of lamp for each luminary should be used and when lamps need to be replaced, it shall be in accordance with the supply voltage. Lamp holders not fitted with a lamp should be capped off. The contractor shall take every effort to illuminate the work site as per the direction of Engineer-in-charge.

Health & Environment:

Model Rules for protection of Health and Sanitary arrangements for workers, laid down in GCC EPC Project-2024, shall be followed by the Contractor.

Labour Hutments: (Toilets 1 each per 50 labourers)

Agency has to make double storied labour hutments, in single module consisting of 8 rooms (116 sqft size) with provision for separate toilet for Gents & Ladies and also Crèche for Children's of Workers, Cooking platform, Common Wash area & Drinking water Facilities.

However, these are indicative, the bidder may incorporate the facilities in their own labour hutments drawings as per convenience of space available.

The Contractor shall also establish Medical facilities at site of work and labour camp and Doctor should be available alternatively at both the locations during the construction period.

Contractor shall also establish adequate toilet facilities, bathrooms and portable Sewerage Treatment Plant (STP) at labour camp and utilize the treated water for construction as well as flushing, establish creches for children of workers at labour camp and provide services of trained teachers, supporting staff to run them.

Contractor shall tie up with recognized hospitals for providing ambulance service at short notice on call.

Tie up with reputed Hospital to provide medical help in case of emergency.

Group Insurance: Contractor shall provide Group Insurance Scheme to all workers engaged in the work.

It shall be deemed that rates quoted by the Contractor are inclusive of all the expenditures incurred in the safety, Health & Environment procedures. No extra payment on this account shall be payable to Contractor.

Protection of Environment:

An Environment Cell consisting of an Environmental Engineer with 10 years' experience and a team of one Deputy Environmental Engineers with 5 years' experience reporting to the Environmental Engineer shall be deployed at the site. The Engineers will promptly and fully comply with all needs of the CPWD pertaining to safe SHE management. They will also be a part of Grievance Redressal Cell to ensure grievances reported by stakeholders with regards to environment, community health and occupational health and safety related issues arising out of the construction works and are promptly addressed as relevant.

1.1. Construction Vehicles, Equipment and Machinery:

Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that emission levels comply with environmental emission standards/norms.

All vehicles delivering construction materials to the site shall be covered with Tarpaulin or green net to avoid spillage of materials and maintain cleanliness of the roads. Contractor makes sure that no uncovered vehicles carrying construction material and waste shall be permitted to bringing in sand, cement and other construction materials prone to causing dust pollution at the site as well as taking out debris & soil from the site without being properly covered.

For controlling the noise from Vehicles, Plants and Equipment, the contractor shall confirm the following:

- a. All vehicles and equipment used in construction will be fitted with exhaust silencers.
- b. Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced.
- c. Noise emission from compactors (rollers) front loaders, concrete mixtures, cranes (movable), vibrators and saws should be less than 75 dB(A).
- d. As per the standards/guidelines for control of Noise Pollution from Stationary Diesel Generator (DG) sets, noise emission in dB(A) from DG Set (15-500 KVA) should be less than $94+10\log_{10}(\text{KVA})$. The standards also suggest construction of acoustic enclosure around the DG Set and provision of proper exhaust muffler with insertion loss of minimum 25 dB(A) as mandatory.
- e. A speed limit of maximum 10km/hr shall be enforced for any vehicular movement inside the construction site.

1.2. Wheel washing

Wheel Tires of all vehicles used by the contractor, or any of his sub- contractor or materials supplies shall be cleaned and washed clear of all dust/mud before leaving the project premises. This shall be done by routing the vehicles through tire washing tracks.

Contractor shall arrange for regular water sprinkling for dust suppression of the construction sites and unpaved roads used by his construction vehicles. The Contractor shall insure provision of adequate infrastructure at site as required for wheel washing of vehicles leaving the site including provision of supply water, necessary pumps, provision for managing waste water from washing & wash pit/ gravel pit.

It is also to be noted that the site/location of the project being a VIP area, all rules/guidelines as per standard norms etc issued by authority having jurisdiction over the area shall be followed meticulously without any additional cost. And especially all roads leading to site are through roads frequently used by VIP's, therefore construction work should not cause disturbance in these roads and wheel tyre washing facilities are to be strictly implemented for vehicles leaving the site so that no dust gets accumulated on roads or make them dirty. If any complaint is raised by concerned authority having jurisdiction over these areas/public regarding these & any penalties levied agency is solely responsible.

1.3. Anti-smog Gun

Contractor shall provide Anti-smog guns at the project site as per CPCB/ CAQM policy and other regulatory requirements to keep the air pollution under limits. The deployment of adequate number of anti-smog guns shall be supplemented with suitable system of water storage tank, jet pumps, and nozzles to act as anti-smog guns. The contractor shall keep regular log of usage of Anti-smog guns on site including start & stop times and particulate matter (PM 10 & PM 2.5) levels before & after operations. Nothing extra shall be paid and it is deemed to be inclusive of cost quoted by the agency.

The site/location of the project being VIP area all rules/guidelines as per standard norms etc issued by authority having jurisdiction over the area shall be followed meticulously without any additional cost.

1.4. Sedimentation basin

The Contractor shall prepare sedimentation temporary pit at the lowest convenient point of the site for collecting, trapping and storing sediment produced by the construction activities & storm water runoff generated during construction. A flow detention facility must also be constructed for reducing peak run-off rates. This would also allow most of the sediments to settle before the run-off is directed towards the outfall.

The sedimentation infrastructure shall be suitably sized and located at one or multiple levels as per actual site conditions and shall be maintained throughout the project duration.

1.5. Water sprinkled on unpaved surface and hard road surface

Contractor shall provide suitable dust mitigation measures to keep the air pollution under limits.

The contractor shall arrange for regular water sprinkling for dust suppression of the construction sites and unpaved roads used by his construction vehicles. The STP waste can be used for the sprinkling, and it should meet the CPCB norms. The contractor should regularly monitor that sprinkling should be as per the standard and water monitoring also be followed.

Unpaved surfaces, loose materials and loose soil shall be adequately sprinkled with water to suppress dust at least 2-3 times daily.

1.6. Dust mitigation measure display

The contractor shall display the dust mitigation measures prominently at the construction site for easy public viewing along with all parameters required by CPCB. Cost is deemed to be inclusive of cost quoted by the agency. Nothing extra shall be paid.

A 1.4 Special Conditions: Quality Assurance

1. QUALITY ASSURANCE

- 1.1 The proposed work is a prestigious project, and the quality of work is of paramount importance. Contractors shall have to engage in well-experienced skilled labour and deploy modern T&P and other equipment to execute the work.
- 1.2 The contractor shall ensure quality construction in a planned and time-bound manner. Any sub-standard material / work beyond set out tolerance limit shall be summarily rejected by the Engineer in charge & 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, it shall be replaced / removed by the contractor at his own risk & cost.
- 1.3 In addition to the supervision of work by CPWD engineers, the Architects, CPWD Quality Control / Assurance Team, Third-party Quality Control/ Assurance Team, etc. shall also be carrying out regular and periodic inspection of the ongoing activities in the work and deficiencies, shortcomings, inferior workmanship pointed out by them shall be communicated by CPWD engineers to the contractor. Upon receipt of instructions from Engineer in Charge these are also to be made good by necessary improvement, rectification, replacement up to his complete satisfaction.

Special attention shall be paid towards line and level of internal and external plastering, 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, thinnest joints in stone / tiling / cladding work, non-hollowness in floor and dado tiles work, protection of scratches over flooring by impounding layer of plaster of Paris, water tight pipe linings, absence of hollow vertical joints in brick masonry, proper compaction of filled up earth etc. to achieve museum of International standards and up keeping of quality assurance shall be of paramount importance, as such.

- 1.4 All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer in charge which shall be preserved till the completion of the work. The contractor shall submit the samples as per preferred make list given in the tender document / particular specifications for approval of Engineer in charge. No material shall be used for any purpose at site without the approval of Engineer-in-charge. Technical data sheet alongwith all relevant third party test reports shall be submitted by the contractor for approval of same by the Engineer-in-charge. Same shall be submitted at least 1 month before the start of construction activity at site. Contractor shall be solely responsible for any delay in execution of works due to delay in submission of these details or rejection of material due to submission of details which are not in conformity with agreement provisions.
- 1.5 The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the list attached with the tender documents, as per the item description and particular specifications for the work. The equivalent brand for any item shall be permitted to be used in the work, only when the material from specified makes is not available. This is, however, subject to documentary evidence produced by the contractor for non-availability of the brand specified and also subject to independent verification by the Engineer in charge. In exceptional cases, where such approval is required, the decision

of Engineer in charge as regards equivalent make of the material shall be final and binding on the Contractor. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Nothing extra shall be payable on this account.

- 1.6 All materials shall be checked by the Engineer in charge or his authorized supervisory staff on receipt of the same at site before use.
- 1.7 The Contractor shall at his own cost make all arrangements and shall provide all such facilities including material and labour which the Engineer in charge may require for collecting, preparing, forwarding the required number of samples for testing as per the frequency of test stipulated in the contract specifications or as considered necessary by the Engineer in charge, at such time and to such places as directed by the Engineer in charge. Nothing extra shall be payable for the above.
- 1.8 The Contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case he or his authorized representative is not present or does not associate him, the result of such tests and consequences thereon shall be binding on the Contractor. The Contractor or his authorized representative shall remain in contact with the Engineer in charge or his authorized representative associated for all such operations. No claim of payment or claim of any other kind, whatsoever, shall be entertained from the Contractor.
- 1.9 All expenditure to be incurred for testing of samples e.g. collection, packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor. The cost of material used for testing shall also be borne by the contractor. This provision is applicable for performance testing of glass façade/ skylight/canopy also as defined in tender document as per relevant standards.
- 1.10 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.
- 1.11 Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to bylaws and municipal body / corporation where CPWD Specifications are not available. 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.
- 1.12 The contractor shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.
- 1.13 The contractor shall have to execute guarantee bonds in respect of water proofing works and all other works as per the terms and conditions of Agreement or as decided by the Engineer-in-charge (as per Performa enclosed).
- 1.14 The Contractor shall arrange electricity at his own cost for testing of the various electrical installations as directed by Engineer in charge and for the consumption by the contractor for executing the work. Also, all the water required for testing various electrical installations, fire pumps, wet riser / fire-fighting equipment, fire sprinklers etc. and also testing water supply, sanitary and drainage lines, water proofing of underground sump, overhead tanks, water proofing treatment etc. shall be arranged by the contractor at his own cost. Nothing extra shall be payable on this account.

1.15 **Quality Assurance Plan**

1.15.1 Guidelines and provisions specified in the “Hand book on Total quality management 2019” & “Quality Assurance manual for Building works -2022” available on the official web site of CPWD i.e. www.cpwd.gov.in, shall be followed by contractor, in general for the work. Any differences in the guidelines in both the books' decision of Engineer-in charge is final and binding on the contractor.

1.15.2 The contractor shall submit a “Quality Assurance” plan for the work, within 30 days after award of work which shall be consisting of:

1.15.2.1 It should clearly indicate the machinery and other tool & plants required to be deployed at site by the contractor. Entire machinery and T&P may not be required at the start of work, therefore, a proper time schedule by which each machinery & T&P is to be brought at site should also be indicated.

1.15.2.2 The quality assurance programme should include method-statement for various items of work to be executed along with check lists to enforce quality control.

1.15.2.3 Contractor shall be required to submit detailed method statement for all activities associated with the execution and completion of the work. Such method statement should contain all required details like checklists for pre, post and during execution of the activity/item of work, details of testing methodology, frequency, relevant testing standards as per CPWD specifications/ BIS/ as defined in the contract of the items involved in the activity. Engineer in charge reserves the right to direct any amendment/modification in the submitted method statement and contractor shall be bound to submit the amended/modified method statement as directed by Engineer in charge, after which only contractor shall be allowed to take up such activity. Contractor shall be required to get inspected any activity to be executed on a day from the Engineer in charge or his authorized representatives and get signed the checklist as per the method statement, after which only the activity on that particular day shall be allowed to start. Contractor shall be fully responsible for all contractual implications for any delay caused, if any, on account of delay in submission of such method statement or modified method statement or checklists. Nothing extra, whatsoever, shall be paid on this account and his quoted amount shall be deemed to be inclusive of all such activities.

1.15.2.4 The contractor shall prepare all the needed shop drawings well in advance at his risk and cost deemed to be included in the overall quoted cost and get them approved before placing the order and execution of the item.

1.15.2.5 Contractor shall prepare and submit shop drawings for approval of Engineer in charge, before taking up different activities. Contractor shall be required to make modifications as may be directed by the Engineer in charge in the submitted shop drawings and shall resubmit modified shop drawings. Contractor shall not be allowed to execute the related items without approval of such shop drawings, and he shall be fully responsible for all contractual implications, for any delay caused, if any, on account of delay in submission of such shop drawings or modified shop drawings. Nothing extra, whatsoever, shall be paid on this account and his quoted amount shall be deemed to be inclusive of all such activities.

1.15.2.6 Shop drawings shall be submitted for approval four weeks in advance of planned delivery and installation of any material to allow the Engineer In-Charge ample time for scrutiny. No claims for extension of time shall be entertained

because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.

- 1.15.2.7 Before taking up the work, the contractor shall also provide integrated drawings for various civil and electrical services showing details of layout plan including sectional elevations. Contractor should plan and mobilize his resources as per the integrated drawings and as per the site conditions to facilitate convenient execution, installation as well as maintenance of these services. Nothing extra shall be payable on this account.
- 1.15.2.8 The contractor shall produce / procure all the materials in advance so that there is sufficient time for testing and approving of the material and clearance of the same before use in work.
- 1.15.2.9 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 order 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 confirm, 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.
- 1.15.2.10 The contractor shall give performance test of the entire installation(s) as per the specifications in the presence of the Engineer-in-charge or his authorized representative before the work is finally accepted. Nothing extra what-so-ever shall be payable to the contractor for such test, until and unless mentioned otherwise in the agreement.
- 1.15.2.11 Wherever work is specified to be done through specialized agencies, their names shall be got approved well in advance from Engineer in charge. Failure to do so shall not justify delay in execution of work. The contractor should negotiate with concerned specialist agencies and send their names with all required requisite documents, for approval to Engineer in charge within 30 days of issue of letter of award of work.
- 1.15.2.12 Samples of various materials required for testing shall be provided free of charges by the contractor. All other expenditure required to be including testing charges, taking the samples; conveyance, packing etc. shall be borne by the contractor himself.
- 1.15.2.13 The contractor or his authorized representative shall associate in collection, preparation, forwarding and testing of such samples. In case, he or his authorized representative is not present or does not associate him, the results or such tests and consequences thereon shall be binding on the contractor.
- 1.15.2.14 For certain item, if frequency of tests is not mentioned in the CPWD Specifications, then relevant BIS code shall be followed and tests shall be carried out as per the frequency specified therein.
- 1.15.2.15 If any load testing or special testing is to be done for any sample whose strength is doubtful, the cost of the same shall also be borne by the contractor.

- 1.15.2.16 Samples of all materials and fittings to be used in the work in respect of brand manufacturer and quality shall be got approved from the Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work. 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 / additional 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.
- 1.15.2.17 The contractor shall get the source of all other materials, not specified elsewhere in the document, approved from the Engineer-in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/ make of various materials not specified in the agreement; to be used for the approval of the Engineer-in-Charge along with samples and once approved, he shall stick to it.
- 1.15.2.18 The Stone aggregate to stone, sand shall be brought from any approved quarries subjected to the said materials conforming to CPWD specifications.
- 1.15.2.19 Before taking up the finishing work such as flooring, plastering, false ceiling, panelling, contractor shall prepare full-scale sample unit of each of such unit like toilet, room, corridor etc., for large-scale repetitive items and get approved from Engineer-in-Charge before taking up for execution on large scale.
- 1.15.2.20 Before taking up any specialized activity contractor shall do the sample and get it approved from Engineer-in-charge before taking up for execution on large scale.
- 1.15.2.21 Based on the samples approved by the Engineer-in-Charge for various flooring and dado / cladding materials as specified hereinafter, the contractor shall prepare mock up(s) at actual site of work as specified under relevant flooring and dado / cladding items, for approval of quality of workmanship and material specified. If the quality of the workmanship and the material is as per the required standards and approved by the Engineer-in- Charge, the mock up shall be allowed as part of the work (i.e., it is part of cost of ECPT). Otherwise, it shall be dismantled by the contractor as directed by the Engineer-in-Charge and taken away from the site of the work at his own cost. The mock up(s) so made shall be kept till completion of respective works for reference. Nothing extra shall be payable on this account.
- 1.15.2.22 The contractor shall prepare & display mock-ups in actual position of each and every item and obtain approval of Engineer-in-charge before execution in en masse. The mockup shall be preserved for the purpose of reference till completion of the item represented by the mockup. Similarly, the contractor shall prepare sample toilet blocks comprising of all finishes and fittings included in the scope of

this contract. Approval of Engineer-in charge shall be obtained before taking up finishing works en masse. The work executed in approved mock ups/sample units in actual position forming part of the main work shall be deemed to be included the scope of work and quoted rates of the contract. However, the contractor shall have to dismantle and remove the rejected mock up / sample from the site of work at his cost.

1.15.2.23 The contractor shall invariably prepare the samples of finishing items i.e. flooring of different types, external & internal finishing i/c colour scheme of paint, tiles/stones in dado, different types of false ceiling, different types of doors, windows, different types of panelling, flooring in platforms & staircase, water supply & sanitary fittings and any other item as per direction of Engineer-in-charge. The contractor shall proceed with further finishing items only after getting the samples of these items approved in writing from Engineer-in-charge. No extra claim whatsoever beyond the schedule of quantities will be entertained from the contractor on this account.

1.15.2.24 The construction joints shall the provided in predetermined locations only as decided by Engineer in charge. The cost of shuttering for these construction joints shall be included in ECPT and nothing extra shall be payable on this account to the contractor.

1.15.2.25 All the hidden items such as water supply lines, drainage pipes, conduits, sewers etc. are to be properly tested as per the design conditions submitted before covering it.

1.15.2.26 Mandatory Tests shall be conducted as per CPWD specifications mentioned in Schedule A to F modified and corrected upto previous day of the last date of submission / uploading of bid unless other specified elsewhere in NIT.

1.15.2.27 Machinery and other tools & plants shall be deployed as specified in Schedule F.

1.15.2.28 A field laboratory has to be set up by the contractor with all testing equipment as specified in Schedule F.

1.15.3 Receipt of Material, testing of the same and maintenance of register of tests:

- i. All the registers of tests, receipt of materials (MAS account) carried out at construction site or in outside laboratories shall be maintained by the contractor which may be inspected by Engineer-in-charge or his/her representative at any point of time.
- ii. The contractor shall allow access to Third Party Quality Assurance Agency (TPQAA) engaged by Engineer-in-charge to have a control on quality and methodology of execution.
- iii. Technical Data Sheet of all material required to be used in the project shall be submitted by the contractor within 2 months.

1.17. Method Statement:

- (a) Contractor shall submit detailed method statement for all major activities/items of the work. The method statement should contain all the required details like
 - Description of Item,

- Stepwise elaborate procedure to implement the same,
 - Pre-construction, during construction and post-construction checklist,
 - Details of tools, equipment and machinery to be used,
 - Make and specifications of materials to be used,
 - Role and responsibilities of Managers/Engineers/ Supervisors involved in the activity.
 - Tests to be conducted, frequency of testing, relevant testing standards
 - Precautions, Safety aspects for execution of work.
 - Mode of Measurement, among others
 - Any other data as per the requirement/ specification of item
- (b) Engineer-in-charge shall reserve the right to seek corrections/amendments in the submitted method-statement. The contractor shall submit the corrected / amended method statement as directed by Engineer in charge. Contractor shall execute an activity only after the approval of method statement by the Engineer-in-charge.
- (c) For each and every activity before start of same in particular area, checklist shall be filled and signed by the contractor's site in-charge/engineer, supervising that area (Civil as well as E&M) as well as Assistant Engineer /Assistant Executive Engineer of department, in-charge of respective work. Contractor shall ensure examination/inspection of work by the Engineer in charge or his authorized representatives at various stages of the activity and get his signature on checklist for the activity as per the method statement.
- (d) Method statements for all works shall be submitted by the contractor within 2 months form the stipulated date of start.
- (e) No compensation or hindrance for EOT of work will be granted to the contractor for delay caused in execution of work owing to delay in submission of method statement or modified method statement and approval of same by Engineer-in-charge.

1.18. **Approval of Materials:**

- (a) Samples of all materials and fittings to be used in the work shall be got approved from the Engineer-in-Charge, well in advance of actual execution of corresponding item/work at site. Contractor shall be required to submit different samples of material/fittings/items for selection and approval of Engineer-in-charge unless otherwise directed by the Engineer-in-charge. If none of the samples submitted by contractor are approved by Engineer-in-charge, contractor shall submit new samples of materials/items, in conformity of specifications and requirements stipulated in the contract, for approval of Engineer-in-charge.
- (b) Contractor shall submit samples of an item/material from preferred make list and makes/models/manufacturers specified in the contract document, for approval by Engineer-in-charge. Before proposing any material/item, contractor shall ensure that the product conforms to the specifications/parameters mentioned, technical specifications, CPWD specifications and other applicable relevant codes. Items which satisfy these parameters shall only be approved and the decision of Engineer- in-charge shall be final and binding.
- (c) Materials /items for which preferred make/models are not specified in the contract document, ISI marked materials/items shall be used with prior approval of Engineer-in-Charge, However, if ISI marked material / items are not available,

the contractor shall submit manufacturer details, specifications, test certificates and samples of materials / items for prior approval of Engineer-in-charge. Contractor must procure material/ items manufactured by reputed manufacturers.

- (d) The approved samples shall be preserved safely at site by the contractor, till completion of work. Contractor shall make a yard room for storing approved samples. The samples kept in this room, shall be labelled and stored in an orderly manner to enable easy access at any time during the entire period of execution of work.
- (e) The contractor shall submit details of the source of materials whose manufacturer / supplier is not specified in the contract document, for prior approval of the Engineer-in-Charge. The contractor shall procure material from approved source only. Any change of source shall be done with the prior approval of the Engineer-in-Charge.
- (f) Materials used on work without prior approval of the Engineer-in-Charge and inspection and testing (where testing is necessary) shall be liable to be considered unauthorized, defective and not acceptable.
- (g) The Engineer-in-Charge shall have full powers to order the contractor to remove of any material brought to site which are not in accordance with the contract specifications or do not conform to the samples approved by the Engineer-in-Charge. In case the contractor fails to remove the rejected materials, the Engineer-in-Charge shall get it removed at the risk and cost of the contractor
- (h) The contractor shall produce / procure all the materials well in advance so that there is sufficient time for testing and approving of the material and clearance of the same before use in work.

1.19. Workmanship:

1.19.1. All the work to be executed with high quality of workmanship for all areas and activities. A stringent quality monitoring to be carried out of all the activities.

1.20. Sample Preparation and Mock up units at site:

- (a) The concept of sample & mock-ups is to assess the performance parameters/ quality standards for any specified item in the project. The main objective of the section is to address most issues prior to construction, and to minimize disruption in the critical path of the construction program.
- (b) The contractor shall invariably prepare the samples at site of finishing items of work such as flooring of different types, Stone cladding, Structural Glazing, Painting, Tiles/stones work, different types of false ceiling, different types of doors, windows, different types of partitions dry wall panelling/partitions, glass partitions, different types of flooring, flooring in staircase, modular railings, water supply & sanitary fittings, furniture, furnishing and any other item as per direction of Engineer-in-charge. The size of samples and items for which samples are to be prepared by contractor shall be decided by Engineer-in-charge and contractor shall abide by the same. Samples shall be required to facilitate Engineer-in-charge assess the standard of material quality, workmanship, aesthetics and potential problems and conflicts in execution of work. The contractor shall execute finishing items only after getting the samples of these items approved from the Engineer-in-charge. The samples shall be preserved, for the purpose of reference, till completion of the item represented by the sample and thereafter,

it shall be removed from site by the contractor at his own cost. The contractor shall dismantle and remove the rejected sample from the site of work at his own cost, as per directions of Engineer-in-charge.

- (c) The main objective of samples and mockups shall be to address following aspects:
 - To determine whether the Contractor and his associate agencies possess required skills necessary to execute the work, assemblies or systems such that the built construction will satisfy specified requirements
 - To understand the sequence of operations and discuss alternative sequencing options, if any
 - To assess the standard of workmanship and aesthetics that are to be replicated throughout the project
 - To recognize and resolve potential areas of conflict prior to the commencement of construction of said work on full scale.
- (d) If the quality of the workmanship and material in the full-scale mock-ups is as per the required standards and approved by the Engineer-in-Charge, the mock up unit shall be allowed as part of the work and measured for payment. Otherwise, it shall be dismantled by the contractor as directed by the Engineer-in-Charge and taken away from the site of the work at his own cost.
- (e) Contractor to make mock-up in advance to achieve timelines/milestones specified in the contract agreement and directions of Engineer-in-charge.
- (f) Approval of the samples of items and mock-up units by the Engineer-in-charge shall not absolve the Contractor from the responsibility of replacing defective material brought at site or materials used in the work but found defective at a later date. The Contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
- (g) Contractor shall remain fully responsible for quality of actual work executed at site as per terms of contract, irrespective of approval of samples and mock-up of items.

1.21. Testing of Materials:

- (a) The contractor shall provide at site, a site testing laboratory equipped with testing equipment and materials for conducting routine field tests as specified in contract documents and CPWD Specifications. All tests in the on-site laboratory shall be carried out by the quality control engineers deployed by the contractor. These tests shall be witnessed by Engineer-in-charge and/or his authorized representatives and also TPQA. The contractor shall notify the Engineer-in-charge or his authorized representative, the date and time for tests to be conducted in on-site laboratory / site of work, for his presence and witnessing the test.
- (b) The type of tests and frequency of tests shall be as mentioned in CPWD Specification 2019 unless otherwise mentioned elsewhere in the contract document. Relevant IS Code shall be referred for tests if same is not mentioned in CPWD specification.
- (c) Some of the routine mandatory tests to be performed in field laboratory shall also be sent for testing to external approved testing laboratory. The frequency of such outside testing shall be 10% of the total number of tests to be conducted in onsite laboratory or as decided by the Engineer-in-Charge, unless otherwise mentioned elsewhere in the document.

- (d) Routine field tests, for which facilities are not available in field laboratory, shall be got tested from external test laboratories, approved by Engineer-in-Charge.
- (e) Tests and frequency of testing to be performed in external laboratory shall be as specified in CPWD specifications and as decided by Engineer-in-charge.
- (f) External test laboratories shall be of Government Institutes/IITs/NITs/Central and State Research Centres/Centrally and State Funded Laboratories etc. or other NABL/BIS approved labs or any other accreditation body which operates in accordance with ISO/IEC17011 and accredited labs as per ISO/IEC117025, provided the same are approved by Engineer-in-charge.
- (g) All expenditure on testing samples in on-site laboratory and external approved laboratory such as cost of sample, packing and sealing, transportation, loading, unloading, testing charges etc. shall be borne by the contractor unless otherwise mentioned elsewhere in the document.
- (h) The Design Mix of concrete shall be got done from IIT Delhi, Delhi Technological University (DTU) Delhi, NCCBM Faridabad or any other lab/institute approved by Engineer-in-Charge. If approved by Engineer-in-charge, Design mix of concrete can also be done in on-site laboratory, provided engineering expertise and equipment for design mix of concrete are available at site with the contractor.
- (i) All costs incurred for Design Mix of Concrete such as cost of material samples, packing and sealing, transportation, loading, unloading, testing charges, design mix charges etc. shall be borne by the contractor.
- (j) The contractor shall submit proposed design mix for approval of Engineer-in-charge. If Engineer-in-charge is not satisfied by the proposed design mix of concrete, subsequent to its field trials or the design mix is not in accordance to contract requirements and specifications, contractor shall carry out new design mixes for concrete for approval by Engineer-in-charge. Contractor shall remain fully responsible for quality of concrete and its conformity to relevant specification even after the approval of design mix by the Engineer-in-charge.
- (k) All test samples will be collected/selected by the Engineer-in-charge or his authorized representative. The contractor or his authorized representative shall associate in collection, preparation, forwarding/submission of test samples. If contractor or his authorized representative does not associate in this process, the test results of samples collected by Engineer-in-charge or his authorized representative and consequences thereof, shall be binding on the contractor.
- (l) If any load testing or special testing is to be done for any sample of work or item, whose strength/performance is doubtful, the cost of such tests shall also be borne by the contractor and nothing extra shall be paid to contractor.
- (m) As per test reports, if any material/work fails to meet the acceptance criteria, it shall be removed from the site by the contractor at his own cost. New material shall be procured by the contractor and/or work shall be redone/rectified by the contractor at his own cost. In the absence of any specified test/acceptance criteria, the decision of the Engineer-in-charge shall be final and binding as to whether the said defective material/work be removed and substituted with other suitable material or rectifications to be done. The contractor shall bear all the expenses for any further tests considered necessary.
- (n) The contractor shall produce, on demand from Engineer-in-charge, the manufacturers' certificates for materials brought to site.

- (o) If Engineer-in-charge feels that the material supplied is not as per required specifications even if it is ISI approved and have manufacturers certificate, he can send the sample of such material also for testing in approved lab.
- (p) The Engineer-in-charge or his authorized representative shall be free to visit the manufacturer unit/facilities, at all reasonable times, to witness and inspect the testing of an item/material to be used in work. The Contractor has to arrange facilities for inspection of equipment /materials including conducting the required tests in the manufacturing unit within India. However, the travelling, lodging and boarding and related expenditure on visit of Engineer-in-charge or his authorized representative shall be borne by the department as per applicable rules.
- (q) It shall be duty of contractor to ensure that all manufactured items and materials procured at site for the work are as per relevant specifications and contract requirements.
- (r) Performance test: The contractor shall conduct performance test of hidden items/services such as water supply and sanitary lines, drainage pipes, conduits, sewers, water proofing in toilets /terrace etc. as per the specifications, in the presence of the Engineer-in-charge or his authorized representative, before covering these services/items.
- (s) The samples for tests shall be in all cases, will be selected by the Engineer-in-charge and supplied by the contractor free of cost as part of the contract. If at any time, any material so tested, fails to meet the acceptance criteria, the same shall be removed from the site of works and other materials substituted therefore, but in the absence of any specified test/acceptance criteria, the decision of the Engineer-in-charge shall be final and binding as to whether the said material or materials shall be used on the works, or forthwith removed and other material substituted.
- (t) The contractor shall produce on demand from Engineer-in-charge, the manufacturers' certificates certifying that the materials conform to the technical specifications. For other materials which are ISI/ BIS marked, manufacturer's certificate shall be considered as fulfilling the mandatory test requirement. However, in case Engineer-in-charge feels that the material supplied is not of required specifications even if it is ISI/BIS approved and have manufacturers certificate, he can send the sample to the approved lab for testing. Cost of testing i/c material cost, packaging, sealing, transportation to testing lab etc. to be borne by the agency.
- (u) The contractor shall permit the Engineer-in-charge or his authorized representative to be present during any of or all the tests. The notification to the Engineer-in-charge that the work has been completed, the contractor shall make under the direction and in the presence of Engineer-in-charge such tests and inspections as have been specified or as the engineer-in-charge shall consider necessary to determine whether or not the full intent of requirements of the plans and specifications have been fulfilled. In case the work does not meet the full intent of the specifications it shall be rectified by the contractor at no extra cost and the contractor shall bear all the expenses for any further tests considered necessary.
- (v) The contractor shall arrange for conducting the tests specified in Quality Plan in the presence of an officer, authorized by the Engineer-in-Charge. Full records of all the tests conducted shall be maintained by the contractor in the format given

by Engineer-in-Charge which will be made available to the Engineer-in-Charge or to any officer authorized by him whenever required.

- (w) The contractor (s) shall make his own arrangement for electricity and water required for the execution of work and nothing extra shall be paid for the same. However, the Engineer-in Charge shall recommend the application to the concerned authority for electric connection, if desired. Necessary payment shall be made by the contractor directly to the department concerned. In case Electricity supplying authority fails to sanction the electric connection or delays the sanction for electric connection, the contractor shall make his own arrangement by providing diesel generators of adequate capacity at his own cost.
- (x) The Department's representative shall be free to visit the manufacturer work at all reasonable times to witness and inspect the testing of furniture. It is the duty of contractor to see that all the furniture supplied are tested as per relevant IS specifications. The contractor shall furnish manufacturer test certificate for the routine test conducted on the furniture offered. If necessary, the contractor shall arrange to conduct the entire routine test at the manufacturer premises in presence of Engineer-in-charge or his authorized representative. On receipt of material/equipment at site the contractor shall offer equipment/material for inspection and get approved before installations.
- (y) Approval of the samples/mock-up of various materials given by the Engineer-in-charge and the Architect shall not absolve the Contractor from the responsibility of replacing defective material brought on site or materials used in the work, in case they are found defective at a later date. The Contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
- (z) Ultrasonic pulse velocity test shall be conducted on all RCC columns and at least 10% of the total number of RCC members in each category i.e. beam, shear wall, slab and footing for ensuring quality of concrete as per directions of Engineer in charge. The cost of the same shall be borne by the contractor.

1.22. Maintenance of Tests and Material Procurement Records:

(a) Maintenance of Register of Tests-

- i. All tests carried out at construction site, in house laboratory or outside laboratories shall be recorded in the test registers by the contractor's engineer and reviewed by Engineer-in-charge and/or his authorized representative. Contractor shall procure printed registers, at his own cost, as per format approved by the Engineer in charge. All such registers, procured by the contractor, shall be duly issued by Engineer-in-Charge for use of the lab/field staff. Contractor shall keep all the registers updated with latest valid entries and produce for inspection on the direction of engineer in charge or his authorized representatives. Safe custody of all test records shall be responsibility of contractor till the completion of work. On completion of work, all test records shall be handed over to Engineer-in-charge by the contractor. Scanned copy of test records shall be submitted by the contractor to the Engineer-in-charge every quarter.
- ii. All Samples of materials including Cement Concrete Cubes are taken jointly with Contractor by CPWD staff, as per percentage stipulated in the bid document or

as decided by the Engineer-in-charge. All the necessary assistance shall be provided by the contractor. **Cost of sample materials including testing charges shall be borne by the contractor and he/she shall be responsible for safe custody of samples to be tested at site.**

- iii. All the test in field lab setup at Construction Site shall be carried out by the Engineering Staff deployed by the contractor in presence of CPWD staff as per the provisions of CPWD Quality Assurance Manual for building works 2022 shall be applicable.
- iv. All the entries in the registers shall be made by the designated Engineering Staff of the contractor and same shall be regularly reviewed by the field officers. The contractor shall be responsible for safe custody of all the test registers.
- v. All material received at site shall be entered in MAS (Material at Site) register, MTC & bill-invoice shall be maintained in order. The MAS registers including cement and steel registers shall be maintained by a qualified staff of contractor which may be inspected by Engineer-in charge or his authorized representatives at any time. The daily report of receipt of material shall be sent to Engineer-in-charge or his authorized representatives

(b) Maintenance of Material at Site (MAS) Register-

- i. Contractor shall duly record all receipts and issues of Cement, Reinforcement steel, structural steel, paints, other materials etc. in the MAS, Cement and paint registers etc. and to be reviewed by Engineer-in-charge and/or his authorized representative. Contractor shall procure printed registers, at his own cost, as per format approved by the Engineer in charge. All such registers, procured by the contractor, shall be duly issued by Engineer-in-Charge for use of the lab/field staff. Contractor shall be responsible for safe custody of all records, i.e MAS, cement, paint, steel registers and other materials, till the completion of work. On completion of work, all records shall be handed over to Engineer-in-charge by the contractor. Scanned copy of above records shall be submitted by the contractor to the Engineer-in-charge every quarter.
- ii. These records shall be inspected by Engineer-in-charge or his/her authorized representative regularly. The records shall be available to the Engineer-in-Charge or his authorized representative whenever required.
- iii. All the entries in the material procurement registers (MAS registers) and test registers will be done by the designated engineering staff of the Contractor. All entries in records shall be done on daily basis, as soon as the procurement and test of material is carried out at site.
- iv. MTC, bills / invoice of procured materials, test reports of materials tested in external laboratories etc. shall be maintained at site by the contractor's engineers.
- v. The contractor shall provide access of all records to Third Party Quality Assurance Agency (TPQAA) engaged by Engineer-in-charge for their inputs in quality assurance in the work.

- vi. It shall be mandatory for the field staff to retain the self-attested (by agencies/ contractors) copies of Tax paid bills of the materials entered in the MAS Register viz., Steel, Cement, Bitumen, Paint, Primer, Distemper, Varnishes, Tile Adhesive, Admixture, Anti termite chemical, Water proofing compound material and any other item as decided by the Engineer-in-charge.
- vii. Self-attested copies of Tax paid bills of materials taken in MAS Register shall be obtained by the field staff from the agencies/ contractors before settling the payments. In case of any doubt the same can be verified by the field staff. However, onus of genuineness of Tax paid bills rests with the agencies / contractors.

1.23. Drawings and Documents:

a) The work shall be carried out only in accordance with the detailed drawings given by CPWD Architect and such drawings as may be issued during the course of the work, stamped "GOOD FOR CONSTRUCTION". The Architect CPWD may also issue certain drawings at various stages of the construction. The Contractor shall, however, ensure that only drawings marked "GOOD FOR CONSTRUCTION", and bearing the current revision number, shall be used for constructing the works. Superseded drawings shall be removed from the site immediately on issue of revised drawings.

b) The work 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. During construction & post construction local body clearance wherever applicable.
- III. Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
- IV. Warranty obligation for the equipment and/or fittings/fixtures supplied by the contractor effective from the actual date of completion of work.

c) Correlation/Coordination among drawings:

The contractor shall correlate all the relevant architectural, structural and all services drawings as well as SOQ/Scope of work and specifications and satisfy himself that the information available is complete and unambiguous. In case of any ambiguity, Contractor shall raise the concern well in advance so that progress of the work remains unhindered. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work based on any erroneous and/or incomplete information and no claim whatsoever shall be entertained on this account.

1.24. Shop Drawings:

- (a) Contractor shall prepare shop drawings based on the detailed/intent drawings and wherever specified in the contract document. Contractor shall prepare and submit shop drawings for items of contract in which preparation of shop drawings by contractor and or his vendors/manufacturers is specified. Besides this, items involving design and detailing under the scope of contractor/vendor/manufacture, shall also require preparation and submission of shop drawings by the contractor.

- (b) The contractor shall prepare shop drawings with clash free layout of all services and building elements, on BIM model, proposed to be finally executed at work by him / his vendors and submit it to Engineer-in-charge.
- (c) The contractor shall prepare and submit shop drawings compatible with BIM model as well as AutoCAD software.
- (d) The Contractor shall prepare and submit a detailed program for the preparation and submission of the shop drawings which should be compatible to the integrated program chart for the whole construction work.
- (e) Contractor shall be responsible for ensuring the shop drawings are in compliance of SOQ items/Scope of work, GFC drawings, design intents, stipulated specification and condition of contract agreement.
- (f) Contractor shall be required to make modifications, if required by the Engineer in charge, in the submitted shop drawings and shall resubmit modified shop drawings. When a shop drawing is revised, the particulars of the current revision shall be clearly marked or circled to facilitate checking. All prior revision numbers and references of drawings possibly superseded by the current issue shall also be clearly shown.
- (g) After finalization of shop drawings, sampling and mock-up of item shall be carried out at site. Thereafter, the item shall be taken up for full-fledged execution at site.
- (h) The contractor shall prepare all the needed shop drawings well in advance and submit to Engineer-in-charge for his inputs, if any, before placing the order and execution of the item. Shop drawings shall be submitted to Engineer-in-charge, at least four weeks in advance of planned production, delivery and installation of any material to allow the Engineer-in-Charge to give ample time for scrutiny and give comments if any.
- (i) Contractor shall be fully responsible for any delay caused, on account of delay in finalization of shop drawings or modified shop drawings. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved program.
- (j) Cost of all shop drawings and form work drawings to be furnished by the Contractor shall deem to be included in his tendered rates/quote for the work. Nothing extra shall be payable on this account.

1.25. **Workmanship:**

- (a) All work shall be executed with high quality of material and workmanship. Stringent quality control shall be ensured by the contractor of all the activities.
- (b) **Quality of work is of paramount importance.** Contractor will be required to engage well-experienced supervisors, engineers, skilled labour and deploy modern T&P and other equipment to execute the work in a time-bound manner.

2. Inspection of Work

2.1 Officers of CPWD, Dignitaries from Central Ministry / Department, User Department shall be inspecting the on-going work at site at any time with or without prior intimation. The contractor shall, therefore, keep updated the following requirements and detailing.

- a. Display Board showing detail of work, weekly progress achieved with respect to targets, reason of shortfall, status of manpower, wages being paid for different categories of workers.
- b. Entrance and area surrounding to be kept cleaned.
- c. Display layout plan, key plan, Building drawings including plans, elevations and sections.

- d. Upto date displays of Bar chart, CPM and PERT etc.
- e. Keep plastic / cloth mounted on one sets of building drawings.
- f. Set of Helmets and safety shoes for exclusive use for officers / dignitaries visiting at site.

3. Third Party Quality Assurance (TPQA):

- 3.1 In order to achieve high standards of materials, workmanship and overall quality of the execution, an agency shall be engaged by Engineer-in-charge or client to carry out 'Third Party Quality Assurance'. The quality assurance may also be got done by an independent team of CPWD or any other agency Govt. of India. TPQA agency will carry out checks of the quality assurance procedures followed at site, take samples of the materials for independent testing and check the workmanship of the works carried out. The contractor shall extend full cooperation to the TPQA agency in facilitating the inspections and collection of samples during execution of work. Reports and recommendations by QA agencies shall be strictly adhered to/complied by the contractor. The contractor shall be required to co-operate with agency in carrying out various activities including documentation at no extra time and cost to the department. In case of any adverse findings by the TPQA agency, the contractor shall do the needful rectifications to the entire satisfaction of the TPQA agency and Engineer-in-Charge. If contractor fails to rectify the defects of the serious nature within a reasonable time frame, Engineer-in-charge shall have right to hold any further payment. If work is stopped due to non- rectification of defects and delay occurs on this account, no relief in completion of milestones by way of grant of EOT or any other relaxation shall be given. TPQA will conduct the Quality Control Test as per CPWD QA manual, relevant standards and manufacturer's specifications. The samples shall be collected in presence of representatives of contractor and Engineer-in-charge.

Note: All the above-cited quality assurance plan is part of the cost of the project and no claim whatsoever shall be entertained. Costs related to all above cited activities to be borne by the contractor except payment to TPQA agency employed/ engaged by department

4. Land & other establishments, Electricity & water etc:

Contractor shall be allowed to temporarily use any available space within construction site(s) for establishing his site related office. Provided, such establishment should not hinder or slow down the execution of planned construction work. Contractor shall submit layout drawings of his proposed temporary establishment at construction site for approval of Engineer-in-charge, prior to such establishment. Contractor may be required to remove his establishment at site by Engineer-in-charge at any time during execution of work. No lease/rental charges shall be levied on contractor for space within construction site utilized by contractor to make his temporary establishments with prior approval of engineer-in-charge. Further for backup office, labour camp, batching plant, storage yards etc. contractor has to arrange land at his own cost. Nothing extra shall be payable on this account. However, if any government land can be made available no charges will be payable for the same. Contractor will arrange electricity, water and other facilities etc. on his own and bear all charges complete. Nothing extra shall be payable on this account.

Special conditions For Specialized Works

- 1.1. In case the main contractor intends to change any of the specialized/ associates agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in- Charge of relevant component(s). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-Charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.
- 1.2. The main contractor has to enter into MoU with specialized agency(s) associated by him. Copy of such MoU shall be submitted to EE/ DDH in charge of each relevant component as well as to EE-in-charge of major component. In case of change of associate contractor, the main agency(s) has to enter into MoU/agreement with the new contractor associated by him. (**Form N**)
- 1.3. Specialized items of works (Civil): Various specialized items of works under this agreement in respect of civil construction are as below
 - (a) False ceiling works (other than acoustic and Gypsum)
 - (b) Dry wall partition work
- 1.4. The items of the specialized work such as the ones listed below, shall be executed by the contractor through the Manufacturer of the items or through their authorized applicators/installers only
 - (a) Acoustics all items (i/c Acoustic False ceiling)
 - (b) Modular aluminium Glass partition and doors
 - (c) Waterproofing works

The associate specialized agencies for the works mentioned under Clause 1.3 & 1.4 should have satisfactorily completed the works as mentioned below during the last 7 years :

 - i Three completed works each costing not less than 40% of the tendered cost of the proposed similar specialized work concerned.
 - Or
 - ii Two completed works each costing not less than 60% of the tendered cost of the proposed similar specialized work concerned.
 - Or
 - iii One completed work costing not less than 80% of the tendered cost of the proposed similar specialized work concerned.

1. 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 month previous to the one in which association is proposed. In case main contractor himself has satisfactorily completed similar work of required magnitude as mentioned above, he may also be allowed to carry out specialized work. The contractor shall submit all required relevant documentary evidences to the satisfaction of Engineer in charge for ascertaining credentials of specialized agencies as may be demanded

- by Engineer in charge like certified copy of work order/contract with BOQ, income tax TDS certificates/Form-26AS in support of amount paid, satisfactory completion certificate etc. including inspection of such works.
2. In case Engineer-in-charge is satisfied that the Specialized Agencies with above credentials are not available, then multiple agencies may be approved or the above criteria may be relaxed with the approval of NIT approving authority.
 3. Additional Security Deposit: Additional security @5% of value of work done and paid for water proofing subhead (all items), Acoustic works (all items), modular aluminium-partitions, furniture work shall be deducted from bills. This additional security can also be deposited in the form of bank guarantee issued by the scheduled bank. Such bank guarantee bond shall be valid for the period of 10 years from date of completion of whole construction work, recorded by the Engineer-in-charge. The Performa for the BG shall be as given in the tender document. The 50% of such additional security amount can be released after of half of the total guarantee period on satisfactory performance of the item.
 4. Guarantee bond: The contractor shall submit Guarantee bond for various items of work as stipulated in the contract document. Performa for Guarantee bond shall be as given in the tender document.
 5. All materials obtained from Govt. stores or otherwise shall be got checked by the Engineer-in-charge or his authorized representative of the work on receipt of the same at site of work before use.
 6. The Contractor has to make his own arrangement for all T & P like ladders, scaffolding, sutli, empty containers, brushes, and paper, brush etc. required for work and nothing extra shall be paid for the same.
 7. The contractor shall have to get approved the brands and shades of all types of Paints from the Engineer-in-charge before execution of same.
 8. Materials shall be brought to the site of work in original containers with the intact Manufacturer's seal.
 9. Before the commencement of work, the contractor shall prepare sample of each work or as directed for approval of the Engineer-in-charge. After the sample is approved by the Engineer-in-Charge, the contractor shall be allowed to commence the work and the quality of work shall confirm to the approved sample.
 10. Before the commencement of work, the contractor shall draw up a programme in consultation with the Engineer-in-charge for the execution of work.
 11. Defective work/sub-standard work or work not done according to the specifications of the contract shall be liable for summary rejection & shall not be measured and paid for. This shall be without prejudice to taking any other action against the contractor in accordance with the terms & conditions of contract.
 12. The contractor shall depute his representative daily to the site of work. The

name and signature of his representative attested by the contractor shall be intimated to the Engineer-in-charge.

- 13 The entire work shall be carried out in close co-operation and Co-ordination with all other agencies working in the building. The Contractor (s) shall not be entitled to any compensation on account of temporary stoppage of work due to other construction.
- 14 No payment will be made to the contractor for damage caused by rains during the execution of the works and no claim on this account will be entertained.
- 15 Deviation in quantities shall be done only with prior written permission of the Engineer- in-charge. Deviation in quantities done without approval of the Engineer-in-charge shall not be measure and paid for.
- 16 Any damage to the building, furniture, fittings of any other articles etc. done by the Contractor or his workmen during the execution of work, shall be made good by the Contractor, failing which the same shall be made good by the Engineer-in-charge or his authorized representative at the risk and cost of the contractor.
- 17 All doors, windows, floors, furniture, electrical fittings and other articles shall be protected from dust, splashes & damage Splashes & droppings from white washing, colour washing, distempering painting etc. on walls, floors, doors and window, down take pipes/furniture shall be removed by the contractor at his own cost and the surface cleaned simultaneously after the completion of the day's work is done, without waiting for the actual completion of the other items of work of the contract. In case the Contractor fails to comply with this requirement, the Engineer-in-charge or his authorized representative shall have the right to get this work done at the risk and cost of the Contractor either departmentally or through another agency without issue of any notice to the Contractor, on his account. The representative of the Engineer-in-charge will however, mention about it in the Site Order Book before employing the labour on the job at the contractor's cost.
- 18 The contractor should write their correct postal address on the application for tender papers. In case it is found that the address given in their application is not correct and as a consequence of the same if any registered letter sent through postal authorities is received back by the department undelivered to the contractor, the contractor shall be fully responsible for all the consequence and by such letter sent through registered post shall be deemed to have been delivered to him.
- 19 The scope of work covered under this contract shall be carried out in the building which is occupied by other Govt. offices and is under operation. Hence, the work shall be executed in such a manner that there is no disturbance or inconvenience to the other occupants of the building.
- 20 No labour huts shall be allowed inside the campus of above said work. The Contractor shall arrange for the stay of labours outside the campus including their transport to & from site, and nothing extra shall be payable on this

account.

Samples of various materials required for testing shall be provided free of cost by the contractor unless otherwise specified in the item. **The cost of all tests and of all materials, conducted in and outside laboratory shall be borne by the contractor.** All other expenditures required to be incurred for taking the samples, conveyance, packing etc. shall also be borne by the contractor

PARTICULAR SPECIFICATIONS & CONDITIONS FOR CIVIL WORKS

1. General

Work shall be executed as per BOQ item and notes and applicable CPWD specifications. Manufacturer prescribed method of application, as approved by Engineer-in-charge, shall be adopted where CPWD specifications or BIS standards/guidelines are not available.

If for any BOQ item of work, exact specification is not available in CPWD specifications, then CPWD specifications of nearest similar item in terms of material and/or application shall be referred as directed by Engineer-in-charge.

2. **FLOORING WORK:** The item shall be executed as per BOQ item and notes, applicable CPWD specifications and manufacturer's method of application as approved by Engineer- in-charge. For avoiding of scratch marks or damage to the vitrified / ceramic floor tile, the necessary arrangement of hessian cloth with a coat of POP or shuttering ply with foam underneath shall be provided. Nothing shall be paid extra on this account.

3. **PLASTERING WORKS:** The item shall be executed as per BOQ item and notes, applicable CPWD specifications and manufacturer's method of application as approved by Engineer- in-charge.

- 3.1 Plastering shall be done using spray application except portions where spray application is not feasible, as approved by Engineer-in-charge. Ready mix polymer modified cement plaster suitable for spray application shall only be used for spray application.

- 3.2 Gypsum suitable for spray application shall only be used.

- 3.3 Sand shall not be mixed in Ready mix polymer modified cement plaster and mortar, except with prior approval of Engineer-in-charge for specific requirement.

4. WATER PROOFING WORK

- 4.1 The work in general shall be executed as per CPWD specifications & specialized agency for water proofing to be engaged for the work as per direction of Engineer-in- Charge.

- 4.2 Total quantity of the water proofing compound and chemicals required shall be arranged only after obtaining the prior approval of the Engineer in Charge in writing. It shall be ensured that the consumption of the compound is as per specified requirements.

- 4.3 The finished surface after water proofing treatment for floor in sunken portion shall have minimum slope of 1 in 48 unless otherwise decided by the Engineer in Charge.

- 4.4 Before commencement of treatment on terrace (if required), it shall be ensured that the outlet drain pipes/spouts have been fixed and the spout openings have been eased and rounded off properly for easy flow of water.

- 4.5 Contractor shall associate himself with specialized firms as per NIT Conditions for the work relating to Water Proofing Treatment. The work of water proofing shall start only after written approval of specialized agency by the Engineer-in-Charge. However, the entire responsibility for the quality of this treatment and its efficiency shall however, rest with the main contractor only.

5. METAL WORKS:

- 5.1 All metal works shall be executed as per BOQ item and notes, applicable CPWD specifications and manufacturer specification as approved by Engineer-in-charge. Contractor shall submit methodology statement, if required by Engineer-in-charge, with all detail in illustrative sketch form and get approved from Engineer-in-charge before start of work.

5.2 Aluminium Frame Works

- (a) All aluminium works shall be executed as per BOQ item and notes, applicable CPWD specifications and manufacturer specifications as approved by Engineer-in-charge. Contractor shall submit methodology statement, if required by Engineer-in-charge, with all detail in illustrative sketch form and get approved from Engineer-in-charge before start of work.
- (b) Contractor shall procure and install/erect the complete aluminium framework including clamps and anchors for backup support frame to stone cladding only from the specialized manufacturer for such systems, as per preferred make list.

6. CEILING AND WALL PANELLING WORKS

- 6.1 All false ceiling and wall panelling items shall be executed as per BOQ item and notes, applicable CPWD specifications and manufacturer's method of application as approved by Engineer-in-charge. Contractor shall submit methodology statement with all detail in illustrative sketch form and get approved from Engineer-in-charge before start of work.
- 6.2 The deflection loading of the false ceiling system shall be 12.5 kg/ m². Main support beam shall be tested as per ASTM C635. Deflection should be less than $L/360$ with a deflection loading of 15kg/ m. All main beam to main beam and cross tee to cross tee connection shall have a pull-out strength of more than 100kg.
- 6.3 Following salient aspects of wall paneling shall be ensured by the contractor:
- (a) Gypsum Boards/MDF boards/Plywood shall be stored in a dry place and water should not come in contact with boards/ ply. If the boards/ply get wet, they should not be used in work.
 - (b) The floor should be perfectly level before laying the first course/member of paneling. All boards/ply must be properly aligned to the plumb.
 - (c) Paneling must be properly aligned vertically and horizontal, true to

desired line and levels.

- (d) The recommended quantity of Gypsum Bonding Plaster must be used for joints and filling the grooves made for conduits, pipelines, etc. Excess Bonding Plaster must be scooped and removed, so that the joints and the places where the grooves are filled in are flush and even.
- (e) The Gypsum walls lining should be dry and sanding done properly especially at joints.
- (f) Use electrical saw or grooving tools for conduiting, chase cutting etc. Hammer and chisel techniques to form chases must be avoided. For concealed piping and conduit, the depth of groove should not exceed 50 mm.
- (g) Provision of ply boards of suitable size shall be made in GI frame of dry wall for anchorage of service conduits and fixtures.
- (h) Back-to-back provision of switch boxes should be avoided for better fire protection and sound insulation.
- (i) Baffling of boards in the GI frame of dry walls shall be done behind skirting and switch boxes location for better sound and fire insulation.
- (j) In case of double layered dry wall, the joints of inner and outer boards should be staggered for better stability and fire & sound insulation.
- (k) Anchors/fasteners shall be of reputed makes and installed as per manufacturer specifications. Anchors/fasteners must be of adequate and required load carrying capacity as required for the member.
- (l) Contractor shall prepare shop drawing based on concept drawing including services and prepared mock-up of required area. As per approved shop drawing and mock-up, contractor shall start the work.

6.4 The measurement shall be made for finished work of flooring.

7. WATER SUPPLY AND SANITARY INSTALLATIONS:

The contractor shall submit completion plans for water supply, internal sanitary installations and building drainage work on drawings prepared preferably through computers (1 original copy plus 3 Photostat) on suitable scales to show the general arrangement and desired details. In case the contractor fails to submit the completion plans as aforesaid, security deposit shall not be released.

7.1 **General requirements**

- 7.1.1 Sanitary fixtures shall be of the best quality and shall be of approved make and manufacture (wherever specified) as defined in the item of work or defined anywhere in this document otherwise shall be as mentioned in the CPWD specifications failing which the same shall be of ISI mark duly approved by the Engineer-in-Charge.
- 7.1.2 All fixtures and fittings shall be provided with all such accessories as are required to complete the item in working condition whether specifically

mentioned or not in the Schedule of Quantities, specifications, elsewhere in this tender document & drawings. The quoted rates shall be deemed to be all-inclusive for a complete item fit for use including all materials, labour, T&P, specials, equipment's, testing & commissioning etc. Accessories shall include proper fixing arrangement, brackets, nuts, bolts, screws and required connection pieces. All the accessories shall be of the quality and make as per manufacturer's specifications except otherwise specified in specifications, schedule of quantities and elsewhere in this tender document. Nothing extra whatsoever shall be payable on aforesaid account.

- 7.1.3 Fixing screws shall be half round head chromium plated brass screws with C.P. washers where necessary or otherwise as provided in the item.
- 7.1.4 Porcelain sanitary ware shall be glazed vitreous china of first quality free from warps, cracks and glazing defects and shall conform to I.S. 2556-1967.
- 7.1.5 All fittings and fixtures shall be fixed in a neat workmanlike manner true to required level and heights and in accordance with the manufacturer's recommendations and directions of Engineer-in-charge. Care shall be taken to fix all inlet and outlet pipes at correct positions.
- 7.1.6 All holes or chases shall be properly made good by C.C 1:2:4 (in brick wall) or the concrete mix of RCC element as directed by the Engineer-in-Charge. Nothing extra shall be payable on this account.
- 7.1.7 Wherever M.S. clamps are required to be anchored directly to brick walls, concrete slabs, beams, walls or columns, nothing extra shall be payable for making good the same.
- 7.1.8 The soil waste and vent pipes & its related fitting shall conform to IS 3989-84 with latest amendments.
- 7.1.9 Nothing extra for providing and fixing CP Brass caps/extension pieces wherever required for CP Brass fittings shall be paid beyond the rates payable for corresponding CP Brass fittings.
- 8. **Dry wall partitions:** The agency shall provide the fixing system of TV unit in dry wall partition. If required the strengthening of frame of dry wall shall be done by the contractor as per the requirements or as decided by Engineer-in-charge. No extra payment shall be made for this.

TECHNICAL SPECIFICATIONS (For Furniture Work)

1.0 GENERAL

These specifications are for work to be done, item to be supplied and materials to be used in the works as defined in the BOQ and to the satisfaction of the Engineer-in-Charge.

- 1.1. The workmanship is to be the best possible and of a high standard. The contractor shall take all steps immediately to make up deficiency if any noticed by the Engineer-in-charge. Use must be made of special tradesmen in all aspects of the work and allowance must be made in the rates for the same.
- 1.2. The furniture provided by the vendor shall be in accordance with the samples approved by the Engineer-in-Charge and in conformity with specification and approved list of manufacture and brand. The contractor shall produce all invoices, vouchers or receipts for any materials if called upon to do so by the Engineer-in-charge.
- 1.3. Samples of all materials are to be submitted to the Engineer-in-charge for their approval before the contractor orders or deliver the material to the site. Samples together with their packing are to be provided free of charge by the contractor and should any materials be rejected they will be removed from the site at the contractor's expense. All samples will be retained by the Engineer-in-charge for comparison with materials which will be delivered at site. Also, the contractor will be required to submit specimen finishes colors, fabric, etc., for the approval of the Engineer-in-charge before proceeding with the works.
- 1.4. The contractor shall be responsible for providing and maintaining temporary coverage required for the protection of finished work. No secure storage space shall be made available at the site. The contractor shall be responsible for making all necessary storage and security arrangements. The contractor shall also ensure that no damage is caused to the work and material of any other vendor at site and that the site is kept totally free of debris at all times and to the complete satisfaction of the architects. There shall be a penalty for failure to maintain cleanliness on site.
- 1.5. Contractor shall maintain uniform quality and consistency in workmanship throughout the execution of the work.
- 1.6. All materials brought on the site of works and meant to be used in the same, shall be the best of their respective kinds and to the approval of the Engineer-in-charge. The Engineer-in-charge or his Representative will accept that the materials are really the best of their kinds, when it is proved beyond doubt that no better materials of the particular kind in question are available in the market.
- 1.7. The materials shall be stored and stacked on the site as directed by the Engineer-in-charge, and if any additional space is to be hired for this purpose;

the contractor will do so at their own expense.

- 1.8. Workmanship: All works shall be to line, level, plumb and square corners, edges and arises in all cases shall be unbroken and finished neat. Laser alignment to be used for aligning the workstations
- 1.9. Aluminum, CRCA steel (Cold rolled close annealed) and stainless steel shall be of approved manufacture and suitable for its particular application.
- 1.10. All steel, brass, bronze, aluminum and stainless steel articles shall be subjected to a test for strength, if so required by the Employer/Architect at the particularly at the contractor's expense.
- 1.11. All material and workstation to be with BIFMA certification and certified wood.
- 1.12. All fabric needs to be 30min. fire rated fabric and scotch guard.

MATERIAL SPECIFICATIONS FOR VARIOUS COMPONENTS FOR MODULAR FURNITURE

- 1.1.1. The furniture provided by the vendor shall be in accordance with the samples approved by the Engineer-in-Charge and in conformity with specification and approved list of manufacture and brand. The contractor shall got approved all the items from Engineer-in-Charge before mass production.
- 1.1.2. The contractor shall produce all invoices, vouchers or receipts for any materials if called upon to do so by the Engineer-in-Charge.
- 1.1.3. The Contractors are to take care in loading and unloading furniture for the works.
- 1.1.4. All the contractors should consider the below mentioned points before quoting for the job.
 - All furniture's to be approved prior to fix the same wherever mentioned.
 - Contractor should be responsible for lifting of the furniture's to the respective floors and expenses of the same should be borne by him.
- 1.1.5. These specifications are for work to be done, item to be supplied and materials to be used in the works as shown and defined on the drawings and herein to the satisfaction of the Engineer-in-Charge.
- 1.1.6. The workmanship is to be the best possible and of a high standard. The contractor shall take all steps immediately to make up deficiency if any noticed by the Engineer-in charge. Use must be made of special tradesmen in all aspects of the work and allowance must be made in the rates for the same.
- 1.1.7. The materials to be provided by the contractor shall be in accordance with the samples/ Mock-up already got approval from the Architect by the contractor and in conformity with specification and approved list of manufacture and brand. The contractor shall produce all invoices, vouchers or receipts for any materials if called upon to do so by the Engineer-in-Charge Samples of all materials are to be submitted to the Engineer-in-Charge for their approval before the contractor orders or

deliver the material to the site. Samples together with their packing are to be provided free of charge by the contractor and should any materials be rejected they will be removed from the site at the contractor's expense. All samples will be retained by the Engineer- in-Charge for comparison with materials which will be delivered at site. Also the contractor will be required to submit specimen finishes colors, fabric, etc., for the approval of the Engineer-in-Charge before proceeding with the works.

- 1.1.8. The contractor shall be responsible for providing and maintaining temporary coverage required for the protection of finished work. No secure storage space shall be made available at the site. The contractor shall be responsible for making all necessary storage and security arrangements. The contractor shall also ensure that no damage is caused to the work and material of any other vendor at site and that the site is kept totally free of debris at all times and to the complete satisfaction of the Engineer-in-Charge. There shall be a penalty for failure to maintain cleanliness on site.
- 1.1.9. All materials brought on the site of works and meant to be used in the same, shall be the best of their respective kinds and to the approval of the ENGINEER-IN-CHARGE. The ENGINEER-IN-CHARGE or his Representative will accept that the materials are really the best of their kinds, when it is proved beyond doubt that no better materials of the particular kind in question are available in the market.

1.2. QUALITY ASSURANCE

Vendor to provide quality assurance certificate from the Manufacture

1.3. DELIVERY, STORAGE

Vendor to deliver packaged furniture to project site with manufacturer's labels and seals intact.
Storage: Furniture shall be stored in at desired place before installation

**GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL
OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER-PROOFING
WORKS**

The Agreement made this day of two
thousand and

between son of of (hereinafter called the
Guarantor of the

one part) and the PRESIDENT OF INDIA represented by Executive Engineer,
(Division)....., CPWD or his successor (hereinafter called Government of the other
part).

WHEREAS this agreement is supplementary to a contract (hereinafter
called the Contract) dated and made between the GUARANTOR of the one part
and the Government

of the other part, whereby the Contractor, inter alia, undertook to render the
buildings and structures in the said contract recited completely water and leak-proof.

AND WHEREAS GUARANTOR agreed to give a guarantee to the effect that the
said structures will remain water and leak-proof for ten years from the date of
completion of the construction work under the contract, as recorded by Engineer-
in-charge for the work.

NOW THE GUARANTOR hereby guarantees that water proofing treatment
given by him will render the structures completely leak-proof and the minimum life
of such water proofing treatment shall be **for ten years** from the date of completion
of the construction work under the contract, as recorded by Engineer-in-charge for
the work.

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

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

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

and binding.

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

IN WITNESS WHEREOF these presents have been executed by the Obligor
(Name of

Contractor)and by(Executive Engineer) and for and on behalf of the
PRESIDENT

OF INDIA on the day, month and year first above written.

.....

(Signed, sealed and delivered by
OBLIGOR) in the presence of

1(Sign, Name & Address of Witness)

2(Sign, Name & Address of Witness)

.....
.. (Signed & Seal for and on behalf of THE PRESIDENT
OF INDIA)

in the presence of

1.....(Sign, Name & Address of Witness)

**GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL
DEFECTS AFTER COMPLETION IN RESPECT OF**

MODULAR ALUMINIUM AND GLASS PARTITION/FALSE CEILING/ Acoustics/Bamboo flooring

The Agreement made this day of two thousand and

between son of of (hereinafter called the Guarantor of the one part) and the PRESIDENT OF INDIA represented by Executive Engineer, (Division)....., CPWD or his successor (hereinafter called Government of the other part).

WHEREAS this agreement is supplementary to a contract (hereinafter called the Contract) dated and made between the GUARANTOR of the one part and the Government

of the other part, whereby the Contractor, inter alia, undertook to render the work under said contract structurally stable to fulfil its intended purpose, sound, free from workmanship defects and use of only specified, certified material.

AND WHEREAS GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable to fulfil its intended purpose, sound, and guarantee for quality workmanship, material and finishing for ten years from the date of completion of the construction work under the contract, as recorded by Engineer-in-charge for the work.

NOW THE GUARANTOR hereby guarantees that work executed by him will remain structurally stable to fulfil its intended purpose, sound, and guarantee for quality workmanship, material and finishing **for 10 years** from the date of completion of the construction work under the contract, as recorded by Engineer-in-charge for the work.

The decision of "The Government" with regard to nature and cause of defect shall be final and binding on Guarantor.

During this period of guarantee, the guarantor shall make good all defects within the notice period, to the satisfaction of "The Government" calling upon him to rectify the defects, failing which the work shall be got done by the Department by some other contractor at the GUARANTOR'S cost and risk. The decision of "The Government" as to the cost, payable by the Guarantor shall be final and binding.

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

IN WITNESS WHEREOF these presents have been executed by the Obligor
..... (Name of

Contractor)and by(Executive Engineer) and for and on behalf of the PRESIDENT

OF INDIA on the day, month and year first above written.

.....

(Signed, sealed and delivered by
OBLIGOR) in the presence of

1 (Sign, Name & Address of Witness)

2 (Sign, Name & Address of Witness)

.....
.. (Signed & Seal for and on behalf of THE PRESIDENT
OF INDIA)

in the presence of

1..... (Sign, Name & Address of Witness)

**GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR
REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF
FURNITURE WORK**

The Agreement made this day of
two thousand and
..... between son of of
..... (hereinafter called the
Guarantor of the one part) and the PRESIDENT OF INDIA represented by Executive
Engineer, (Division)....., CPWD or his successor (hereinafter called Government
of the other part).

WHEREAS this agreement is supplementary to a contract (hereinafter called
the Contract) dated and made between the GUARANTOR of the one part
and the Government of the other part, whereby the Contractor, inter alia, undertook
to render the furniture work under said contract structurally stable to fulfil its
intended purpose, free from workmanship defects, warping, moisture effect,
termite/borer proof, rust free, durable, strong and operational easiness and use of
only specified, certified material.

AND WHEREAS GUARANTOR agreed to give a guarantee to the effect that said
work will remain structurally stable to fulfil its intended purpose, free from
workmanship defects, warping, moisture effect, termite/borer proof, rust free,
durable, strong and operational easiness and use of only specified, certified material
for the minimum life of **ten years** from the date of completion of the construction
work under the contract, as recorded by Engineer-in-charge for the work.

NOW THE GUARANTOR hereby guarantees that work executed by him will
remain structurally stable to fulfil its intended purpose, free from workmanship
defects, warping, moisture effect, termite/borer proof, rust free, durable, strong and
operational easiness and use of only specified, certified material, for the minimum life
of ten years from the date of completion of the construction work under the contract,
as recorded by Engineer-in-charge for the work.

The decision of "The Government" with regard to nature and cause of defect shall
be final and binding on Guarantor.

During this period of guarantee, the guarantor shall make good all defects within
the notice period, to the satisfaction of "The Government" calling upon him to rectify
the defects, failing which the work shall be got done by the Department by
some other contractor at the GUARANTOR'S cost and risk. The decision of "The
Government" as to the cost, payable by the Guarantor shall be final and binding.

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

IN WITNESS WHEREOF these presents have been executed by the Obligor
(Name of Contractor)and by(Executive Engineer) and for and on
behalf of the

PRESIDENT OF INDIA on the day, month and year first above written.

.....

(Signed, sealed and delivered by OBLIGOR) in the presence of

1(Sign, Name & Address of Witness)

2(Sign, Name & Address of Witness)

.....

(Signed & Seal for and on behalf of THE PRESIDENT OF
INDIA) in the presence of

1(Sign, Name & Address of Witness)

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

S. No.	Material / Item	Make
	PPC & RCC WORK	
1.	Cement (OPC/ PPC)	UltraTech, ACC, Ambuja, JK Super cement, Wonder Cement
2.	Cement - White	J.K. White, Birla White
3.	Admixture for Concrete (Plasticizers & Super-Plasticizers, VMA, Mineral Additive)	Master Builder, Sika, Fosroc, Mapei, MC Bauchemie, Alccofine (Ambuja)
4.	Reinforcement Steel	TATA (TISCO), SAIL, RINL, JSPL, JSW
5.	Ready Mix Cement Concrete	Ultratech, ACC, NUVOCO, RMC India, NDCON and/or by setting the Fully Automatic batching plant of minimum capacity 60 cum/hr by contractor and/or any other manufacturer as approved by the Engineer-in-charge
6.	Expansion Filler board- Premoulded compressible (non- Bituminous)	Supreme, STP
7.	Concrete Curing Compound	Master Builder , Sika, Fosroc, Mapei, MC Bauchemie, Pidilite
8.	Expanded polystyrene sheet (EPS) and Extruded Polystyrene Sheet (XPS)	Penguin, Kiwi, E-pack, Supreme, STP
9.	Core cutting machine	Hilti, Fischer, Wuerth
10.	Polysulphide Sealant/ PU sealant	Sika, Fosroc, Master Builder, MYK
	MASONRY WORK	
11.	Ready mix polymer cement mortar	UltraTech, Saint Gobain-Weber, Fosroc, Ferrouscrete, ACC

S. No.	Material / Item	Make
	DOORS & WINDOWS WORK	
12.	Flush door shutter (With pine block board infill) (All flush doors shall be procured from fully owned factory of the manufacturer and not from JV / outsourced)	Greenply (Green), Century (PRO), Duroply (TOWER), Merino, Archidply, Green panel
13	Air transfer grill	Ruskin Titus, System Air, Trox
14	System Aluminium Window	Schuco, AluK, Technal, Reynaers, Axsys solutions
15.	Aluminium glass partition system	Dormakaba, Kubik, Otic, Lindner, Axsys Solutions
16	Glass	Saint Gobain, AIS, Modiguard, Sisecam, Pilkington
17	Silicone Sealant	Wacker, Dow Corning, GE Momentive,
18	Floor spring, door closer & door automation	Dormakaba, Assa Abloy (except Enox), Hafele, IR Briton, Yale or as specified in BOQ item
19	All type of Door lock including Mortice locks	Dormakaba, Assa Abloy (except Enox), Geze, Hafele, IR Briton, Yale, Kich, Godrej or as specified in BOQ item
20	SS 304 Door Hardware (other than Floor spring, Closer, Locks)	Dormakaba, Assa Abloy (except Enox), Geze, Hafele, IR Briton, Yale, Kich or as specified in BOQ Item
21	Double Action Hinge	Dormakaba, Assa Abloy (except Enox), Hafele, IR Briton, Yale, KICH or as specified in BOQ Item
22	Concealed automatic drop-down seal/ Acoustic Seal / or any other type of Door seal	Raven, Athmer, Dormakaba, Lorient, Kilargo, Hafele, Hormann, 3M, IR Briton or as specified in BOQ item
23	Wooden Fire rated Doors	Promat, Navair, Ardor
24	Metal Fire rated Doors & Vision Panel	Shakti Hörmann, Navair, Tata Praves, IHMS
25	Fire Rated Hardware & System	Dormakaba, Assa Abloy (except Enox), Hafele, Geze, Hormann

26	Fire seal, Fire smoke seal	3M, Hilti, Promat, Fischer, Dormakaba, Lorient, Kilargo, Raven, Athmer, STI
27	Fire rated rolling shutter	Shakti Hormann, Gandhi Automation, iHMS, Avian
28	Fire rated Glass	Vetrotech (Saint-Gobain), SCHOTT, Pyroguard, AIS-Pyrobelt
29	Fire rated Insulated Glazed door (Swing, Sliding & Automatic Sliding Door)	Saint Gobain, Shakti Horman, Navair, IHMS,
30	Laminates and compact laminate sheet	Greenlam, Merino, Century, Royale Touche
31	Glass Processors (Toughened/Laminated / Heat Strengthened)	Saint Gobain, ASAHI, Shankar Glass, Shiv Shakti, Kochhar, ABS, Flair Glass, Al Rahmat
32	Mirrors/ interior mirror (superior quality crystal clear)	Saint Gobain, Modi Guard, Asahi India Glass Ltd., Sisecam, Pilkington
33	Epoxy / Polyester Powder coating/ PVDF Coating	Jotun, AkzoNobel, Asian PPG, Nippon
34	Structural Silicon sealant, Pre pigmented Weather Silicone	Dow Corning, Momentive (GE), Tremco, Wacker,
35	Wood Adhesive	Fevicol, Araldite, kerakol, Astral, 3M
36	PVB/SGP Laminate film, Sentry Film, Acoustic film	Dupont, Saflex, Eastman, Kuraray , LG, 3M, Saint Gobain, XDS
37	Frosted film	LG, 3M, Dupont, Saint Gobain, Avery Denison, Garware
PLASTER WORK		
38	Gypsum light weight Plaster (Sprayable)	Saint Gobain Gyproc (Elite-90), Ultra tech, JK Laxmi (Gypgold), USG Boral, Birla White, Ferrouscrete
39	Ready mix plaster	UltraTech, Saint Gobain-Weber, Fosroc, Ferrouscrete, ACC
WATER PROOFING WORK		
40	Water Proofing compound	Fosroc, Sika, Master Builder , Mapei, Pidilite
41	Water Stops - Hydrophilic Swellable bar (Not bentonite type)	Fosroc, Sika, Pidilite, Master Builder, Mapei
42	Polyurethane over deck insulation foam	Master Builder, Bayer, Lloyd Insulations, Pidilite, Sika, Mapei, Fosroc

S. No.	Material / Item	Make
	FLOORING WORK	
43	Vitrified Tiles (All tiles shall be procured from fully owned factory of the manufacturer and not from JV /outsourced)	Restile, Kajaria, RAK
44	Tiles/ Stone fixing Adhesive (Only High performance, polymer modified, non-slip adhesive)	MYK - Laticrete, Ardex Endura, Kerakoll, Saint Gobain-Weber, Maipei, Ferrouscrete, Ultratech
45	Epoxy Grout/ Cementitious Grout for Flooring	Ardex Endura, MYK- Latricrete, Saint Gobain- Weber, Ferrouscrete
46	Polyurethane Concrete Flooring, Epoxy flooring, Self-levelling Flooring	Fosroc, Ardex Endura, Sika, Saint Gobain – Weber
47	Bamboo wood flooring and skirting	EPITOME, ESES, Ply boo, Hunter Douglas
48	Raised/ false access flooring system	Tankaria, Unifloor, Access floor system, PWS floor, Lindner, Knauff, Unitile
49	Tile trim & Threshold	Genesis, Surfaces, Genotek
50	Engineered Marble Stone	HR Johnson, Kalinga stone, NITCO, Haique, AGL
51	Vinyl Flooring (Gym Flooring)	Forbo, Ebaco, Armstrong, Tarkett, LG, Gerflor, Polyflor
52	Carpet flooring	Milliken, Suminoe, Shaw
	METAL WORK	
53	Stainless Steel	SAIL, Jindal Stainless, TATA
54	Structure Steel & Hollow Section	SAIL, TATA (TISCO), RINL, Jindal Steel & Power (JSPL), APL Apollo tube, JSW
55	Aluminium sections and plates (Other than modular/system aluminium products for	Hindalco, Jindal, Bhoruka, Balco

	partitions, windows and curtain wall)	
56	Anchor Fastener, Rebar, Chemical/ Mechanical fastener, Expandable fasteners, Clamps	Hilti, Fischer, Wuerth, Mungo
57	SS Modular system railing and SS Cable railing	Kich, Q-Railing, JSL Lifestyle, Dormakaba
58	Non shrink cementitious precision (anchoring) grout	Fosroc, Sika, Mapei, Pidilite, Ultratech
59	ACP sheet	Aludecor, Alucobond, Alstone , Alubond
CEILING & WALL PANELLING WORK		
60	Gypsum false ceiling system (plain/ perforated/ Mould resistance paperless) i/c suspension systems	Saint Gobain, USG Boral, Knauf Danoline
61	Gypsum Panelling/Dry wall partitions	Saint Gobain, USG Boral, Knauf Danoline
62	Bamboo panelling	EPITOME, ESES, Ply boo, Hunter Douglas
63	Calcium silicate false ceiling	Aerolite, Saint gobin, Knauf, Armstrong
64	Bamboo wood false ceiling	EPITOME, ESES, Ply boo, Hunter Douglas, Armstrong, SAS
65	Metal Ceilings	Armstrong (Knauf ceiling system), Hunter Douglas, Durlum
66	Plywood (All plywood shall be procured from fully owned factory of the manufacturer and not from JV / outsourced)	Greenply (Platinum), Century Ply (Club Prime), Duroply (Platinum), Archidply (Platinum),
67	Veneer	Greenlam (Decowood), Century, Duroply, Greenply, Turakhia
68	MDF / Prelaminated MDF	Greenlam, Action Tesa, Century, Green panel, Merino
69	Acoustic panel and ceiling	Anutone, Techno Ceiling, Saint Gobain, Armstrong, Uniacoustics, Hunter Douglas, Rockworth
70	Cement Fiber Board/ Cement bonded particle board	Everest, NCL Industries (Bison Panel), Shera Board, Visaka Industries (V- Next), Century (Zykron), Saint Gobain
71	Access panel in False ceiling system	Saint Gobain, USG Boral, Knauf Danoline,
72	Rock wool/ Glass wool Insulation	UP Twiga, Rockwool India, Roxul Rockwool India, Lloyd, Siderise.

73	Galvanized/ Galvalume Roofing sheet and accessories	TATA, Everest, JSW, INTERARCH, Lloyd
74	Soft board	Jolly board, Kanpur Company (Kani Soft board)
75	Vinyl Sticker	3M, LG, Avery Denison
76	PAINTING WORK	
77	White cement-based putty	Birla, JK, Asian paints, Berger
78	Paint - Plastic Emulsion (Internal)	Asian paints, Jotun, Akzo Nobel (Dulux), Nippon, Berger
79	Paint - Synthetic Enamel	Asian paints, Akzo Nobel (Dulux), Jotun, Berger
80	Paint - Acrylic Emulsion (Exterior)	Asian Paints, Akzo Nobel (Dulux), Jotun, Berger
81	Paint - PU & epoxy paint and primer	Asian paints, Akzo Nobel (Dulux), Jotun, Nippon,
82	PU Polish for woodwork	Akzo Nobel (Dulux), Asian paints, ICI Dulux, ICA
83	Aluminium Flooring Expansion joint	Migua, CS, ASP, AEJ
External Development Work		
84	Precast Concrete elements (Grass paver, Paver block, Cobbles, kerb, car stopper etc)	Konkrete products Co. Dalal Tiles, Vyara, KK Manholes & Gratings, Nimco, Unistone, NTC.
Soft Furnishing Work		
85	Readymade Fabrics	Atmosphere, D Décor, Pure, Response, RR Decore, Jagdish Store, Vaya Fabrics, DEE Furnishing, Fabric Haus, Ador by AP, The pure concept, Drape Shoppe
86	Curtain/ Roller Blinds	Mac, Marvel, Hunter Douglas, Vista, Deck, D D'ecor, Aerolux
87	RTS Motor/Remote	Deck/Hunter Douglas/ D DÉCOR / Aerolux/ Somfy
88	INTERNAL GLASS FILM/Signages/	UK/ Orafol/ Avery Dennison / LG /3M/ Metamark

	FURNITURE	
90	Furniture items (Chairs, tables, storage units, workstations, compactors, sofa etc.,)	Godrej, Rockworth, Hayworth, Steelcase
91	Furniture Hardware	Godrej, Hettich, Hafele, Dorma, Kich, Ebco, Blum
92	Foam/ Rubber	Geo Foam, Sleepwell, Century, Godrej
93	Glides	Hettich, Hefele, Ebco, Grass, Blum
94	Buffer	Hettich, Ebco, Ezee, Hafele
95	Wood Polish on Furniture	Asian paints, ICI, ICA
96	MDF – Prelaminated or Plain	Greenlam, Action Tesa, Century, Green panel, Merino
97	Polyester fiber	Recron (Reliance) or as specified in BOQ
98	Laminate	Greenlam, Merino, Century, Royale Touche
99	Veneer	Greenlam (Decowood), Century, Duroply, Greenply, Turakhia
	PHE works	
100	All types of valves	Zoloto, Sant /Honeywell/Siemens /Lehry/Leader/Kirloskar/Audco (L & T)
101	Stainless Steel Pipe	Jindal, Viega, J Press
102	Stainless Steel Pipe Fittings	Jindal, Viega, J Press
103	G.I Pipes	SAIL/Tata/Jindal/APL-Apollo/Surya
104	G.I fittings	Unik, KS, ICS
105	Cast Iron/Ductile Iron pipe & Fitting	Electrosteel - Lanco, Neco, Kapilansh, Kartar valve & fitting, SKF
106	uPVC & cPVC -water supply pipes and fittings	Astral, Ashirwad, Supreme, Finolex
107	Hot/Cold Water Pipe Insulation	Armacell / K- Flex/ A-Flex/ ALP aeroflex/ Thermaflex
108	G.I/ MS pipe protection wrapping and coating	IWL- Pypkote, Rustech-Coatek, Neotape, STP Ltd.

109	C.I pipe Joint	Acqua Bond, Drip Seal, Mega Seal
110	G.I pipe sealent	Henkel-Loctite 55, Holdtite
111	Water Meters	Deshmesh, Aquamet Zenner, Rockwin, Kranti, Capstan
112	Rain Water Outlet/ Scupper drain	ACO, Neer, GMGR, Kessel, MIFAB, Chilly
113	Floor Clean out plug/ clean out plug/ Floor Trap/Floor drain/ Cockroach Trap	Chilly, ACO, Neer, GMGR, Kessel, MEA, Geberit, MIFAB, Kich
114	Indian/European WC, urinals, Wash Basin, Sanitary Installation and other sanitary fittings.	Kohler, TOTO, Roca, Jaquar Artize
115	Dry wall Insulation material / Acoustic	UP twiga, Rockwool India, Lloyd, Siderise, Roxul
116	CP Fittings	Kohler, TOTO, Roca, Jaquar Artize
117	Hand Dryer/Soap Dispensor/ Deodorizer	Kohler, TOTO, Roca, Euronics, Dolphy

For Items/Materials not covered in the list above, the 1st quality material is to be used as per the Nomenclature of items or 1st quality material of the reputed Make/Brand required to be used for execution of either agreement item or any Extra/Substituted item as per approval and direction of Engineer-in-Charge

Note:

1. The grouping of various items in above table is only for convenience purpose
2. Preferred makes for items shall be applicable anywhere in the contract work.
3. All materials and products shall conform to the relevant standards (IS, EN, BS, ASTM, ISO, AS/NZS) and shall be of approved make and design.
4. The Engineer-in-charge shall give the approval of a make of material to be used for the work only after review of the Technical

Data Sheet and sample/ mock-up.

5. Only "First" class quality materials shall be used.
6. The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the above list attached with the tender documents, as per the item description and particular specifications for the work. The equivalent brand for any item shall be permitted to be used in the work, only when none of the specified make have the material available of the required specifications. This is, however, subject to documentary evidence produced by the contractor for non-availability of the material with the makes specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, the decision of Engineer-in-Charge as regards equivalent make of the material shall be final and binding on the Contractor. Nothing extra shall be payable on this account.
7. In case of any item/ product neither covered in this list nor having a BIS specification, the contractor shall submit the proposed item/ product along-with technical details/ specifications (as per bid), test certificates etc. and other credentials of the manufacturer for approval by Engineer-in-charge.

Schedule of Quantity (Civil)					
Name of Work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA at Netaji Nagar, New Delhi (SH: Block No. 1).					
Item No.	DESCRIPTION OF ITEM	Quantity	Rate (Rs.)	Unit	Amount (Rs.)
1.0	Carriage of Materials				
1.01	Disposal of building rubbish/moorum/ malba/ similar unserviceable, dismantled or waste materials by mechanical means, including loading, transporting, unloading to approved municipal dumping ground or as approved by Engineer-in-charge, beyond 50 m initial lead, for all leads (upto 24 Km) including all lifts involved.(Processing fees at prescribed rate of C & D waste Management plant will be deposited by the agency and shall be reimbursed by the department on production of only original cash receipts) Note: Stack measurement shall be done	500 cum	690.90	cum	345,450
2.0	Concrete Work				
2.01	Providing and laying in position ready mixed or site batched design mix cement concrete for plain cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana/Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering and finishing as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the minimum specified cement content, the contractor shall have discretion to				

	either re-design the mix or bear the cost of extra cement.				
2.01.1	All works above plinth and upto floor V level				
2.01.1.1	Concrete of M15 grade with minimum cement content of 240 kg /cum	4260 cum	9457.55	cum	40,289,163
2.02	Extra for R.C.C./ B.M.C/ R.M.C. work above floor V level for each four floors or part thereof.	1420 cum	360.00	cum	511,200
2.03	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. above plinth level up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement :				
2.03.1	1:1.5:3 (1 cement : 1.5 coarse sand(zone-III) derived from natural sources : 3 graded stone aggregate 20 mm nominal size derived from natural sources)	181 cum	10985.50	cum	1,988,376
2.04	Centering and shuttering including strutting, propping etc. and removal of form for				
2.04.1	Lintels, beams, plinth beams, girders, bressumers and cantilevers	1928 sqm	745.40	sqm	1,437,131
2.05	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.				
2.05.1	TMT bars of grade Fe-500D or more.	21720 kg	109.25	kg	2,372,910
3.0	Masonry Work & Partitions				
	Note:- 1) Ready mix polymer modified cement mortar shall be of approved make, complies with IS 2250', and technical parameter as per specification. The compressive strength of ready mix polymer modified cement mortar shall be minimum 7.5 MPa. 2) Masonry work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual).Nothing extra shall be paid on this account.				

3.01	Brick work with non-modular Cement based fly ash bricks of required size conforming to IS:16720, class designation 10 average compressive strength with Ready mix polymer modified cement mortar in super structure above plinth for all floor levels.	2434 cum	12140.70	cum	29,550,464
3.02	Half brick masonry with non-modular Cement based fly ash bricks of required size conforming IS :16720, of class designation 10, in super structure, super structure above plinth for all floor levels with Ready mix polymer modified cement mortar .	5093 sqm	1490.90	sqm	7,593,154
3.03	Providing and fixing of 103mm thick Drywall with estimated STC -50 (+/-3) shall consists of Floor and Ceiling channel (0.55 mm thick, 52mm wide & having two flanges of 30mm each) fixed to the RCC Floor and Slab with 8mm Dia 40mm long Anchor Fasteners at 600 mm c/c. Wall Studs (0.55 mm thick, 50 mm wide having one flange of 34mm another of 36 mm) are placed at 610 mm centres in Floor and Ceiling channel. Drywall framework profiles are rolled with G.I Steel (120 GSM & 230 Mpa Yield Strength) conforming to as per IS 277.Floor channel to be wrapped with 70µ Self Adhesive LDPE moisture barrier film. Provide 99x2500x0.90mm thick Fixing Channel or Noggin Channel 0.5mm thick as per manufacturer recommendation shall be fixed behind Horizontal Board Joints of the outer layer of the board with the help of 4.2x13mm wafer head metal to metal screws. Insulation of 50mm thick glass / mineral wool of minimum density 16 kg/m³ (If density required is higher to achieve requisite STC as per item same shall be provided), wrapped in black cloth, with no added formaldehyde is placed in the cavity with the help of insulation hold strap fixed at 150mm down from soffit level and then at 1200mm centers vertically till the floor level. The insulation shall be non-combustible as per BS 476-4:1970,				

	achieving Class 0 classification in accordance with BS 476-6:2009 and BS 476-7:1997 be free of CFCs, HCFCs, HFCs and asbestos, resistant to fungi growth in accordance with ASTM C1338, non-corrosive to steel and aluminium as per ASTM C665, with water vapour sorption $\leq 5\%$ by mass. TVOC emissions shall not exceed $100 \mu\text{g}/\text{m}^3$ after 28 days in accordance with EN 16516; free from any harmful ingredient certified by Declare - Red List Free. Double layer boarding with Gypsum Plasterboards fixed on both sides of Drywall framework with first layer consisting of Standard Gypsum Plasterboard of density $880\text{kg}/\text{m}^3$ confirming to Type D as per IS 2095 Part I: 2023 and second layer Gypsum plasterboard is a high-performance Gypsum board providing durability and impact resistance of minimum density $950 \text{ kg}/\text{m}^3$ confirming to Type R1 & R2 as per IS 2095 Part I: 2023.				
	All Gypsum Plasterboards are BIS certified, confirming to fire performance as per BS 476 Part 4,6&7 are screw fixed to both side of Metal Framing with the help of 25/38mm long Drywall screws at 300 mm centres. The screw fixing of gypsum boards to the metal framing at the periphery, openings and cut edges should be at 150mm centres. All the Gypsum plasterboards must be staggered . All joints to be taped & finished with 50mm wide Paper tape & readymix All purpose Jointing Compound and angle beads shall be provided at all corners. All Openings cut outs & periphery shall be treated with appropriate fire & acoustic sealant and baker rod. Appropriate Cavity Toggles to be used for any unplanned loading in the Drywall and to be installed as per manufacturers recommendation. Provision shall be made in the drywall system for fixing the skirting to achieve a flush finish as per the architectural drawings. All work should be carried out as per the recommendation of				

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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	Engineer Incharge and as per recommended practices of the manufacturer. All overlaps in the metal studs required for extension to achieve the wall height shall be boxed for minimum length of 300mm and no horizontal joints of the boards should coincide with the overlap. All Openings cut outs & periphery shall be treated with Fire & Acoustical sealant. The drywall should withstand lateral wind pressure of 200 Pa with deflections limited to L(Span)/240 criteria.				
	Rate shall be included for the cost of making fixing arrangement for TV (including providing plywood or additional members), openings for light fittings, switch board, Duct / pipe crossing or any other services cut-outs made and the requirement of additional member required for strengthening with additional member, alongwith requirement of provisioning of members for holding concealed conduits / fixing switch boxes, uniform groove at interface with skirting and other materials etc complete for all level all height and as directed by the Engineer in Charge but excluding the cost of painting work. All Openings cut outs & periphery shall be treated with Fire & acoustical sealant. Contractor may be required to cut first layer of gypsum board for provision of skirting and, additional board shall be provide and top layer to be cut properly as per skirting detail nothing extra shall be payable on this account and for maintaining and providing 5 mm uniform groove with skirting. At the location of door frame in dry wall system, wooden member shall be fixed of required size and as per manufacturer's specification. Skirting and wooden work shall be paid in	20350 sqm	4304.40	sqm	87,594,540

	relevant tender items. Horizontal framing member shall be provided as per architectural requirement and as suggested by Engineer in charge. Out to out area of dry wall elevation on one side only shall be measured for payment after deducting for openings for doors/windows and service cut-outs of size more than 0.36 sqm etc, complete for all floors, all height. Any additional members, support members, fasteners, fixing details etc required to be provided in designed dry wall system approved by Engineer-in-charge, shall also include in the rate of this item and nothing extra shall be payable for the same.				
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3.04	Providing and fixing of 102mm thick Drywall with 120mins Fire Rating third party tested as per BS 476 20 & 22, STC -50 (+/-3) consists of Floor and Ceiling channel (0.70 mm thick, 52mm wide & having two flanges of 50mm each) to the RCC Floor and Slab with 8mm Dia 40mm long Anchor Fasteners at 600 mm c/c. Wall Studs (0.70 mm thick, 50 mm wide having one flange of 34mm another of 36 mm) are placed at 610 mm centres in Floor and Ceiling channel. Drywall framework profiles or equivalent are rolled with G.I Steel (120 GSM & 230 Mpa Yield Strength) conforming to as per IS 277. Floor channel to be wrapped with 70µ Self Adhesive LDPE moisture barrier film. Provide 99x2500x0.90mm thick Fixing Channel or Noggin Channel 0.5mm thick as per manufacturer recommendation shall be fixed behind Horizontal Board Joints of the outer layer of the board with the help of 4.2x13mm wafer head metal to metal screws. Insulation of 50mm thick glass / mineral wool of minimum density 16 kg/m³ (If density required is higher to achieve requisite STC as per item same shall be provided), wrapped in black cloth, with no added formaldehyde is placed in the cavity with the help of insulation hold strap fixed at 150mm down from soffit level and then at 1200mm centers vertically till the floor level. The insulation shall be non-combustible as per BS 476-4:1970, achieving Class 0 classification in accordance with BS 476-6:2009 and BS 476-7:1997. be free of CFCs, HCFCs, HFCs and asbestos, resistant to fungi growth in accordance with ASTM C1338, non-corrosive to steel and aluminium as per ASTM C665, with water vapour sorption ≤ 5% by mass. TVOC emissions shall not exceed 100 µg/m³ after 28 days in accordance with EN 16516; free from any harmful ingredient certified by Declare - Red List Free.	1048.00 sqm	4209.70	Sqm.	4,411,766
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	Double layer boarding with fire resistant Gypsum Plasterboards fixed on both sides of Drywall framework of 12.5mm fire resistant Gypsum plasterboard of Density 880kg/m³ (confirming to IS 2095 Part I: 2023 Type F, GreenPro certified by CII and EPD verified). All work should be carried out as per the recommendation of Engineer Incharge and as per recommended practices of the manufacturer. All Gypsum Plasterboards are BIS certified, confirming to fire performance as per BS 476 Part 4,6&7, are screw fixed to both side of Metal Framing with the help of 25/38mm long Drywall screws at 300 mm centres. The screw fixing of gypsum boards to the metal framing at the periphery, openings and cut edges should be at 150mm centres. All the Gypsum plasterboards must be staggered . All joints to be taped & finished with 50mm wide Paper tape & redimix All purpose Jointing Compound and angle beads shall be provided at all corners. All Openings cut outs & periphery shall be treated with appropriate fire & acoustic sealant and baker rod. Appropriate Cavity Toggles to be used for any unplanned loading in the Drywall and to be installed as per manufacturers recommendation. Provision shall be made in the drywall system for fixing the skirting to achieve a flush finish as per the architectural drawings. All work should be carried out as per the recommendation of Engineer Incharge and as per recommended practices of the manufacturer. All overlaps in the metal studs required for extension to achieve the wall heigh shall be boxed for minimum length of 300mm and no horizontal joints of the boards should coincide with the overlap. All Openings cut outs & periphery shall be treated with Fire & Acoustical sealant. The drywall should withstand lateral wind pressure of 200 Pa with deflections limited to L(Span)/240 criteria.				
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	Rate shall be included for the cost of making fixing arrangement for TV (including providing plywood or additional members), openings for light fittings, switch board, Duct / pipe crossing or any other services cut-outs made and the requirement of additional member required for strengthening with additional member, alongwith requirement of provisioning of members for holding concealed conduits / fixing switch boxes, uniform groove at interface with skirting and other materials etc complete for all level all height and as directed by the Engineer in Charge but excluding the cost of painting work. All Openings cut outs & periphery shall be treated with Fire & acoustical sealant. Contractor may be required to cut first layer of gypsum board for provision of skirting and, additional board shall be provide and top layer to be cut properly as per skirting detail nothing extra shall be payable on this account and for maintaining and providing 5 mm uniform groove with skirting. At the location of door frame in dry wall system, wooden member shall be fixed of required size and as per manufacturer's specification. Skirting and wooden work shall be paid in relevant tender items. Horizontal framing member shall be provided as per architectural requirement and as suggested by Engineer in charge. Out to out area of dry wall elevation on one side only shall be measured for payment after deducting for openings for doors/windows and service cut-outs of size more than 0.36 sqm etc, complete for all floors, all height. Any additional members, support members, fasteners, fixing details etc required to be provided in designed dry wall system approved by Engineer-in-charge, shall also include in the rate of this item and nothing extra shall be payable for the same.				
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3.05	Extra for providing curvilinear portion of drywall partition, including requirement of decreasing stud spacing, requirement of additional cutting in boards, bending of horizontal members, placing of all material in curves, finishing of joints and making the surface smooth; any additional material, machinery or labour as required to achieve the specified curvature, complete in all respects as directed by the Engineer-in-Charge.	6716 sqm	602.15	Sqm.	4,044,039
3.06	Designing, providing and fixing in position modular glass and aluminium glazing partition system as per approved make, double glazed mullion free demountable glass partition with featured concealed sealing (no visible gasket / seal) using acoustic laminated heat strengthened glass for outer glass and toughened glass for inner glass and approved color extruded aluminium sections of size min 100x30mm having min 1.5 mm thickness excluding of powder coating with acoustic rating minimum 45 db with third party certificate. It must have intermediate slim junctions for glass to glass vertical joints, 90 degree L& I junctions profiles suitably to used as per room configuration designs.no visible clip lines to provide clutter free view at both sides of section. The glazing system will have 6 mm Heat Strengthened glass - 0.76/0.8 acoustic PVB - 6 mm Heat Strengthened glass (exterior) +10mm toughened (interior) layer of glass with gasket . All aluminum section will have minnum 50 micron polyester powder coated finish of approved make and shade, the rate shall be inclusive of everything as stated above (Only Door shutter shall be paid sepeartly). Shall be fixed with SS screws / fasteners.	3709 sqm	17276.50	sqm	64,078,539
	Standards applicable •Structural stability test accordance to BS 5234: Part 2:1992 & EN 1991-1-1:2002 •Acoustic test for sound insulation in accordance to DIN EN ISO 10140-2				

	ASTME-E 90 Max System Height shall be 3 meter as per design and drawing and direction of Engineer in charge. The contractor shall submit shop drawing with all details for approval of Engineer-in-charge. Contractor/ manufacturer shall overall be responsible for the structural stability and safety of the partition system. Cost is inclusive of requirement of providing straight as well as curved aluminum member (wherever required), PVC shims / ply for maintaining uniform groove all around and sealing the same. For payment purpose out to out of aluminum profile with fixed glass portion only shall be measured.				
3.07	Extra for providing and fixing modular glass and aluminium glazing partition system in curved, curvilinear portions, including suitably curved/bent aluminium sections, flexible components, necessary accessories, fittings, joints, sealants and finishing, complete as per approved drawings, manufacturer's specifications and directions of the Engineer-in-Charge. This item will be payable only for the area where both the glass as well as aluminum are required to be bend. All other areas will be covered under BoQ Item 3.07. Note: In curved portion average of outer and inner area will be measured for payment purpose.	371 sqm	32063.85	sqm	11,895,688
3.08	Providing and fixing low-height partition of 1500 mm height and upto 75 mm thickness, comprising 12 mm thick BWP Grade Marine Plywood conforming to IS:710:2024 on both faces, finished with 4 mm thick decorative veneer (minimum 0.3 mm slice of veneer) of Type 1 - BWP Grade conforming to IS 1328:2025 of approved make and shade, fixed over the MS framework in any pattern and design. The partition may be constructed in straight or curvilinear profile as per the approved drawings.	2165 sqm	13454.10	sqm	29,128,127

	Wherever curvilinear portions are required, suitable flexible plywood or approved flexible veneer/material shall be used to achieve the desired curvature without compromising the strength, durability or finish of the partition. The exposed vertical and top edges of the partition shall be finished with 18 mm thick second-class teak wood beading of size 18 mm × 70–75 mm. The veneer and teak wood surfaces shall be finished with water-based low VOC content PU polish of approved make and finish. The item shall include all necessary cut-outs, openings and provisions for electrical switch points and accessories wherever required, complete with approved hardware, fasteners, adhesives, floor anchors complete as directed by the Engineer-in-Charge. The cost of the MS framework shall be paid separately under the relevant tender item. The partition shall be measured in square metres based on the outer face area only, and no extra payment shall be made for straight or curvilinear portions, cut-outs, edge finishing, hardware, fixing accessories or any other incidental works required for complete installation.				
4.0	Cladding Work				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				
4.01	Providing and fixing 4 mm thick one side decorative veneer (factory pressed with door shutter or plywood) conforming to IS: 1328:2025 (type-1), for lining/ cladding/ ceiling work/ on flush door shutter/ pelmet or any interior work in any design, any pattern, any shape, any size, any type of design and pattern, grooves etc as per drawing with necessary screws, adhesive including priming coat on unexposed surface. The veneer shall have minimum 0.3 mm thick slice (of natural	681 sqm	1970.00	sqm	1,341,570

	veneer) and back up ply BWP grade (IS – 710:2024) with density 650 Kg/Cum. Veneer shall be fixed with or without groove as per drawing. Sample shall be approved by Engineer-in-charge. If required, perforation shall be executed as per GFC drawing (on ply+ veneer surface) and shall be paid separately in relevant item of schedule.				
4.02	Providing and fixing machine cut, mirror/ eggshell polished , Granite stone work for wall lining (veneer work) including dado, skirting, risers of steps etc., in required design and pattern (if required with Granite stone slab pieces of different shapes, sizes & texture but of even thickness) with stone adhesive (As per IS 15477) of thickness 6mm including providing grooves of size upto 5mm and filling them with epoxy grout and chamfering of edges for providing V shaped grooves (if required) including rubbing, curing, polishing, groove, epoxy grout, supply and apply stone sealer on back side and all 4 edges etc. all complete as per Architectural drawings, and as directed by the Engineer-in-Charge.	3843 sqm	5418.70	sqm	20,824,064
4.02.1	18 mm thick Polished Granite stone slab jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent.				
4.03	Manufacturing, providing and placing in position machine made acoustic panels (as per the sample finally approved by the department) including Laser / CNC cutting and 3 D printing and fixed with approved adhesive, nails, screw etc on perforated 16 mm thick BWP grade ply (IS 710:2024) with acoustic fleece between 16 mm thick perforated ply and acoustic panel. This 16 mm thick perforated ply shall be mounted on GI frame of wall panelling (Cost of GI frame wall panelling and perforation in ply shall be paid separately in relevant tender item).Providing non-woven Acoustical panels of approved make, shade and pattern including Laser / CNC cutting, 3 D printing, making grooves /	4210 sqm	4957.80	sqm	20,872,338

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	chamfering and of the following specification: Product should be Made of high quality polyester fibers with high content of regenerated/recycled fibers from post-consumer discarded plastic drinking water bottles (PET Bottles) only with superior quality and shall be manufactured using needle punching process ensuring breathable open cell structure. The density should be 150-200 kg/m³. The total thickness of the panel should be 10 mm (±10%). The panel size should have the dimension of 1.22X 2.44m. These panels not only serve as acoustic panels but also as thermal insulations. They are recyclable and recycled. The panel should be random tested for sound absorption coefficient measurement through ASTM C-423/ISO 354 Fire Rating: Class A as per ASTM E-84 Tunnel Test. The Acoustic Panel should have NRC of 0.30-0.50 for 10 mm thick panels, without air gap with test report from ARAI Pune, TUV, Eurofinn or any other equivalent reputed laboratory. Cost is inclusive of providing and fixing 16mm thick ply, acoustic panel, acoustic fleece, glue alongwith laser/CNC cutting, 3 D printing etc. for all heights, levels and leads all complete as per directions of Engineer-in-charge. (Cost of GI / CRS frame for wall panelling and perforation in ply shall be paid separately in relevant tender item)				
4.04	VENEER WALL PANELLING Frame: - The frame work shall consist of Aluminium section 25x50mm with per running meter weight of 0.5kg/mtrs alongwith providing of aluminum brackets to adjust the face of veneer in line with adjacent area finishings. Aluminium to be fixed on wall surface at Centre to Centre distance of 600 mm Vertically. Paneling—Ply & Veneer. 12mm thick BWP grade marine ply (IS 710:2024) to be used for preparing the Wall Paneling base and providing veneered decorative plywood (Type 1 - 0.3 mm slice with 4 mm thick BWP grade Base ply -	1871 sqm	7170.15	sqm	13,415,351

	confirming to IS 1328:2025) on same of approved make and shade and shall be fixed as per duly approved design including patterns, grooves, fine slices etc. Veneer Paneling shall be fixed with compressor nails to expedite the work. Veneer surface shall be PU polished in approved shade and color. The PU polish shall be formaldehyde free low VOC content water-based polish. Installation Precautions: The following to be ensured before installation of the Veneer Paneling system: The area is dry prior to Panelling installation work. All wet trades are completed such as plastering, flooring etc. Air conditioning duct work is completed. Electrical chasing or drawing lines etc are in place. Cost is inclusive of providing and fixing aluminum frame, aluminum brackets, 12 mm thick ply and veneer including all necessary accessories, fasteners, screws etc. all complete as per directions of Engineer-in-charge.				
4.05	Providing edge moulding to 18 mm thick marble stone counters, Vanities etc., including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.	2700 metre	517.20	Metre	1,396,440
5.0	Wood and PVC Work				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				

	Note - 1. Only Superior class wood shall be used for any kind of woodwork. All wood (kiln seasoned and termite treated) and wood base material shall be treated with anti-termite treatment as per relevant IS before use and after installation. 2. All veneer, wood shall be FSC (Forest Stewardship Council) & Green Guard Certified. 3. All loose sample of materials shall be approved by Engineer in charge. 4. All manufactured products shall conform to Green building norms. 6. All adhesives and sealants shall be with low VOC and lead free with acceptable VOC content as per GRIHA requirements. 5. Contractor shall prepare shop drawing based on intent/ concept drawing and get approval from Engineer-in-Charge. The contractor shall prepare mock-up doors, windows and other elements with all required hardware and approved by the Engineer-in-Charge before execution of work. Work shall be carried out as per the final approved shop drawing and approved mock up. Contractor shall responsible against stability, safety, leakage, etc all complete. Testing work shall be carried out by Contractor as suggested by Engineer in charge. (If required).				
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	6. All type of locks shall be with computerized 4 No. keys (SS 304/ brass) and master keys (if mentioned in the nomenclature of the item). Grouping of master keys shall be as suggested by Engineer-in-Charge. Nothing extra shall be payable for master key provision.7. Glass for external doors and windows shall be with desired parameters as per Green building requirement.8. Contractor shall provide test certification for all fire rated items.9. Contractor shall make provision for access control system and other mechanical/ automation devices, co-ordinate with other services work and making good etc complete.11. All Doors, windows and other elements shall be fabricated and finished at the factory/ workshop, and only fixing and final finishing shall be executed at site, unless otherwise approved by Engineer-in-charge. 12. Door, window and other elements work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual).				
5.01	Providing and fixing factory made and pressed laminated/ veneer finish 40mm thick flush door shutter excluding thickness of veneer/ laminate, made of ISI marked non decorative type flush door shutters conforming to IS:2202 (Part I), core of block board construction with frame of 1st class hard wood, pine filler and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters having laminates/ veneer of approved make, shade, finish (which paid separately) as approved by Engineer-in-charge on both faces of shutter fixed with phenol formaldehyde synthetic resin type adhesive conforming to IS 848 including providing and fixing 6mm thick peripheral external lipping made out of superior class teak wood, on all edges of door shutter with PU polishing of required shade on all exposed faces	848 sqm	5184.85	sqm	4,396,753

	of lipping including fixing shutters etc complete for all floor all level as per drawings and as directed by Engineer-in-charge. Door frame shall be with suitable acoustic peripheral door seal of approved make and shade at three side of frame. Rate shall be inclusive of flush shutter, lipping, peripheral door seal, necessary consumable, accessories, making provision for automatic drop down seal etc but excluding the cost of veneer/ laminates, all required hardware and polishing etc complete for all height and floor levels as per drawing, design & direction by Engineer-in-charge. Out to out dimension including beading thickness shall be measured for payment.				
5.02	Providing and fixing in position superior class teak wood work in door, window and fixed panel frames; shutter frame of fully glazed door and window; jambs, skirting, louver, grill, cornice, pelmet, cladding on bullet resistant door, window and fixed glazing, wooden band, wooden batten panelling, panelling, ceiling, fixed panel of door and framing and any type of interior work, wrought framed and fixed in position with hold fast lugs or dash fasteners of approved make, required dia & length etc for all floor, all level all height as per drawing and as directed by engineer in charge. Rate shall be inclusive of all type of consumable, accessories, fastener and any type of corner treatment (i.e. champering, pencil corner, bevelling, moulding etc.). Polishing, carving work and hardware shall be paid in relevant agreement items.				
5.02.1	First class teak wood	13 cum	162982.08	cum	2,118,767
5.03	Providing & Fixing decorative high pressure laminated sheet of plain / wood grain in gloss / matt/ suede finish with high density protective surface layer and reverse side of adhesive	1163 sqm	1058.70	sqm	1,231,268

	bonding quality conforming to IS : 2046 Type S, including cost of adhesive of approved quality.				
5.03.1	1.5 mm thick				
5.04	Providing and fixing first class teak wood moulding of specified size on wall/ plywood/ RCC surface. Moulding shall be in tapered, circular or any other shape in shape and size with carving work (to create a design) and inclusive of material, labor, accessories etc complete for all level all height as per drawing and as directed by engineer in charge. Length of finished moulding shall be measured for payment. Finishing of moulding shall be paid in relevant tender item.				
5.04.1	A solid wood moulding having size approximate 40x20 mm	4780 metre	174.55	Metre	834,349
5.05	Providing and fixing first class teak wood moulding of specified size on wall/ plywood/ RCC surface. Moulding shall be in tapered, circular or any other shape in shape and size with carving work (to create a design) and inclusive of material, labor, accessories etc complete for all level all height as per drawing and as directed by engineer in charge. Length of finished moulding shall be measured for payment. Finishing of moulding shall be paid in relevant tender item.				
5.05.1	A solid wood moulding having size approximate 50x20 mm	3187 metre	201.50	Metre	642,181
5.06	Providing and fixing 12 mm thick ply BWP grade (IS – 710:2024) of approved make having, density minimum 600 Kg/m ³ , emission levels as per E-1 formaldehyde, for plain lining/ cladding/ ceiling work, on flush door shutter/ pelmet or any interior work with necessary screws/fasteners for all height all level etc complete as directed by Engineer-in-Charge.	1935 sqm	1513.35	sqm	2,928,332
5.07	Providing and fixing bright /matt finished Stainless Steel handles of approved quality & make with necessary screws etc all complete.				
5.08.1	100mm	100 Nos	91.55	each	9,155

5.08	Providing and fixing stainless steel soft closing spring hinges at 0 (zero) degree hinges (hydraulic type) of approved make/brand to cupboard shutters with full threaded steel screws including making necessary recess in board and finished etc. complete as per direction of Engineer-in-charge.	1792 Nos	275.30	each	493,338
5.09	Providing and fixing stainless steel soft closing heavy type telescopic drawer channels of approved make 500 mm long with screws etc. complete as per directions of Engineer- in-charge.	256 sets	895.90	One set	229,350
5.10	Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) decorative type, core of block board construction with frame of 1st class hard wood and well matched teak 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters.				
5.11.1	30 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	95 sqm	3206.65	sqm	304,632
5.11	Providing and fixing factory made modular VANITY wardrobe with 8mm thick both sides Pre-laminated BSB(Both Side Balancing white paper) HDMR board of approved make minimum density 850 kg/m ³ with suitable full threaded steel screws etc. on the backing of racks, drawer, cupboard, Vanity,kitchen cabinet under kitchen counter etc. all complete as per direction of Engineer-in-charge.	627 sqm	2245.60	sqm	1,407,991
5.12	Providing and fixing factory made Vanity cupboard shutter with 18mm thick OSL one side decorative and other side balancing lamination factory pressed HDMR board of approved make minimum density 850 kg/m ³ including 2mm thick PVC edge banding tape with hot glue by edge bending machine, Legs etc. with auto closing spring loaded hinges (hydraulic type) of approved make etc.undercut arrangement in shutter as a door handle may be required in vanity shutteras per direction of Engineer-in-charge for which nothing extra shall be payable .(Payment for providing and fixing	1260 sqm	4598.15	sqm	5,793,669

	auto closing hinges shall be paid separately)				
5.13	Providing and fixing factory made modular Vanity wardrobe with 18mm thick both side balancing lamination factory made HD MR of approved make for boxes, shelves, racks, almirah, cupboard and drawer etc. including necessary nails, screws PVC edge binding, Legsetc. complete as per direction of Engineer-in- charge.	722 sqm	3568.25	sqm	2,576,277
5.14	Door closer Providing and fixing concealed door closer of approved make with controlled adjustable closing speed and power adjustable with back check with track arm with screws to hinged door for specified door width with minimum one year guarantee. All adjustment screws face fixed. Rate shall be inclusive of fixing with using the template as per manufacturer's specification & maintain in good working condition. Selection of door closer shall be as per size and weight of door, as per manufacturer's recommendation and as directed by Engineer-in-charge. Concealed door closer confirm for door Width beyond 900mm and up to 1500mm and height up to 2700mm and as per manufacturer's specification. The door closure shall confirm to EN 1154 standard and shall be tested for 5,00,000 cycles of durability.	362 Nos	20964.05	each	7,588,986
5.15	Providing and fixing SS 304 grade push-pull pair of handle made out of satin (brush) finish hollow pipe of minimum 1.0mm thick having offset (C or D shape)/ H-shape/ D-shape (dent free at bending point) of approved make with necessary screws etc. complete for wooden doors/ aluminium doors/ metal doors as per drawing as approved by Engineer-in-charge. Rate shall be for all heights, all floors and all places. The length of handle shall be perfect centre to centre as below specified.	36 Pair	3601.70	each pair	129,661

5.16.1	a) 450 mm long x 25 mm dia.				
5.16	Mortise lock w/o handle Providing and fixing set of mortise latch and lock including strike plate SS 304 as per DIN 18251-1, grade 2 and prepared for euro profile cylinder (EPC) including standard Euro profile Pin Cylinder (with/ without latch) of approved make with both side key/ one side key one side knob operation with one pair of SS 304 Escutcheons (key hole plate) of approved for wooden/ aluminium doors with necessary SS Phillips head screws etc complete as per drawing and sample approved by Engineer-in-charge. The lock shall be with 4 keys. Provision of master key shall be as per client's requirement. Pair of lever handle shall be paid in relevant tender item. Mortise lock shall be of make Kich (Model No. MLB92S-SPL + PC11KN60 + PREEP50S), Hafele (Model No. 911.77.292+916.96.016), DormaKaba (Model No. 51200021), Geze (Model No.9168508 + 9168463 + 9000000), Assaabloy (Model No. AA5103 6072-F + AADC30/30SNKD-S)	362 sets	2852.65	one set	1,032,659
5.17	Plain mortise lever handle Providing and fixing SS 304 grade satin/ brush finish pair of Mortise lever handle with cap of 150mm to 200mm long of any shape, size of approved make with necessary screws, escutcheons etc. complete for wooden/ aluminium doors as per drawing as approved by Engineer-in-charge. Rate shall be for all heights, all floors and all places. Items shall be of make Kich (Model No. MH223S), Hafele (Model No.902.92.964), DormaKaba (Model No. 90050055010), Geze (Model No.9168508), Assaabloy (Model No. ATL-010), Godrej Model No (6548).	362 Pair	2217.50	each pair	802,735
5.18	Providing and fixing of SS 304 satin finish lever action Flush tower bolt with 19mm projecting bolt (extended rod of 600mm length) aluminium casted of approved make for double shutters aluminium door, with	36 Nos	1681.70	each	60,541

	necessary screws etc. complete as approved by Engineer-in-charge. Rate shall be for all heights, all floors and all places.				
5.19	Providing and fixing SS 304 grade 5 knuckle, 2 bearing butt hinge in satin stainless steel finish, as per EN 1935 of specified size of approved make as per approved sample with necessary SS 304 screws etc. complete for all floor all height all level as directed by Engineer-in-charge. Hinge to be suitable for door weights upto 120 kg. Template drilled with M6 screws for metal door and staggered drilled with screws suitable for wooden door with provision of NRP pins with grub screws in all the high security area.	1810 Nos	555.50	each	1,005,455
5.20.1	a) 125 x 75 x 3 mm - with ball bearing				
5.20	Providing and fixing factory made ISI marked partly insulated metal fire rated door set assembly for requisite area consisting of galvanized iron steel frame and double leaf shutter including necessary hardware accessories, conforming to FD 120 PI classification of IS 3614 :2021 with fire rating of 120 minutes integrity and 30minutes insulation. The door frame and shutter shall be made out of minimum 1.20 mm thick GI Sheet with minimum 120 GSM Zinc coating as per IS: 277. The entire fire rated doorset assembly shall be tested as per IS 17518 (Part-1) -1:2022. Recommended fire door shall have doors tested at CBRI or ARAI for maximum rating of 2hrs with minimum 30 mins insulation with vision panel. Frame: The frame shall be of minimum size 90 x 60mm with grooved profile to take appropriate fire rated smoke seal, having mitred cut joints (self tab/screwed assembled at site) and provided with appropriate reinforcement suitable for taking hardware and flush fixing as per IS:4351. The smoke seal material shall be of EPDM or any other material tested in accordance with BS 476 (Part-22) / ASTM E-84 of minimum size	585 sqm	26858.75	sqm	15,712,369

	10x4 mm, fixed within the inbuilt groove or stuck with adhesive on the entire perimeter of the frame. The door frame shall be fixed in all three sides to masonry wall opening with CSK headed fasteners of minimum 8 mm dia size and minimum 80 mm long hot dip galvanized with 8mm dia polyamide sleeves @4 numbers at each on vertical side and 3 numbers on top side.				
	Door shutter:The double skin double leaf door shutter shall be consisting of minimum 50 mm thick and having box like structure, slots cut and holes punched for fixing of hardware with stiffener as per IS 16074 including Resin bonded mineral wool/ceramic wool infill material of minimum density 96 Kg/cum. Each door leaf shall be provided with vision panel, having maximum area of 0.06 sqm, of 120-minute fire rated minimum 6 mm thick clear borosilicate glass pane fixed with clip-on arrangement and fire rated ceramic tape having minimum size 13x2mm to be fixed all around the glass on both the sides. The intumescent seal of minimum size 15x1.5 mm or of size as per test evidence shall be fixed on all the three edges of the door leaves. The Integral astragals to be provided for double leaf doors on the meeting style each on active and inactive leaf. The door shutters shall be mounted on the frame with SS 304 grade ball bearing hinges as per EN 1935 2002 or butt hinges as per IS 12817 both, of minimum size 100x75x3 mm @5 numbers hinges per door leaf upto 2400 mm height or as per test evidence, whichever is more, fixed with M6 25 screws All doors shall be factory prepared for receiving appropriate hardware and provided with necessary reinforcement for hardware accessories.				
	Hardware Accessories: Fire door set shall provided with one				

	number fire rated SS 304 grade Mortise dead/sash lock, 50-80 mm Back Set, Back Set with both side key operation, with both side key conforming to IS:16015:20221 EN12209, One pair of D type Pull/Lever handle of SS 304 grade of minimum 19 mm dia Centre to centre distance of 300 mm back to back fixing with spindle, and two number 600 mm long Concealed lever action flush bolt (Dye-Cast Stainless Steel Finish) on top and bottom of one leaf with SS dust proof socket on double door. Two number fire rated surface mounted heavy-duty door closer of size EN 3-5 with standard arm, of desired finish conforming to IS 3564/EN 1154. All hardware used shall be 120 minute fire rated and shall have third party approval certificate from reputed agency such as Certifire / UL etc.				
	Finishing: Both frame and door shutters shall be factory finished with polyester powder coating of minimum 50 microns thick and shall have passed salt spray test as per IS:13871 of approved colour and shade all complete as per manufacture/s specifications and as per direction of the Engineer-in-charge. installation: The hollow space in the door frame shall be filled with fire rated self-extinguishing type polyurethane foam (PUF)after installation at site of work. The rate shall be inclusive of complete door assembly including hardware; supply and installation by approved manufacturer.				
5.22	Providing & fixing SS 304 brush finish any type door stopper/ buffer of approximate 70mm size (floor mounted, door/ wall mounted) of approved make with necessary s.s screws etc. complete as per direction of Engineer-in-charge in Charge.	362 Nos	280.35	each	101,487
6.0	Steel Work				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				

	Note – 1. Contractor shall prepare shop drawing base on concept design/ drawing for any type of fabrication work and get approved. Contractor shall prepare mock-up/ prototype (as suggested) as per approved shop drawing for approval. Work shall be carried out as per approved shop drawing, approved mock-up/ prototype and as suggested by Engineer in charge. 2. Structural stability shall be responsibility of contractor for all kind of metal work. 3. All elements shall be factory fabricated and finished, only final finishing to be made on site with all precautions. 4. Contractor shall coordinate all services work (cut-outs and provisions) in metal work. All cut-out and services provisions shall be finished at factory/ work shop.				
6.01	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc., including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer and painting with synthetic enamel paint of approved brand and manufacture of required colour Two or more coats including welding and bolted with special shaped washers etc. complete. Electrical Resistance or Induction butt welded tubes	180120 kg	201.55	kg	36,303,186
6.02	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved primer and painting with synthetic enamel paint of approved brand and manufacture of required colour Two or more coats using structural steel etc. as required.				
6.02.1	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	28749 kg	179.05	kg	5,147,508

6.03	Providing and fixing carbon steel galvanised (minimum coating 5 micron) dash fastener of 10 mm dia double threaded 6.8 grade (yield strength 480 N/mm ²), counter sunk head, comprising of 10 mm dia polyamide PA 6 grade sleeve, including drilling of hole in frame , concrete/ masonry, etc. as per direction of Engineer-in-charge.				
6.03.1	10 x 80 mm	19166 Nos	139.35	each	2,670,782
7.0	Flooring				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				
	Note:- 1) Stones/granite shall be free from cracks, lines, stains, white spots of efflorescence and even in shade for all kind of stone work. 2) All natural stones shall be selected and sorted for uniform colour, figure and thickness and approved by Engineer-in-charge prior to procurement. 3) Stone shall be from same lot and/ or source (stone quarry) for same kind of work and as approved by Engineer-in-charge. 4) All type of loose and laid sample of flooring shall be approved by Engineer-in-charge. 5) Contractor shall co-ordinate and execute for all services in flooring and wall lining/ cladding work i.e. making openings/ cut-outs for any services (i.e. elevator operating panel in lift wall cladding, race way in flooring, junction box etc), and making good as per satisfaction of Engineer-in-charge.				

	6) All adhesives and sealants shall be with low VOC and lead free with acceptable VOC content as per Green building requirements. 7) Finished floor surfaces shall be protected with 12mm thick shuttering ply over a LDPE sheet /foam till handling over of the project. Tread of stair shall be protected with metal angle so as to avoid the damage the edges of tread. 8) Screed below flooring/ base mortar thickness shall be as per drawing. Any type of stone/ tile shall be fixed with adhesive and total thickness of base mortar/ screed shall be paid separately in relevant tender item. 9) All stone shall be factory cut and factory finished. Polish on any stone shall be as per satisfaction of Engineer in charge. 10) Tile shall be with 5-10% recycle material as per green building norms. 11) Cement mortar shall be have minimum 25% fly ash content except white cement mortar. 12) All the tile/ stone adhesives shall be provided as per IS 15477. 13) Flooring work shall be carried out for all floor, all level, all height, all places. 14) Rate shall be inclusive of all type of wastage of all material.				
7.01	Providing and laying Polished/matt finished Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab fixed with stone adhesive (water based) conforming to IS: 15477, in minimum 6 mm thickness including provision of groove up to 5 mm wide with PVC spacer, abrotap etc and grouting with Epoxy grout of approved make and shade including rubbing , curing and polishing, supplying and applying stone sealer on bottom face and all four edges etc. all complete as specified and as directed by the Engineer-in-Charge.	3650 sqm	4343.05	Sqm	15,852,133
7.01.1	Polished/matt finished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent				

7.02	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/sqm including pointing the joints with white cement and matching pigment etc., complete.	10115 sqm	1109.95	sqm	11,227,144
7.03	Providing and laying full body homogeneous unglazed vitrified tile in floor of minimum thickness 15 mm with water absorption less than 0.06% and conforming to IS:15622, of approved make, brand and manufacture, in all colours, shades, finish (anti skid/ satin/ polished etc), laid over existing cement mortar bed or screed, fixed with tile adhesive (water based) conforming to IS: 15477, in minimum 6 mm thickness including provision of groove up to 5 mm wide with PVC spacer, abrotap etc and grouting with Epoxy grout of approved make and shade. (Grouting of the groove shall be paid in relevant tender item.)Rate shall be inclusive of vitrified tile (as per approved sample), adhesive for fixing etc complete. The tile must be cut with the zero chipping diamond cutter only. Laying of tile will be done with the help of notch trowel, wedge, clips of required thickness, vacuum cups for lifting, leveling system and rubber mallet for placing the slab gently and easily.				
7.03.1	Size of tile 800x2400mm of all finishes, colours and shades as approved by Engineer-in-charge.	36273 sqm	4068.65	sqm	147,582,141
7.04	Extra for Providing and Grouting the joints of flooring/ wall tiles/ granite flooring having joints of up to 5 mm width in total thickness, using epoxy grout mix of 0.70 kg of organic coated filler of desired shade (0.10 kg of hardener and 0.20 kg of resin per kg), including PVC spacer, filling/ grouting, protecting tile, abro-tap and finishing				

	complete as per direction of Engineer-in-charge.				
7.04.1	Size of tile 800x2400mm	36273 sqm	201.00	sqm	7,290,873
7.05	Providing & Fixing in Position heavy duty, 100 % Solution Dyed Nylon (Polyamide Nylon 6 or Nylon 6,6) carpet tile of approved make & size and fixing the same as per manufacturer's specification in approved pattern and as directed by engineer in charge. The construction of the carpet shall be Loop Pile Tip Sheared Carpet. The Pile Weight of the carpet shall be minimum 850 g/m ² having 3 mm minimum pile height and total thickness not less than 8 mm . The Carpet shall have tuft density not less than 1,00,000 no of tufts per Sqm with tufting Gauge as 1/10". The Backing structure shall be PVC< 100 % vinyl or polyolefin . The dimensional stability of the carpet shall be < 0.2% as per EN 986. The Impact sound Insultaion should be minimum 20 dB as per ISO 10140-3 and having smoke density less than 450 as per EN ISO 9239-1:2002 having static propensity of less than 2.0 Kv when tested to ISO 6356 and appearance retention grade not less than 3.5 for heavy commercial duty when tested to ISO 10361 with EN 1471 assessment. The Carpet shall be fixed in approved pattern with the help of syntheic adhesive of approved make. The work shall be executed as per approved architectural drawing and direction of Engineer - in - Charge.	6082 sqm	4927.35	sqm	29,968,143
7.06	Providing and fixing vinyl flooring minimum 6.0 mm thickness with wear layer minimum 0.8mm thick as per EN-ISO 24346 and/ or EN 14904 for indoor area of weight approximate 3.00 kg/m ² construction in multiple layer. It shall possess ball bounce >90%, shock absorption > 25%, impact sound reduction not less than 20 dB, and a polyurethane surface treatment cured by ultraviolet light. The flooring shall	200 sqm	5003.85	sqm	1,000,770

	be good resistant to scratch, slip, fire, chemical, anti fungi and anti bacteria duly installed on smooth and hard surface with suitable adhesive as recommended by manufacturer and seamless protection. The welding/seaming shall be done by using welding rod of same shade and make, using hot air welding gun. Actual laid area shall be measured for payment without considering any wastage. Stone/Tile flooring/self levelling screed if provided under vinyl sports flooring shall be payable under relevant item.				
7.07	Pre-Polished Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) : 25 mm thick	4524 sqm	2249.30	sqm	10,175,833
7.08	Providing and laying Polished Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building for covering the gap between the Slab and external facade system all complete as per the architectural drawings with 18 mm thick stone slab fixed with stone adhesive (Water based) conforming to IS: 15477, in overhang portion with GI channel of average 3mm thickness over 1.5 mm thick size 35mm x 35mm x 50 mm with pigment of matching shade including rubbing and polishing screwing fixing with aluminium frame etc. all complete as specified and as directed by the Engineer-in-Charge. Nothing extra shall be payable on this account Polished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent	810 sqm	5194.10	sqm	4,207,221
7.09	Providing and laying skirting with full body homogeneous unglazed vitrified tile of minimum thickness 15 mm with water absorption less than 0.06% and conforming to IS:15622, of approved make, brand and manufacture, in all colours, shades, finish (anti skid/ satin/ polished etc), fixed with approved make of dry wall adhesive (confirming	2539 sqm	5793.40	sqm	14,709,443

	to IS 15477) of 3 mm minimum thickness, as per site requirements, including provision of upto 5 mm spacer/groove between tiles with PVC spacer, Abro tape etc., and grouting the groove with epoxy grout of approved make and shade, complete as per the direction of Engineer-in-Charge.				
7.09.1	Size of tile 800x2400mm of all colours and shades. Polished / Matt Finish of all colours and shades as approved by Engineer-in-charge.				
7.10	Providing and fixing removable raised/false access flooring with system and its components of approved make for different plenum height with possible height adjustment upto 50 mm, comprising of modular load bearing floor panels supported on G.I. rectangular stinger frame work and G.I. Pedestal etc. all complete, as per the architectural drawings, as specified and as directed by Engineer-in-charge consisting of:	400.00 sqm	5692.65	sqm	2,277,060
	(a) Providing at required spacing to form modular framework, pedestals made out of GI tube of thickness minimum 2 mm and 25 mm outer diameter, fully welded on to the G.I. Base plate of size 100mm x 100mm x 3mm at the bottom of the pedestal tube, G.I. pedestal head of size 75mmx75mmx3.5 mm welded with GI fully threaded stud 16mm outer diameter with two GI Check nuts screwed on the stud for level adjustment upto 50mm, locking and stabilizing the pedestal head in position at the required level. The pedestals shall be fixed to the subfloor (base) through base plate using epoxy based adhesive of approved make or the machine screw with rawl plug.				

	(b) Stringers system in all steel construction hot dipped galvanized of rectangular size 570x20x30x0.80mm thick having holes at both ends for securing the stringers on to the pedestal head using fully threaded screws ensuring maximum lateral stability in all directions, the grid formed by the pedestal and stringer assembly shall receive the floor panel, this system shall provide adequate solid, rigid support for access floor panel, the system shall provide a minimum clear uninterrupted clearance between the bottom of the floor for electrical conduits and wiring etc. all complete as per the architectural drawings, as specified and as directed by the Engineer-in-charge.				
	(c) Providing and fixing Access Floor panel of 600x600x32 mm medium grade Filled Steel anti static high pressure Lamination of 800H grade (FS800H). Access Floor panel shall be steel welded construction with an enclosed bottom pan with uniform pattern of 64 hemispherical cones. The top and bottom plates of Steel Gauges: top 0.6 mm and bottom 0.7 mm fused spot welded together (minimum 64 welds in each dome and 20 welds along each flange). The panel should be Corroresist epoxy coated for lifetime rust protection and cavity formed by the top and bottom plate is filled with Pyrogrip noncombustible Portland cementitious core mixed with lightweight foaming compound. The access floor shall be factory finished with Anti-static High Pressure laminate with Non Warp technology upto 1mm thickness for superior adhesion and Surface flatness within 0.75mm. The panel is to withstand a Concentrated Load of 363 kgs applied on area 25mm x 25mm without collapse in the centre of the panel which is placed on four steel blocks. The panel will withstand and Uniformly Distributed Load (UDL) minimum 1250 kg/sqm and an impact load of 50kg all complete as per the approved manufacturers specification and as per the direction of Engineer-in-				

	charge. All specification must be printed on the side of the panel to ensure the quality of the product.				
	300 mm Finished Floor Height (FFH)				
8.0	False Ceiling work				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				
	<u>Notes for False ceiling work</u> 1. Points to be taken care of by contractor before selecting a manufacturer from approved make list • Board/ tiles/ panel, grid system, suspension system and all accessories shall be from a single vendor and from the same make unless otherwise approved by Engineer-in-charge. 2. Points to be taken care of by contractor before installation • Contractor shall correlate all services drawings from different installers and prepare a clash free shop drawing as per architectural drgs for RCP, with all services integration vis a vis HVAC, FPS, FAS, PLUMBING, ELE, ELV & any other services planned and part of design. • The methodology statement for execution of all services coordinated with ceiling execution shall be submitted by Contractor for approval of Engineer-in-charge before commencing execution work at site. • Installation to be carried out by an approved and certified installer of manufacturer. Contractor to submit manufacturer approved certificate of installer to Engineer-in-charge before commencing work.				

	3. Points to be taken care of during installation • False ceiling work to be strictly supervised for alignment, line & level and overall quality of installation and contractor to strictly follow approved methodology statement. • False ceiling suspension work shall be strictly from mother slab or secondary support installed for false ceiling and not from any other services suspension members. • Trap door to be fixed in line & level with false ceiling, with separate suspension system from mother slab, not with false ceiling member. Groves around trap doors should be uniform on all sides.				
	4. Points to be taken care of post execution • Warranty for false ceiling system to be provided by installer & manufacturer to ensure that work is completed as per specification (material and workmanship) and methodology statement. • Completion certificate to be provided by installer & to be signed and verified by manufacturer with respect to tender specifications and approved shop drawing. • All test reports are to be submitted by the contractor for performance.				
	5. General Notes • Contractor to quote the rate considering all points mentioned in the specifications. • All service equipment & light fixtures, curtains etc to be fixed with a separate suspension system from mother slab, not on false ceiling tile or false ceiling member. • In gypsum ceiling, contractor shall provide perimeter channel at periphery of all services cutout for strengthening the system. All cutout in board shall be finished with tape, angle skimming coat etc as per manufacturer's specification. • If required, additional supports to be provided for fixing the false ceiling (in				

	case of special shape, more height etc). • Sequence of execution of different services to be aligned with RCP to avoid any rework. • Movement joints/ groove to be provided in board or grid ceiling system in large span area.				
8.01	VENEER FALSE CEILING Frame - The frame work shall consists of Aluminum section 25x50mm with per running meter weight of 0.5kg/mtrs. Ceiling shall be suspended from true ceiling height with 35x35x3mm thick MS angle brackets (shall be provided with primer and synthetic enamel paint) , brackets shall be fastened with true ceiling with Zinc galvanized anchor fastner of size 10x75mm long. Aluminum section shall be fixed in a grid of 600x600mm in both the direction of the ceiling. Ceiling — Ply & Veneer. 12mm thick BWP grade marine ply (IS 710:2024) to be used for preparing the Wall Paneling base and providing veneered decorative plywood (Type 1 - 0.3 mm slice with 4 mm thick BWP grade Base ply - confirming to IS 1328:2025) on same of approved make and shade and shall be fixed as per duly approved design including patterns, grooves, fine slices etc. Veneer ceiling shall be fixed with compressor nails to expedite the work.Veneer surface shall be PU polished in approved shade and color. The PU polish shall be formaldehyde free low VOC content water based polish . General -; This section covers the requirements for all materials, labour, tools, scaffolding and equipment complete in all respect for suspended false ceiling as per nomenclature of the item. Installation Precautions: The following to be ensured before installation of the ceiling system: The area is dry prior to	4868 sqm	12458.50	sqm	60,647,978

	ceiling installation work. All wet trades are completed such as plastering, flooring etc. Air conditioning duct work is completed. Electrical chasing or drawing lines etc are in place. No unauthorized weight is put on ceiling. Ceiling shall be done by experienced contractors in compliance with manufacturers specifications and conditions. Installations shall be done in areas free from chemical fumes / freezing temperatures and vibrations. In order to achieve acoustic perforations might be required in ply + veneer, same shall be provided, however, payment for same shall be made in the corresponding BoQ item and is not inclusive in this. Cutouts for light and A/C fixtures: Tendered cost shall include the cost of making cut outs and strengthening their periphery required for fixing light, AC grill or any other MEP equipment. Measurement shall be done of the Veneer surface W/O deducting the Cutouts. The cost of work shall be inclusive of all material, labour accessories and polishing.				
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8.02	Solid Baffle - 65x16mm CTC 70mm Providing & Fixing in position strand woven phenol bonded Bamboowood bespoke baffle ceiling of the panel with equal spacing grid for perfect alignment. The Baffle Ceiling panel comprising of customized bamboowood solid rafter of thickness 16 mm with a height of 65 mm and a centre spacing of 70 mm. The Rafter should have minimum length of 1880mm with dimensional accuracy up to ± 0.5mm. The bamboowood baffle blades are to be coated on all four exposed surfaces with Epoxy solvent based Polyurethane coating with minimum 200 gm deposition per sqm. Finish shall have gloss level upto 15-20 % in approved shade. The baffles need to be arranged and fixed in a way to form a panel with a customized CRCA framing channel having 28mm x 30mm x 28mm x 1 mm section size with laser cut slot, to be fixed at 450~600mm centre to centre as a Secondary member and Intersection cross member tube of 50mm x 25mm x 1.2mm overall size as a Primary member to be fixed at 900~1100mm centre to centre along with accessories hex nut, washer, half threaded wood screw etc that automatically control the centre to centre distance, and to have the flexibility to match the length as per the site requirements. Entire hanging system shall be provide with protective epoxy powder coating of minimum 55 micron thickness. The entire panel is to be suspended to the RCC ceiling using G1 M6 Full threaded rod and G1 M6x40mm bullet fastener at interval of 900-1200mm distance. The baffles are to be screwed using SDST screws form above the framing. The Bamboowood material shall comply with ASTM E84 Class B (Min.) Fire Classifications. The bamboowood shall have a minimum density of 1000 Kg/Cum and minimum hardness of 1000 kgf, all complete as per the direction of Engineer In-Charge. Note: Size of support members referred	5081 sqm	20487.30	sqm	104,095,971
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	are minimum sizes and maximum spacing to be provided, however, contractor has to submit structural calculations establishing sufficiency of sizes proposed by him in terms of permissible stress (Factor of Safety not less than 3) and deflection (not exceeding $\text{Span} / 360$ under full design load) and nothing extra shall be paid in case sizes of members required will be more or spacing of members required will be less as per structural calculations. Necessary provisions for making the false ceiling system structurally stable under seismic conditions shall also be made, nothing extra shall be paid for same.				
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8.03	Acoustical Baffle Ceiling Providing acoustic baffles made from non-woven acoustic panels of approved make, shade and pattern in straight as well as curved alignment. Acoustic panel shall be Made of high-quality 100% polyester fibres with high content of regenerated/recycled fibres from post-consumer discarded plastic drinking water bottles (PET Bottles and shall be manufactured using needle punching process ensuring breathable open cell structure. The density should be 150-200 kg/m³. The thickness of the panel should be 10 mm (±10%). These acoustic panels shall be bent to make hollow baffle ceiling of finished size 50 mm x 100 mm and shall be hold from the top with polyester powder coated aluminium section (minimum thickness – 50 micron) and shall be covered at the ends. The curved baffles required shall be made by providing ply (Fire resistant treated - BWP grade) /GI/aluminum insert in the hollow part of baffle. Baffles shall be provided at 150 mm centre to centre. This acoustic baffle shall be hanged to minimum 1.2 mm thick GI slotted channel which is subsequently hanged to C Channel of GI having thickness of 1.2 mm. Both the channels shall be powder coated with polyester powder coating of minimum 50-micron thickness. This entire framework shall be hanged to the ceiling by using adjustable minimum 1.5 mm diameter GI aircraft / clutch wire rope at the grid of minimum 1200 mm c/c using carbon steel galvanized expansion fastener, complete with adjustable grippers of matching safe working load. The rope and gripper assembly shall have a factor of safety of not less than 5 against the minimum breaking load of the rope. The Acoustic Panel should have NRC of 0.30-0.50 for 10 mm thick panels, without air gap with test report from ARAI Pune, TUV, Eurofins or any other equivalent reputed laboratory. Fire Rating shall be Class A as per ASTM E-84 and B s1 d0 as per EN 13501. Cost is inclusive of	12329 sqm	7648.10	sqm	94,293,425
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	straight as well as curved portions and include all material, labours including carbon steel galvanised, metal separators, nut-bolt, fasteners etc. required all complete as per directions of Engineer-in-charge and is applicable for all heights and lifts.				
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	Note: The unit of measurement shall be the square metre (sqm), measured to the nearest 0.01 sqm. The out-to-out plan area of the baffle ceiling along with its suspension system shall be measured for payment, without any deduction for lights, diffusers, columns and the like. Nothing extra shall be paid for making provisions for lights, diffusers, AC grilles, fire alarm devices, sprinkler systems and other such fittings. Deduction shall, however, be made for any area in which baffles are omitted, or in which the centre-to-centre spacing between adjacent baffles, or the end-to-end gap between consecutive baffles in the same line, exceeds 150 mm. The area to be deducted shall be the plan area of the gap concerned, measured out-to-out between the faces of the baffles bounding that gap. Note: Size of support members referred are minimum sizes and maximum spacing to be provided, however, contractor has to submit structural calculations establishing sufficiency of sizes proposed by him in terms of permissible stress (Factor of Safety not less than 3) and deflection (not exceeding $\text{Span} / 360$ under full design load) and nothing extra shall be paid in case sizes of members required will be more or spacing of members required will be less as per structural calculations. The calculations shall be based on the following design loads: the self weight of the complete baffle ceiling system, together with an incidental load of 0.15 kN/m^2 acting downwards or upwards, or a point load of 0.5 kN applied at any single suspension point, whichever governs. Necessary provisions for making the false ceiling system structurally stable under seismic conditions shall also be made, nothing extra shall be paid for same.				
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8.04	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed,including making of all type of cob, shapes,	22402 sqm	1547.75	sqm	34,672,696
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	vertical, latak etc any design and pattern as per the drawings and site requirements nothing extra will be paid for this. all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :				
	12.5 mm thick tapered edge gypsum moisture resistant board Note: Exposed surface area of installed board shall be measured for payment purpose				
8.06	Providing and fixing cold formed light gauge GI members of required size in miscellaneous framing works (including wall panelling or false ceiling both) as per site requirement, including providing and fixing of angle cleats, fasteners, all nuts and bolts, as required, complete as per site requirements and as per the direction of the Engineer-in-Charge.(Note: Only the weight of cold formed light gauge GI members shall be measured for payment purpose.	15250 kg	335.80	kg	5,120,950
8.07	Providing, fixing, Refixing 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,	4860 sqm	1308.10	sqm	6,357,366

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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	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 x 1.6 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. "The members recovered safely from the dismembering of the ceiling shall be reused in the installation of the ceiling system.				
	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.				
8.08	Providing and fixing false ceiling with Gypsum Plasterboard made of glass fiber reinforced gypsum core (850 kg/cum density) of size 1220x2440mm with low-level of water absorption of less than 3% conforming to IS 2095 (Part 1) :2023 – Type W, EN 15283-1 Type GM - FH1IR, Mold Resistant scores 10 as per ASTM D3273, Termite Resistance (ASTM D3345) Rating 10, BIS certified, EPD verified fixed to the Gypsum Ceiling framework. The framework consists of fully knurled Perimeter Channel (0.5mm thick having one flange of 20mm and another flange of 30mm and a web of 28mm) screw fixed to brick wall/partition with the help of Nylon sleeves with steel screws at 600mm centers. Then suspending fully knurled intermediate section (45mm x 0.90mm thick with two flanges of 15mm each) from the soffit at 1220mm centers with fully knurled Ceiling L Angle	234 sqm	2268.70	sqm	530,876

	(25x10mmx0.55mm thick) fixed to RCC Slab with 27x25x37x1.6mm, Soffit Cleat and 8mm Dia 40mm long Fasteners at 1200mm Centers respectively. Ceiling Section (51mm x 0.55mm thick with two flanges of 27mm each) are then fixed to the Intermediate channel with the help of 2.64mm Dia wire connecting in perpendicular direction to the intermediate channel at 406mm centers. Metal profiles are rolled with GI Steel (120 GSM & 230 MPa Yield Strength) conforming to IS 277. The Gypsum Plasterboards are fixed with the help of 25mm long Drywall screws at 230 mm centers. The screw fixing of gypsum boards to the metal framing at the periphery, openings and cut edges should be at 150mm centers. All the fixing of boards must be staggered. All joints to be taped & finished with 50mm wide jointing tape & Easy Joint 180 or all-purpose joint compound as per manufacturer recommendation. All work should be executed as per manufacturers recommendation and of Engineer-in-charge. Cost is inclusive of making opening and provisions for services etc. alongwith the requirement of strengthening along the cut out made by providing additional channels all around the periphery and holding the same from ceiling, including making of all type of cob, shapes, vertical, latak etc any design and pattern as per the drawings and site requirements nothing extra will be paid for this. all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting. Note: Exposed surface area of installed board shall be measured for payment purpose				
9.0	Finishing				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual).				

	Nothing extra shall be paid on this account.				
	Note:- 1) Before start of ceiling finishing work Contractor has to make arrangements for marking/covering of the PT cable locations in ceiling area marked in red colour with the help of masking tapes etc so that the red marking strip may clearly visible after painting. (nothing extra will be paid for this). 2) Ready mix polymer modified cement mortar shall be of approved make, technical parameter as per specification and complies with IS 2250. (Sand shall not be added in ready mix mortar for use). The compressive strength of ready mix mortar shall be minimum 5 MPa for masonry plaster and minimum 7.5 MPa for plaster on RCC surface. 3) Rate shall be inclusive of any type of groove and drip mould in all type of plaster work. 4) The rate shall be for all floor, all height, all level in any shape. 5) Contractor shall provide GI chicken mesh/ glass fiber mesh (with alkali resistant coating) at all junctions, corner, services cut-out/ chasing, doors window joints etc. as per specification and as directed by Engineer in charge. 6) If plaster thickness shall be more than mentioned in BOQ description, contractor shall provide GI chicken mesh/ glass fiber mesh (with alkali resistant coating) in entire area.				

	Note:- 1) All adhesives, sealants & paint shall be water based, with low VOC with acceptable VOC content as per Green Building Norms requirements and lead free. 2) Paint shall be applied after thoroughly brushing the surfaces, free from mortar dropping and other foreign matter, preparing the surface even and sand papered smooth etc, after applying every coat of putty and primer complete. 3) Contractor shall furnish warranty paper, wherever applicable. 4) If necessary more coats shall be applied till the surface presents a uniform appearance without any extra cost. 5) Paint shall be applied with any means (i.e. brush, roller, spray etc) 6) Contractor shall prepare sample of minimum three shades as suggested by engineer in charge for approval. 7) The rate shall be applicable for all floor, all level, all height by any means of scaffolding.				
9.01	Providing and applying 12 mm Plaster (smooth or wire finished plaster) of Polymer added ready mix cement mortar, finished with trowel. GI hexagonal chicken mesh of size aperture 20 mm x 20 mm of 22 gauge and minimum 200 mm wide at RCC & masonry junctions or between different materials and 145 GSM of minimum 150mm wide fiber glass mesh with alkali resistant coating shall be fixed at plumbing and electrical work chasing areas, at corner and doors and window joints as per manufacturer's specifications with GI nails, hacking of concrete/ application of bonding agent, finishing, curing, scaffolding for all floor, all level, all height etc. complete as directed by Engineer-in-charge. Rate shall be inclusive of all labour and material including hacking of concrete/ bonding agent, chicken mesh, glass fiber mesh, provision of groove/ drip mould as per drawing, incidentals etc.	15677 sqm	494.75	sqm	7,756,196

	complete and as directed by Engineer-in-charge.				
9.02	Providing and applying 15 mm Plaster (smooth or wire finished plaster) of Polymer added ready mix cement mortar, finished with trowel. GI hexagonal chicken mesh of size aperture 20 mm x 20 mm of 22 gauge and minimum 200 mm wide at RCC & masonry junctions or between different materials and 145 GSM of minimum 150mm wide fiber glass mesh with alkali resistant coating shall be fixed at plumbing and electrical work chasing areas, at corner and doors and window joints as per manufacturer's specifications with GI nails, hacking of concrete/ application of bonding agent, finishing, curing, scaffolding for all floor, all level, all height etc. complete as directed by Engineer-in-charge. Rate shall be inclusive of all labour and material including hacking of concrete/ bonding agent, chicken mesh, glass fiber mesh, provision of groove/ drip mould as per drawing, incidentals etc. complete and as directed by Engineer-in-charge.	11834 sqm	583.15	sqm	6,900,997
9.03	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :				

9.03.1	Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture	8000 sqm	229.00	sqm	1,832,000
9.04	Providing and applying 12 mm thick (average) premixed formulated one coat gypsum lightweight plaster having additives and light weight aggregates as vermiculite/ perlite respectively conforming to IS: 2547 (Part - 1 & II) 1976, applied on hacked / uneven background such as bare brick/ block/ RCC work on walls & ceiling at all floors and locations, finished in smooth line and level etc. complete. Cost is inclusive of hacking / bonding agent application.	2000 sqm	474.65	sqm	949,300
9.05	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	117036 sqm	158.50	sqm	18,550,206
9.06	Wall painting with premium acrylic emulsion paint of interior grade, 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.	162649 sqm	144.80	sqm	23,551,575
9.06.1	Two coats				
9.07	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.	117036 sqm	74.85	sqm	8,760,145
9.07.1	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre				
9.08	Providing and applying minimum 6 mm cement plaster in walls with polymer added ready mix cement mortar finished with trowel including application of bonding agent/ hacking of concrete to receive the plaster, finishing, curing, scaffolding for all floor, all level, all height etc. complete and as directed by Engineer-in-charge.	2000 sqm	322.20	sqm	644,400

9.09	PU polish Providing and applying exterior grade water base Poly urethane (PU) clear matt finish/ glossy finish/ semi gloss finish polish of approved make and shade for external/ internal wooden & veneered surfaces. Polish work shall be carried out as following: 1) Surface preparation with sand papering with different grade of sand paper up to satisfaction of Engineer-in-Charge. 2) Base coat application with compatible wooden primer 3) Stainer coat application of approved shade (for polish with shade) 4) Minimum Three subsequent coat of PU polish followed by sand papering with fine sand paper. Polish application shall be for all floor all level all height as per manufacturer's specification and as per drawing and as directed by Engineer in charge. Sample shall approved by Engineer-in-Charge.	1817 sqm	2851.60	sqm	5,181,357
9.10	Providing and applying premium interior decorative texture coating with water-based two-tone velvet/pearl finish (low VOC, wipeable grade) using special pearl pigments in approved colour and texture, including surface preparation by scraping and cleaning, application of one coat of masonry primer, two coats of base coat, and two coats of decorative pearl finish, complete as per the manufacturer's specifications to achieve the approved texture and pattern. The finish shall be UV-resistant, anti-algae, washable, and suitable for interior applications. The rate includes all materials, labour, scaffolding, tools and tackles, and all incidental works complete as directed by the Engineer-in-Charge.	1037 sqm	1867.40	sqm	1,936,494
10.0	Dismantling and Demolishing				

	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				
10.01	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge.				
10.01.1	Nominal concrete 1:3:6 or richer mix (i/c equivalent design mix)	100 cum	2464.00	cum	246,400
10.02	Dismantling tile work in floors and roofs laid in cement mortar including stacking material within 50 metres lead.	200 sqm	81.15	sqm	16,230
10.02.1	For thickness of tiles 10 mm to 25 mm				
10.03	Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground within 50 metres lead.	1500 sqm	55.30	sqm	82,950
10.04	Dismantling aluminium/ Gypsum/ metal false ceiling at any floor including disposal of unserviceable material and stacking of serviceable material with in 50 meters lead as directed by Engineer-in-charge.	9720 sqm	57.05	sqm	554,526
10.05	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-chargeIn cement mortar	100 cum	2085.35	cum	208,535
11.0	Sanitary Installations				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				
11.01	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets,				

	cutting and making good the walls wherever required :				
11.01.1	Kitchen sink without drain board				
11.01.1.1	510x610 mm bowl depth 200 mm	128 Nos	5001.15	each	640,147
11.02	Providing and fixing soil, waste and vent pipes :				
11.02.1	100 mm dia				
11.02.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	1945 metre	1183.60	metre	2,302,102
11.03	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
11.03.1	100 mm dia				
11.03.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	1552 Nos	574.15	each	891,081
11.04	Providing and fixing shielded coupling for Hubless centrifugally cast iron pipe				
11.04.1	100 mm dia				
11.04.1.1	SS 304 grade coupling with EPDM rubber gasket	1552 Nos	437.35	each	678,767
11.05	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors :				
11.05.1	100 mm inlet and 100 mm outlet				
11.05.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	310 Nos	865.00	each	268,150
11.06	Providing, fixing, testing and commissioning of White Vitreous China Wall Mounted Water Closet of approved shape with C.P. bolts, nuts, C.I. chair or other hanging arrangements, C.P. brass screw, washer with all accessories. including providing and fixing with dual flush valve with concealed cistern having Flushing capacity minimum 2 Liter and 4.5 Liter including brass / SS screws and washer complete. PVC WC connector (straight or bend type) with rubber lip ring. Including 110 mm dia PVC pipe / bend of required	26 Nos	17832.00	each	463,632

	length and proper connection complete as required. Including cutting & making good the walls, floors, slab wherever required including all necessary accessories and consumables, including seat cover and cistern, fittings, nuts bolts and gasket etc. complete as per specification/drawings and as directed by Engineer In Charge.				
11.07	Providing, fixing, testing and commissioning of ABS Chrome plated Brass Hand Shower (Health Faucet) of approved make and quality and as approved by Engineer - In - Charge, including 8 mm dia, 1 to 1.5 Meter long Flexible tube & wall hook including cutting and making good the walls wherever required complete with necessary accessories as per directions of Engineer in charge.	26 Nos	1394.55	each	36,258
11.08	Providing, fixing, testing and commissioning of 15 mm dia. CP brass two way bib cock (flow rate of 5 lpm) with wall flange and ceramic disc cartridge complete, making all necessary connections etc. All complete as per directions of the Engineer in charge.	26 Nos	2978.95	each	77,453
11.09	Providing and fixing chrome finish Toilet paper holder with flap and shelf along with all necessary accessories complete as per directions of the Engineer in charge	26 Nos	1594.85	each	41,466
11.10	Providing, fixing, testing and commissioning of SS 304 grade floor drain and Should consist of cockroach trap of suitable size with all necessary fittings and accessories complete in all respect as per specification/drawings and as directed by Engineer In Charge.	52 Nos	1646.50	each	85,618
11.11	Providing and fixing CP brass Swivel towel holder along with all necessary accessories complete as per directions of the Engineer in charge .	26 Nos	1730.65	each	44,997

11.12	Providing, fixing, testing and commissioning of 304 Grade Jindal Stainless Steel body Dimensions: 80(L) x 55(W) x 235(H) battery (2 x AA size) operated EA66S Fragrance Dispenser (LCD-with Digital Programming (Timer)) i/c Wall mounted Refill , Low Battery Reminder indicator with Key and Lock & with all necessary fittings and accessories complete in all respect as per specification/drawings and as directed by Engineer In Charge. (EA66S- Made in India)	26 Nos	5081.40	each	132,116
11.13	Providing and Fixing Vitreous china Over Counter Wash Basin of size 630 x 450 mm as per IS: 2556 (Part 4) of approved size and shape, in white colour of approved make and quality, including making water and drain connections. The wash basin shall consist of the following and shall be with and without hot water supply. All junctions shall be sealed with silicon sealant. Rate shall include 32 mm dia CP brass waste coupling, 32 mm CP cast brass bottle trap, union & extension piece of required length and CP wall flange complete including cutting & making good the walls where required and as directed by the Engineer -in - charge.	26 Nos	9273.15	each	241,102
11.14	Providing, fixing, testing and commissioning of Wall Mounted Single Lever Basin Mixer (Flowrate as 5.0 Lit per min AT 3.0 bar) Consisting of Operating Lever, Cartridge Sleeve, Nipple, Spout & Two Wall Flanges with 2 no. 15 mm Angle Cock and Flexible Hoses complete required for Wash Basin of approved make and quality, and as approved and directed by the Engineer In Charge, including all necessary materials required for fixing and making good as required.	26 Nos	5391.40	each	140,176

11.15	Providing, fixing, testing and commissioning of brass with chrome plating grade COUNTER AUTOMATIC SOAP DISPENSER battery (220v/50Hz) operated with 1 litre capacity of approved make and quality, and as approved by the Engineer in charge, including all necessary materials required for fixing. All complete as per directions of the Engineer in charge. (Make : Dolphy, Euronics)	26 Nos	10365.90	each	269,513
11.16	Providing, fixing, testing and commissioning of Recessed Washroom Panel (3-in-1) comprising Manual Paper Towel Dispenser, Brushless Automatic Hand Dryer and Waste Receptacle, housed in a recessed cabinet fabricated from 304 Grade Stainless Steel with satin finish, complete with touch-free infra-red activated hand dryer incorporating solid-state electronic controls, single brushless blower motor, automatic operation with time delay, vandal-resistant construction, lockable front panel with key, and all internal components. The manual paper towel dispenser shall be suitable for paper rolls/folded towels of approved size (approximately 200 mm width or as recommended by the manufacturer), and the integrated waste receptacle shall be of adequate capacity with removable waste container including hardware, fasteners and accessories, as per the manufacturer's specifications, approved drawings and directions of the Engineer-in-Charge. (Make : Dolphy, Euronics)	26 Nos	70595.20	each	1,835,475
11.17	Providing and fixing frameless Mirror with inbuilt LED Lighting, round/rectangle of required size (Minimum area 1 sqm), Anti-Fog, wall mounted backlit mirror. Thickness 5mm, round Dimmable Touch button 6000k (Cold White) SGS approved environmental protection copper free mirror all	26 Nos	10792.60	each	280,608

	complete as per direction of Engineer- in-charge.				
11.18	Mirror with wooden frame Providing and fixing 6mm thick extra clear mirror (with low iron content) of approve make in any shape and sizes with kiln seasoned termite treated superior class teak wooden frame of size upto 100mm x 38mm and as per drawing. Wooden framing shall be with some carving, molding work as per intent and water based exterior grade PU polished. Cement bonded particle board/ cement fiber board of minimum 6 mm thickness shall be fixed to wall with SS 304 screw/ fastener in proper plumb and level. Mirror shall be fixed with silicon sealant/ double sided tape on cement board. Wooden frame shall be fixed at periphery of glass in good workmanship manner etc. complete at all floors, all levels, all heights as directed by Engineer-in-charge. Rate shall be inclusive of mirror, cement bonded particle board/ fiber cement board, wooden framing including moulding, carving, adhesive, double sided tape, screw, fasteners, PU polish and all required accessories. Out to out area of mirror with wooden frame shall be considered for payment without any wastage.	50 sqm	5728.18	sqm	286,409
11.19	Providing, fixing, testing and commissioning of 15 mm dia. CP Brass Single-handle kitchen sink faucet with wall flange and ceramic disc cartridge complete, making all necessary connections etc. All complete as per directions of the Engineer in charge.	128 Nos	3805.25	each	487,072
12.0	Water Supply				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or				

	manual). Nothing extra shall be paid on this account.				
12.01	Providing and fixing Stainless Steel Grade SS 304 pipes confirming to JIS G3448, JWWA G 116, complete with Press Type fittings (V-Profile) including sockets, bends, elbows, tees, reducers, unions, flanges, clamps with hanger at a spacing of 1m, center to center min or as required etc. necessary adapters for GI/ Copper and CP fittings, jointing, sundries, cutting holes, chase in walls/ floors/ slabs and making good complete. This includes testing of joints complete as per the direction of Engineer incharge including chipping walls, and making them good with filler material and finished in cement mortar etc. complete. as per direction of Engineer In charge. Application : pipes concealed or as directed by Engineer-in-charge.	980 metre	811.30	metre	795,074
12.01.1	22.22 Dia. Outer Diameter				
12.02	Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc.& stacking of serviceable material with in 50 meters lead and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete to make it leak proof as directed by Engineer-in-charge.	620 Nos	457.50	each	283,650
12.03	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc.				
12.03.1	Internal work - Exposed on wall				
12.03.1.1	20 mm dia nominal bore	1512 metre	442.65	metre	669,287
12.04	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work) :				

12.04.1	20 mm nominal bore	120 Nos	351.05	each	42,126
12.05	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes , having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge.				
12.05.1	40 mm nominal dia Pipes	120 metre	711.55	metre	85,386
12.06	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes , having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall				
12.06.1	25 mm nominal dia Pipes	620 metre	406.45	metre	251,999
12.07	Providing and fixing Brass Ball valve with handle of approved quality (screwed end) :				
12.07.1	15 mm nominal bore	312 Nos	382.80	each	119,434
12.08	Providing and fixing ball valve CPVC of approved quality, High or low pressure complete :				
12.08.1	25 mm nominal bore	624 Nos	647.65	each	404,134
13.0	Aluminium Work				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				

13.01	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) :Note: The rate is inclusive of forming cut-outs in the aluminium profile to receive the hinges, providing 6 mm thick galvanised steel plate within the profile as hinge reinforcement, and providing EPDM rubber gasket in the frame to ensure an acoustic seal and proper closing of the door shutter.				
13.01.1	For fixed portion				
13.01.1.1	Polyester Powder coated aluminium (minimum thickness of powder coating 50 micron)	1000 kg	537.40	kg	537,400
13.02	Single glazed aluminium door shutter in glass partition system. Providing and fixing glass door with aluminium shutter profile in modular partition system (frame) Shutter door with frame -polyester Powder coated (min 50 micron) Aluminium section minimum 100x30mm having minimum thickness of 1.5mm excluding powder coated finish along with door jamb as a frame for shutter minimum 75x45mm thickness of 1.5mm excluding powder coated finish will be used on four sides to accommodate 1 layer of 12.76 mm acoustic laminated heat strengthened	1072 sqm	29624.00	sqm	31,756,928

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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	glass (6mm HS - 0.76 mm acoustic PVB - 6mm HS glass) and also style door must have concealed automatic acoustic drop down seal at the bottom of style door - finish as per approved by Engineer in Charge. The rate includes shutter frame, all accessories and hardware and glass mentioned in the item and labour. Out to out area of shutter shall be measured for payment.				
	Door closure - providing and fixing cam action concealed door closure of approved make with controlled adjustable closing speed and power adjustable with back check with track arm with screws to hinged door for specified door with minimum 1 warranty . All adjustment screws face fixed , rate shall be inclusive of fixing with using the template as per manufacturer's specifications & maintain in good working conditions. The door closure shall confirm to EN 1154 standard and shall be tested for 5,00,000 cycles of durability. Selection of door closure shall be as per width and weight of door leaf , as per manufacturer's recommendation and as directed by Engineer in charge. Applicable for single and double leaf styer door ,				
	Providing and fixing narrow mortise stile dead lock for shutter, including strike plate SS 304 as per DIN 18251-2/EN 12209, grade 3 and prepared for euro profile cylinder (EPC) including strike plate and epc length suitable as per door stile, standard Euro profile Pin cylinder of approved make with one side key one side knob operation with pair of SS304 Escutcheons (key hole plate) in round shape of approved make for aluminum doors with necessary SS phillips head screw etc complete as per drawings and sample approved by Engineer incharge . the lock shall be				

	with 3 number of keys.nothing extra shall be paid for the same				
	Providing and fixing SS 304 grade pair of pull offset handle made out of stain finish hollow pipe pf minimum 1mm thick having H/D shape (dent free at bending point) of approved make with necessary screws etc.complete for wooden door /aluminium doors /metal doors are as per drawings as per approved by Engineer incharge . the length of handle shall be perfect centre to centre as 450x25mm dia				
	Providing and fixing SS 304 Knuckle ,2 ball bearing NRP butt hinges in stain stainless steel finish , as per EN 1935,CE marked of specified size of approved make as approved sample with necessary SS 304 screws etc.Template drilled with M6 screws (125x75x3mm with ball wearing), including of forming cut-outs in the aluminium profile to receive the hinges, providing 6 mm thick galvanised steel plate within the profile as hinge reinforcement, and providing EPDM rubber gasket in the frame to ensure an acoustic seal and proper closing of the door shutter all complete as per approved by Engineer In Charge				
13.03	Filling the gap in between aluminium/ stone/ wood frame and adjacent RCC/Brick/ Stone/ wood/ Ceramic/ Gypsum work by providing weather/structural non sag elastomeric PU sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete, complying to ASTM C920, DIN 18540-F & ISO 11600	2700 metre	203.40	Metre	549,180
	Upto 10 mm depth and 10 mm width				
14.0	Water proofing				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting,				

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	erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				
14.01	Providing and laying water proofing treatment to vertical and horizontal surface for WC, bathroom, kitchen and the like consisting of: (i) 1st course - applying cement slurry @ 4.4 kg/sqm mixed with water proofing compound of approved make in recommended proportions including rounding off the junctions of vertical and horizontal surfaces. (ii) 2nd course - 20 mm cement plaster 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound in recommended proportion including rounding off junctions of vertical and horizontal surfaces. (iii) 3rd course-Applying of NITOPROOF 600 PF of Fosroc or equivalent of approved make @ 2Kg/sqm on the surface area and vertical sides of wall up to 300mm from floor. (iv) 4th course- applying on the joints and upto 300mm FOSROC NITOSEAL PU40 of Fosroc or equivalent of approved make (v) 5th course- CONBEXTRA GP-2 of FOSROC or equivalent of approved make to fill in hole cutting as per actual requirement.(vi) 6th course- applying cement slurry @ 3.3 kg/sqm with FOSROC NITOBOND SBR LATEX mixed @ 10% of cement Qty.(vii) 7th course- Dr.FIXIT PIDIPROOF LW or equivalent of approved make applied @200ML in 50kg cement bag. (viii) 8th course- SIKA MULTISEAL or equivalent tape of approved make applying at Horizontal and Vertical joint with 50mm laping each surface. The treated surface shall continuously be filled with water for 7 dyas to check any leakage from the surface, joints or core cuttings etc. Make of chemicals and applicator of waterproofing shall be approved by the engineer in charge.	673 sqm	1771.90	sqm	1,192,489
15.0	New Technologies and Materials				

	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				
15.01	Providing and fixing false ceiling at all heights with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595 mm of approved texture, design and patterns having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Non combustible as per BS:476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal conductivity < 0.043 W/m K as per ASTM 518:1991, in true horizontal level suspended on inter-locking metal powder coated T-Grid of hot dipped galvanised iron section of 0.40 mm thick on Silhouette profile, rotary stitched double webbed white with 6mm reveal profile (white/black), comprising of main-T runners of size 15x42mm of length 3000 mm, cross - T of size 15x42 mm of length 1200 mm and secondary intermediate cross-T of size 15x42 mm of length 600mm to form grid module of size 600 x 600 mm, suspended from ceiling using galvanised mild steel items (galvanizing @ 80 grams per sqm) i.e. 50 mm long, 8 mm outer diameter M-6 dash fasteners, 6 mm dia fully threaded hanger rod upto 1000 mm length and L-shape level adjuster of size 85x25x2 mm. Galvanised iron perimeter wall angle of size 22x19x0.40 mm of length 3000 mm to be fixed on periphery wall / partition with the help of plastic rawl plugs at 450 mm center to center and 40mm long dry wall S.S screws. The work shall be carried out as per specifications, drawing and as per directions of the Engineer-in-Charge.				

15.01.1	With 15 mm thick integral densified micro edge light weight calcium silicate false ceiling tiles	1930 sqm	2662.50	sqm	5,138,625
15.02	Providing & fixing in position Phenol bonded Bamboowood flooring with planks of sizes 14mm thick, minimum 1800mm length and minimum 100 mm wide, in approved colour, texture and finish. The flooring shall be fixed with tongue and groove interlocking system, with underlayment of 4mm thick expanded polyethylene foam sheets having density 40kg/cum, over prepared surface with necessary quarter round planks of size 1900mm x 18mm and door reducer of size 1900mm x 44mm, wherever required. The bamboowood planks shall have minimum density of 1000 Kg/cum & minimum Hardness 1000 Kgf. with Eco friendly UV coating, all complete as per direction of the Engineer in-charge.	3226 sqm	6220.90	sqm	20,068,623
16.0	Miscellaneous Items				
	Note :- Work shall be carried out for all floor, all level, all height, all places including loading, unloading, stacking, transporting, hoisting, erecting by any means (mechanical or manual). Nothing extra shall be paid on this account.				

16.01	Internal Glass Film Design, providing and fixing decorative translucent self-adhesive vinyl film for interior glass finish, of an approved make, with a pressure sensitive permanent acrylic adhesive and a silicone coated polyester release liner, of the following specification: film thickness not less than 75 microns for dusted finish and not less than 115 microns for frosted finish; peel adhesion to glass, polycarbonate and acrylic of not less than 15 N per 25 mm width after 24 hours; tensile strength not less than 15 N per 25 mm width at 23 degrees Celsius; and, when applied to glass in interior applications, surface burning characteristics of flame spread index not exceeding 25 and smoke developed index not exceeding 450 when tested to ASTM E84, corresponding to Class A as defined in NFPA 101, or Class B-s1,d0 or better when tested to EN 13501-1. The finish shall present a uniform dusted or frosted appearance free from banding, and shall be suitable for application to glass, acrylic and polycarbonate surfaces. The film shall be capable of being plotter cut to a customised design. The manufacturer shall warrant the film for not less than ten years for non-perimeter glass and not less than five years for perimeter glass, warranty on printed product excepted. The rate includes design development, thorough cleaning and preparation of the glass, wet application, squeegeeing, trimming and removal of all residue. MEASUREMENT: the net applied area shall be measured, without allowance for wastage or offcuts.	10387 sqm	2180.25	sqm	22,646,257
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16.02	Providing and fixing in position the wall cladding of Thermo-ash wood of approved make and of width 90 mm and thickness 21 mm , the thermo ash wood shall have one groove on one side horizontally on surface when fixed and plain on other side. The Cladding shall be fixed on Aluminium sections of 50 mm X 25 mm weighing not less than 0.75kg/metre filled with softwood stuffing , the aluminium section shall be fixed at a equal distance of 600mm and should be firmly fixed on the wall with screws. The wood shall be fixed in such a way that no screw is visible when seen from outside. The cost of work shall be inclusive of all materials, labour, accessories and polishing etc. all complete as per direction of the Engineer in charge.	100 sqm	7973.45	sqm	797,345
16.03	Drilling suitable holes in reinforced or plain cement concrete with power driven drill machine to a minimum depth of 100mm upto 200mm in RCC beams, lintels, columns and slabs to introduce steel bars for sunshades/balconies including fixing the steel bars in position using epoxy resin anchor grout of approved make but excluding the cost of reinforcement, all complete as per direction of Engineer-In-Charge. Upto and including 12mm dia.	2500 Nos	142.95	each	357,375
16.04	Providing and fixing glazing in door, window, ventilation , fixed glazing and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per drawings and directions of engineer-in-charge.(Cost of beading shall be covered in basic item). Glass shall be of any shade ,any size, any shape as per Drawing and conform to IS:2835 or IS:2553. Sample shall be approved before execution the work. Installed area shall be measured for payment without considering any wastage.	964 sqm	3789.40	sqm	3,652,982
16.04.1	With clear toughened glass panes of 12.0 mm thickness				

16.05	Acrylic Solid Surface Sheet Rectangular Vanity with Trough Basin: Providing, fabricating, supplying and fixing Premium Grade Imported Acrylic Solid Surface Vanity with Integrated Trough Basin, conforming to ISO 19712, manufactured from 100% acrylic, thermoformable (bendable), non-porous, fire-certified solid surface material of approved colour and finish from approved makes such as DuPont Corian, Avonite, Tristone or equivalent. The item shall comprise fabrication of vanity top with integrally moulded rectangular trough basin as per approved drawings, including cutting, thermoforming, edge profiling, jointing with manufacturer-recommended adhesives, reinforcement at all load-bearing joints, seamless joint finishing, sanding and buffing to achieve minimum 600 grit finish, making all required cut-outs for taps, waste coupling, soap dispensers, sensor fittings, dustbins and other fixtures, providing all necessary brackets, supports, sealants, consumables, fixing arrangements and accessories, complete in all respects, including installation, testing, cleaning and making good adjoining surfaces as directed by the Engineer-in-Charge.	65 sqm	26820.35	sqm	1,743,323
16.06	Screed cutting for fixing of the Raceways : Marking the outer to outer cutting lines of raceways on the screed according to the raceway size. Cut the screed along the marked lines to the required depth (taking care not to damage underlying structures or services) with concrete cutter and chipping machine. Removing of loose material from the cut area to ensure a clean and leveled surface for raceway installation. complete the work as directed by Engineer-in-charge.				
16.06.1	Size upto 300 mm wide & upto 38mm Deepth	1000 metre	489.10	metre	489,100

16.07	Geometrical Bamboowood Flooring 10 mm thick Providing & fixing in position Phenol bonded, Bamboowood pattern flooring system, comprising of Bamboowood pre-shaped factory cut pieces having varied dimension and 10mm thickness. Each Panel is to be installed in a way to form a desired pattern. The flooring shall be fixed in a customised Versailles design pattern from planks of 130mm width minimum. The hydra based flooring glue of approved make as per direction of engineer in charge is to be used to stick the flooring tiles to the floor. Post sticking process the top layer of the flooring is to be sanded to achieve even surface. Over the prepared surface is to be protected with Solvent based acrylic coating system of approved make as per direction of engineer in charge . The Bamboowood planks shall have minimum density of 1000 Kg/cum & minimum Hardness 1000 Kgf. with Eco friendly PU coating, all complete as per direction of Engineer in-charge.	1205 sqm	12873.75	sqm	15,512,869
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16.08	Providing and fixing roller blind with screen fabric, of an approved make, comprising an aluminium top tube, powder coated bottom bar, roller clutch mechanism and plastic ball chain, with fabric of the following specification: composition approximately 36 percent fibreglass and 64 percent vinyl (PVC coated fibreglass); openness factor 3 percent to 5 percent as directed by the Engineer-in-Charge; fabric thickness 0.43 mm with a tolerance of plus or minus 5 percent; mass per unit area 393 g/sqm with a tolerance of plus or minus 5 percent; roll width not less than 300 cm; colour fastness to light not less than grade 5 when tested to ISO 105-B02; ultraviolet blockage not less than 95 percent; flame retardancy to NFPA 701 or to IS 15061 or to BS 5867 Part 2 Type B; antifungal and antibacterial protection assessed to ASTM E2180; certified to GREENGUARD Gold or an equivalent indoor air quality emission standard; and noise reduction coefficient not less than 0.40. COMMON REQUIREMENTS FOR THE ROLLER TUBE, MECHANISM AND HARDWARE: the roller tube shall be a circular extruded aluminium section of alloy 6063 in temper T5 or T6 conforming to IS 1285, of not less than 38 mm diameter, with anodising of not less than 10 microns or polyester powder coating of not less than 60 microns dry film thickness; tensile strength not less than 90 MPa and elongation not less than 8 percent. The bottom rail shall be a flat extruded aluminium section of the same alloy and finish. The control shall be a heavy duty chain drive clutch comprising a gear clutch housing and a locking plug with not fewer than six ribs, inserted not less than 38 mm into the roller tube, self-lubricating, with safety pins for secure bracket installation and an unlocking pin for manual removal, of	1500 sqm	3581.80	sqm	5,372,700
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	gear ratio not less than 1.75:1, positionable at either hand of the shade. Mounting brackets shall be universal brackets of stamped and hardened steel with powder coated finish, including an end plug bracket with lock-down retainer. The ball chain shall be 2 mm diameter cord with moulded plastic balls forming an endless loop, and shall be provided with a chain tensioner or safety device conforming to EN 13120 to prevent strangulation. All plastic components shall be of ultraviolet stable compound.				
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16.09	Providing and fixing blackout roller blind of an approved make, comprising an aluminium top tube, powder coated bottom bar, roller clutch mechanism and plastic ball chain, with fabric of the following specification: 100 percent polyester, foam coated, opaque with an openness factor of nil; roll width not less than 300 cm; colour fastness to light not less than grade 4 when tested to ISO 105-B02; fabric thickness 0.44 mm with a tolerance of plus or minus 5 percent; mass per unit area 310 g/sqm with a tolerance of plus or minus 5 percent; woven from high tenacity polyester yarn with fungistatic treatment; providing complete blockage of light flux and elimination of glare and solar heat gain; flame retardancy to AS 1530.3 or NFPA 701 or IS 15061 or BS 5867 Part 2 Type B; treated with a fluorocarbon fabric protector for water and stain resistance; certified to OEKO-TEX Standard 100 or an equivalent harmful substance standard; and fabric construction of 16.5 plus or minus 1 warp ends per cm and 17.5 plus or minus 1 picks per cm. COMMON REQUIREMENTS FOR THE ROLLER TUBE, MECHANISM AND HARDWARE: the roller tube shall be a circular extruded aluminium section of alloy 6063 in temper T5 or T6 conforming to IS 1285, of not less than 38 mm diameter, with anodising of not less than 10 microns or polyester powder coating of not less than 60 microns dry film thickness; tensile strength not less than 90 MPa and elongation not less than 8 percent. The bottom rail shall be a flat extruded aluminium section of the same alloy and finish. The control shall be a heavy duty chain drive clutch comprising a gear clutch housing and a locking plug with not fewer than six ribs, inserted not less than 38 mm into the roller tube, self-lubricating, with safety pins for secure bracket installation and an	500 sqm	3581.80	sqm	1,790,900
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	unlocking pin for manual removal, of gear ratio not less than 1.75:1, positionable at either hand of the shade. Mounting brackets shall be universal brackets of stamped and hardened steel with powder coated finish, including an end plug bracket with lock-down retainer. The ball chain shall be 2 mm diameter cord with moulded plastic balls forming an endless loop, and shall be provided with a chain tensioner or safety device conforming to EN 13120 to prevent strangulation. All plastic components shall be of ultraviolet stable compound.				
16.10	Zebra Blinds Providing and fixing dual-layer zebra or twilight blind of an approved make, with band width 75 mm to 120 mm, fabric of 100 percent polyester, roll width 250 cm to 280 cm, mass per unit area 160 g/sqm to 190 g/sqm, thickness 0.50 mm to 0.70 mm in the opaque band, and colour fastness to light not less than grade 4 when tested to ISO 105-B02. The roller tube shall be extruded aluminium of not less than 36 mm diameter. The bottom rail shall be powder coated aluminium weighing not less than 390 g per metre, fitted with end caps in a colour matching the fabric. The mechanism shall be a plastic chain mechanism with metal bracket. The blind shall be supplied with an aluminium head box faced with matching fabric. COMMON REQUIREMENTS FOR THE ROLLER TUBE, MECHANISM AND HARDWARE: the roller tube shall be a circular extruded aluminium section of alloy 6063 in temper T5 or T6 conforming to IS 1285, of not less than 38 mm diameter, with anodising of not less	1500 sqm	6704.75	sqm	10,057,125

	than 10 microns or polyester powder coating of not less than 60 microns dry film thickness; tensile strength not less than 90 MPa and elongation not less than 8 percent. The bottom rail shall be a flat extruded aluminium section of the same alloy and finish. The control shall be a heavy duty chain drive clutch comprising a gear clutch housing and a locking plug with not fewer than six ribs, inserted not less than 38 mm into the roller tube, self-lubricating, with safety pins for secure bracket installation and an unlocking pin for manual removal, of gear ratio not less than 1.75:1, positionable at either hand of the shade. Mounting brackets shall be universal brackets of stamped and hardened steel with powder coated finish, including an end plug bracket with lock-down retainer. The ball chain shall be 2 mm diameter cord with moulded plastic balls forming an endless loop, and shall be provided with a chain tensioner or safety device conforming to EN 13120 to prevent strangulation. All plastic components shall be of ultraviolet stable compound.				
16.11	Fabric venetian window blinds Providing and fixing fabric venetian window blind of an approved make, to the approved sample, with a vane size of 75 mm and a vane width of 58 mm or 82 mm as directed, comprising: head rail, rotator rail and bottom rail of extruded aluminium alloy 6063 T6 conforming to ASTM B221 or IS 1285, powder coated in standard natural white; a rolling tube of extruded aluminium of 34 mm diameter; a head rail sized to suit the run and available space and faced with fabric matching the louvre; and a cassette concealing the operating mechanism, comprising a white polycarbonate spring tempered rotary clutch which raises, lowers and tilts the blind, with white polycarbonate limit assemblies on each side to control vane over-rotation.	500 sqm	8381.45	sqm	4,190,725

	FABRIC: room darkening fabric of anti-static polyester vanes with facings between two sheer layers of 82 mm width to reduce glare; sheer layers of white 100 percent knitted polyester spider mesh; colour, texture and opacity as approved; fabric of spun-bonded 100 percent polyester fibre of mass 447 g/sqm with a tolerance of plus or minus 5 percent; flame retardant to NFPA 701 or IS 15061 or BS 5867 Part 2 Type B. OPERATION: by continuous cord loop system with a cord tensioner or safety device conforming to EN 13120. All parts, components and hardware in the shade approved by the Engineer-in-Charge.				
16.12	RTS Motor Providing and fixing tubular motor for roller blinds, of an approved make, with radio frequency remote control, of the following specification: nominal torque not less than 6 Nm; nominal speed approximately 28 rpm; overall length not exceeding 512 mm; suitable for a tube of 40 mm internal diameter or greater; rated power not exceeding 115 W; rated current not exceeding 0.45 A; sound level not exceeding 40 dBA at 1 m; ingress protection rating IP44 or better; thermal cut-out with a run time of not less than 4 minutes; electronic limit setting; and operating in a radio frequency band permitted for licence-exempt use in India by the Wireless Planning and Coordination Wing. Complete with mounting brackets, crown and drive adaptors, and all wiring accessories, all complete as directed by the Engineer-in-Charge.	50 Nos	28550.70	each	1,427,535

16.13	Remote Providing and fixing five channel radio frequency remote control handset of an approved make, compatible with and supplied by the manufacturer of the motors provided under item 16.12, capable of operating up to five blinds individually or together, with an operating range of not less than 200 m in open area, complete with battery and wall cradle, all complete as directed by the Engineer-in-Charge.	27 Nos	8720.95	each	235,466
16.14	Name Change Board / Room No. Plates Design, providing, fixing and dismantling of name change boards and room number plate signage as per the site survey, comprising:(a) SUBSTRATE: aluminium composite panel of 3 mm total thickness with aluminium skins of not less than 0.25 mm on each face, of alloy AA1100 or better, with a tensile strength of not less than 110 N per mm width, with a core of fire retardant or recycled low density polyethylene, capable of being bent through 360 degrees at the manufacturer's specified radius without delamination, warranted by the manufacturer for not less than ten years against delamination and coating failure.(b) GRAPHIC FILM: polymeric calendered vinyl of not more than 90 microns thickness excluding adhesive, with a pigmented pressure activated adhesive permitting repositioning and incorporating air release channels for bubble-free application, on a polyethylene coated paper liner. The film shall be free of heavy metals, shall comply with the limits of RoHS Directive 2011/65/EU as amended, and shall not contain any Substance of Very High Concern identified under Article 59 of REACH at a concentration exceeding 0.1 percent by weight. The film shall have a flame spread index not exceeding 25 and a smoke developed index not exceeding 450 when tested to ASTM E84, or shall be Class B-s1,d0 or	512 sqm	11692.30	sqm	5,986,458

	better when tested to EN 13501-1. The manufacturer's name shall be printed on the liner.(c) OVERLAMINATE: matt finished calendered overlamine of not more than 90 microns thickness, designed for flat and smooth application, resistant to mild alkalis, mild acids, salt and occasional fuel spills, and complying with the phthalate limits of EU Directive 2011/65/EU as amended by EU 2015/863 in respect of DEHP, BBP, DBP and DIBP.(d) PRINTING: latex or equivalent wide format digital printing using inks manufactured or co-branded by the media manufacturer, in a six colour process, at a print resolution of not less than 600 dpi, on a printer platform recommended by the media manufacturer. The ink layer shall not peel, crack or fade from the base film in the intended application.(e) FRAMING: powder coated mild steel square hollow section of 20 mm (three quarter inch) nominal size and 1.2 mm (18 gauge) wall thickness for internal framing and stiffening.				
	(f) WARRANTY: the film and overlamine system shall be warranted by the manufacturer for not less than three years from installation, issued in electronic form, valid for film printed on a recommended platform, overlaminated and installed in accordance with the manufacturer's instructions, covering fading, cracking, peeling, blistering, excessive dimensional change and manufacturing defect, but excluding vandalism, arson, natural calamity and intentional damage. MEASUREMENT: the face area of the finished signage shall be measured.				

16.15	Hanging Name Board/ Hanging Signage Design, providing, fixing and dismantling of hanging name board signage as per the site survey, comprising the substrate, graphic film, overlamine, printing, framing and warranty as specified below from clause (a) to (f): (a) SUBSTRATE: aluminium composite panel of 3 mm total thickness with aluminium skins of not less than 0.25 mm on each face, of alloy AA1100 or better, with a tensile strength of not less than 110 N per mm width, with a core of fire retardant or recycled low density polyethylene, capable of being bent through 360 degrees at the manufacturer's specified radius without delamination, warranted by the manufacturer for not less than ten years against delamination and coating failure. (b) GRAPHIC FILM: polymeric calendered vinyl of not more than 90 microns thickness excluding adhesive, with a pigmented pressure activated adhesive permitting repositioning and incorporating air release channels for bubble-free application, on a polyethylene coated paper liner. The film shall be free of heavy metals, shall comply with the limits of RoHS Directive 2011/65/EU as amended, and shall not contain any Substance of Very High Concern identified under Article 59 of REACH at a concentration exceeding 0.1 percent by weight. The film shall have a flame spread index not exceeding 25 and a smoke developed index not exceeding 450 when tested to ASTM E84, or shall be Class B-s1,d0 or better when tested to EN 13501-1. The manufacturer's name shall be printed on the liner. (c) OVERLAMINATE: matt finished calendered overlamine of not more than 90 microns thickness, designed for flat and smooth application, resistant to mild alkalis, mild acids,	203 sqm	13311.90	sqm	2,702,316
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	salt and occasional fuel spills, and complying with the phthalate limits of EU Directive 2011/65/EU as amended by EU 2015/863 in respect of DEHP, BBP, DBP and DIBP. (d) PRINTING: latex or equivalent wide format digital printing using inks manufactured or co-branded by the media manufacturer, in a six colour process, at a print resolution of not less than 600 dpi, on a printer platform recommended by the media manufacturer. The ink layer shall not peel, crack or fade from the base film in the intended application. (e) FRAMING: powder coated mild steel square hollow section of 20 mm (three quarter inch) nominal size and 1.2 mm (18 gauge) wall thickness for internal framing and stiffening.				
	(f) WARRANTY: the film and overlamine system shall be warranted by the manufacturer for not less than three years from installation, issued in electronic form, valid for film printed on a recommended platform, overlaminated and installed in accordance with the manufacturer's instructions, covering fading, cracking, peeling, blistering, excessive dimensional change and manufacturing defect, but excluding vandalism, arson, natural calamity and intentional damage. together with suspension by stainless steel single loop chain of 23 mm (0.9 inch) link diameter and J hooks of 13 mm (0.5 inch) width and 38 mm (1.5 inch) height, and all fixings to the soffit. MEASUREMENT: the face area of the finished signage shall be measured on one face only.				
16.16	Providing & fixing of Bamboowood 3D Wall Panelling system, made up of phenol bonded bamboowood, comprising of 3D planks having minimum overall surface dimensions	1871 sqm	23359.65	sqm	43,705,905

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	as 130mm x 130mm and thickness minimum 10mm. The Panels are to be pre constructed over 9 mm ply by arranging as per the approved designed pattern and are to be installed side by side matching its overlapping leap over each other as recommended by OEM. The customised support structure will be made up of CRS C-Channel having cross section of 50mm x 20mm and 0.6mm minimum thickness placed vertically maintaining in between distance of 650~900mm. To mount CRS C-channel U clamp of size 30mm x 20mm and length of 50mm is to be used along with the PVC packing for the depth adjustment. 9 mm ply is to be used to create a base in a perfect line for 3D panels to get fix over it. The prebuilt 3D panels are then to be stick over this base using construction quality glue and allow it cure overnight. The accessories such as Top Beading, Outer Corner, Inner Corner are placed on appropriate location in all approved colours and shade The Bamboowood material shall either comply with IS: 12777 or EN 3501 Part 1 Class B1, or ASTM E84 Class B (Min.) Fire Classifications. The bamboowood shall have a minimum density of 1000 Kg/Cum and minimum hardness of 1000 kgf and shall be provided with epoxy solvent based polyurethane coating system, all complete as per the direction of Engineer In-Charge.				
16.17	Dis-Membering/ Dismantling of aluminium/ Gypsum partitions and false ceiling including disposal of unserviceable material including proper handling and stacking of serviceable material with in 50 meters lead as directed by Engineer-in-charge.	500 sqm	185.90	sqm	92,950

16.18	Shifting of existing double leaf frameless toughened glass door from one location to another at any floor within the same building, including careful dismantling, handling, vertical and horizontal transportation, refixing with existing floor spring, patch fittings, pivots, lock, handles and all other hardware, making good the disturbed flooring/finishes, alignment, complete as directed by the Engineer-in-Charge.	654 sqm	2413.19	sqm	1,578,226
16.19	Providing and fixing double scaffolding system (cup lock type) on the exterior side, up to seven story height made with 40 mm dia M.S. tube 1.5 m centre to centre, horizontal & vertical tubes joining with cup & lock system with M.S. tubes, M.S. tube challies, M.S. clamps and M.S. staircase system in the scaffolding for working platform etc. and maintaining it in a serviceable condition for the required duration as approved and removing it there after .The scaffolding system shall be stiffened with bracings, runners, connection with the building etc wherever required for inspection of work at required locations with essential safety features for the workmen etc. complete as per directions and approval of Engineer-in-charge .The elevational area of the scaffolding shall be measured for payment purpose .The payment will be made once irrespective of duration of scaffolding.	3360 sqm	342.40	sqm	1,150,464
16.20	Dismantling of GRC jali for all heights including stacking within 50 metres lead. Note: The cost of providing and installing scaffolding shall be payable under relevant item.The payment for scaffolding will be made once for execution of complete work of dismantling of GRC jali, sealing of duct openings and fixing/ refixng of GRC jali, irrespective of duration of scaffolding.				
16.20.1	Thickness above 40 mm up to 75 mm	720 sqm	438.85	sqm	315,972

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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16.21	Providing and fixing 50 mm thick glass reinforced concrete jali (GRC) of required size, pattern, design and colour made from 53 grade portland cement, quartz. Fine silica sand, Alkali resistant glass fibre, super plasticizers and UV resistant synthetic inorganic pigment. the material casting should take place in synthetic rubber/FRP moulded as per approved manufacturer by Engineer-in-charge. GRC jali is to be fixed on/between RCC/Brick work column or structural steel work with dry fixing method with appropriate steel framed work, using fastener and necessary hardware etc. The jali shall be securely fixed with stainless steel bolts and anchor fasteners (304 grade) of required size as specific location etc. complete up to all lead and lift.	432 sqm	4773.98	sqm	2,062,359
16.22	Refixing of available 50 mm thick glass reinforced concrete jali (GRC) between structural steel work with dry fixing method using fastener and necessary hardware etc. The jali shall be securely fixed with stainless steel bolts and anchor fasteners (304 grade) of required size as specific location etc. complete up to all lead and lift.	173 sqm	1495.90	sqm	258,791
16.23	Providing and fixing powder-coated aluminium beading/profile of approved make, minimum 1.2 mm thick, of approved size and section (U/L/T or equivalent), at the junction between two dissimilar materials such as glass and drywall/gypsum board, tile and drywall/gypsum board, or similar interfaces, to provide a neat finish and prevent cracking due to differential movement. The profile shall be factory powder-coated (minimum 50 microns) in approved shade and fixed with suitable adhesive/fasteners, complete with all materials, labour, cutting, fixing, and finishing as directed by the Engineer-in-Charge.	7000 metre	315.61	meter	2,209,270

16.24	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & double acting hydraulic floor spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc. to be paid separately).	916 sqm	5483.20	sqm	5,022,611
16.25	Providing and laying polymer modified cement based high performance pre-mixed high strength mortar specially formulated for multipurpose applications including screed and other applications minimum thickness 10 mm complete as per the manufacturer's specifications and directions of the Engineer-in-Charge.	135 cum	43491.30	cum	5,871,326
16.26	Providing and applying self-levelling, cementitious floor levelling compound for levelling and smoothing of internal floor surfaces over suitable substrates, in thickness up to 4 mm, including surface preparation, mixing, laying, spreading and finishing, complete in all respects as per the manufacturer's specifications and directions of the Engineer-in-Charge	1903 sqm	976.27	sqm	1,857,842
16.27	Providing and fixing stainless steel Grade 304 profile of minimum 1.2 mm thickness, of approved size and section (U/L/T profile), at junctions between any two materials in flooring, ceiling or wall, including cutting, fitting, mitring, fixing and finishing, complete as per drawings and directions of the Engineer-in-Charge.	1080 metre	423.59	meter	457,477

16.28	Designing, fabricating, installing and fixing in position Aluminium Composite Panel Cladding, with open grooves for linear as well as curvilinear portions of the building , for all heights and all levels etc. including: (a) Structural analysis & design and preparation of shop drawings for load taking capacity (b) Providing, fabricating and supplying and fixing panels of aluminium composite panel cladding in pan shape in metallic colour of approved shades made out of 4 mm thick aluminium composite panel material consisting of 3 mm thick FR grade mineral core sandwiched between two Aluminium sheets (each 0.5 mm thick). The aluminium composite panel cladding sheet shall be coil coated, with Kynar 500 based PVDF / Lumiflon based fluoropolymer resin coating of approved colour and shade on face # 1 and polymer (Service) coating on face # 2 as specified using stainless steel screws, nuts, bolts, washers, cleats, non staining weather silicone sealant, backer rods etc.				
	(c) The fastening brackets of Aluminium alloy 6005 T5 / MS with Hot Dip Galvanised with serrations and serrated washers to arrest the dead load, thermal movements and carbon steel galvanized fasteners and SS 316 screws of approved make and Nylon separators to prevent bi-metallic contacts all complete required to perform as per specification and drawing The item includes cost of all material & labour component, the cost of all mock ups at site, cleaning and protection of the aluminium composite panel till the handing over of the building for occupation. Base frame work for ACP cladding is payable under the relevant aluminium items. The Contractor shall provide aluminium composite panel, having all the performance characteristics all	1080 sqm	3093.00	sqm	3,340,440

	complete , as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer-in-Charge. However, for the purpose of payment, only the actual area on the external face of the Aluminum Composite Panel (including width of groove) shall be measured in sqm. up to two decimal places.				
16.29	Providing and supplying aluminium extruded tubular and other aluminium sections as per the architectural drawings and approved shop drawings , the aluminium quality as per grade 6063 T5 or T6 as per BS 1474, including anodised coating of 20 microns of natural colour and shade as approved by the Engineer-in-Charge. (The item includes cost of material such as cleats, sleeves, screws etc. necessary for fabrication of extruded aluminium frame work. Nothing extra shall be paid on this account). The weight of aluminium extruded section shall be taken for purpose of payment. (For framing of ACP flashing)	5400 kg	419.35	kg	2,264,490
16.30	Providing and fixing 50 mm thick Resin Bonded Rockwool insulation conforming to IS:8183, having density 48 kg/m ³ , wrapped in 200 gauge virgin polythene sheet or other approved wrapping material, and securely fixed to ceiling/wall surfaces with 50 × 50 × 3 mm metallic cleats at 600 mm c/c and 12.5 mm × 24 gauge wire mesh or any the materail approved by engineer-in-charge including all necessary fasteners, supports, labour, tools and tackles, complete as directed by the Engineer-in-Charge.	5513 sqm	675.20	sqm	3,722,378

16.31	Extra for providing perforations in ply or (ply + veneer) of approved size, pattern, spacing and percentage open area for improved acoustic performance/NRC, including all additional cost towards perforation, machinery, labour and finishing, complete as directed by the Engineer-in-Charge. Cost of ply and veneer is payable in correposing item. Note: Perforations required to be made shall either be of 25 mm diameter on 16mm ply to achieve 50 % perforation or of 3 mm diameter on 12 mm ply + 4 mm veneer @ 16 mm c/c.	10381 sqm	1038.20	sqm	10,777,554
16.32	Providing and fixing mill finish solid aluminum joint cover (having total movement - 4 mm (+/- 2), visible width - 10mm, Total width - 77mm, Joint height total - 15-20 mm) for expansion/contraction / movement joints of width 10 mm in tile / granite flooring and 50 - 55 mm thick and 50mm wide Compressible Expansion Joint Polymeric filler board (for screed height). Multihole Base flange of joint cover shall be sandwiched between screed and tile / granite and fixed with adhesive used for fixing tile / granite. Solid aluminum joint cover shall be fixed on Compressible Expansion Joint Polymeric filler board fixed on mother slab using general purpose construction adhesive. Cost of item includes all operations, materials including aluminum joint cover, Expansion Joint filler board, labour, T&P, wastage etc. as required and mentioned in the item and is applicable for all floor levels.	3960 metre	3235.32	meter	12,811,867

16.33	Air Transfer Grill for door shutter Providing and fixing powder coated (powder coating not less than 40 microns) non vision extruded aluminum "Air Transfer Grill" of required sizes to be fixed in the opening made in the laminated/ veneer finished/ non decorative flush door shutters. The grill shall be 1.20 mm thick, in approved size, shade, and pattern, shape, as per the drawing and as per directions of Engineer in charge. Rate shall be inclusive of cutting the door as per approved grill size, providing and fixing required depth of beading on the cutting edges of flush door shutter with finishing. The air transfer grill shall be of double frame and fixed flush with the surface of door shutter on both sides. Area of the Air Transfer Grill on one side of door shutter shall be measured for payment.	11 sqm	10771.72	sqm	118,489
		Total Civil (A)			1,309,470,439

SCHEDULE OF WORK (MODIFIED)

Name of Work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.	
<u>FURNITURE WORKS</u>	
	Note: Images given against each item are indicative/reference images only. A. <u>For S.No 2 to 9,18, 22-25, 27:</u> 1. All MDF used shall be High Moisture Resistance (HMR) Furniture purpose (FN) Grade MDF board as per IS 12406:2025 and shall have density greater than 750 Kg/cum. Also, shall have formaldehyde Class E1. 2. All prelaminated MDF used in the furniture shall be High Moisture Resistance (HMR) Furniture purpose (FN) Grade, with Type 1 Surface, as per IS 14587:2025 and shall have density greater than 750 Kg/cum. Also, shall have formaldehyde Class E1. 3. All veneer used for the furniture shall be having veneer slice thickness of at least 0.3 mm and shall have Type 1 panel face quality and shall confirm to IS 1328:1996. Also, shall have formaldehyde Class E1. All veneered surfaces shall be polished with exterior grade PU. 4. All demountable / knock down connections shall use threaded metal inserts (brass / SS), no screw shall be driven directly into MDF/prelaminated MDF. 5. All aluminum surfaces shall be epoxy powder coated with minimum thickness 50 micron. 6. All channels provided for drawers shall be fully extendable undermount channel with soft closing and push open features. 7. All hinges provided shall be wide opened soft closing hinges 8. All brackets / connectors etc. used shall be epoxy powder coated (50 micron) aluminum or SS 304 9. All drawers and cabinets shall be provided with individual locks and Locks provided for drawers and cabinets till 450 mm height shall be SS - 304 body, with reversible key and shall be tested for at least 50,000 cycles. 10. Cabinets of height more than 450 mm shall be provided with 3-point lock system. Cabinets with double door shutter shall be provided with suitable arrangement to make one shutter inactive and ensure proper locking mechanism. 11. Thicknesses of the board mentioned in the item are minimum thickness required to be provided. However, all finished furniture products shall conform to the safety, strength, stability and durability requirements of the BIFMA standard corresponding to the product type and necessary documentation for the same shall be furnished. 12. All exposed edges of MDF / prelam MDF shall be provided with 2 mm thick PVC edge banding of not less than 2 mm thickness, matching the adjacent surface, applied by machine using polyurethane reactive (PUR) hot-melt adhesive. 13. Wire manager (ensure concealing of all wires from floor level), anodized Aluminum Access flap panel and ABS grommet shall be provided in all workstations, desk and conference tables. Cost of same is included in the quoted price.
	B. <u>For S. No - 10-17:</u> (a) The basic rate shown against each chair in the BoQ is for supply and installation of the material at site and is exclusive of GST. (b) All chairs shall be procured directly from the manufacturer or from a supplier authorized by the manufacturer. Proof of such authorization shall accompany the purchase documents.

(c) For selection of chairs NIT approving authority shall constitute a committee and suggest the final chair to be selected against each category/item from the chairs proposed by the contractor and those similar to the corresponding item. (d) The Contractor shall submit the proposed rate for every chair for approval, supported by quotations or invoices from the manufacturer or authorized supplier covering supply and installation at site. The Committee may verify these documents and may negotiate the price directly with the manufacturer or supplier. The Approved Purchase Rate shall be the lower of (i) the basic rate shown in the tax invoice against which GST has been paid (ii) the rate negotiated by the Committee. (e) The Contractor shall submit with each Running Account Bill a Cost Adjustment Statement in the proforma below, showing the difference between the basic rate and the Approved Purchase Rate for all relevant items, together with delivery challans, purchase invoices, proof of payment and any other document required by the Engineer-in-Charge. The adjustment shall be given effect in that Running Account Bill and finally reconciled in the Final Bill. Refer table below for deriving cost adjustment in basic rates:							
S.No	Item	Unit	Basic Rate as per Tender	Approved Purchase Rate	Rate Difference	Total executed quantity as per RA or Final Bill	Amount of Difference – Payable or recoverable (+ ve or – ve)
			(a)	(b)	(c) = b - a	(d)	e = c x d
1	Item 1	No.	1500	1200	(-) 300	5	(-) 1500
2	Item 2	No.	3500	3600	100	2	200
Positive total is payable to the Contractor; negative is recoverable from him. f=							(-) 1300
<i>Note:</i> On the amount at column (e), CPOH @ 7.5% shall be added and GST @ 18% applied on the resulting sum, carrying the same sign as (e) — i.e. amount payable/recoverable = $f \times 1.075 \times 1.18$.							

Sr. No.	Description of Item	UNIT	QTY	UNIT RATE	AMOUNT	INDICATIVE/REFERENCE IMAGE
1.0	Manufacturing, providing and placing in position machine-made, factory-assembled Minister Cabin Table (as per finally approved sample by department) of the following dimensions with the following specifications.					
	Providing and placing Ministers' Cabin Table with side unit, forming part of the premium table, luxuriously designed and ideal for large executive cabins. The overall width of the desk is designed with an overall tabletop thickness of 80–90 mm, fabricated from multiple layers of 19 mm thick calibrated plywood (4 layers BWP grade IS–710) and finished on both sides with 4 mm thick veneer. The tabletop shall feature a genuine leather writing inset, flushed with the adjacent veneer top, and bordered on all sides with high-quality solid wood inlay and engraved detailing as per the reference image. The tabletop shall have a rectangular profile with rounded corners and half-round edges, enhancing its luxurious aesthetics. The desk assembly shall comprise three sections – the main table and two side units, each equipped with multiple drawers and shutters for functional storage. The understructure, side units, shutters, and shelves shall be constructed from 19 mm thick calibrated plywood, externally finished with 4 mm thick veneer of approved make and shade, and internally finished with matching laminate. All drawer sides shall be made of calibrated plywood, with finger profile handles for drawer and shutter operation. The table lipping shall incorporate solid wood inlay patterns as per the approved design reference. The main table shall include a concealed wire management system integrated within the desk, with two wire boxes positioned beneath the leather-covered work area. Each wire box shall be equipped with power, network (LAN), and HDMI ports for efficient and discreet connectivity. Cable management shall be fully integrated from floor level to all work surfaces to ensure seamless concealment of electrical and data cables. The front and side panels shall be detailed with wooden carving borders and moulding, following the approved reference design. All visible wooden surfaces shall be meticulously finished in rich veneer with water-based PU polish or clear polyurethane coating of approved make and shade, ensuring superior surface protection, rich sheen, and long-lasting durability.					

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

	Full Height Back Storage: The top & carcass of the Storage made out of 19 mm thick calibrated ply with 4 mm thick veneer finish with matching lipping and inner parts are with laminated finish matching with veneer finish. Storage Top & bottom having the round edge matching with main table profile. Storage should be provided with adjustable leveller. Back Storage is combination of calibrated ply & glass shutter, Ply shutter made from 19 mm thick calibrated ply with veneer finish & Glass shutter made from calibrated ply frame with 6 mm thick clear toughened glass. All swing doors should be operated with profile handle and easily close & open shelf. All shelves are adjustable. Storages should be provided Skirting with adjustable levellers. All joinery shall be knock-down type for ease of assembly and relocation. The product is BIFMA Gold-rated and SCS Global certified for in-house air quality, ensuring compliance with industry standards. Product shall have 5-year warranty, reflecting its quality and durability. All specifications are completed as per the manufacturer's guidelines, approved samples, etc. and direction of the Engineer-in-Charge.					
1.1	Minister Cabin Table of Size: 3600mm(L) x 1200mm(D) x 740- 760mm(H) with Side Combo Storage: 1100Wx 450-600Dx 580-600mm(H2).	each	5	431575.00	2157875.00	
1.2	Cabin Back Storage of size: 3600Wx 600D x 1800Hmm	each	5	220013.00	1100065.00	
	Manufacturing, providing and placing in position machine-made, factory-assembled Secretary & MoS Cabin Table (as per finally approved sample by department) of the following dimensions with the following specifications.					

1.3	Providing and placing Secretary & MoS Cabin Table with the following specifications: The table features a top made of 50–55 mm thick E-1 Grade MDF Board (Environmentally Friendly) with Veneer Finish. A leatherette pad measuring 900–1200 mm W × 460–560 mm D is fixed in the centre of the main table. The table's shape is tapered with an inline 18 mm thick modesty panel, finished with matching cover edge banding (PVC). The top is supported by two elements: on one side, a hollow leg (700 mm W × 150 mm D) made of 18 mm thick E1 grade MDF board with PVC edge banding; on the other side, an 18 mm thick E1 grade MDF board with a three-drawer wooden pedestal. Wiring Tray: A closed wiring tray is installed below the access flap, designed to hold 2–3 switch sockets. It is made from 1.2 mm thick MS, epoxy powder-coated in a spray colour, and baked at 200°C. Side Combo Storage: The side unit combines a swing door and open shelf, suitable for storing a CPU or bags. It features a 25 mm thick top and an 18 mm thick MDF board (E-1 Grade) body with Veneer finish and 2 mm PVC edge-banding. The storage unit is equipped with adjustable levellers, a three-way lock mechanism with central locking for hinged doors, and a hinge-damping mechanism for soft closing. Full Height Back Storage: The top & carcass of the Storage made out of 19 mm thick calibrated ply with 4 mm thick veneer finish with matching lipping and inner parts are with laminated finish matching with veneer finish. Storage Top & bottom having the round edge matching with main table profile. Storage should be provided with adjustable leveller. Back Storage is combination of calibrated ply & glass shutter, Ply shutter made from 19 mm thick calibrated ply with veneer finish & Glass shutter made from calibrated ply frame with 6 mm thick clear toughened glass. All swing doors should be operated with profile handle and easily close & open shelf. All shelves are adjustable. Storages should be provided Skirting with adjustable levellers. The product is BIFMA and SCS Global certified for in-house air quality, ensuring compliance with industry standards. Product shall have 5-year warranty, reflecting its quality and durability. All specifications are completed as per the manufacturer's guidelines, approved samples, and the direction of the Engineer-in-Charge.					
1.3.1	Secretary/MOS Cabin Table of Size: 3000mm(L) x 1050mm(D) x 740- 760mm(H) with Side Combo Storage: 1200Wx 600Dx 580-600mm(H2).	each	10	384999.00	3849990.00	
1.3.2	Cabin Back Storage of size: 3000Wx 450D x 1800Hmm	each	10	220013.00	2200130.00	

2.0	Manufacturing, providing and placing in position machine-made, factory-assembled AS/JS Cabin Table (as per finally approved sample by department) of the following dimensions with the following specifications.					
2.1	Providing and placing AS/JS Cabin Table with the following specifications: Main Tabletop: The top is constructed of 36 mm thick E-1 Grade MDF board, which is environmentally friendly. It features a Melamine finish with reverse chamfer edge banding on all sides. The grains of the tabletop should be unidirectional. The top is supported on one side by a slanted leg made of 36 mm thick MDF board, and on the other side by a side combo storage unit. Wire Management: The table includes a completely concealed wire management system. It features an aluminium anodized flipper with soft closure, a wiring tray, and housing made from 1.2 mm MS sheet. The flange structure is epoxy powder-coated (70–80 micron) and baked at 200°C. Vertical wire uptake from the floor is facilitated via a flexible cable riser. Side Combo Storage: The body of the storage unit is made from 18 mm thick E1 Grade MDF board with Melamine finish and PVC edge-banding. It combines two swing shutters, two pull-out drawers, and an open space. The storage top is 25 mm thick, while the carcass is 18 mm thick, both using E1 grade MDF board. It features extruded aluminium recess handles and adjustable levellers. The hinged doors have a three-way lock mechanism with central locking and are equipped with a hinge-damping mechanism for soft closing. Modesty Panel: Between the Side Combo Storage and the slanted leg, there's a 25 mm thick MDF board modesty panel. The modesty panel should be 450 mm below the tabletop. Material Quality and Certification: The E1 Grade laminate used provides no urea formaldehyde emission. Formaldehyde should be phenol-based with emission not exceeding 8 mg/100 g oven dry board (perforated method) for better in-house air quality, complying with EN 120-1892. The product is BIFMA Gold-rated and SCS Global certified for in-house air quality, ensuring compliance with industry standards. Product shall have 5-year warranty, reflecting its quality and durability. All specifications are completed as per the manufacturer's guidelines, approved samples, and the direction of the Engineer-in-Charge.					

	The Medium height modular storage cabinet carcass shall be constructed from 18 mm thick MDF board with all internal surfaces finished in approved melamine shade. The top, side, and shutter panels shall be made of 18 mm thick MDF board with approved melamine shade and edge-banded with 2 mm PVC lipping for a seamless and durable appearance. The front façade shall comprise swing-type shutters, each made of 18 mm thick MDF board and fitted with concealed soft-close hinges of Hettich, Blum, or Ebco make, or equivalent approved hardware. All shutters shall include a locking mechanism where required. The storage cabinet shall rest on metal legs fabricated from powder-coated mild steel section (25 mm Dia or 25 × 25 mm box section) finished in an RAL-approved shade, each equipped with height-adjustable levelling glides for uneven flooring. Each shutter compartment shall have one adjustable internal shelf supported on concealed shelf supports. The entire cabinet shall be factory-finished, modular, and knock-down in design, ensuring ease of assembly, precision, and high-quality workmanship. The product is BIFMA Gold-rated and SCS Global certified for in-house air quality, ensuring compliance with industry standards. Product shall have 5-year warranty, reflecting its quality and durability. All specifications are completed as per the manufacturer's guidelines, approved samples, and the direction of the Engineer-in-Charge.					
2.1.1	AS/JS Cabin Table is of Size: 2400mm(L1) x 2300mm(L2) x 1050-1250(D1) x 600mm(D2)x 740-760mm(H1)	each	86	221874.00	19081164.00	
2.1.2	AS/JS Cabin Back Storage of size: 2400Wx 450D x 1200Hmm	each	86	152620.00	13125320.00	
3.0	Manufacturing, providing and placing in position machine made factory assembled Director Cabin Table (as per finally approved sample by department) of following dimensions with the following specifications.					

3.1	Providing & Placing Dir/ Dy. Director Cabin Table with side unit with following details and specification:- Main Table:- Top and legs are made of 36 mm thick prelam MDF board (E-1 Grade) finishes with matched 2 mm PVC edge-banding. E1 grade prelam MDF board with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{ g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty made of Grade E-1 prelam MDF board (Environmental Friendly) 18 mm thick with matching 2mm Edge-Banding (PVC). Also legs are made of prelam MDF board Grade E-1 (Environmental Friendly) thickness 36 mm with matching edge banding. Top of the main table shall be furnished with 3.5 - 4mm thick veneer surface. Side Combo Storage is combination of 2nos swing shutter with three drawer pedestal & some open space, Storage carcass made out of 18mm thick & only top thickness is 25mm thick prelam MDF board (E-1 Grade) with 2 mm matching edge-banding. E1 grade laminate with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{ g}$ oven dry board-perforated method) for better in-house quality. Storages should be provided with adjustable levelers. The hinged doors can be locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors. Top of the side combo storage shall be furnished with 3.5 - 4mm thick veneer surface. Shutters of all drawers and cabinets shall be provided with recessed anodized aluminum profile handle / recessed profile grip (handle-less, finger-pull), as per requirement. Drawer Unit : 3 drawer Metal pedestal of overall dimensions internal and external dimensions 380-430 mm (W) x 430-480 mm (D) x 600-620 mm (H). Drawer body should be made of CRCA of thickness 1.2 mm of top and bottom sheet and 0.7-0.8 mm for other areas and shall be duly epoxy powder coated with 70-80 micron. Each pedestal should be provided with pencil tray of 40-45 mm(H) x 110-120 mm (D) x 300-310mm (W). Each pedestal should have 5 Nos castor fitted to it where in one castor will be fitted to lower most drawer to provide extra stability. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality.					
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	Low height back storage: Body of storages and shutters made out 18 mm thick (E1 Grade) prelam MDF board and only top thickness is 25 mm thick pre lam MDF board with PVC edge-banding . All shelf are adjustable. This should comply with (EN 120-1992).The storage should have recessed anodized aluminum profile handle / recessed profile grip (handle-less, finger-pull), as per requirement. Storages should be provided with adjustable levellers. Door Lock should be of three-way lock mechanism, the hinged doors can be locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors. Top of the storage shall be furnished with 3.5 - 4mm thick veneer surface. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality.					
3.1.1	Table (Main Table + Side Combo Storage + Drawer Unit) of Size: 2200mm(L1) x 1950mm(L2) x 900mm(D1) x 550-600 mm(D2)x740-760mm(H1)/620-640mm(H2).	each	177	146006.43	25843139.00	
3.1.2	Cabins Back Storage of size: 2200W x 400-450D x 740-760 H mm	each	177	58072.53	10278838.00	
4.0	Manufacturing, providing and placing in position machine made factory assembled LVL 11 Cabin Table (US) of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					
4.1	Providing and placing of Lvl 11 Cabin Tables with following details and specification : - Providing and placing table top and legs are made of 36mm thick prelam MDF board (E-1 Grade) finishes with matched 2 mm PVC edge-banding.E1 grade laminate with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty is Grade E-1 prelam MDF board (Environmental Friendly) thickness 18 mm cover with edge banding Edge-Banding(PVC) 2 mm. Also legs are made of Grade E-1 prelam MDF board (Environmental Friendly) board thickness 36 mm, cover with 2 mm matching PVC edge banding. Drawer Unit : 3 drawer Metal pedestal of overall dimensions internal and external dimensions 380-430 mm (W) x 430-480 mm (D) x 600-620 mm (H). Drawer body should be made of CRCA of thickness 1.2 mm of top and bottom sheet and 0.7-0.8 mm for other areas and shall be duly epoxy powder coated with 70-80 micron. Each pedestal should be provided with pencil tray of 40-45 mm(H) x 110-120 mm (D) x 300-					

	310 mm (W).Each pedestal should have 5 Nos castor fitted to it where in one castor will be fitted to lower most drawer to provide extra stability. Side Combo Storage is combination of 2nos swing shutter with three drawer pedestal & some open space, Storage carcass made out of 18mm thick & only top thickness is 25mm thick prelam MDF board (E-1 Grade) with 2 mm matching edge-banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. Storages should be provided with adjustable levellers. The hinged doors can be locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors.Shutters of all drawers and cabinets shall be provided with recessed anodized aluminum profile handle / recessed profile grip (handle-less, finger-pull), as per requirementLow height back storage: Body of storages and shutters made out 18 mm thick (E1 Grade) prelam MDF board and only top thickness is 25 mm thick pre lam MDF board with PVC edge-banding . All shelf are adjustable. This should comply with (EN 120-1992).The storage should have recessed anodized aluminum profile handle / recessed profile grip (handle-less, finger-pull), as per requirement. Storages should be provided with adjustable levellers. Door Lock should be of three-way lock mechanism, the hinged doors can be locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors.Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality.ranty.					
4.1.1	LVL 11 Cabins Tables (Main Table + Side combo + Drawer Unit) of size :Main Table 1650W x750D x 740-760Hmm, Return Table :900W x 450D x740-760Hmm	each	273	70281.74	19186914.00	
4.1.2	Cabins Back Storage of size: 1650W x 400-450D x740-760Hmm	each	273	40420.37	11034760.00	
5.0	Manufacturing, providing and placing in position machine made factory assembled Lvl 8,9 and 10 (as per finally approved sample by department) of following dimensions with the following specifications.					

5.1	Providing and placing of Lvl 8, 9 and 10 Tables with following details and specification : - Providing and placing table top and legs made of 25mm thick prelam MDF board (E-1 Grade) finishes with matched 2 mm PVC edge-banding. E1 grade laminate with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty is Grade E-1 prelam MDF board (Environmental Friendly) thickness 18 mm cover with edge banding Edge-Banding(PVC) 2 mm. Also legs are made of Grade E-1 prelam MDF board (Environmental Friendly) board thickness 25 mm, cover with 2 mm matching PVC edge banding. Drawer Unit : 3 drawer Metal pedestal of overall dimensions internal and external dimensions 380-430 mm (W) x 430-480 mm (D) x 600-620 mm (H). Drawer body should be made of CRCA of thickness 1.2 mm of top and bottom sheet and 0.7-0.8 mm for other areas and shall be duly epoxy powder coated with 70-80 micron. Each pedestal should be provided with pencil tray of 40-45 mm(H) x 110-120 mm (D) x 300-310 mm (W). Each pedestal should have 5 Nos castor fitted to it where in one castor will be fitted to lower most drawer to provide extra stability. Return Storage is combination of 2nos swing shutter with three drawer pedestal & some open space, Storage carcass made out of 18mm thick & only top thickness is 25mm thick prelam MDF board (E-1 Grade) with 2 mm matching edge-banding. E1 grade laminate with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. Storages should be provided with adjustable levellers. The hinged doors can be locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors. Shutters of all drawers and cabinets shall be provided with recessed anodized aluminum profile handle / recessed profile grip (handle-less, finger-pull), as per requirement Low height back storage: Body of storages and shutters made out 18 mm thick (E1 Grade) prelam MDF board and only top thickness is 25 mm thick pre lam MDF board with PVC edge-banding . All shelf are adjustable. This should comply with (EN 120-1992). The storage should have recessed anodized aluminum profile handle / recessed profile grip (handle-less, finger-pull), as per requirement. Storages should be provided with adjustable levellers. Door Lock should be of three-way lock mechanism, the hinged doors can be					
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	locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality.					
5.1.1	LVL 8.9,10 Cabin Table , Main Table 1500W x 750D x 740Hmm, Return Table :900W x 300-450D x740-760Hmm + Drawer Unit	each	1087	61234.78	66562208.00	
5.1.2	LVL 8.9,10 Cabin Table Back Unit of size: 1500W x 400-450D x 740-760Hmm	each	1087	34821.72	37851214.00	
6.0	Manufacturing, providing and placing in position machine made factory assembled LVL Below 8 ASO/SO Hybrid Workstation (as per finally approved sample by department) of following dimensions with the following specifications.					
6.1	Providing and placing Hybrid Panel based Workstations with following specifications: Frame Work, Partition and Cable management : Frame work shall consist of main spine and return spine of epoxy powder coated aluminum extruded section of minimum thickness of 1.2 mm. The overall thickness of Panel base System should be minimum 60-70 mm. The thickness of main spine partition panel should be minimum 60-70 mm and & Return spine partition panel should be minimum 22-30 mm. The panel will be hollow inside to accommodate wiring for electrical/data and outer frame of panel should be made of extruded aluminium. The panel shall be made up of 3 mm thick prelam MDF board both sides of the aluminum frame to create the hollow for the wire management. The panel outer aluminium frame is designed in such a way that it can be easily slide in to the columns/ Connectors by means of stacking one over the other. Horizontal race way should be 150-170 mm height aluminium profile. There shall be complete cable management arrangement with openable raceway above/ below worktop with provision for fitting electrical/data switches and holes for passing cable. Panel Finishes : Finishes of panel above the worktop can be fabric pinup/fabric/laminate + Glass/metal writable marker board or single finish tile with raceway on main spine (as per the requirement and as approved by Engineer-in-charge). Finishes of main spine panel below the worktop should be made of prelam MDF board tile and 0.5mm thick steel sheet pasted on prelam MDF board which is powder coated with EPC finish 80-90 microns for					

	durability on the inside as well on the outside. Raceway can be provided above/below the worktop. Connectors/Brackets: End Post: Aluminium 60-70 mm width 1180-1220 mm height. Two way post: Aluminium 30-70 mm width 1180-1220 mm height. Three way post: Aluminium 30-70 mm width 1180-1220 mm height. Four way post: Aluminium 30-70 mm width 1180-1220 mm height. Brackets: Table top supported with 50-60mm width steel bracket. Table top to table top connector: 150-170 mm Width x 120-140 mm Depth width connector.					
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	Worktop :Worktop Made of 25mm thick E-1 grade prelam MDF board finished with 2mm PVCedge banding. E1 grade with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{ g}$ oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The prelam MDF board should be E-1 Grade with pvc edge banding. Side Medium Height Combo Storage : Medium Height Combo Storage, The combination of storage of three drawer & Open shelves. Body of storages made out 18 mm thick prelam MDF board (E-1 Grade), prelam MDF board finishes with 2 mm PVC edge-banding. E1 grade prelam MDF board to be used which provide no urea formaldehyde emission and formaldehyde should be phenol base with emission of not more than ($\leq 8\text{mg}/100\text{ g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). Front of Medium height Storages should be made out of 18 mm thick (E-1 Grade) prelam MDF board finishes with 2 mm PVC edge-banding fitted with extruded recessed aluminium profile handle, as per requirement. Top should be 25 mm thick prelam MDF board (E-1 Grade), prelam MDF board finishes with 2 mm PVC edge-banding. Storages should be provided with adjustable levellers. Door Lock should be of three-way lock mechanism, the hinged doors can be locked at once. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality.					
6.1.1	LVL Below 8 ASO/SO Linear Workststion of size: 1450Wx 600D x 1200/ 740H & Side Combo Storage 1050Wx 300-450D x 1200/740Hmm	each	1533	79739.30	122240341.00	
7.0	Manufacturing, providing and placing in position machine made factory assembled MTS workstation (as per finally approved sample by department) of following dimensions with the following specifications.					

7.1	Providing and placing Hybrid Panel based Workstations with following specifications: Frame Work, Partition and Cable management : Frame work shall consist of main spine and return spine of epoxy powder coated aluminium extruded section of minimum thickness of 1.2mm. The overall thickness of Panel base System should be minimum 60-70 mm. The thickness of main spine partition panel should be minimum 60-70 mm and & Return spine partition panel should be minimum 22-30 mm. The panel will be hollow inside to accommodate wiring for electrical/data and outer frame of panel should be made of extruded aluminium. The panel shall be made up of 3 mm thick MDF board both sides of the wooden frame to create the hollow for the wire management. The panel outer aluminium frame is designed in such a way that it can be easily slide in to the columns/ Connectors by means of stacking one over the other. Horizontal race way should be 150-170 mm height aluminium profile. There shall be complete cable management arrangement with openable raceway above/ below worktop with provision for fitting electrical/data switches and holes for passing cable. Panel Finishes : Finishes of panel above the worktop can be fabric pinup/fabric/laminate + Glass/metal writable marker board or single finish tile with raceway on main spine(as per the requirement and as approved by Engineer-in-charge). Finishes of main spine panel below the worktop should be made of prelam MDF board tile and 0.5mm thick steel sheet pasted on prelam MDF board which is powder coated with EPC finish 80-90 microns for durability on the inside as well on the outside. Raceway can be provided above/below the worktop. Connectors/ Brackets: End Post: Aluminium 60-70 mm width 1180-1220 mm height. Two way post: Aluminium 30-70 mm width 1180-1220 mm height. Three way post: Aluminium 30-70 mm width 1180-1200mm top connector: 150-170 mm Width x 120-140 mm Depth width connector.					
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	Worktop :Worktop Made of 25mm thick E-1 grade prelam MDF board finished with 2mm PVC edge banding. E1 grade prelam MDF board with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The prelam MDF board should be E-1 Grade with pvc edge banding. Drawer Unit : 3 drawer Metal pedestal of overall dimensions internal and external dimensions 450 mm (W) x 450 mm (D) x 600 mm (H). Drawer body should be made of CRCA of thickness 1.2 mm of top and bottom sheet and 0.7-0.8 mm for other areas and shall be duly epoxy powder coated with 70-80 micron. Each pedestal should be provided with pencil tray of 40-45 mm(H) x 110-120 mm (D) x 300-310 mm(W).Each pedestal should have 5 Nos castor fitted to it where in one castor will be fitted to lower most drawer to provide extra stability. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality.					
7.1.1	MTS Workstation of size:- 1200mm (W) x 600mm (D) x 740mm(Worktop Height) x 1180-1220 mm	each	763	36684.05	27989927.00	
8.0	Manufacturing, providing and placing in position machine made factory assembled medium Height Partition for Office Cabins (as per finally approved sample by department) of following dimensions with the following specifications.					

8.1	Providing and placing of medium height panel: Frame Work, Partition and Cable management : Frame work shall consist of main spine of epoxy powder coated aluminium extruded section of minimum thickness of 1.2 mm. The overall thickness of Panel base System should be minimum 60-70 mm. Panel divide in three parts, lower panel, middle Panel & upper panel, The panel will be hollow inside to accommodate wiring for electrical/data and outer frame of panel should be made of extruded aluminium. The panel shall be made up of 3 mm thick MDF board both sides of the wooden frame to create the hollow for the wire management. Finishes of panel above the worktop: Above the top Middle Panel fabric pinup/ Glass writable marker board and upper panel finish is clear toughened glass (4mm). The hollow panel made of prelam MDF board and 3mm thick foam which is upholstered with 0.5mm thick fabric with half fabric pinup/ half glass marker board/ 4mm thick clear toughened glass. The thickness of main spine partition panel should be minimum 60-70 mm thick .Finishes of main spine panel below the worktop: Below the top the hollow panel should be made of prelam MDF board tile and 0.5mm thick steel sheet pasted on prelam MDF board which is powder coated with EPC finish 80-90 microns for durability on the inside as well on the outside. The panel outer aluminium frame is designed such a way that it can be easily slide in to the columns/ Connectors by means of stacking one over the other. Horizontal race way should be 150-170 mm height aluminium profile. There shall be complete cable management arrangement with openable raceway above/ below worktop with provision for fitting electrical/data switches and holes for passing cable. Connectors/ Post Description: End Post: Aluminium 60-70 mm width 1450-1500mm height. Two way post: Aluminium 30-80 mm width 1450-1500 mm height. Three way post: Aluminium 30-80 mm width1450-1500 mm height. Four way post: Aluminium 30-80 mm width 1450-1500 mm height. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality.	Sq.m	5355	14492.00	77604660.00	
9.0	Manufacturing, providing and placing in position machine made factory assembled Meeting Rooms Table (as per finally approved sample by department) of following dimensions with the following specifications.	-				

9.1	Providing & Placing of Conference Table having top of 36 mm thick bevelled edge prelaminated MDF board with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The legs are 36 mm thick recessed legs and Modesty is 18 mm thick Prelam MDF board Grade E-1 (Environmental Friendly) with Edge-Banding(PVC) 2 mm. Wire management: Access Flap and Switch Mounting Tray is provided in the table. It is Made from Matt silver Anodized Aluminium extrusion and plastic moulded components to facilitate access of Electrical/Data/Voice sockets access from Top. Powder coated switch mounting tray and wire management tray made from 0.8-1.2 mm MS sheet(IS:513) which is powder coated 80-90micron. Switches to be mounted on tray as per requirement. Provision for mounting 8 Module Switch plate on switch mounting tray shall be provided. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality					
9.1.1	25 Pax U/V Shape or as per drawing Conference Table: 9000L1 x 2860W1/2400W2 x 750D x 740-760Hmm	each	16	277659.17	4442547.00	
9.1.2	19 Pax U /V Shape or as per drawing Conference Table: 6500L1 x 23500W1/2075W2 x 750D x 740-760Hmm	each	32	200531.41	6417005.00	
9.1.3	15 Pax U/V Shape or as per drawing Conference Table: 5000L1 x 2300W1/2075W2 x 750D x 740-760Hmm	each	32	154255.53	4936177.00	
10.0	Manufacturing, providing and Placing High Back revolving chairs for AS/JS Cabin Main Chair of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

10.1	Providing and placing in position high back chair for Cabins with comfortable Backrest, The seat shall be made up of 12mm thick hot pressed plywood & upholstered with leatherette / mesh / fabric over moulded medium density foam. Overall dimensions of Chair shall be, Width of Chair - 640mm, Depth of Chair - 645mm, Height of Chair-1185-1245mm as measured till pedestal . The back shall be designed with contoured lumber support for extra comfort. Size of back shall be W-510+/-10mm, H-715mm & size of seat shall be W-520+/-10 mm x D-450mm x H-473- 533mm. Medium density foam should be used in making seat & back which shall be moulded with density 45kg/m³ and hardness load 16kgf. The seat and back should be arrested together with spine made of 8mm thick HR steel and should be powder coated in black with 40-60 micron . The fixed armrest are made of aluminium with PU padded. The mechanism of the chair shall have following features : 360 degree swivel type, Knee Tilt mechanism, Seat & back tilting ration of 1: 1.5, Front pivot for tilt with feet resting on ground ensuring more comfort, multiple locking position. Gas lift allows 100 mm of height adjustment. The pedestal shall be made of die-cast aluminium base. it shall be fitted with 5 nos twin wheel castor. The size of the pedestal shall be 670mm pitch-centre-dia 700-720mm with castors). The twin wheel castors shall be made of Nylon injection moulded in black color. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Basic Rate : 35587.50	Nos.	86	46048.20	3960145.00	
11.0	Manufacturing, providing and Placing Mid Back revolving chairs for AS/JS Cabin Mid back visitor Chair of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

11.1	Providing and placing in position Mid back chair for Cabins With comfortable Backrest. The seat shall be made up of 12mm thick hot pressed plywood & upholstered with leatherette / mesh / fabric and moulded medium density foam. Overall dimensions of Chair shall be, Width of Chair - 640mm, Depth of Chair - 620mm, Height of Chair-1000-1065mm as measured till pedestal . The back shall be designed with contoured lumber support for extra comfort. Size of back shall be W-490+/-10 mm, H-530 mm & size of seat shall be W-500+/-10 mm x D-450 mm x H-470- 530 mm. Medium density foam should be used in making seat & back which shall be moulded with density 45 kg/m³ and hardness load 16 kgf. The seat and back should be arrested together with spine made of 8mm thick HR steel and should be powder coated in black with 40-60 micron . The fixed armrest are made of aluminium with PU padded. The mechanism of the chair shall have following features : 360 degree swivel type, Knee Tilt mechanism, Seat & back tilting ration of 1: 1.5, Front pivot for tilt with feet resting on ground ensuring more comfort, multiple locking position. Gas lift allows 100 mm of height adjustment. The pedestal shall be made of die-cast aluminium base. it shall be fitted with 5 nos twin wheel castor. The size of the pedestal shall be 670mm pitch-centre-dia 700-720mm with castors). The twin wheel castors shall be made of Nylon injection moulded in black color. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Basic Rate : 32625.00	Nos.	688	42214.58	29043630.00	
12.0	Manufacturing, providing and Placing High Back revolving chairs for Confernce Room/ Meeting Room of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

12.1	Providing and placing High Back chairs for Conference Room/ Meeting Room. seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, seat size 44.5 - 52.5 cm depth (approx.), 46.4 - 51.0 cm width (approx.), sub assembly back size 55.5 cm- 62 cm height. (approx.), effective back height from Seat - 57 cm (approx.), polyurethane foam for seat having density ≥ 45 kg/m³, armrest top injection moulded in polyurethane and mounted on the injection moulded height adjustable type armrest, armrest height adjustable up to 4.5 cm (approx) in 3 steps & width movement adjustable, 360 degree revolving type. mechanism, single point control for seat and back adjustment, front pivot for tilt, tilt adjustment for back in 3 position locking with antishock feature, pneumatic height adjustment of 8.5 cm spine bracket made of aluminum die cast piece connecting to back with mechanism, pedestal made of die cast aluminium fitted with 5 nos. twin wheel castors (castor wheel dia. 6.0 cm approx.), base pedestal dia 65.0cm (approx.) and pitch center dia. 71.0 cm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Basic Rate : 19875.00	Nos.	78	25716.39	2005878.00	
13.0	Manufacturing, providing and Placing Mid Back revolving chairs for Conference Room/ Meeting Room of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

13.1	Providing and placing Mid Back chairs for Conference Room/ Meeting Room Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, seat size 44.5 - 52.5 cm depth (approx.), 46.4 - 51.0 cm width (approx.), sub assembly back size 55.5 cm- 62 cm height. (approx.), effective back height from Seat - 57 cm (approx.), polyurethane foam for seat having density $\geq 45 \text{ kg/m}^3$, armrest top injection moulded in polyurethane and mounted on the injection moulded height adjustable type armrest, armrest height adjustable up to 4.5 cm (approx) in 3 steps & width movement adjustable, 360 degree revolving type. mechanism, single point control for seat and back adjustment, front pivot for tilt, tilt adjustment for back in 3 position locking with antishock feature, pneumatic height adjustment of 8.5 cm spine bracket made of aluminum die cast piece connecting to back with mechanism, pedestal made of die cast aluminium fitted with 5 nos. twin wheel castors (castor wheel dia. 6.0 cm approx.), base pedestal dia 71.0cm (approx.) and pitch center dia. 67.0 cm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Basic Rate : 17625.00	Nos.	1676	22805.17	38221472.00	
14.0	Manufacturing, providing and Placing High Back revolving chairs for Dy. Director/LVI 12,13,11 Cabin Main Chair of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

14.1	Providing and placing High Back chairs Dy. Director/LVI 12,13 Cabin. Chair Overall size: 680Wx 680Dx 1125- 1215Hmm, Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, seat size 450 - 460 mm depth (approx.), 490 - 500 mm width (approx.), sub assembly back size 540 mm- 620 mm height. (approx.), effective back height from Seat - 560-570 mm (approx.), polyurethane foam for seat having density $\geq 45 \text{ kg/m}^3$ kg/m3, armrest top injection moulded in polyurethane and mounted on the injection moulded height adjustable type armrest, armrest height adjustable up to 4.5 cm (approx) in 3 steps & width movement adjustable, 360 degree revolving type. mechanism, single point control for seat and back adjustment, front pivot for tilt, tilt adjustment for back in 3 position locking with antishock feature, pneumatic height adjustment of 8.5 cm spine bracket made of aluminum die cast piece connecting to back with mechanism, pedestal made of die cast aluminium fitted with 5 nos. twin wheel castors (castor wheel dia. 6.0 cm approx.), base pedestal dia 71.0cm (approx.) and pitch center dia. 67.0 cm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Basic Rate : 13387.50	Nos.	472	17323.29	8176594.00	
15.0	Manufacturing, providing and Placing Mid Back revolving Visitor chairs for Dy. Director/LVI 12,13,11 Cabin of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

15.1	Providing and placing Mid Back chairs for Dy. Director/LV1 12,13 Cabin. Chair Overall size: 680Wx 680Dx 960 - 1050H mm, , Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, seat size 450 - 460 mm depth (approx.), 490 - 500 mm width (approx.), sub assembly back size 540 mm- 620 mm height. (approx.), effective back height from Seat - 560-570 mm (approx.), polyurethane foam for seat having density $\geq 45 \text{ kg/m}^3$ kg/m³, armrest top injection moulded in polyurethane and mounted on the injection moulded height adjustable type armrest, armrest height adjustable up to 4.5 cm (approx) in 3 steps & width movement adjustable, 360 degree revolving type. mechanism, single point control for seat and back adjustment, front pivot for tilt, tilt adjustment for back in 3 position locking with antishock feature, pneumatic height adjustment of 8.5 cm spine bracket made of aluminum die cast piece connecting to back with mechanism, pedestal made of die cast aluminium fitted with 5 nos. twin wheel castors (castor wheel dia. 6.0 cm approx.), base pedestal dia 65.0cm (approx.) and pitch center dia. 71.0 cm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Basic Rate : 11625.00	Nos.	1143	15042.58	17193669.00	
16.0	Manufacturing, providing and Placing High Back revolving chairs for Lvl 8,9,10 Cabin of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

16.1	Providing and placing High Back chairs for Lvl 8,9,10 Cabins. Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, Overall chair size: W63.0 -67.0cms , D 63.0-67.0cm , H112.5.0-121.5cm, seat size 44.5 - 52.5 cm depth (approx.), 46.4 - 51.0 cm width (approx.), sub assembly back size 55.5 cm- 62 cm height. (approx.), effective back height from Seat - 57 cm (approx.), polyurethane foam for seat having density $\geq 45 \text{ kg/m}^3$ kg/m3, armrest top injection moulded in polyurethane and mounted on the injection moulded height adjustable type armrest, armrest height adjustable up to 4.5 cm (approx) in 3 steps & width movement adjustable, 360 degree revolving type mechanism, single point control for seat and back adjustment, front pivot for tilt, tilt adjustment for back in 3position locking with antishock feature, pneumatic height adjustment of 8.5 cm spine bracket made of aluminum die cast piece connecting to back with mechanism, The pedestal shall be made of nylon base.it shall be fitted with 5 nos twin wheel castor. The size of the pedestal shall be 670 mm pitch-centre-dia, 700-720mm with castors). The twin wheel castors shall be made of Nylon injection moulded in black color. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Basic Rate : 11550.00	Nos.	1087	14945.28	16245519.00	
17.0	Manufacturing, providing and Placing Mid Back revolving chairs for Workststion & Lvl 8,9,10 cabin Visitor Back of approved make (as per finally approved sample by department) of following dimensions with the following specifications.					

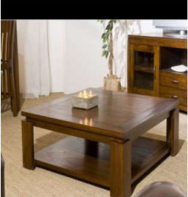
17.1	Providing and placing Mid Back chairs for Workstation & Lvl 8,9,10 cabin Visitor . Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, Overall chair size: W61.0 -62.0cms , D 61.0-63.0cm , H96.0-105.0cm, Seat size 46.5 - 51.5 cm depth (approx.), 45.4 - 51.0 cm width (approx.), sub assembly back size 55.5 cm- 62 cm height. (approx.), effective back height from Seat - 57 cm (approx.), polyurethane foam for seat having density $\geq 45 \text{ kg/m}^3$ kg/m^3, armrest top injection moulded in polyurethane and mounted on the injection moulded height adjustable type armrest, armrest height adjustable up to 4.5 cm (approx) in 3 steps & width movement adjustable, 360 degree revolving type. mechanism, single point control for seat and back adjustment, front pivot for tilt, tilt adjustment for back in 3position locking with antishock feature, pneumatic height adjustment of 8.5 cm spine bracket made of aluminum die cast piece connecting to back with mechanism, The pedestal shall be made of nylon base.it shall be fitted with 5 nos twin wheel castor. The size of the pedestal shall be 670mm pitch-centre dia, 700-720mm with castors). The twin wheel castors shall be made of Nylon injection moulded in black color. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality Basic Rate : 8850.00	Nos.	4480	11452.21	51305901.00	
18.0	Manufacturing, providing –and Placing Medium height Storages (as per finally approved sample by department) of following dimensions with the following specifications.					

18.1	Providing & Placing of Medium Height metal storage with prelam MDF board shutter & top. Storage body and shelf shall be made of 1.2 mm CRCA steel sheet, Shelves and doors should have stiffeners for better strength and load bearing capacity. Hinges for better adjustment of doors. Chrome plated three way Recess type spring loaded rectangular snap shut handle cum lock with duplicate keys. Storage unit shall be made of 100% virgin Epoxy Powder Coated CRCA steel confirming to IS : 513 CR2 (Cold Reduced Carbon Steel Sheets & Strips (Part 1), 2016, procured from primary manufacturers like TATA Steel, SAIL RINL, Jindal etc. (Manufacturer Test Certificate to be produced). Furthermore, Complete material shall pass through 7 stage, NANO-TECHNOLOGY based Pre-treatment plant prior to powder coating to make corrosive resistant. Powder coating should be done on Fully Automatic Powder Coating Plant to ensure smooth, uniform and highest quality levels of Powder Coating Each Compartment's shelf should have uniformly distributed load capacity of >45 kg. Front of Medium height Storages should be made out of 18 mm thick prelam MDF board (E-1 Grade), prelam MDF board finish with 2mm PVC edge- banding fitted with extruded aluminum handle as per requirement. Storages should be provided with adjustable levellers Door Lock should be of three- way lock mechanism. Door should be provided with Hinge-damping mechanism to enable soft closing of doors. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality					
18.1.1	750mm W x 450mm D x 1200mm H	each	5000	18148.40	90741980.00	
19.0	Manufacturing, providing and placing in position machine made factory assembled Sofas for lobby & waiting Area (as per finally approved sample by department) of following dimensions with the following specifications.					

19.1	Providing and placing in position fully upholstered sofa of box form with square arms and stainless steel sled base, of approved design as per reference image and approved shop drawing. Frame of good quality hardwood, duly seasoned and free from knots, sap and warp, treated with anti-termite paint of approved brand and manufacture. Seat platform on M.S. helical springs, sides and back webbed with jute strips, with polyfill covered with jute cloth and finished with thick marking cloth. PU foam of approved make, non-CFC — seat 100 mm thick of 40-45-32 kg/cum density, back 60 mm thick of 35-40 kg/cum, inner faces of sides 45 mm thick of 40-45 kg/cum, outer faces of sides and rear of back 25 mm thick of 35-40 kg/cum; seat and back cushions, cores wrapped in bonded polyester fibre. Seat resting on concealed stainless steel frame supported on continuous chrome-plated sled base of flat section with radiused corners, 225 mm high, fixed with concealed fixings; all stainless steel work of Grade SS 304 with welds ground smooth and polished; clear height of sofa body 200-250 mm (approx.). Fully upholstered on all faces including rear in A-grade embossed leatherette of approved shade, 360 GSM, 100% polyester, 140 cm width, plain tailored with single-needle seams, without piping or buttoning; finished width of arm 100 mm after upholstery. Including injection-moulded plastic adjusters in black colour at each bearing point and all hardware, fixings, adhesives, lining and consumables required to complete the item. Complete in all respects as directed by the Engineer-in-Charge.					
19.1.1	2 seater sofa overall dimension - 1480-1530mm W x 709mmD x 780-820mm H. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality	each	152	35195.36	5349694.00	
20.0	Manufacturing, providing and placing in position machine made factory assembled Sofas for Other Cabins (as per finally approved sample by department) of following dimensions with the following specifications.					

20.1	Providing and placing in position fully upholstered sofa of box form with square arms on tapered solid wooden legs, of approved design as per reference image and approved shop drawing. Wooden structure fabricated from hardwood of approved quality, duly seasoned and anti-termite treated with approved chemical and methodology. Wooden base frame provided with M.S. helical springs together with high quality elastic belt of 70–80 mm; sides and back with elastic belt of 40–60 mm; seat and back covered with jute, foam covered with Polyfilla and finished with thick marking cloth before final finish in fabric (Titch). PU foam of approved make — seat 100 mm thick of 40–45 kg/cum density, back 50 mm thick of 32–40 kg/cum, inner faces of sides 45 mm thick of 32–40 kg/cum, outer faces of sides and rear of back 25 mm thick of 35–40 kg/cum; 2 nos. seat and 2 nos. back cushions. Seat shell resting on legs of solid wooden section, 50–180 mm high, finished in White Ash / Teak wood polish with P.U. coat; base of sofa infilled with suitable wooden sections / prelam particle board so as to give proper support to the seat; height of base of sofa 75–220 mm (approx.). Fully upholstered on all faces including rear in fabric of approved quality and shade, duly embossed, plain tailored without piping or buttoning; finished width of arm 100–180 mm (approx.) after upholstery. Including providing and fixing of all other required materials, hardware, fixings, adhesives, lining and consumables to complete the item. Product to carry 5 years warranty from date of completion of the project, and to be certified to BIFMA LEVEL 3 (Gold) or higher and certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Complete in all respects as directed by the Engineer-in-Charge.					
20.1 .1	2 seater sofa overall dimension - 1430-1480mm W x 706mm D x 680-700mm H	each	215	50868.44	10936715.00	
20.1 .2	1 seater sofa overall dimension - 730-780mm W x 709mm D x 680-700mm H	each	215	31894.94	6857412.00	
21.0	Manufacturing, providing and placing in position machine made factory assembled Sofas for Secretary/ AS/ JS Cabins (as per finally approved sample by department) of following dimensions with the following specifications.					

21.1	Providing and fixing continuous sofa of approved design as per reference image and approved shop drawing, comprising single-seater, two-seater and three-seater modules capable of being ganged together to form continuous seating. Side and back covers of 18 mm thick factory pressed BWP grade marine ply conforming to IS 710 of approved brand, decorative and laminated, finished with fire retardant fabric of approved make, with necessary hardwood and plywood framing. Wooden structure fabricated from hardwood of approved quality, duly seasoned and anti-termite treated with approved chemical and methodology. Wooden base frame provided with M.S. helical springs together with high quality elastic belt of 70–80 mm; sides and back with elastic belt of 40–60 mm; seat and back covered with jute, foam covered with Polyfilla and finished with thick marking cloth before final finish in fabric of approved quality. PU foam of approved make, medium firm — seat 100 mm thick of 40–45 kg/cum density, back 50 mm thick of 32–40 kg/cum, inner faces of sides 45 mm thick of 32–40 kg/cum, outer faces of sides and rear of back 25 mm thick of 35–40 kg/cum. Seat shell resting on legs of solid wooden section, tapered, 50–180 mm high, finished in White Ash / Teak wood polish with P.U. coat; base of sofa infilled with suitable wooden sections / prelam particle board so as to give proper support to the seat; height of base of sofa 80–160 mm (approx.). Fully upholstered on all faces including rear in fabric of approved quality and shade, duly embossed, of 137 ± 2 cm width and 615 GSM, suitable for heavy-use applications, plain tailored without piping or buttoning; finished width of arm 90–120 mm (approx.) after upholstery. Including providing and fixing of ganging / linking hardware and all other required materials, hardware, fixings, adhesives, lining and consumables to complete the item. Product to carry 5 years warranty from date of completion of the project, and to be certified to BIFMA LEVEL 3 (Gold) or higher and certified by SCS Global Services under Indoor Advantage Gold for indoor air quality. Complete in all respects as directed by the Engineer-in-Charge.					
21.1 .1	3 seater sofa overall dimension - 1830mm W x 640-680mm D x 700-740mm H, Seating Height 425mm	each	24	64286.11	1542867.00	
21.1 .2	2 seater sofa overall dimension - 1291mm W x 640-680mm D x 700-740mm H, Seating Height 425mm	each	78	50868.44	3967738.00	
21.1 .3	1 seater sofa overall dimension - 752mm W x 640-680mmD x 700-740mmH, Seating Height 425mm	each	162	31894.94	5166980.00	

22.0	Manufacturing, providing and Placing Centre & Corner table for Minister/Secretary Cabin (as per finally approved sample by department) of following dimensions with the following specifications.					
22.1	Providing and Fixing Minister/Secretary Cabin Centre Table of size 1200 mm (W) × 600 mm (D) × 450 mm (H), comprising a 18 mm thick top and bottom shelf, comprising of 1st class superior teakwood frame and top and bottom shelf and infills with veneer on MDF. The table shall be finished teak wood with polish and all exposed surface edges shall be sealed with 2 mm thick PVC edge banding. Overall Size: 1200 mm (W) × 600 mm (D) × 450 mm (H). Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality	each	24	14022.88	336549.00	
22.2	Providing and fixing Minister/Secretary Cabin Corner table Size- 450mm W x 450mm D x 400mm H comprising of 1st class superior teak wood (exterior grade PU polish) with 12mm thick toughened tinted glass for top. The top frame shall have recess to receive the top glass.. Product shall have 5 year warranty from completion of the project	each	48	8358.07	401187.00	
23.0	Manufacturing, providing and Placing Centre & Corner table for (as per finally approved sample by department) of following dimensions with the following specifications.					
23.1	Providing and fixing Centre table of Size - 900mm W x 600mm D x 365mm H for whose top, side & Base are made of prelam MDF board Grade (same type of lamination on both faces) E-1 (Environmental Friendly), thickness 18mm, Edge banding (PVC) 2mm. Support legs shall be provided of lockable nylon castor wheel or SS legs, as approved by the department. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality	each	64	11878.38	760217.00	

23.2	Providing and fixing Side table of Size - 450mm W x 450mm D x 400mm H for whose top, side & Base are made of 18 mm prelam MDF board (same type of lamination on both faces) Grade E-1 (Environmental Friendly), Edge banding (PVC) 2mm. Support legs shall be provided of locakable nylon castor wheel or SS legs, as approved by the department. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality	each	405	9679.40	3920159.00	
24.0	Manufacturing, providing and placing in position machine made factory assembled Meeting Table for Minister/ Secretary/ AS/JS Cabin (as per finally approved sample by department) of following dimensions with the following specifications.					
24.1	Providing & Placing of Meeting Rooms Table for Minister/ Secretary/ AS/JS Cabin whose top is made of 36mm thick bevelled edge prelam MDF board E-1 (Environmental Friendly) with 3.5-4 mm thick top veneer surface, Edge banding (PVC) 2mm. E1 grade prelam MDF board with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The wiring tray is made of 1.2 mm thick CRCA steel, Epoxy powder coated (50 micron) spray colour, baked at temperature $200\text{ }^{\circ}\text{C}$. Raceways contain the horizontal cable channel that fitted with a modesty panel tidily and effectively. Table shall be provided with cover for wire tray and anodized aluminum access panels. The under structure is made of 50 mm apparently thick prelam MDF board Grade E-1 (Environmental Friendly) with Edge banding (PVC) 2mm. E1 grade prelam MDF board with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality					
24.1.1	9 Pax Meeting Table : 3000W x 1200D x 740-760Hmm	each	24	160981.00	3863544.00	
	Cafeteria –	–				
25.0	Manufacturing, providing and Placing High table of following dimensions with the following specifications.					

25.1	Providing and fixing tables of High table Counter - 2700mm W x 600mm D x 1000mmH. High Table top is made of prelam MDF board Grade E-1(Environmental Friendly), thickness 25 mm with prelam MDF board, Edge banding (PVC) 2mm.E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The under structure is made of MS epoxy Powder coated (minimum 50 micron thick) base leg with supporting MS plate. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality	each	20	29147.00	582940.00	
26.0	Manufacturing, providing and Placing High chair of following dimensions with the following specifications.					
26.1	The highchair with overall dimensions of 480mm in width, 440mm in depth, and 990mm in height, with a seatng height of 760-800mm. The chair features a lightly cushioned seat with epoxy coated metal pipe legs. The product is BIFMA Gold-rated and SCS Global certified for inhouse air quality, ensuring compliance with industry standards. Product shall have 5-year warranty, reflectng its quality and durability. All specificatons are completed as per the manufacturer's guidelines, approved samples, and the directon of the Engineer-inCharge.	each	20	12556.00	251120.00	
27.0	Manufacturing, providing and placing in position machine made factory assembled Cafeteria Table of following dimensions with the following specifications:					

27.1	Providing and placing Cafe table, Worktop shall be made out of 25mm thick E-1 grade (Environmental Friendly) prelam MDF board cover with all the edges of worktop shall be provided with machine pressed 2 mm thick ABS edge banding glued with hot melt EVA glue. E1 grade prelam MDF board with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The under structure is made of 2 mm thick Steel square pipe dimension 50 X 50 mm with Epoxy powder coated spray paint, baked at temperature 200 C° coated of 70-80 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method). Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality					
27.1.1	Square Table of Size - 900mm W x 900mm D x 740 - 750 mm H	each	6	19796.66	118780.00	
27.1.2	Rectangular Table of Size - 1200mm W x 900mm D x 740 - 750 mm H	each	4	22546.36	90185.00	
27.1.3	Rectangular Table of Size - 1800mm W x 900mm D x 740 - 750 mm H	each	20	26397.49	527950.00	
28.0	Manufacturing, providing and placing in position machine made factory assembled Cafeteria Chair of following dimensions with the following specifications:					
28.1	The cafeteria chairs must feature a comfortable ergonomic design. The backrest should be 400mm to 420mm in height and 470mm to 490mm in width. The seat and Understructure are to be made from polypropylene plastic (PP) injection moulded in a specific design. The seat and back must be constructed from high-impact strength polypropylene polymer (PP) with indoor-grade UV resistance. The seat size should be 510mm in width and 525mm in depth, with a minimum seating height of 790mm. The chairs are to be available in vibrant colours derived from organic pigments. Epidium leg bushes must be provided to prevent scratches on flooring. The product is BIFMA Gold-rated and SCS Global certified for inhouse air quality, ensuring compliance with industry standards. Product shall have 5-year warranty, reflecting its quality and durability. All specifications are completed as per the manufacturer's guidelines, approved samples, and the direction of the Engineer-in-Charge.	each	122	5829.00	711138.00	
29.0	Manufacturing, providing and placing in position machine made factory assembled Metal Almirah of following dimensions with the following specifications:					

29.1	Supplying and fixing in position Knock Down Steel Almirah – Overall Size - 900W x 480D x 1980H mm Having 4 shelves making 5 compartments, Whole body, doors and shelf made of minimum 0.8mm CRCA sheet, Shelves and doors should have stiffener for better strength and load bearing capacity. Auto closing CED Coated “HETTICH”/ “HAEFFLE” / equivalent Hinges for better adjustment of doors. Chrome plated three way Recess type spring loaded rectangular snap shut handle cum lock with duplicate keys Highly durable – Made of 100% virgin, Epoxy Powder Coated, CRCA confirming to IS : 513 CR2 (Cold Reduced Carbon Steel Sheets & Strips (Part 1), 2016, procured from TATA Steel (TestCertificate available on request). Furthermore, Complete material passes through 7 stage, ultra-modern NANOTECHNOLOGY based Pre-treatment plant prior to powder coating, making it highly corrosive resistant. Superior Finish – 50 micron epoxy polyester Powder coating done on Fully Automatic Powder Coating Plant. Rigid Knock Down Construction done out of complete minimum 0.8 mm thick CRCA sheet. Each Compartment Shelf has uniformly distributed load capacity not less than 45 Kg. The rigid construction gives extra strength and durability, whereas the epoxy-polyester adds the finishing touch to the unit. Logistic Friendly – 100% Knock Down product makes transportation a very easy and SAFE, product gets assembled at site only. Design Simplicity - Simplistic Design with “NO PEDESTAL” at bottom makes for an aesthetic look and seamless finish, apart from offers large storage capacity that makes sure you have enough space for storage. Product shall have 5 year warranty from completion of the project and shall be certified to BIFMA and shall be certified by SCS Global Services under Indoor Advantage Gold for indoor air quality	each	500	25784.00	12892000.00	
Total					77,10,74,237.00	
Total Furniture (B)					77,10,74,237/-	
Total (Civil A+ Furniture B)					208,05,44,676/-	

Part- C

Particular Specifications

for

Electrical & Mechanical Works

PROFORMA OF SCHEDULES

SCHEDULE 'A'

Schedule of quantities: As per NIT document

SCHEDULE 'D'

Extra schedule for specific requirements/documents for the work, if any

As per NIT document

SCHEDULE 'E'

Reference to General Conditions of contract – GCC 2023 Construction Works shall be applicable in this contract along with up-to-date amendments, if any up to the last date/extended date of submission of bid.

Name of work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.

Estimated cost of the work:	Rs. 1969032707 - (For Original work Rs. 188,63,41,343+ For Operation and Comprehensive Maintenance Rs. 82691364)
(i) Earnest Money	As per Schedule F of Major Component
(ii) Performance Guarantee	As per Schedule F of Major Component
(iii) Security Deposit	As per Schedule F of Major Component

SCHEDULE 'F'

(GENERAL RULES & DIRECTIONS)

Officer inviting tender	As per Schedule F of Major Component
Maximum percentage of quantity of items of work to be executed beyond which rates are to be determined in accordance with Clause 12.2 & 12.3	See below under clause 12

Definitions:

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

(i)	Engineer-in-Charge	Executive Engineer (Electrical), Central Vista Project Electrical Division-II, CPWD, A 503, IP Bhawan New Delhi or successor thereof.
(iv)	Accepting Authority	As per Schedule F of Major Component.
(v)	Percentage on cost of materials and Labour to cover all over heads and profits	15%
(vi)	Standard of schedule of rates	DSR(E&M) 2025 amended upto the last date of receipt of tender/Market Rate.
(vii)	Department	Central Public Works Department (CPWD)
(viii)	Standard CPWD Contract Form	As per Schedule F of 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. (ii)Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period as provided in (i) above	As per Schedule F of Major Component As per Schedule F of Major Component
Clause 2	Authority for fixing Compensation under Clause 2	As per Schedule F of Major Component
Clause 5	Number of days from the date of issue of letter of acceptance for reckoning date of start	As per Schedule F of Major Component

TABLE OF MILE STONES

Sl. No.	Description of milestone	Time allowed in days (from date of start)	Amount to be with-held in case of non-achievement of mile stone.
As per Schedule F of Major Component			

Time allowed for execution of work**Construction Work:**

As per Schedule F of Major

Component

Authority to decide:

(i) Extension of time	As per Schedule F of Major Component
(ii) Rescheduling of milestones	As per Schedule F of Major Component
(iii) Shifting of date of start in case of delay in handing over of site	As per Schedule F of 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
Total	Handing Over of site	As per Schedule F of Major Component	As per Schedule F of Major Component

Clause 6 Mode of Measurement: Computerized Measurement Book (CMB)

Clause 7 Gross work to be done together Rs 16 Cr
with net payment /adjustment of
advances for material collected, if
any, since the last such payment
for being eligible to interim
payment

Clause 7A Whether Clause 7A shall be applicable As per Schedule F of Major Component

Clause 8A Authority to decide compensation Superintending Engineer (E),
on account if contractor fails to CVPEC-II, CPWD, A 501, IP
submit completion plans Bhawan New Delhi or successor
thereof

Clause 10A	List of testing equipment to be provided by the contractor at site lab.	Earth tester, TDS meter, Tong tester, Multimeter, Digital Thermometer, Conduit Bending Machine, Digital & Analog Vernier Caliper, Digital & Analog Screw Guage, Megger, Lux meter, Electrical wire drawing equipment etc. The above-mentioned list is not exhaustive in nature and the testing equipments to be provided at the site shall be as per actual requirement.
Clause 10 B (ii)	Whether clause 10-B (ii) shall be applicable.	As per Schedule F of Major Component

Clause 10 C	Component of labour expressed as percentage of value of work	15%
Clause 10 CC	Not Applicable	
Clause 11	Specifications to be followed for execution of work:	
For Electrical Works	As per CPWD General Specification for electrical work Part-I Internal – 2023, Part-II External-2023, Part IV Substation– 2013, Part V Wet-riser & Sprinkler Systems – 2020, Part – VI Fire Detection & Alarm System – 2018, Part -VIII Gas based fire extinguishing system- 2013, Heating, Ventilation & Air-Conditioning(HVAC) – 2024, and any other specifications as mentioned in Part C and as amended up to last date of submission of bid and specifications mentioned in NIT.	
Clause 12	Yes, applicable as per OM DG/CON/Construction/2023/03 dated: 06.12.2023	
Clause 12.2 and 12.3:	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building and other works: -	100% (One Hundred Percent)
Clause 12.4	(i) Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except items mentioned in earth work subhead in DSR & related items) (ii) Deviation Limit for items mentioned in earth work subhead of DSR and related items	Not Applicable Not Applicable
Clause 16	Competent Authority for Deciding reduced rates:	

	For Electrical items of work	Upto 5% of contract value: Chief Engineer, CVPEZ-I, CPWD, Room No. 308, Vidyut Bhawan, New Delhi-110001 or successor thereof. Beyond 5%: Chief Engineer, CVPEZ-I, CPWD, Room No. 308, Vidyut Bhawan, New Delhi-110001 or successor thereof, with prior in Principle Approval of SDG(PRND), CPWD, New Delhi.
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Clause 18: Earth tester, TDS meter, Tong tester, Multimeter, Digital Thermometer, Conduit Bending Machine, Digital & Analog Vernier Caliper, Digital & Analog Screw Gauge, Megger, Electrical wire drawing equipment etc. The above mentioned list is not exhaustive in nature and the testing equipments to be provided at the site shall be as per actual requirement.

Clause 19 C: As per Schedule F of Major Component.

Clause 19 D As per Schedule F of Major Component

Clause 19 G: As per Schedule F of Major Component

Clause 19 K: As per Schedule F of Major Component

Clause 25: As per Schedule F of Major Component

Clause 32 Requirement of Technical Representative(s) and Recovery
: Rate

S. 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 non-fulfilling of requirement
	Qualification	Number			
1.	Graduate Engineer (Electrical)	1	20 years (and having experience of one similar nature of work)	Project Manager with degree in major discipline of Engineering	Rs. 60,000/- per Month per person

2.	Graduate Engineer (One Electrical)	1	12 years (and having experience of one similar nature of work)	Deputy Project Manager	Rs. 40,000/- per month per person
3.	Graduate Engineer (Electrical/ Mechanical/ Electronics) or Diploma Engineer (Electrical/ Mechanical/ Electronics)	4 (HVAC-1 Number Mechanical Engineer Electrical – 1 number Electrical Engineer Fire Fighting and Fire alarm -1 Number ELV – 1 number Electronic Engineer)	5 or 10 years respectively	Project / Site Engineer	Rs. 25,000/- per Month per person
3.	Graduate Engineer (Electrical/ Mechanical)	1	8 years	Quality Engineer	Rs. 25,000/- per Month per person
4.	Graduate Engineer	1	8 years	Project Planning/ billing	Rs. 20,000/- per month per person

	(Electrical/ Mechanical)				
1. The Technical Representative mentioned at S.No. 1, 4 are to be deployed for full contract period.					

Clause 38: Not applicable as given below

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION		
i)	Schedule/statement for determining theoretical quantity of cement & bitumen based on Delhi Schedule of Rates	Not Applicable
ii)	Variations permissible on theoretical quantities.	
(a)	Cement	Not applicable
	Cement for works with estimated cost put to tender more than Rs. 5 Lakh.	Not applicable
	Bitumen for all works.	Not applicable
(b)	Steel reinforcement and structural steel sections for each diameter, section and category.	Not applicable
(c)	All other materials	Nil

Provision of Independent External Monitors:

As per schedule F of Major Component

**PRE-QUALIFICATION CRITERIA FOR ASSOCIATION OF SPECIALIZED
AGENCY FOR E&M WORK FROM SUB-HEAD C-1 TO C-7**

**Sub-Head C-1: EI & FANS, ELECTRICAL PANELS, UPS, LIGHTING FIXTURE
(ECPT - Rs. 39,05,36,408.00)**

- a) CPWD registered contractor in appropriate class of composite category.
- b) Electrical contractor licence OR undertaking that they will obtain either valid electrical licence at the time of execution of electrical work OR associate contractor having valid electrical licence of valid class

Note: if main contractor is not itself registered in CPWD in appropriate class he will associate CPWD registered contractor in appropriate class of composite category.

Sub-Head C-2: Fire Alarm System & PA System (ECPT- Rs. 3,61,81,743.00)

The successful tenderer has to Associate a specialized agency satisfying following

Having satisfactorily completed similar work of following magnitude during the last 7 years ending last day of the month previous to the one in which tenders are invited:

- a. Three similar completed works each costing not less than Rs 145 Lacs
OR
- b. Two similar completed works each costing not less than Rs. 217 Lacs
OR
- c. One similar completed works costing not less than Rs. 289 Lacs

Definition of similar works: Similar works shall mean **"Supply, Installation, testing & commissioning of Addressable fire alarm system work"**.

The value of executed similar 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 last date of submission of bid.

Sub-Head C-3: Fire Fighting System (ECPT- Rs. 4,58,85,307.00/-)

The successful tenderer has to Associate a specialized Agency satisfying following:

Having satisfactorily completed similar work of following magnitude during the last 7 years ending last day of the month previous to the one in which tenders are invited:

- a. Three similar completed works each costing not less than Rs 184 Lacs
OR
- b. Two similar completed works each costing not less than Rs. 275 Lacs
OR
- c. One similar completed works costing not less than Rs. 367 Lacs

Definition of similar works: Similar works shall mean **"Supply, Installation, testing & commissioning of water based firefighting system"**.

The value of executed similar 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 last date of submission of bid.

Sub-Head C-4: HVAC (ECPT- Rs. 47,12,84,828.00/-)

The successful tenderer has to Associate a specialized Agency satisfying following:

Having satisfactorily completed similar work of following magnitude during the last 7 years ending last day of the month previous to the one in which tenders are invited:

- (i) One similar completed works costing not less than Rs. 1885 Lacs
OR
- (ii) Two similar completed works each costing not less than Rs. 2828 Lacs
OR
- (iii) Three similar completed works each costing not less than Rs. 3770 Lacs

Definition of similar works: Similar works shall mean **"Supply, Installation, testing & commissioning of Heating Ventillation and Air Conditioning system"**.

The value of executed similar 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 last date of submission of bid.

Sub-Head C-5: Audio Video System (ECPT- Rs. 41,71,51,490.00/-)

The successful tenderer has to Associate a specialized Agency satisfying following:

Having satisfactorily completed similar work of following magnitude during the last 7 years ending last day of the month previous to the one in which tenders are invited:

- a. Three similar completed works each costing not less than Rs 1669 Lacs
OR
- b. Two similar completed works each costing not less than Rs. 2503 Lacs
OR
- c. One similar completed works costing not less than Rs. 3337 Lacs

Definition of similar works: Similar works shall mean **"Supply, Installation, testing & commissioning of Audio Video System"**.

The value of executed similar 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 last date of submission of bid.

Sub-Head C-6: IBMS (ECPT- Rs.6,32,99,406.00)

The successful tenderer has to Associate a specialized Agency satisfying following:

Having satisfactorily completed similar work of following magnitude during the last 7 years ending last day of the month previous to the one in which tenders are invited:

- a. Three similar completed works each costing not less than Rs 253 Lacs
OR
- b. Two similar completed works each costing not less than Rs. 380 Lacs
OR

- c. One similar completed works costing not less than Rs. 506 Lacs

Definition of similar works: Similar works shall mean “**Supply, Installation, testing & commissioning of Integrated Building Management System**”.

The value of executed similar 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 last date of submission of bid.

Sub-Head C-7: ICT (ECPT- Rs. 45,51,87,656.00)

The successful tenderer has to Associate a specialized Agency satisfying following:

Having satisfactorily completed similar work of following magnitude during the last 7 years ending last day of the month previous to the one in which tenders are invited:

- a. Three similar completed works each costing not less than Rs 1821 Lacs
OR
- b. Two similar completed works each costing not less than Rs. 2731 Lacs
OR
- c. One similar completed works costing not less than Rs. 3642 Lacs

Definition of similar works: Similar works shall mean “**Supply, Installation, testing & commissioning of Information & Communication Technology systems**”.

The value of executed similar 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 last date of submission of bid.

Sub-Head C-8: Kitchen Equipments (ECPT- Rs. 68,14,505.00)

The successful tenderer has to Associate a specialized Agency satisfying following:

Having satisfactorily completed similar work of following magnitude during the last 7 years ending last day of the month previous to the one in which tenders are invited:

- a. Three similar completed works each costing not less than Rs 27 Lacs
OR
- b. Two similar completed works each costing not less than Rs. 41 Lacs
OR
- c. One similar completed works costing not less than Rs. 55 Lacs

Definition of similar works: Similar works shall mean **"Supply, Installation, testing & commissioning of Kitchen Equipments"**.

The value of executed similar 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 last date of submission of bid.

In support of the eligibility conditions of the proposed Associated Specialized Agency, the consent letter, the work experience (completion certificate), Valid Electrical License, the copy of MoU and other documents as specified in the NIT or as required by Engineer-in-Charge shall be submitted to the **Executive Engineer, Central Vista Project Electrical Division-2**.

The applicant shall either himself meet the eligibility conditions for the respective E&M packages or otherwise, he will have to associate an agency meeting the eligibility requirements as given in this tender document and submit the details as per **Form "G"** given in Part C of this tender document

The applicant/ main contractor has to submit consent letters as per **Form "H"**, given in Part C of this tender document from eligible associate agency of the respective component of E&M work for each of the component of E& M works by clearly indicating the component of work

The main contractor should submit an affidavit of MoU signed with eligible associated contractor. The MoU in the enclosed **Form 'I'** shall be signed by both the parties, main contractor as 1st party and associated contractor as 2nd party independently for all electrical and mechanical components.

The Associate specialized Agency will submit undertaking stating that firm/agency is not debarred from any government agency as on the day of application for tender participation.

The Associate agency will have to submit the undertaking stating that the 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.

In case the main contractor intends to change any of the above agency / agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-Charge of relevant specialized component(s). The new agency / agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-Charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.

Such associates shall also give an undertaking along with the main tenderer but both of them together will stand guarantee for the equipments

already supplied for which payment has been released by the department in part. If any equipment supplied for the work, during the currency of the earlier Associate contractor and paid partly by the Dept., becomes redundant / not in a position to be installed and commissioned and put to beneficial use due to change in agency for execution of E&M work, the main contractor shall be liable for replacement of the equipment(s) at no cost to Department. No change of Associated Contractor will be allowed without prior approval of the Engineer-in-charge of the work.

FORM –G

PROPOSAL FOR ELIGIBLE ASSOCIATING AGENCIES FOR MINOR COMPONENTS OF WORK

Name of work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.

I/we hereby propose the following agencies as per mentioned against each for executing corresponding minor component of work. Their consent letters are also attached.

S. No	E&M Component	Name of Associate Contractor	Category and Class of registration	Enlistment copy/ completion Certificates attached	Monetary Limit of work	Validity of registration	Consent letter attached (Yes/ No)
1							
2							
3							

Note: Self Attested photocopies of enlistment order, valid electrical contractor license for E&M work shall be submitted by the main contractor/associated contractor whoever is eligible.

Signature of contractor(s)

MEMORANDUM OF UNDERSTANDING [M.O.U] BETWEEN

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

Enlistment Status

Valid upto:

[Henceforth called the main contractor]

And

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

Enlistment Status

Valid upto:

[Henceforth, called Associated Contractor]

Name of Work: -Specify the E&M Services.

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

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

us shall be responsible for the execution of work as per the agreement to the extent of this MOU allows. Both the parties shall be paid consequent to the execution as per agreement to the extent this MOU permits.

We have agreed as under:

- 1- The associated contractor shall be liable for disciplinary action if he failed to discharge the action(s) and other legal action as per agreement besides forfeiture of the security deposit.
- 2- All the material, machinery and equipments, tools and tackles required for execution of the electrical works as per agreement shall be the responsibility of the associated contractor.
- 3- The site staff required for the electrical work shall be arranged by the associated contractor as per terms and conditions of the agreement.

Signature of main contractor

Signature of associate contractor

Date:

Date:

Place

Place:

Countersigned by executive Engineer

WILLINGNESS CERTIFICATE

Name of Work:

Sub work:

Agreement No:

I hereby give my willingness to work as associated contractor for the above-mentioned work. I will execute the work as per specifications and conditions for the agreement and as per direction of the Engineer-in-charge. Also, I will employ full time technically qualified supervisor for the works. I will attend inspection of officers of the department as and when required.

Date:

Signature of Contractor

Certificate to be furnished by Agency and their Specialized agencies under Rule 144 (xi), in the General Financial Rules (GFRs), 2017 (added vide OM F. note 6/18/2019-PPD dated. 23rd July 2020)

CERTIFICATE

"I have read the clauses regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub- contracting to contractors from such countries, I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. I hereby certify that this bidder fulfills all the requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]". It is also certify that Amendment to Rule 144(xi) of the General Financial Rules (GFRs), 2017 vide No.F.7/10/2021-PPD dtd. 23/02/2023 with reads as "Rule 144 of the GFRs, 2017 titled 'Fundamental principles of public buying, had been amended by inserting sub-rule (xi) vide Department of Expenditure (DOE) OM No. F.6/18/2019-PPD dated 23.07.2020. It has now been decided to amend the Rule 144(xi) as under: Notwithstanding anything contained in these Rules, Department of Expenditure may, by order in writing, impose restrictions, including prior registration and/ or screening, on procurement from bidders from, or bidders having commercial arrangements with an entity from, a country or countries, or a class of countries, on grounds of defense of India, or matters directly or indirectly related thereto including national security; no procurement shall be made in violation of such restrictions." may also be abide by me.

[Note: similar certificate may also be obtained from the approved specialized agency for various works by Main agency.]

CHAPTER: 2

GENERAL CONDITIONS FOR ALL E&M SUB HEADS

1. The work shall be generally carried out in accordance with tender/bid specifications and the following specifications / rules.
 - (i) CPWD General Specifications for electrical works, Part-I: Internal -2023 with up-to-date amendments
 - (ii) CPWD General Specifications for electrical works, Part-II: External 2023 with up-to-date amendments
 - (iii) CPWD General Specifications for electrical works Part-IV: Substation-2013 with up-to-date amendments
 - (iv) CPWD General Specifications for electrical works Part-V: Wet riser and sprinkler systems- 2020 with up-to-date amendments
 - (v) CPWD General Specifications for electrical works Part-VI: Fire Detection and Alarm System- 2018 with up-to-date amendments
 - (vi) CPWD General Specifications for Heating, Ventilation and Air Conditioning (HVAC)- 2024 with up-to-date amendments
 - (vii) CPWD General Specifications for electrical works Part VIII Gas Based Fire Extinguishing System 2013
 - (viii) The Indian Electricity Act, 2003, as amended upto date.
 - (ix) Indian Electricity Rules 1956 amended upto date.
 - (x) Additional technical specifications for this work.
 - (xi) National Electrical Code 2023.
 - (xii) National Building Code 2016.
 - (xiii) Relevant IS Codes.
 - (xiv) IEC, ISHRAE/ASHRAE standards.
2. Scope of work covers supply, installation, testing and commissioning of all electrical & mechanical services required to be provided in the said scheme & as detailed in the NIT. The work shall be executed as per scope & specifications of E & M works given hereafter in respective subheads/part of the scheme. If any services/work required to make the building/scheme habitable & functional, including the statutory compliance, is not specifically mentioned in the scope of services, the same is deemed to be included within the scope of this tender.
3. The scope of works also covers the preparation of shop drawings for E&M services, Inventories of fittings, fixtures, equipment's, preparation and submission of room wise HVAC heat load calculation etc., clash free BIM model integrating all the services drawings and approval of the same from the Engineer-in-Charge before commencement of work.
4. The tenderer is advised to read and examine the tender documents for the work and the set of drawings in the tender document and also available in office of Engineer-in-

charge. He should himself inspect and examine the site and its surroundings before submitting his tender.

5. Separate conditions & specification and scope are included in this tender for each of the sub-head.
6. The contractor should schedule the supply of various Electrical & Mechanical equipments/materials in consonance with the progress of other associated works etc. or as per directions of the Engineer-in-Charge so that the equipment can be installed directly on the civil foundation or location of installation without keeping them stored at site on receipt the equipment at site.
7. The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted. The quality assurance programme should include method statement for various items of work to be executed along with check lists to enforce quality control.
8. The contractor shall submit technical data sheet of various materials, equipment and machinery along with the fabrication drawings of equipments and shop drawings of various E&M services mentioned in the tender as per requirement of sites before procurement/execution of materials/work for approval. Material shall be procured only after approval of TDS from the competent authority. Work shall be executed only after approval of shop drawings from the competent authority.
9. Frequency and type of tests of various materials/items/ article shall be conducted as per specifications and relevant BIS-Codes. The test results confirm to the specification/codes and details given in relevant para.
10. After execution, obtaining clearances from the statutory authorities viz. CEA (Central Electricity Authority), local fire authorities and any other local body, shall be the responsibility of the contractor. All statutory fees / charges required for obtaining clearances shall be paid by the department if any in this regard.
11. Reference to 'Bidder' shall be equally applicable to other references such as "Contractor", "Integrator" etc. and vice-versa.
12. For ICT, IBMS & All other Low Voltage Equipment's & Software's, circulars viz. DOT Circular No.18-10/2017-IP dated 29th August 2018, MEITY Circular related to Cyber Security dated 6th December 2019 & MEITY Circular No W-43/4/2019-IPHW-MEITY Dated 7th September issued by DOT & MEITY to be complied by all OEMs. The self-certification mentioned in these circulars to be furnished by OEMs before delivery of Materials.

13. Completeness of the Tender, Submission of Programme, Approval of Drawings and commencement of work

- (i) **Completeness Of Tender:** All sundry equipments, fittings, assemblies, accessories, hardware items, foundation blots, supports, termination lugs for electrical connections, cable glands, junction boxes and all other items which are useful and necessary for proper assembly and efficient working of the various equipments 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 or not.
- (ii) **Submission Of Programme:** Within 15 days of stipulated date of start of work the successful tenderer shall submit his programme / Bar Chart for submission of drawings, supply of equipment at site, installation, testing, commissioning and handing over of the installation to the Engineer-in –charge using the scheduling softwares PRIMAVERA. This programme shall be framed keeping in view the building progress and progress of other component of this agreement and the milestones fixed in Schedule 'F' Clause-5 of CPWD-8 shall be given priority. In case department desires some changes in the same, contractor shall honor the same.
- (iii) While preparing working Drawings, care shall be taken to provide flexible/expandable material to take care of Thermal variations/ seismic vibration/ climatic changes.
- (iv) **Procurement of Material at site:**
- a. The lowest tenderer shall submit before the supply of materials an undertaking from the OEM's for all main equipments system regarding:
 - (i) Authorization Certificate
 - (ii) The OEM shall unconditionally support the lowest tenderer technically throughout the execution of contract as well as for Maintenance/ Comprehensive Maintenance Contract for the useful life of the system.
 - (iii) The contractor shall furnish undertaking from respective OEM's so as to ensure that all necessary spares will be available for each equipment **for minimum 5 years** from the date of completion of work.
 - b. The Qty taken in BOQ are based upon estimate prepared by Department and are indicative. Only the required qty, as worked out by contractor and approved by Department shall be brought at site and paid. Contractor shall CHECK /VERIFY DESIGN and Quantity THOROUGHLY, and suggestions for improvement (additional, substitute items etc) and Deviations, enclosing full justification be given for consideration by department. Orders for such additional/substitute items/deviated qty be placed on suppliers only after getting written confirmation from Department
14. The Contractor shall execute the work on the basis of working drawings, prepared by contractor and approved by department.
15. Site, Movement of Vehicles, Security and VIP movements:

- i. The site is in secured area of Delhi. There are restrictions of plying the type of Vehicle, on registration and on their movements on road during certain times. Contractor shall well acquaint himself about the rules regarding the same. The contractor shall make his own arrangement for getting the permission to ply the trucks from the traffic police. Hence the contractor shall plan his activities in such a manner that supply of material as required at site is received as per requirement. No claim in this regard shall be entertained by the department.
 - ii. At some occasion due to VIP visit / inspection, restriction may be imposed for working in certain areas, no claim what so ever on account of loss of time and labour shall be entertained in this regard.
 - iii. In the event of any restrictions being imposed by the Security agency, CPWD, Traffic 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.
 - a. General Security restrictions are given as under:
 - b. Due to the site restrictions, labour huts at site can not be erected.
 - c. The contractor shall be responsible for behaviour and conduct of his worker. No worker with doubtful integrity or having a bad record shall be engaged by the contractor.
 - d. The labourers / staff should not be changed too frequently once the verification of the character and antecedents is done.
 - e. As and when there will be security requirements, certain additional restriction (s) can be imposed as per the requirement of the situation.
 - f. No claim whatsoever will be entertained by the department on account of any restriction (s) imposed by the security agencies in execution of work.
16. **Site Coordination, Review Meetings and Joint Inspection:** Every Week review and Coordination meeting shall be held at site by CPWD officers/Client, which shall be attended by contractor's representative competent enough to take all sorts of decisions related to work along with his Supervisors. Frequency of such meetings shall be increased or decreased based upon site requirements. Joint Inspection of work site shall be carried out as required.
17. Conformity with statutory Acts, Rules, Standards and codes.
- i. Contractor shall obtain all local / statutory approvals required as per rule of land.
 - ii. All components shall conform to relevant Indian Standard Specifications, wherever existing, amended to date.
 - iii. The contractor shall comply with proper and legal orders and directions of the local or public authority or Municipality and abide by their rules and regulations and pay all fees and charges which he may be liable.

- iv. The contractor shall give due notices to Municipality, Police and /or other authorities that may be required under the law/ rules under force in the and obtain all requisite licenses for temporary obstructions/ enclosures and pay all charges which may be leviable on account of his execution of the work under the agreement. Nothing extra shall be payable on this account.
- 18. **Power Supply & Water Supply:** Power & water supply shall be arranged by the contractor for execution of the work.
- 19. **Machinery for Erection:** During construction as well as maintenance stage all tools and tackles required for unloading/handling /transporting/ testing/ Commissioning/ Maintenance of equipments and materials at site shall be the responsibility of the contractor.
- 20. **Dispatch of Materials to Site and their Safe Custody:** The contractor shall dispatch material to site in consultation with the Engineer-in-Charge. Part of the site may be used for storage of the materials. The arrangement to make it lockable/secure by means of partitions, locks etc. shall be responsibility of the contractor. Watch and ward however, shall also be the responsibility of contractor. Program of dispatch of material shall be framed keeping in view the progress of other works. Safe custody of all machinery and equipment supplied by the contractor shall be the responsibility of the contractor till final taking over by the department. Contractor may note that various other agencies may also be working at site simultaneously. Hence proper arrangement shall be made by the contractor for safety and security of material kept at site as well as elected material.
- 21. **Commencement and Execution of Work:** The contractor shall commence work as soon as the drawings submitted by him are approved either in full or in part as the case may be. The work in general shall be carried out in accordance with the BOQ and Specifications enclosed separately.

The following are general guidelines only:

- i. In order to ensure that the work is carried out according to the programme drawn, the contractor shall ensure adequate supply of the material and employ required workmen strength for execution of work. In case contractor fails to arrange/ employ adequate labour and stick to the programme, the Engineer-in-Charge may supplement the labour, at the cost of the contractor after issue of one day's notice to the contractor. No claims for idle labour on any account shall be entertained. The contractor shall put his authorized representatives daily at the site of work and Enquiry Office for receiving instructions from Assistant Engineer and other inspecting officials of the department. His name and signature shall be attested by the contractor and kept on the record with the department.
- ii. The rooms / sites where the work is to be executed on any day shall be got approved from the representatives of the Engineer-in-Charge at the site of work. No work shall be carried out in any room site without the approval of the representative of the Engineer-in-Charge at the site of work. Works carried out without the approval

of the representative of the Engineer-in-Charge shall be rejected and will not be measured and paid for.

- iii. The E&M services and architectural drawings shall at all times be properly correlated before executing any work. However, in case of any discrepancy in the item given in the schedule of quantities appended with the tender and architectural drawings relating to the relevant item, the former shall prevail unless and otherwise given in writing by the Engineer-in-Charge.
- iv. Work to be executed in planned manner to achieve requisite speed and quality.
- v. The work shall be carried out in the manner complying in all respects with the requirements of relevant bye-laws of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-Charge and nothing extra shall be paid on this account.
- vi. The contractor shall not stack building material/malba on the Municipal land or road or on the land owned by any other authority, as the case may be. In case, the Contractor is found stacking the building material/malba as stated above, he shall be liable to pay the stacking charges as may be levied by NDMC/MCD or any other local body or authority and also to face penal action as per the rules, regulations and bye-laws of the said body or authority. The Engineer-in-Charge shall be at liberty to recover the sums due but not paid to the concerned authorities on the above counts from any sums due to the contractor including amount of the Security Deposit or Retention Money in respect of this contract or any other contract.
- vii. The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor (s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed, so as not to interfere with the operations of other contractors, or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.
- viii. The contractor shall provide at his own cost suitable weightings, measuring and levelling equipments at site for checking the weight, dimensions and levels as may be necessary for execution of the work, if the work is carried out in more than one shift or during night, no claim on this account shall be entertained.
- ix. Existing HVAC/FIRE pipes, cables, cables, panels, wires, water lines etc. all other materials encountered in the course of the execution of the work shall be protected against the damage by the contractor at his own expense. The contractor shall not store materials or otherwise occupy and part of the site in a manner likely to hinder the operation of such services.
- x. The contractor shall be responsible for the watch and ward of the material provided by him against pilferage and breakage during the period of installation and thereafter till the work is physically handed over to the department.

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

22. Coordination with other Agencies:

The contractor shall co-ordinate with all other agencies involved at the site of work so that the work of other agencies is not hampered due to delay in his work. Part of the work directly affecting the progress of work of other agencies, shall be given priority. In case of any such dispute with any agency at site, decision of Engineer in Charge shall be final and binding.

23. Quality of Materials and Workmanship:

- i. The components of the installation shall be such design so as to satisfactorily function under all conditions of operation.
- ii. The entire work of manufacture/fabrication, assembly and installation shall conform to sound engineering practice.
- iii. All equipments and material to be used in work shall be manufactured in factories of good repute having excellent track record of quality manufacturing, performance and proper after sales service.
- iv. Manufacturing date of all materials delivered at site shall not be **1 (one)** year older from the date of delivery of material at site.

24. Care of the Building: Care shall be taken by the contractor during execution of the work to avoid damage to the building. Care shall also be taken by the contractor to avoid the damage to any of these existing service/service lines, any part of the building etc. If any damage is caused to any of the existing services/service lines, or any part of the building the same shall be repaired / rectified and made functional or restored so its original finish by the contractor immediately at his own expenses failing which the same shall be repaired/ rectified and made functional by department at the risk and cost of the contractor. The decision of the Engineer-in-charge in this regard shall be final & binding. He shall also remove all unwanted and waste materials arising out of the installation from the site of work from time to time.

25. Final Inspection and Testing

- i. Final Inspection and testing will be done by the Engineer-in-Charge or his representative as per details indicated in relevant section of Technical Specifications.
- ii. The installation will be offered for inspection by local bodies (Chief Fire Officer, Environmental, Green Building Certification agency, Electrical Inspector, Labour Inspector etc). The contractor or his representative shall attend such inspection, extend all test facilities as are considered necessary, rectify and comply with all observations of the Chief Fire Officer which are part of the agreement and arrange for obtaining necessary FIRE NOC clearance certificate in favor of department. In case contractor fails to attend the inspection and make desired facilities available

during inspection, the department reserves the right to provide the same at the risk and cost of the contractor and impose penalty for the same. The installation will be accepted by the department only after receiving clearance from Chief Fire Officer for the work executed by the contractor under the agreement. But under no circumstances shall this absolve the Contractor of his responsibility for Performance of the Equipment or System.

26. Running in Period and Date of Acceptance:

After the installation work has been completed by the contractor, he will conduct test and make adjustment as may be necessary to satisfy himself that the systems are capable of continuous running as specified in the relevant specifications. Only after completion of Running in period the installation shall be accepted.

27. **Guarantee/Warranty:**

- i. The Contractor shall execute the work on the basis of indicative designs hereby given and accepted by him with or without modifications or new designs submitted by him at the tender stage and accepted by Engineer in charge, as the case may be. All Variations, i.e. additions, omissions or substitutions necessitated at any time for any reason whatsoever, shall be deemed to have been accepted by the Contractor as not vitiating the performance-based nature of this contract. If any such variations, irrespective of whether such variations are intended to be executed by other agencies employed by the Engineer-in-charge, have any bearing on the performance of this Contract, the same shall immediately be brought to the notice of Engineer-in-charge by the Contractor in writing. In any case the Contractor shall have to guarantee for due and proper performance of the works agreed to be so erected.
- ii. The contractor shall **guarantee** the complete system to maintain the specified conditions under all conditions of ambient temperature.
- iii. All systems and its individual equipments will be guaranteed for a period as the details given below from the date of acceptance and taking over of the installation by the department against unsatisfactory performance and/ or breakdown due to defective design, material, manufacture, workmanship or installation.

S. No.	Sub Head	Warranty /Guaranty Period (from Date of Completion)
1	Lighting fixtures all Type	5 years
2	UPS with batteries	3 years
3	Audio Video	3 years
4	IBMS	3 years
5	ICT/IPBX active component	3 years

Undertaking for Warranty/Guarantee: The contractor shall submit the Undertaking from respective OEMs that Items under above Subhead shall stand Guarantee/Warranty for the period specified against each Subhead from the date of completion

For rest of the subheads of E&M works the subhead as a whole and its component equipments will be guaranteed for minimum period as per schedule F of major Component from the date of taking over of installation by the Department. The equipment or component or any part thereof so found defective during the 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 Engineer-in-Charge in this regard shall be final.

28. Procurement of items with aesthetic value and visibility shall be on prior approval of Architect and Engineer in charge for specific area of application for all preferred makes.
29. Test Certificates: Copies of all documents for routine, acceptance and type test certificates of the equipment carried out at the manufacturers premise shall be furnished to the department along with supply of the equipment.
30. **Quality Assurance and testing policy:** The Contractor shall make available, on request from the Department, for record, copies of challans, cash memos, receipts and other certificates, if any, vouchers towards the quantity and quality of various materials procured and the same shall be kept in record. These shall also provide information on the name of the manufacturer, manufacturer's product identification, manufacturer's instructions, warning, date of manufacturing and test certificates from manufacturers for the product for each consignment delivered at site, shelf life, if any, for the department to ensure that the material have been procured from the approved source and of the approved quality, as directed by the Engineer-in-Charge. Day to day account of receipt of such material shall be maintained at site of work and shall be regulated by the department. Noting extra shall be payable on this account.
31. **After delivery of materials at site, third party quality testing also to be carried out for various E&M equipments if applicable as per the guidelines of Quality Assurance Policy & Check List of E&M Services / Specifications. All expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor.**

The minimum material which shall be tested are detailed out below:

A - Internal EI							
Sta	Ma	Sta	Tot	Wh	Wh	Sa	Location of
nd	ter	nd	al	le	le	mp	Test
ard	ial	ard	Qt	Wh	Wh	le	
Ap	/	Ap	y			Siz	
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							At manufacturer works	At third Party Lab.
1.	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	100%	Y	N
2.	LT Panels with incomer 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
3.	Rising Main and Bus Trunking	CPWD specs part IV/QA Plan	Length upto 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

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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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 Spec. Part-I/II: Check for perforation area, paint/Glvanising 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
7.	Wire	IS 17048	upto 10000 mtr	Y	N	N	N	N
			> 10000 mtr	Y	Y	1 piece for every 10000 mtr or less	N	Y
8.	LT Cable	IS 7098 Part-I	Up to 2500 mtr	Y	N	N	N	N
			> 2500 mtr	Y	Y	1 piece for every 2500 mtr	N	Y
9.	Fittings	Whether in conformity with tender specs.	> 100	Y	Y	NA	N	N
10	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

B – Air Conditioning								
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	Whether Manufacturer's	Sample Size	Location of Test	
							At manufacturer works	At third Party Lab.
1.	Split/WT AC	As per tender specs. and BEE ratings.	upto 50	Y	Y	NA	N	N
			> 50	Y	Y	1 for every 50	Y*	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.	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 Sq. mtr.	Y	Y	1 sample for every 1000 sqm	N	Y
4.	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

5.	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
6.	Ducting Material	As per relevant BIS	Up to 1000 Sq. mtr.	N	N	NA	N	N
			> 1000 Sq. mtr.	Y	Y	1 sample for every 1000Sq. m	N	Y
7.	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

C- Fire Fighting								
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	Whether Manufacturer's	Sample Size	Location of Test	
							At manufacturer works	At third Party Lab.
1.	MS Pipes	To be tested for thickness and weight as per applicable IS	Any	Y	Y	1 for every 100 mtr	N	N
2.	Valves	Flow and controls as	Up to 20	Y	N	NA	N	N
			> 20	Y	Y	1 for every 20	N	Y

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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		per data sheet						
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32. Initial Inspection and testing

- i. All equipment shall be tested at manufacturer's Works as per latest relevant EN/BS/BIS/CPWD specifications. Approved testing methods shall be followed and Test Certificates/ Reports submitted to the Engineer-in-charge.
- ii. In case of material requiring witnessing Factory Inspection by Department as mentioned above the contractor shall intimate in advance the probable date of such tests to the Engineer-in-charge to enable their representatives to witness the tests if they so desire. The contractor shall give sufficient advance notice regarding the dates proposed for such tests to the department's representative(s) facilitate his presence during testing. The Engineer-in-Charge at his discretion may witness such testing. Equipments will be inspected at the manufacturer/authorized dealer's premises, before dispatch to the site by the contractor.
- iii. The department also reserves the right to inspect the fabrication job at factory and the successful contractor has to make arrangements for the same. The materials duly inspected by Engineer-in-Charge or his authorized representative shall be dispatched to site by the contractor.
- iv. No additional payment shall be made to the contractor for initial inspection /testing at the manufacturer's works by the representative of the Engineer-in-Charge. However, the department will bear the expenses of its representative deputed for carrying out initial inspection/testing.
- v. The Contractor shall leave necessary provisions required for fixing instruments, gauges, meters, etc. for testing the installation even if these are not shown on the drawings. All such instruments, services etc. needed for the tests shall be arranged by the Contractor at his own cost.
- vi. It is the sole responsibility of Contractor to obtain all the necessary approvals from the statutory authorities, either prior to, during or after installation as required. All tests specified herein-after and witnessed/ approved by Engineer-in-charge, may be deemed to be invalid at the option of Engineer-in-charge, if the requisite, final and unconditional approvals from the concerned statutory authorities are not obtained by the Contractor.
- vii. Notwithstanding approval of tests or equipment or materials by Engineer-in-charge etc., up to the tests in static state as described here-in above, the Contractor shall be required to perform site tests to prove correctness of ratings and performance of equipment and materials supplied and installed by him, in normal operating condition.
- viii. All equipment shall be capable of performing the duties specified in these specifications without damage, distortion or failure of any component.

- ix. The performance of various equipments individually shall not be less than quoted ratings and consumption of power shall not exceed the ratings quoted by the tendered, when tested in normal operating condition. Otherwise the equipment / material are liable for rejection.
- x. All test instruments shall be calibrated by contractor at his cost for accuracy prior to taking the performance tests.
- xi. All routine tests shall be conducted before dispatch of equipments. No equipment shall be dispatched from the manufacture's premises without such tests being conducted and test result recorded. These test certificates shall be given along with the supply of equipments. The Engineer In-charge shall, if he so desires inspect and witness the pre-delivery tests. For this purpose, the contractor shall give 15 days' advance notice. Agency shall arrange for inspection by the department. Department shall bear expenses for inspection as far as traveling, boarding and / lodging is concerned. However, waiver if any, for inspection shall be at the discretion of the department without any cost implication but ROUTINE TEST & TYPE TEST Certificates shall have to be submitted for equipments. Prior to dispatch, all equipments shall be adequately protected & insured for the whole period of transit, storage and erection against corrosion and incidental damages etc. from the effect of vermin sunlight, rain, heat and humid climate.
- xii. Inspection and Testing at site:
- xiii. The installation shall be subject to necessary inspection during every stage of erection, by the Engineer In-charge or his authorized representative. The successful tenderer shall provide all facilities and assistance for the purpose.
- xiv. The Contractor shall intimate in writing to Engineer-in-charge as and when individual components of the installation are ready for tests required for further progress of erection. All such tests shall be carried out as per these specifications and/ or as directed by Engineer-in-charge and recorded in the presence of Engineer-in-charge or his authorized representatives
- xv. The completed installation shall be inspected and tested by the Engineer-in-Charge in the manner as will be laid down by him, in consultation with the contractor.
- xvi. All instruments and facilities necessary for the tests shall be provided by the contractor.
- xvii. The Contractor shall intimate in writing to Engineer-in-charge, the proposed date of initial startup. The Contractor shall, on approval of Engineer-in-charge, proceed with necessary pre-commissioning activities and tests and put the installation initial operation and start-up during which preliminary adjustments and addressing shall be carried out.
- xviii. Based on preliminary observations during the initial operation described above, necessary modifications/ repairs/ replacements/ etc. if any shall be carried out by the Contractor to the entire satisfaction of Engineer-in-charge.

On successful completion of initial operation, the Contractor shall proceed with trial runs.

- xix. Failing satisfactory performance of equipment and/ or overall installation after rectification etc. as stated above, the Engineer- in-Charge, at his sole discretion, reserves the option of charging liquidated damages for such non-performance or demand supply and installation of new installation all at no extra cost to Engineer-in-Charge or demand for full refund of all "On Account payments made to the Contractor for that part of the work which has failed to perform, and the Contractor shall be obliged to do so as directed by the Engineer-in-Charge.
- xx. No waiving of legal rights and power
- xxi. The Engineer-in-Charge shall not be precluded or stopped from taking any measurements, and framing of estimates or detaining any certificates made either before or after the completion and acceptance of the work and payment, from showing the true amount and character of the works performed and materials furnished by the Contractor and from showing that any such measurements, estimates or certificates untrue or incorrectly made and that Engineer-in-charge shall not be precluded or stopped from recovering from the Contractor such damages as it may be sustained by reasons of his failure to comply with the terms and conditions of the contract.
- xxii. The tenderers shall take into account the element of wastage(s) those are likely to be there in all elements of the work and quote his price, taking that into account. The tenderers shall study all the items from the point of view of wastage(s), which are likely to take place.
- xxiii. Works to be done by the contractor: Unless otherwise mentioned in the tender documents, 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: -
- xxiv. Foundations for equipments including foundation bolts and vibration isolation spring/pads.
- xxv. Suspenders, brackets and floor/wall supports for suspending/ supporting ducts/pipes.
- xxvi. Suspenders and or cable trays for laying the cables.
- xxvii. Sealing of all floor slab/wall openings provided by the Department or made by the contractor for lying of pipes, ducts and cables, form fire safety points of view.
- xxviii. Making opening in the wall/floors. Slabs or modifications in the existing openings wherever provided for carrying ducts/cable/cable tray etc. Opening in the slab/retaining walls/brick wall etc. shall be made by means of core cutting machines only.

- xxix. Making good all damages caused to the structure during installation and restoring the same to their original finish. Approval from local fire authorities and other statutory bodies as may be required as per local bye-laws after execution or during execution as required.
33. **The tender drawings provided are only indicative in nature and contractor shall prepare and submit all the working drawings and take approval of the department before starting execution at site.**
34. **Payment terms for E&M packages: The following percentage of contract rates shall be payable against the stages of work shown herein:**

Payment Terms			
Stage.	Stage of Work	Machinery and Equipments)	All other items
1	After initial inspection (wherever specified) and delivery at site in good condition on pro-rata basis.	80%	70%
2	On completion of pro-rata installation.	15%	20%
3	On Commissioning and completion of successful running in period	5%	10%

35. In the event that the Department appoints a Third-Party Quality Assurance (TPQA) Agency, the Contractor shall be obligated to provide all necessary support, assistance, and cooperation required by the TPQA Agency for carrying out its works, inspections, and quality assurance activities at the site. The Contractor shall also be responsible for ensuring timely compliance with all observations, comments, and directions raised by the TPQA Agency.
36. As the subject work constitutes a part work and certain components of the work have already been completed, the tenderer is required to visit and inspect the site before quoting/submitting the tender. The tenderer shall assess the existing site conditions, the extent and quality of the work already completed, and the scope of the balance/furnishing work to be executed.
No claim arising out of any misunderstanding or lack of knowledge of the existing site conditions or the work already completed shall be entertained subsequently.

Taxes and Duties:

1. 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.

2. The rates quoted by the tenderer, shall be firm and inclusive of all taxes (including works contract tax), GST, octroi, entry tax, duties and levies and all charges for packing forwarding, insurance, freight and delivery, installation, testing, commissioning etc at site i/c temporary constructional storage, risks, overhead charges, general liabilities/obligations and clearance from local authorities. The fee for the inspection of installation by government authorities shall be reimbursed by the department on production of receipts. No dedicated space for storage of material shall be provided however contractor shall use part of basement area as storage space by providing suitable partition at their own cost.

Specifications & Preferred Make List for all E&M Packages

Specification for C1

**(Electrical Installation, Lighting
Fixture & UPS)**

C1 –ELECTRICAL INSTALLATION

The work shall be carried out strictly in accordance with CPWD General Specifications for Internal Electrical Works 2023 and in accordance with Indian Electricity Rules, 1956, Indian Electricity Act, 2003 and NEC as amended up to date and as per instructions of the Engineer-in- Charge.

Specifications shall be read in conjunction with above specification, General Conditions of Contract, Special Condition of Contracts, Schedule of Work, Drawings and other documents connected with the work.

Most of the items are covered in CPWD specification, however additional condition for the work is as under

1. All material shall be got approved from Engineer-in-Charge before use. One sample Bay shall be made for approval of final location of switch boards/ fittings etc. and then only work shall be executed in other bays. Nothing extra shall be paid for the same.
2. All hardware items such as screws, thimbles, G.I. wires etc. which are essentially required for completing an item as per specifications will be deemed to be included in the item even when the same have not been specifically mentioned. All hardware materials such as nuts/bolts/screws/ washers etc. to be used in the work shall be zinc/cadmium plated iron.
3. Conduit layout shall be prepared by contractor and got approved before execution of work.
4. Minimum No. of Junctions to be kept, & if required junctions to be kept underneath the fitting locations in corridor/rooms so that junctions are not visible after fittings are fixed/in position. Drop of conduit shall be well planned w.r.t. location of fitting/D.B. and criss crossing to be avoided. All chases in walls shall be cut using electrical chisels/cutters. For this purpose, electricity shall be arranged by contractor. In case it is not feasible to do chase cutting by electrical chisels/cutters and require to do manual method than the same to be approved by engineer in charge.
5. Any conduit which is not to be wired by the contractor shall be provided with GI fish wire for wiring by some other agency subsequently. Nothing extra shall be paid for the same.
6. Termination of multi-stranded conductors shall be done using crimping type thimbles at both the ends. Nothing extra shall be paid for the same.
7. For Submain Wiring, Colour Code for different phases and Neutral (R.Y.B. black) to be maintained. While circuit wiring, wiring for fan point, wiring for light point shall be done with different colours for easy identification. Wiring for neutral shall be done with black colour and all connections to fans & fittings wherever visible shall be made with white HFFR insulated copper wire or wherever cover

sleeve may be provided. At Switch board, Switch shall be fixed in a logical manner w.r.t. fittings layout.

8. Unless specifically approved by Executive Engineer (E.), loose wire box, above DB shall not be provided however DB's shall have loose wire box of same make. All connections to MCB's shall be made using thimble/lugs.
9. All fittings and fans should be properly earthed through the protective conductor.
10. Provision of earth bars in main boards, earth terminal block in DB's & earth studs in all metal boxes shall be made, connection to this stud shall be crimped.
11. A clamp type termination should be made in the termination of earth strips (where provided) to pipe electrodes to provide surface type contact.
12. The earthing shall be carried out in the presence of the Engineer-in-charge or his authorized representative.
13. The size at switch box for providing Modular Plate type Switch/Sockets shall be properly settled to take care of all necessary switches/screws/fan regulators. Blanking plate if required shall also be provided at no extra cost. Switch board module detail shall be prepared by contractor.
14. For point wiring in steel conduit all modular type switches/sockets/ shall be of only one make.
15. Contractor to prepare shop drawing layout with conduiting & dimensions as per requirement at site.
16. The work shall be carried out according to approved drawings/details of shop drawing which shall be subsequently issued to the successful tenderer for execution of work and as per instructions of the Engineer-in- Charge.
17. Make of MCB/MCCB shall be the same as the make of MCB DB.
18. All drops above false ceiling shall be covered with flexible metallic conduit. Nothing extra shall be paid for providing metal flexible conduit.
19. Contractor shall preserve the copies of invoices, test certificates; gate passes etc. to prove the genuineness of material / purchases which are used at site as per agreement
20. All items of interrelated works consider necessary to make the installation complete and operative are deemed to be included shall be provided by the contractor at no extra cost.
21. Quantities indicated in Schedule of work are only tentative, contractor shall consult EE-in-Charge before procurement. Payment shall be made only for the quantities actually executed and measured
22. All vertical drop from ceiling / floor to distribution boards shall be laid in metallic conduit or metal raceway as per instruction of engineer in charge.

23. Typical installation details like (1) conduit installation details from ceiling to fixture (2) conduit installation detail from floor junction box to furniture (3) cable tray installation detail etc. are to be provided by successful tenderer during execution stage as part of shop drawing submission for review and approval of engineer in charge

CABLE TRAY & RACE WAY

1.1 Cable Tray System

The cable tray shall be supplied in convenient lengths and assembled at site to the desired lengths along with all required accessories and supports from same manufacturer. Cable tray systems shall be so designed and so constructed that in normal use, when installed according to the manufacturer's or responsible vendor's instructions, they ensure reliable support to the cables contained therein. They shall not impose any unreasonable hazard to the user or cables. Type test certificate for each size and its accessories are to be provided in compliance as per IEC 61537. This type test certificates should be provided from NABL accredited third party labs only.

The maximum permissible uniformly distributed load for various sizes cables trays and for different supported span shall be considered as per CPWD specifications. Load for future cables and empty spaces to be also considered while designing supports. However minimum two supports for each standard length shall be provided. A third-party load test certificate conducted at reputed labs are to be provided in compliance of loading capacity each typical size as specified in BOQ.

The width of the cables tray shall be chosen so as to accommodate all the cables in one tier, plus min. 30% additional width for future expansion. The overall width of one cable tray shall be limited to 900mm.

The cable tray shall be suspended from the ceiling slab or side walls or as required with the help of required supports. Supports are to be made of minimum 10 mm dia continuous threaded GI round bar or as per requirement as instructed by engineer in charge. In case more than one tray are required to be installed in multi-tier formation, supports and clamps are required to be provided as per actual load calculation as required. Round suspenders shall be threaded and bolted to the cable trays or to independent support angle min. 50 mm x 50 mm x 5mm at the bottom or as specified. These shall be grouted to the ceiling slab including required anchor fasteners at the other end through an effective means, as approved by the Engineer in charge, to take the weight of the cable tray with the cables. Load for future cables and empty spaces to be also accounted while designing supports.

Each system component shall be durably and legibly marked with the manufacturer's or responsible vendor's name or trademark or identification mark and a product identification mark which may be, for example, a catalogue number, a symbol, or the like as suggested by engineer in charge.

The manufacturer shall provide in his literature all information necessary for the proper and safe installation and use of the cable tray system, The SWL and impact resistance is valid for the whole temperature classification declared. The information shall include instructions for the assembly and installation of system components and for the precautions required to avoid excessive transverse deflection, which could cause damage to the cables. The appropriate material specification and environmental conditions, chemical environments, or aggressive agents for which the product is suitable for.

Safe Working Load (SWL): Cable tray systems are suitably designed to carry the maximum permissible uniformly distributed load in Kgs. per running meter for different unsupported free spans as per CPWD specification. Cable tray systems shall provide adequate mechanical strength to carry the maximum permissible uniformly distributed load. The main criterion for the SWL is safety in use of the product. For the declared application, the manufacturer shall declare the SWL to be tested. Following details are required to provide however not limited to this only.

- SWL in Kg/Mt for the cable tray lengths including joints, where applicable for one or more installation methods as required. i.e., mounted in the horizontal plane running horizontally on multiple spans.
- SWL in Kg/Mt for the fittings when not directly supported and the distance Y from the supports adjacent to the fittings.
- SWL in Kg for cantilever brackets and if used for cable tray only.
- SWL for pendants as a bending moment in Kg/mt and/or as a force in Kg
- Safety Factor : Load test with applying 1.7 times SWL. The sample shall sustain this increased load without collapsing. Buckling and deformation of sample are permissible at this loading.

Compliance for cable tray for SWL is to be provided by carrying out the relevant tests as per IEC 61537 on samples of the widest and narrowest width for each product type. The deflection of cable tray must be no more than 1/100th of the distance between two supports and tested in accordance with the standard IEC 61537. For the intermediate widths, the SWLs shall then be determined by interpolation of the test results.

Cable tray systems shall have adequate electrical continuity to ensure equipotential bonding and connection(s) to earth if required according to the application of the cable tray system. The calculated impedances shall not exceed 50 mohm across the joint and 5 mohm per meter without the joint as per IEC61537. All system components shall have adequate resistance against corrosion.

A Perforated Cable Tray and its Accessories

The cable tray and its accessories shall be fabricated out of single slotted / perforated MS sheets with single or double bended. These sections shall be hot dipped galvanized as specified made of 1.6mm / 2.0mm thick MS perforated sheet as specified in BOQ. Overall Perforation shall not more than 17.5% and Galvanization thickness should not be less than 50 microns to be provided. Each section of standard length is to be manufactured from single sheet and should not be welded / bolted out of multiple sheets. The jointing between the sections shall be made with coupler plates of the same material and thickness as the channel section. Two coupler plates, each of minimum 200mm length, shall be bolted on each of the two sides of the channel section with 8mm dia round headed bolts, nuts and washers. Each such coupler plates are to be provided with minimum eight slotted holes. In order to maintain proper earth continuity bond, the paint on the contact surfaces between the coupler and cable tray shall be scraped and removed before the installation if provided.

Factory fabricated bends, reducers, tee / cross junction etc. shall be provided as per good engineering practice. The radius of bends, junctions etc. shall not be less than the minimum permissible radius of bending of the largest size of cable to be carried by the cable tray. The entire cable tray and all accessories like couplers, bend, Tee, Threaded rod or Flats for suspension, base support angel etc. shall be hot dipped galvanized. The cable tray shall be bonded to the earth terminal at both ends. The cable tray shall be measured on unit length basis, along the center line of the cable tray, including bends, reducers, tees, cross joints, all kind of supports etc., and paid for accordingly.

1.2 Raceways and Junction Boxes

Underfloor systems intended for the support and accommodation of Power, Data and Multi-media cables required for electrical / Communication systems made out of pre-galvanized sheet with minimum thickness of 1.6 mm and coated with minimum 275 GSM.

1.2.1 GI raceways made of pre-galvanized sheet with minimum thickness of 1.6 mm for lid, base & Partition between compartments for distributing LV and ELV cabling in

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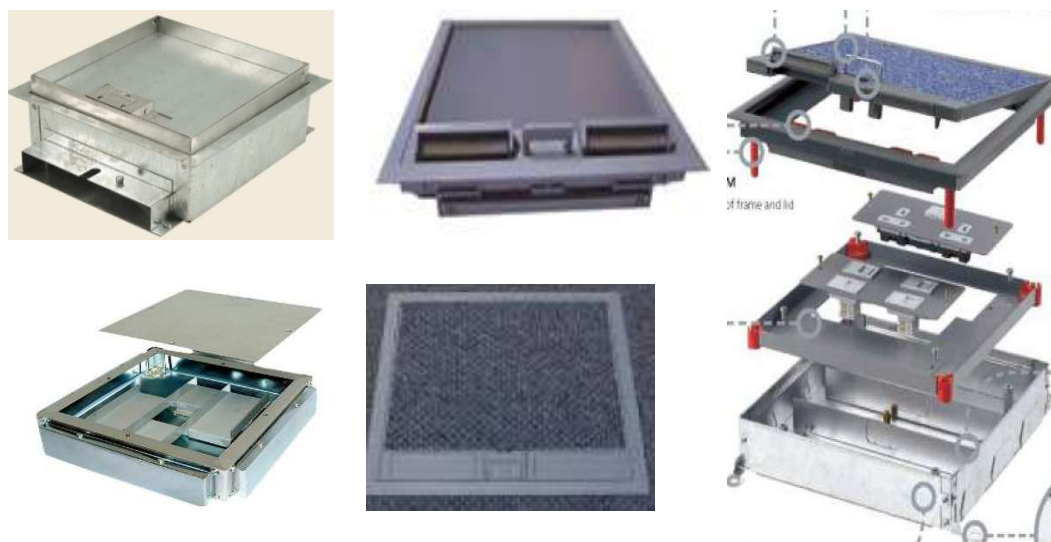
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screed floors installations. Raceway should be rectangular formed with top & bottom plates double folded and spot / mig welded together to provide the rigidity and at the same time to prevent seepage of concrete or screed water. Partition between two compartments should be continuous and to be properly spot / mig welded at bottom level. Aluminum painting / zinc paint should cover all the welding spots to avoid corrosion. Raceway should be suitable to combined with junction boxes, backboxes (floor boxes) for wiring devices, Raceway should be provided with all fixing and coupler accessories as required. Protection level should be min. IP 20 & IK 08. Raceway and all accessories should be provided in compliance and confirmation to standard EN 50 085 - 2 - 2. Resistance to vertical load applied through small surface area should be 1500 N & Resistance to vertical load applied through large surface area should be minimum 3000 N. Race ways should be supplied with complete accessories i.e. fixing brackets & couplers for joining raceways from the same manufacturer.



1.2.2 Junction boxes for direct access to cables at the intersection of raceways. Supply completely with base and cover plate (Lid) with height adjustable feature from 50 mm to 80 mm or 60mm to 75mm or 65mm to 90 mm as per manufacturer standard. All size & type of junction boxes, cross over boxes etc. as per BOQ & should be provided in compliance & confirmation to standard EN 50 085 - 2 - 2. For adjustable junction box, resistance to vertical load applied should be min. 5000N. Use junction box with fly over for direct access to cables at the intersection of floor raceways while maintaining perfect separation and 90 degree cross overs between data and power cables. Junction box should be made out of minimum 1.6mm thick 275 GSM pre-galvanized sheet & LID should be min. 2.00 mm thick 275 GSM pre-galvanized sheet. Junction box should be min. IP20. Raceways and junction boxes should be supplied with complete accessories i.e. fixing brackets & couplers for joining raceways. Cover of raceway should be fixed either by 4 nos. of screws on support or with hinged facilitate frame as per requirement or informed by engineer in charge. Access outlet facility to mount switch, socket with ELV accessories also to be provided if required or informed by engineer in charge.



1.2.3 On wall trunking & its all finishing accessories (end, joint of lid, joint of body, interior angle, exterior angle, flat angle, derivation) shall be made with PVC DLP & as per confirming standard EN 50085-2-1. Trunking should accept Wiring device with all the functions by associating the accessory of installation. Trunking should confirm to the current specifications of NF C 68-104 in terms of both performance and level of functions provided by the system. Installation trunking (which carries electrical wiring accessories) should be type 3 (installation) in the new standard. Material should be Non-flame propagating. Degrees of protection provided by enclosure should be IP 40. Protection against mechanical impact should be IK 07. The trunking covers and partitions should be in PVC white RAL 9003. The accessories should be in plastic ABS white RAL.

SPD (Surge protection device)

A) Type 1 SPD (with integrated Fuse) - at LT Panel

- The device should be tested as per latest and valid IEC 61643-11:2011 or EN 61643-11:2012 standards.
- The device shall be having Maximum impulse current I_{imp} as per 10/350 μ s of 12.5kA
- Voltage Protection level of device shall be ≤ 1.5 KV for L-N / N-E.
- The device shall have built in d) QuickSafe functionality disconnects the internal circuit before the internal components (MOVs) go into short circuit.

- The device shall have mechanical indication for both the states (green for 'healthy' and red/orange for failure)
- The device shall be certified as per the standards IEC 61643-11/EN 61643-11:2012/A11:2018 and manufacturer to furnish third-party test certificate

Type 2 SPD - at Each Sub Distribution Panel/DB

- The device should be tested as per latest and valid IEC 61643-11:2011 or EN 61643-11:2012 standards.
- Maximum continuous voltage is $\geq 253V$
- Voltage Protection level of device shall be ≤ 1.5 KV for L-N / N-E.
- The nominal discharge current for 8/20 μs is minimum 20KA for L-N
- The device shall have mechanical indication for both the states (green for/orange 'ok' and red for failure) on all modules
- The device shall have pluggable option to change cartridge without disconnection
- The device shall be certified as per the standards IEC 61643-11/EN 61643-11:2012/A11:2018 and manufacturer to furnish third-party test certificate

Occupancy/ Presence Sensor

- Shall be based on PIR technology
- Rated current/Maximum peak current – 10A
- Rated Voltage – 230V
- Ambient temperature range - -10 to +50 degree
- IP – 40
- Coverage area – As mentioned in SOQ
- Shall be with manual override option.

MEDIUM VOLTAGE CABLING AND TERMINATION

1.1 Scope:

The scope consists of Supply, laying, testing and commissioning of L.T. XLPE Cable and its termination.

1.2 Standards:

AS PER SCHEDULE OF INDIAN STANDARDS; ATTACHED IN THE DOCUMENT

1.3 Cables:

1100 volt grade XLPE cables

All cables shall be 1100 Volt grade XLPE insulated FRLSH sheathed with or without steel/GI wire or flat armoring as specified. The cable shall conform to IS-7098, Part I. Cables shall have high conductivity stranded aluminum or copper conductors and cores colour coded to the Indian Standards. All cables laid up to load should be without any joint.

All cables shall be new without any kind or visible damage. The manufacturers name, insulating material, conductor size and voltage class shall be marked on the surface of the cable at every 600 mm centers.

Insulation: The core insulation shall be with XLPE compound applied over the conductor by extrusion and shall confirm to the requirement of IS-5831.

Core identification shall be provided with prominent and indelible Arabic numerals on the outer surface of the insulation colour as under.

Single core	-	Red, Black, Yellow or blue.
Two core	-	Red and Black.
Three core	-	Red, Yellow, and blue.
Four core	-	Red, Yellow, Blue and Black.
3.5core	-	Red, yellow, Blue and Black. (Reduced neutral)
Five core	-	Red, Yellow, Blue, Black and Light Grey.

In case of cables having more than 5 cores two adjacent (counting and directional) in each layer shall be coloured Blue and yellow respectively and the remaining cores shall be light grey.

The inner sheath shall be applied over the laid up cores by extrusion and shall be of extruded XLPE compound.

Armouring shall be applied over the inner sheath. Armour shall be of galvanized round steel wires up to the cable diameter of 13 mm and above 13 mm galvanized flat steel wires shall be provided. Requirement and methods of tests for armoured material and uniformity of galvanism shall be as per IS-3975 and IS -2633. The outer sheath for the cables shall be applied by extrusion and shall be of FRLSH compound confirming to the requirement of compound of IS-5831 for protection of the cable against atmospheric

effect. Pollution rodent and termite attack suitable chemical shall be added in FRLSH compound. Colour shall be black.

Testing and Inspection: All the cables shall be tested and examined at the manufacturer work. All the materials employed in the manufacturing of cable shall be subject to examination and testing after manufacture of cable. All routine and acceptance tests in accordance with the relevant standard shall be conducted on each size of cables and shall be submitted to client at the time of hand over.

Packing and Marking: Cables shall be dispatched in wooden drums of suitable barrel diameter, securely battened with the take off end fully protected against mechanical damage. The wood used for construction of the drum shall be properly seasoned. Sound and free from defect. Wood preventative shall be applied to the entire drum. On flange of the drum, necessary information such as manufacturers name, type, size, voltage grade of cable, length of cable in meters, drum no., cable code, ISI certification mark gross weight etc. shall be printed. An arrow shall be printed on the drum with suitable instructions to show direction of rotation of the drum. Cable shall be supplied in drum length as follows.

1100 volt grade Fire survival cables

All cables shall be stranded circular plain copper conductor, glass-mica taped, 950 degree for 3 hours, XLPE insulated, cores laid up together, Fiber Glass Tape Wrapped, extruded LSZH(low smoke zero halogen) LTS 1 bedding, galvanized steel round / flat wire armoured, overall LSZH type LTS 1 sheathed 0.6/1.0 KV LT FS cables. Generally confirming to BS 7846 and IS 7098. FS cable should pass circuit integrity test as per BS 6387 – CWZ and vendor should submit third party test passed as per BS: 8491, CWZ test or category F120 for any higher size of cable, Viz, 4 x 300 sqmm, along with GTP to get approval from engineer in charge.

All U.G. Cable work shall be got inspected and measurements lest checked by the Assistant Engineer in charge of work and his authorized representative before filling up the trenches, failing which work remain subject to 100% recheck at the risk and cost of the contractor. All U.G. Cables before laying shall be got tested for continuity in presence of the authorized representative of the Engineer-in-Charge. Note to this effect shall be

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

1.4 Cable joints and termination:

Connectors:

Cable terminations shall be made with copper/Aluminium Heavy duty long neck copper crimping lugs only crimped type solderless lugs for all aluminium cables and stud type terminals. For copper cables copper crimped solderless lugs shall be used.

Crimping shall be done with the help of hydraulically operated crimping tool. All cable lugs should be long neck type only.

Bimetallic Spacer / washer to be provide wherever 2 different metal (Cu. / Al. / GI) jointing with each other.

Cable Glands:

Cable glands shall be of heavy duty brass single compression type as specified. Generally single compression type cable glands shall be used for indoor protected locations and double compression type shall be used for outdoor locations. Glands for classified hazardous areas shall be CMRS approved.

Ferrules:

Ferrules shall be of self sticking type and shall be employed to designate the various cores of the control cable by the terminal numbers to which the cores are connected, for ease in identification and maintenance.

Cable joints:

Kit type joint shall be done and filled with insulating compound. The joint should be for 1.1 KV grade insulation

MULTI FUNCTION METER

Multi-function meter - should be having facility to read all the parameter as mentioned in the below table. It should contain real time clock. The meter should be field programmable and to generate high / low profile for all power parameters with date & time, also able to store previous period integrated data. The meter should have RS 485

port with Modbus TCP-IP protocol for networking purpose. All the programming should be password protected.

Lighting Fixture:

The contractor shall submit LM-79 report, LM-80 report, Photometric test report and type test report of the fixture during TDS approval.

List of Parameters received for Various multi-function meters		
Location	Category	Key Parameters
UPS Incoming, Outgoing and Kitchen Panel incomer and outgoing MFM	Instantaneous Parameters	V1, V2, V3, V12, V23, V31
		A1, A2, A3
		PF-1, PF-2, PF-3, PF (Avg)
		W1, W2, W3, W(total)
		VA1, VA2, VA3, VA(total)
	Cumulative Parameters	Import Wh
		Import Vah
		Import load hours
	Reset (old) Cumulative parameters	Import Wh
		Import load hours
	Communication	Modbus TCP/IP or (converted RTU ethernet port with converter is accepted.

ANNEXTUR-1 (TECHNICAL COMPARATIVE DATA SHEET)

The following is part of the Scope of Works and shall be read in conjunction with the associated Tender Documents which shall be filled and submit fixture wise, in comparison with tender BOQ requirement by Engineer-in-charge

SL. No.	DESCRIPTION	CONSULTANT SPECIFICATION	Vendor proposed fitting details	AS PER APPROVED MAKE LIST, for Consultant Approval
1	Brand & Model No			
2	Image of fixture			
3	Luminaries			Fixture Description as per original Specification
4	Country of origin for Fixture			
5	LED Make			
6	Country of origin for LED			
7	System Lumens Efficacy			
8	Lamp lumens depreciation factor for fixture			
9	Light output (Lumens)			
10	Color temperature & CRI			As per original specification only. However, CRI > 80 for all fixtures and CRI to be mentioned accurately.

11	LM 79 & photometric reports			Reports to be provided by vendor
12	LM 80 reports			Reports to be provided by vendor
13	ISTMT report			Reports to be provided by vendor
14	Lamp Life at L70			
15	Power Consumption: (W)			Power consumption to be optimized by vendor
16	Material type (E.g. Aluminum Die Cast, marine grade 316Lstainless steel, etc.)			
17	LED warranty			
18	Ingress Protection (IP rating)			All as per Original Specifications.
19	Safety arrangement			Shall be in line with Indian Standards and Guidelines, vendor to comply
20	Mounting arrangement			For Interior Landscape and External Lights

21	Driver/ Ballast make			-As per approved make list -Provide Model number, Technical specification with PF, BF, THD Etc., THD < 20%.THD
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				requirement should be as per detailed specification provided for Drivers. Note:- In general THD for driver should be less than 20% percent. Unless otherwise specified in BOQ item. BOQ item specification shall prevail mainly.
22	Driver/ Ballast warranty			Minimum 5 years
23	Dimmable/ Non Dimmable with type			As per original specification
24	Cable gland			As per original specification only
25	Earthing Provision			Shall be properly connected with the fitting and holder with suitable size of Copper Lug
26	Additional accessories supplied with fitting should be mentioned clearly			- Fixture body maximum temperature
27	Proposed Separate driver / Integral driver as per requirement			-

28	Dimming Criteria to be mentioned			Compatibility with Dimmer system shall be ensured
29	ON/OFF isolation switch			Shall be provided, switch coloring to be aligned to the requirement of ID
30	Plug top			Shall be 3 pin Type G plug top(As per Indian Standards and Local Norms)
31	Holder Specification			E-27 type Holder to be used depend on Wattage & E-14 type Holder to be used depend on Wattage
32	Harmonic distortion			All nonlinear loads such as LED Driver, electronic Ballast etc., shall comply with Low Harmonic Distortion, i.e., <20% and shall be within limits specified in IEEE 519.(Refer CL II.A.1.03)
33	Weight/Loading details			Loading details on ceiling to be provided for Chandeliers/hanging Light fixtures

34	Centre beam candela power in Cd			Maximum Intensity at 0 degree. Indicates the Luminous intensity in Candela
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Annexure:2 FORM FOR LUMINAIRE TEST REQUIREMENTS COMPLIANCE

Product Details					
Product Type					
Product					
LED Used					
LED Driver					
LED Module					
Test Details	SI	Name of the Test	Applic	Test	Report Ref.
LM79	1	Photometry	CIE-121	Photometry	
	2	CCT, CRI	LM79-08	LM79 Test	
	3	Power	LM79-08		
	1	Marking	IEC6059		
	2	Constructional	IEC6059		
	3	Mechanical Strength	IEC6059		
	4	Vibration	IEC6059		
	5	Provision for Earthing	IEC6059		
	6	Protection against	IEC6059		
	7	Resistance to Dust &	IEC6059		
	8	Thermal	IEC6059		
	9	Endurance	IEC6059		
	10	Humidity Test	IEC6059		
	11	High Voltage	IEC6059		
	12	Insulation Resistance	IEC6059		
	13	Touch Current /	IEC6059		
	14	Heat , Fire & Tracking	IEC6059		
	15	Creepage & Clearance	IEC6059		
	16	Terminal	IEC6059		

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

Safety	17	Test Under fault	IS 16103	Type Test Report	
	18	Conformity testing	IS 16103		
		Tests on screws,			
	20	Heat management tests as per Clause 21	IS 16103		
Performance (LED Luminaire)	1	Lumen maintenance	IS16107-	Type Test	
	2	Thermal Cycling test	IS16107-		
	3	Accelerated Life Test	IS16107-		
	4	Supply Voltage	IS16107-		
Packaging	1	Drop Test	ISO 2249	Type Test	
	2	Transportation Vibration			
CRS Requirement	1	Compulsory Safety Registration with BIS	IS10322 Part5	License No. / Third	

UPS

Specification for SubHead (UPS)

1.0 SCOPE:

The scope covers supply, installation, testing & commissioning of UPS system given in BOQ, complete with batteries & all accessories.

UPS:-

"True Online-Double conversion type single module UPS.

Modular Construction UPS (built in single frame)

IGBT based Rectifier cum charger

IGBT based Inverter (Minimum 3 Level Inverter Switching Technology)

SMF Sealed maintenance free battery with back up time mentioned in the BOQ

Inter connecting cables; Links; Racks and standard accessories

Built in SNMPv3 card with Dry contacts & MODBUS TCP IP connectivity

AC/DC Capacitor having service life of minimum 8 Years without replacement.

UPS to battery Interconnectivity by Uninyvin type cables : Links, Racks & accessories

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

Contractor have to provide suitable size and numbers of incoming and outgoing copper conductor cables termination from UPS Input panel to UPS and from UPS to UPS output panel as per the manufacturer recommendations and standard engineering practice along with cable trays, hangers, clamps etc., as required. Cost of such cables and its related work is included in scope of UPS supply and no extra payment shall be made for the same.

2.0 GENERAL

SUMMARY

This specification describes the operation and functionality of a continuous duty, dual input feed with three-phase output power (3:3), solid-state, static Uninterruptible Power Supply (UPS) hereafter referred to as the UPS. The UPS shall utilize double conversion online topology designed to protect electronic equipment by supplying reliable, network-grade power with extremely tight voltage and frequency regulation. The UPS shall feature an internal static bypass and input power factor correction. The UPS shall be of Modular/monolithic construction as per rating given in BOQ and having internal fault tolerant architecture. Each Power module contains fully rated, Power Factor corrected Input rectifier/Boost converter, fully rated output inverter and battery charging circuit. Rack capacity shall be as per BOQ and individual module for making the rack capacity shall be from (20 KVA - 50 KVA)

Configuration Specifics:

- The system power train shall comprise of, input disconnect and filter stage, input PFC power stage, energy storage stage (DC bus capacitor bank), output power stage (inverters), static bypass switch for connecting bypass line to the output, and battery charger.
- The system shall also include, field-replaceable fan module, removable input/output wiring trays, battery disconnects, an LCD interface display, EPO, and an integrated UPS network management card with temperature monitoring.
- The UPS and associated equipment shall operate in conjunction with a primary power supply and an output distribution system to provide quality uninterrupted power for mission critical, electronic equipment load.
- All programming and miscellaneous components for a fully operational system as described in this specification shall be available as part of the UPS.

STANDARDS

A. Safety:

1. IEC 62040-1: 2008-06, 1st edition Uninterruptible Power Systems (UPS) - Part 1: General and safety requirements for UPS
2. EN 62040-1: 2013-01, 1st edition amendment 1

B. EMC/EMI/RFI:

1. IEC 62040-2: 2005-10, 2nd edition Uninterruptible Power Systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements

C. Performance:

1. IEC 62040-3: 2011-03, 2nd edition Uninterruptible Power Systems (UPS) - Part 3: Method of specifying the performance and test requirements

D. Environmental:

1. IEC 62040-4: 2013-04, 1st edition Uninterruptible Power Systems (UPS) - Part 4: Environmental aspects – Requirements and reporting

E. Markings: CE, IEC 62040-2

MODES OF OPERATION

Normal: The input Power Factor Corrector (PFC) stage and output inverter stage shall operate in an on-line manner to continuously regulate power to the critical load. The input and output converters shall be capable of full battery recharge while simultaneously providing regulated power to the load for all line and load conditions within the range of the UPS specifications.

Design

UPS should be Insulated-gate bipolar transistor (IGBT) rectifier and with double conversion and also capable of operating in High Efficiency mode with harmonics mitigation, power factor correction and as per Class-1 classification of IEC 62040-3. Maximum 6 milisecond break shall be allow transfer to Double conversion

mode in case of synchronization. In High Efficiency ECO mode , THDI & power factor should be as per Input.

Operation

In online mode allows the system to supply the active part of the load through the bypass. The inverter is kept running in parallel with the bypass source and supplies the reactive part of the load. The input power factor of the UPS is, regardless of the load power factor, maintained close to unity as the reactive part of load is significantly reduced in the UPS input current. In case if an interruption to the utility/mains supply, the inverter immediately maintains the output voltage so that breaks or drops during this transfer are practically eliminated.it shall have maximum 6 mili second break for transfer to Battery mode/Double conversion Mode (VFI Mode). Efficiency shall be Minimum 96% from 25% to 100% load. In this mode UPS shall able to recharge the batteries through Inverter acting as bidirectional converter.

The UPS shall have overall efficiency as per the relevant class of IEC 62040, however should not be less than 96%.

Battery: Upon failure of the AC input source, the critical load shall continue being supplied by the output inverters, which shall derive their power from the battery system. There shall be no interruption in power to the critical load during either transfer to or from battery operation back to normal operation.

During the re transfer from battery to on-line operation, the load shall be softly transferred from battery back on-line within 10 seconds, to avoid step load changes on the mains supply.

Recharge: Upon restoration of the AC input source, the input converters and output inverters shall simultaneously provide regulated power to the critical load and recharge the battery.

Bypass operation: Bypass mode shall be reached either as a user selection or automatically.

Bypass mode can be selected through the Control menu screen on the Power View display.

The UPS will automatically switch into bypass mode if

- Both normal and battery operation modes are unavailable
- An output overload condition occurs.
- The UPS has an internal fault

During bypass operation the utility power is connected to the load, bypassing the internal converters. If the bypass mode becomes unavailable the UPS will automatically switch to mains power. In the event that mains power is unavailable the system will switch to battery power.

With the UPS supplied from dual feeds and operating on battery, due to a mains failure, it shall be possible to request the unit to go to bypass, in addition to automatically transfer to bypass when the batteries are depleted.

SUBMITALS.

Proposal Submittals (by successful tenderer):

- bill of materials.
- Product catalog sheets or equipment brochures.
- Product guide specifications.
- System single-line operation diagram.
- Installation information, including weights and dimensions.
- Information about terminal locations for power and control connections.
- Battery Size calculation
- GA / Shop drawings along with power and control circuit diagram

Delivery Submittals:

- Installation manual, which includes instructions for storage, handling, examination, preparation, installation, and start-up of UPS.
- User manual, which includes operating instructions.

PART-2 PRODUCT

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

2.1 MECHANICAL DESIGN

The UPS shall be contained in two rugged steel cabinets one containing the power electronics and the other containing the batteries and single phase distribution outlets; UPS & battery cabinets shall be minimum IP20 rating.

The UPS shall be housed in multiple / single freestanding cabinets with dead front construction. The mechanical structure of the UPS shall be sufficiently strong and rigid to withstand handling and installation operations. The sheet metal elements in the structure shall be protected against corrosion by a suitable treatment, such as zinc electroplating or bi-chromating or epoxy paint or an approved equivalent.

Cable Access: UPS shall be able to Top or bottom both the type of cable entries.

The UPS shall be designed for forced air cooling. Air path should be design in such way that air can pass through all internal cabinet / accessories / PCB's

2.2 SYSTEM CHARACTERISTICS

System Capacity:

The system shall be rated for unity PF on rated output

Input:

AC input nominal voltage:

- 220/230/240VAC, single phase, 3 wire (L + N + G) Up to 5 KVA
- 380/400/415VAC, three phase, 5 wire (L1+L2+L3+N+G); for above 5 KVA

AC input voltage window:

- Full Load, +/- 10% (Line-Neutral) for single phase input or +15% to -20% for three phase input;

- Half Load, +/- 10% (Line-Neutral) for single phase input or +15% to -35% for three phase input;

Input frequency range: 45 – 65 Hz

Input Power Factor; > 0.98 at 100% load

Crest factor: 3:1. At full load

Surge Factor : 1.15

UPS Output:

AC Output Nominal Output: (Customer configurable)

- 220VAC, 230VAC or 240VAC, Single Phase three wire, 50/60Hz; up to 5 KVA
- 380VAC, 400VAC or 415VAC, Three phase five wire, 50/60Hz; above 5 KVA

AC output voltage distortion: Max. 2% @ 100% linear load; Max. 5% @ 100% non-linear Load;

AC output voltage regulation (Static): +/-1%;

Voltage Transient Response : +/- 8% maximum for 100% load step

Voltage Transient Recovery within < 10ms / 20ms recovery time as per OEM standard

Output Voltage Harmonic Distortion:

- <2% THD maximum for a 100% linear load
- <5% THD maximum for a 100% non-linear load

Overload Rating:

- Online: 125% - 10 minute; 150% - 60 seconds
- In bypass: 1000% for 100 msec

System AC-AC Efficiency:

- > 96 % from 25% to 100% load in double conversation
- > 98.5% from 50% to 100% load in High Efficiency Eco mode

Output Power Factor Rating : Greater than 0.9 power factor @ 40 Deg

C without any de

rating from 0.7 lagging to 0.7 leading load powerfactor

Output frequency: 50 +/- 3Hz tracking or 50 +/- 0.1Hz tracking (user selectable);

Output connectors:

- Single phase: Hardwire 3-wire (Phase + N + G),
- Three phase: Hardwire 5-wire (3 Phase + N + G)
- Output frequency Slew rate : 1.0Hz/Sec, 0.5Hz/Sec 0.25Hz/Sec

UPS should have protection against the phase reversal of incoming supply.

2.3 INPUT PFC POWER STAGE

A. The input PFC power stage of the UPS shall constantly rectify the power imported from the mains input of the system, converting the input mains AC power to DC power for precise regulation of the DC bus voltage, battery charging, and output power stage (inverter) regulated output power.

B. Input Current Total Harmonic Distortion: The input current THD_I shall be held to 6% or less at full system load, while providing conditioned power to the critical load bus, and charging the batteries under steady-state operating conditions. This shall be true while supporting loads of both a linear or non-linear type. This shall be accomplished with no additional filters, magnetic devices, or other components.

C. Input Current Limit:

The input converter shall control and limit the input current drawn from the utility supply

The input current limiter shall be designed to:

Fast battery recharge:

35% of the UPS output rating upto 80% load

12% of the UPS output rating at 80-100% load

Or as per OEM Standard

Overloads at low line input voltages shall draw power from the battery, (battery assist mode) in order to support the load and maintain the input current below the set current limit points.

Soft-Start Operation: As a standard feature, the UPS shall contain soft-start functionality, capable of limiting the input current from 0 percent to 100 percent of the nominal input over a default 10 second period, when returning to the AC utility source from battery operation. The change in current over the change in time shall take place in a linear manner throughout the entire operation

D. Charging:

The battery charging circuit shall contain a temperature monitoring / Compensation circuit, which will regulate the battery charging current to optimize battery life. The battery charging circuit shall remain active when

in automatic / Static Bypass and in Normal Operation. The battery charging shall keep the DC bus float voltage within ± 1 percent of tolerance. The UPS shall be capable of reducing the battery charging current under low input voltage conditions. A potential free contact will be provided that will allow the user to inhibit Charging. The battery charging system shall adjust the charging current by automatically sensing the number of battery modules and by monitoring the individual battery current

2.4 OUTPUT POWER STAGE (INVERTER).

The UPS output power stage (inverter) shall constantly recreate the UPS output voltage waveform by converting the DC bus voltage to AC voltage through a set of IGBT switches. In both online operation and battery operation, the output power stage (inverter) shall create an output voltage waveform independent of the mains input voltage waveform. Input voltage anomalies such as brown-outs, spikes, surges, sags, and outages shall not affect the amplitude or sinusoidal nature of the recreated output voltage sine wave of the output power stage (inverter).

Overload Capability: The output power stage (inverter) shall be capable of withstanding 150% overload for 60 seconds or 125% overload for 10 minute. The system shall transfer to bypass if the overload persists and then return back on-line when the overload is removed.

Battery Protection: The UPS shall have monitoring and control circuits to limit the level of discharge on the battery system.

2.5 AUTOMATIC BYPASS

As part of the UPS, a system automatic bypass switch shall be provided. The system automatic bypass shall provide a transfer of the critical load from the Inverter output to the automatic bypass input source during times when the inverter cannot support the load. Such times may be due to prolonged or severe overloads, or UPS failure. The UPS shall constantly

monitor the output current, as well as the bypass source voltage, and inhibit potentially unsuccessful transfers to automatic bypass from taking place.

The design of the automatic bypass switch power path shall consist of an Static bypass switch.

Automatic Transfers: An automatic transfer of load to bypass shall take place whenever the load on the critical bus exceeds the overload rating of the UPS. Automatic transfers of the critical load from bypass back to normal. operation takes place when the overload condition is removed from the critical bus output of the system. Automatic transfers of load to bypass shall also take place if for any reason the UPS cannot support the critical bus.

Manual Transfers: Manually initiated transfers to and from bypass shall be initiated through the UPS interface display or via the serial communications port.

2.6 DISPLAY AND CONTROLS

A. Control Logic: The UPS shall be controlled by an embedded microcontroller which performs the following functions:

1. Monitoring quality of input, bypass and output voltages;
2. Monitoring vital parameters of the UPS;
3. Executing the state machine.
4. Intelligent battery management.
5. Remaining runtime calculation.
6. Self-diagnostics, self-test and proactive fault detection.
7. Communication to the host server via serial port.
8. Communication to the Network Interface Card or another Smart Slot accessory card if equipped.

B. Display Unit: A microprocessor controlled display unit shall be located at the front of the system. The display shall consist of an alphanumeric display with backlight, providing system status, LED alarm indicators and a keypad consisting of pushbutton switches for control and status reading selection.

C. Metered Data: The following metered data, shall be available on the alphanumeric display:

1. Year, Month, Day, Hour, Minute, Second of occurring events
2. Source and Bypass Input Voltages
3. Output AC voltage
4. Input, Bypass and Output AC currents
5. Input, Bypass and Output Frequency
6. Battery voltages and currents
7. Internal and battery pack temperature

D. Event log: The display unit shall allow the user to display a time and date stamped log of the 100 most recent status and alarm events.

E. Alarms: The display unit shall allow the user to display a log of all active alarms. The following minimum set of alarm conditions shall be available:

1. Input Frequency outside configured range
2. AC adequate for UPS but not for Bypass
3. Low/No AC input, startup on battery
4. UPS Fault
5. On Battery
6. Shutdown or unable to transfer to battery due to overload
7. Load Shutdown from Bypass. Input Frequency Volts outside limits
8. Fault, Internal Temp exceeded system normal limits
9. System level fan failed

10. Runtime is below alarm threshold
11. Load is above alarm threshold
12. Load is no longer above alarm Threshold
13. Minimum Runtime restored
14. Bypass is not in range (either frequency or voltage)
15. UPS in Bypass due to Internal Fault
16. UPS in Bypass due to overload
17. Low Battery Shutdown
18. Low Battery Warning

F. Controls: The following controls or programming functions shall be accomplished by use of the display unit. Pushbutton switches shall facilitate these operations.

1. Silence audible Alarm
2. Display or set the date and time
3. Transfer critical load to and from bypass
4. Test battery condition on demand
5. Set intervals for automatic battery tests
6. Adjust set points for different alarms

G. Communication Interface Board: Regular recording of parameters in 10 milliseconds interval to be recorded preceding a fault event. These events to be stored in memory and can be exported in user friendly formats. A communication interface shall provide the following communication ports which can be used simultaneously:

1. RJ-45 Interface port for Power View Display
2. RJ-45 Ethernet connection, on installed Network Management Card
3. MODBUS TCP/IP Port
4. Dry Contacts Card
5. RS 232 serial port

2.7 BATTERY

A. External SMF Battery

1. The UPS battery system shall comprise of user replaceable external batteries providing required voltage DC nominal for the positive DC bus rail and required voltage DC nominal for the negative DC bus rail. as per manufacturer standard. Details to be submitted.
2. The battery blocks shall be of the Valve Regulated Lead Acid (VRLA) type.
3. The UPS shall incorporate an Intelligent Battery Management system at battery bank level to continuously monitor the health of the battery system and notify the user if that system is weak or needs replacing.

B. General description for Batteries

Batteries shall be of the Sealed Lead-Acid type.

4. Each battery system shall have identical Amp-hrs capacity.
5. Ground wires shall be supplied for connection from the UPS to each battery enclosure grounding point.

C. Charging:

1. Charging system shall automatically adjust the maximum charger power, based on the installed proprietary battery capacity and current through each battery string to avoid excessive charging that could result in bloated batteries. Each proprietary battery pack shall report its battery currents and temperature to UPS through communication
2. The intelligent battery management system shall contain a temperature monitoring circuit and compensation algorithm that regulates the battery charging current so as to optimize battery life.

The UPS shall monitor the temperature of all proprietary battery packs and use the highest one as a reference to adjust the battery float voltage.

3. The battery charging circuit shall remain active when in bypass or on-line.
4. Overall battery monitoring is required individual cell monitoring is not required.

Part- 3 ACCESSORIES

3.1 INPUT/OUTPUT ELECTRICAL TERMINAL

The input and output terminal connections shall be designed to be for easy electrical connection.

3.2 SOFTWARE AND CONNECTIVITY

A. Network Adaptor: Built in Smart Slot Network Management Card shall allow one or more network management systems (NMS) to monitor and manage the UPS in TCP/IP network environments.

B. Unattended Shutdown

1. The UPS, in conjunction with a network interface card, shall be capable of gracefully shutting down one or more operating systems when the UPS is operating in the battery mode. Network Shutdown software shall be available with the UPS.
2. The UPS shall also be capable of using an RS232/RS485 port to communicate with the host computer by means of serial

communications so as to gracefully shut down one or more operating systems during an on battery situation.

3.3 REMOTE UPS MONITORING, CONFIGURATION AND CONTROL

The following three methods of remote UPS control, configuration and monitoring to be provided.

Web Monitoring: Remote monitoring shall be available via a web browser such as Internet Explorer.

RS232/RS485 Monitoring: Remote UPS monitoring shall be possible via either RS232/RS485 or contact closure signals from the UPS.

Simple Network Management Protocol V3 (SNMPv3): Remote UPS Monitoring shall be possible through a standard MIB II compliant platform.

3.4 SOFTWARE COMPATIBILITY

The UPS manufacturer shall have available software to support graceful shutdown and remote monitoring for the systems detailed

Part - 4 EXECUTION

4.1 START-UP

Start-up is requested, factory trained service personnel shall perform the following inspections, test procedures, and on-site training:

A. Visual Inspection:

1. Inspect equipment for signs of damage.
2. Verify installation per manufacturer's instructions.
3. Inspect cabinets for foreign objects.

4. Inspect battery chassis and modules.

5. Inspect power chassis

B. Mechanical Inspection

1. Check all UPS and internal power wiring connections.

2. Check all UPS and nuts, and/or spade lugs for tightness.

C. Electrical Inspection:

1. Verify correct input and bypass voltage.

2. Verify correct UPS control wiring and terminations.

3. Verify voltage of all battery modules.

4. Verify neutral and ground conductors are properly landed.

5. Inspect external service bypass panel for proper terminations.

D. Site Testing:

1. Ensure proper system start-up.

2. Verify proper control functions.

3. Verify proper bypass operation.

4. Verify system set points.

5. Verify proper inverter operation and regulation circuits.

6. Simulate utility power failure.

7. Verify proper charger operation.

8. Document, sign, and date all test results.

E. On-Site Operational Training: During the factory assisted start-up, operational training for site personnel shall include key pad operation, LED indicators, start-up and shutdown procedures, maintenance bypass and AC disconnect operation, and alarm information.

4.2 MANUFACTURER FIELD SERVICE

Worldwide service: The UPS manufacturer shall have a worldwide service organization available, consisting of factory trained field service personnel to perform start-up, preventative maintenance, and service of the UPS system and power equipment. The service organization shall offer 24 hours a day, 7 days a week, 365 days a year service support.

Replacement parts: Parts shall be available through the worldwide service organization 24 hours a day, 7 days a week, 365 days a year. The worldwide service organization shall be capable of shipping parts within 4 working hours or on the next available flight, so that the parts may be shipped to the customer site within 24 hours.

4.3 MAINTENANCE CONTRACTS

A complete offering of preventative and full service maintenance contracts for the UPS system and the battery system shall be available from the vendor. All contract work shall be performed by the vendor's factory trained service personnel.

4.4 TRAINING

UPS service training workshop: A UPS service training workshop shall be available from manufacturer. The service training workshop shall include a combination of lecture and practical instruction with hands-on laboratory sessions. The service training workshop shall include instruction about safety procedures, UPS operational theory, sub-assembly identification and operation, system controls and adjustment, preventative maintenance, and troubleshooting.

5.0 ISOLATION TRANSFORMER

APPLICABLE STANDARDS, AGENCY APPROVAL AND REFERENCES

The main isolation transformer is provided as a standard feature. The output rating of the transformer shall be minimum 10% higher than UPS rating also for the continuous duty maximum full load rating. The isolation

transformer is a Dry Type Isolation transformer with 200% rated neutral. Each phase of the transformer is a three-wire DELTA connected input winding and four-wire WYE connected 415/415 VAC output winding. The isolation transformer characteristics are described below:

1. K-Factor: K-13

Windings: Copper

Harmonic Distortion: less than 2%

Efficiency: greater than 98%

Insulation: Class H

Temp Rise: 150°C winding temperature rise

Impedance: 4.5% at rated load

Specification for C2 (FIRE ALARM SYSTEM & PA SYSTEM)

1.1 SCOPE OF WORK

- 1.1.1. This specification covers specific requirements of design, preparation of detailed drawings, manufacture, testing at manufacturer's works, supply, inspection at Bidder's/Sub-Bidder's works, packing, forwarding, transportation, transit insurance, delivery at site, installation, testing at site and commissioning of the Fire Detection and Alarm System (FDAS). Scope shall also include laying of cabling, necessary for installation of the system as indicated in the specification and Bill of Quantities. Any openings/chasing in the wall/ceiling required for the installation shall be made good in appropriate manner.
- 1.1.2. FDAS shall be proposed at each floor of GPOA Block 1 building.
- 1.1.3. Main FACP shall be located in Fire Command Centre monitoring various areas.
- 1.1.4. The building where the work is to be carried out is already installed with NOTIFIER Make Addressable Fire Alarm System by NBCC. The FAS installed as part of this tender shall be integrated with the existing NOTIFIER Fire alarm system and therefore the contractor shall ensure the integration of both FAS before procurement of material. Nothing extra shall be paid for integration of the two Fire alarm system and it is deemed to be included in the quoted amount of the contractor.
- 1.1.5. Graphical presentation of FDAS system shall be viewed through monitor from Fire Command Center.
- 1.1.6. It is not the intent to specify completely herein all details of design and construction of equipment or materials to be supplied or of services to be rendered. However, the equipment, materials and services shall conform in all respects to high standards of engineering design, workmanship and be capable of performing in continuous commercial operation in a manner acceptable to EMPLOYER who will interpret the meaning of drawings and specifications and shall have the power to reject any work or material which in his judgement are not in full accordance therewith.
- 1.1.7. Approval from Fire Department: - The Contractor shall be required to obtain NOC from DFS. Statutory fee if any shall be paid by department. However, all liaisoning work / arranging inspection of DFS shall be the responsibility of contractor.
- 1.1.8. **Specification for Detectors and Devices:**
 1. The I.P. Rating shall be as per OEM standards for all detectors and devices.
 2. The frequency range, dB level, light intensity of sounder cum strobe shall be as per OEM Standards.
 3. The detector shall have integrated built in short circuit isolator to enable isolation of faulty detector in case of short circuit in the detector, keeping loop operational. In case built in short circuit isolator not available/ provided by the manufacturer, a fault isolator unit shall be provided after every 20 detectors/ devices in a loop to ensure loop functional except the faulty detector. Nothing extra on account of providing separate fault isolator shall be paid by the department and it deemed to be included in the cost of the detector.
 4. The FAS shall be compatible with the Building Management System. The BMS shall monitoring of the detector/devices of the Fire Alarm and Detection system.

1.2 SPECIFICATION

Please refer CPWD Standard document

Part -VI Fire Detection and Alarm System 2018, Part -B for Technical specification at Intelligent Addressable Fire Alarm System

UL/FM approved devices for the fire alarm system and design is acceptable as per the tender document and CPWD - General specifications.

- (i) Heat Detectors shall conform to IS-2175 - 1988 or BS-5445 (EN 54) Part 5 -1977(VdS/LPCB approved) or NFPA72 (UL/ULC/FM approved) amended upto date.
- (ii) Smoke Detectors shall conform to IS-11360-1985 or BS 5446 Part I-1977 & Part VII -1985 (VdS/LPCB approved) or NFPA72 (UL/ULC/FM approved) amended upto date.
- (iii) For other detectors/devices relevant IS or BS (EN 54) (VdS/LPCB approved) or NFPA 72 (UL/ULC/FM approved) amended upto date

Intelligent Addressable Monitor Module-

- 1. Single or Dual Input Monitor Module, which is accepted.

Addressable Heat Detector-

- 1. As per UL Standard will also acceptable.

Intelligent Addressable Relay /

- 1. Single or Dual Input Monitor Module, which is accepted.

4.4 Addressable Fire Alarm Control Panel (FACP)

18. The length of loop shall be upto 2 Km for wire size 1.5sq mm. as per manufacturer recommendations.

3.5 Addressable Heat Detector:

(ii) It has maximum triggering temperature programmable from 58 C to 81 C. For rate of rise of temp. type: 6.7° to 8.3°C / Minutes.

The fire alarm system shall be integrated with ICCC platform via open protocols such as Web API; BACNET/OPC/MODBUS; RESTful API.

PUBLIC ADDRESS SYSTEM (PAS)

1.1 Scope of Work

- 1.1.1. The intent of the specification is to define the functional & design requirements for the PA system meant to broadcast announcements and alarm to people in the facility.
- 1.1.2. The building is already equipped with PA system installed by NBCC. The scope of work in this tender is SITC of ceiling/wall speakers inside the workhalls, minister room, secretary room, AS/JS rooms etc. as per the architectural layout including power amplifier and necessary speaker cabling etc. The system installed as part of this tender shall be integrated with the existing PA system installed by NBCC.
- 1.1.3. The work shall be carried out as per NBCS 2026, relevant CPWD specifications and detailed specifications given below.

1.2 Power Amplifiers

- 1.7.1. The amplifier shall be fully and natively IP-networked based, not requiring external converters.
- 1.7.2. IP based/ networked based Layer-2 or above protocol, Digital Class-D multi channel Amplifier of 500W or better with total power output for four or more channels

- 1.7.3. The amplifier shall adapt the maximum output power of each amplifier channel to its connected loudspeaker load, with free assignable output power per channel for a total maximum of 500 watt, supporting 70V or 100V operation with direct drive capability and outputs that are galvanically insulated from ground.
- 1.7.4. Audio-over-IP, using the high-quality digital audio interface, compatible with AES67 /AES 70 standards or TCP/IP Control and Layer 2 or above protocol for audio with encryption and authentication to prevent unauthorized access, misuse and modification of data using an uncompressed, high-definition digital audio format with 24-bit sample size and 48 kHz sample rate.
- 1.7.5. The amplifier shall have a built-in independent spare amplifier channel for automatic failover.
- 1.7.6. The amplifier shall provide an interface for control data and multi-channel digital audio over IP using dual Ethernet ports for redundant network connection, supporting RSTP and loop-through cabling, with automatic failover to an analog lifeline input.
- 1.7.7. The amplifier shall have dual power supply inputs and power supplies.
- 1.7.8. All amplifier channels shall have independent A/B zone outputs with support for class-A loudspeaker loops.
- 1.7.9. All amplifier channels shall supervise the integrity of connected loudspeaker lines without interruption of audio distribution.
- 1.7.10. Digital signal processing on all amplifier channels, including equalization, limiting and delay, to optimize and tailor the sound in each loudspeaker zone.
- 1.7.11. The amplifier shall provide front-panel LED status indications for the network link, ground fault, power supplies and audio channels, and provide additional software monitoring and fault reporting features.
- 1.7.12. The amplifier shall be rack mountable (1U) and feature software-configurable signal processing including level control, parametric equalization, limiting and delay for each channel.

1.3 Ceiling Type Loudspeaker with Back Box (6-Watt)

- 1.11.1. The Ceiling Loudspeaker shall be an ergonomic, flush-mounting ceiling loudspeaker for general-purpose applications. It shall be a full range loudspeaker for speech and music reproduction.
- 1.11.2. The Ceiling Loudspeaker shall be a single-piece, 6W, dual-cone loudspeaker with a 100 V matching transformer mounted on the back of the frame. It shall have a circular metal grille as an integral part of the front. The loudspeaker shall have built-in protection to ensure that, in the

event of a fire, damage to the loudspeaker shall not result in failure of the circuit to which it is connected.

1.11.3. The loudspeaker will have ceramic terminal blocks, thermal fuse and heat-resistant, high temperature wiring. It can also be fitted with an optional fire-dome to increase protection of the cable termination.

1.11.4. It should be in accordance with EN 54/UL Listed for safety.

Max. Power	9 Watts
Rated Power	6 Watts
SPL at 1 KHz, 1m, 1w	90dB or better
Power Tapping	6/3/1.5/0.75 W
Rated Voltage	100 volts
Rated impedance	1667 ohms
Effective frequency range (-10dB)	(160 Hz to 10000 Hz)
Mode of Measurement	"Each"

1.4 Testing and Installation:

System installation, commissioning and testing shall be carried out as per the OEM's guidelines, NBC-2016 and relevant CPWD specifications.

Specification for C3 (FIRE FIGHTING SYSTEM)

C3- FIRE FIGHTING SYSTEM

A. GENERAL

The work shall be executed as per CPWD's general specification for Electrical Works, Part-I-2023, Part-V-2020, for Wet Riser and Sprinkler System-2022, General Conditions of Contract, Special Condition of Contracts, Schedule of Work, Drawings and other documents connected with the work.

Approval from Fire Department: - The Contractor shall be required to obtain NOC from DFS. Statutory fee if any shall be paid by department. However, all liasoning work / arranging inspection of DFS shall be the responsibility of contractor.

In case of if any discrepancy with respect to above mentioned document, the order of precedence mentioned in NIT shall be followed.

1.1. INTRODUCTION

The building is already having Fire Fighting pumps installed by NBCC. The scope of work in this tender includes extending the Automatic Fire Sprinkler system in all floors of GPOA Block 1 as per the drawings/BOQ and necessary integration, testing and commissioning of the system after completion of the work.

1.2. CODES AND STANDARDS

Following codes and standards have been referred.

Codes	Code Description
UBBL-2016	Unified Building Bye-Laws of Delhi
NBCS 2026	National Building Construction Standard
IS: 13039: 2014 Reaffirmed 2019	External hydrant system – Provision & maintenance – Code of practice
IS: 15105: 2021	Design & Installation of Fixed Automatic Sprinkler Fire Extinguishing System – Code of practice
IS 1239 Part-I	Specification for Steel Tubes, Tubular and wrought steel fittings.
IS 1239 Part-II	Specification for Steel Tubes, Tubular and other steel fittings.
IS 3589	Steel pipes for water and Sewage (168.3 to 2540 mm Outside diameter) –Specification.

Codes	Code Description
NFPA 13: 2019	Standard for the Installation of Sprinkler Systems

B. SCOPE OF WORK & SPECIFIC REQUIREMENT – FIRE FIGHTING SYSTEM

1. EQUIPMENT & SERVICES TO BE PROVIDED BY THE CONTRACTOR

- 1.1. This specification covers the general requirements of design, preparation of detailed drawings, manufacture, supply of material, testing, inspection at BIDDER'S works, packing, forwarding, transportation, transit insurance, delivery at site, unloading and handling at site from storage area to workplace, erection / installation, testing, commissioning at site and carrying out performance / acceptance tests of the equipment, warranty certificate as per Client requirement, materials and services as per enclosed data sheets and other documents for FIRE FIGHTING system (FPS).
- 1.2. The scope of work is as listed below:
 - a. This package is for provision of FIRE FIGHTING System for GPOA Block 1 building.
 - b. Design, supply, Installation, Testing, Commissioning & handing over of sprinklers system, piping, cabling, fittings, valves and ancillary equipment as per technical specifications, schedule of quantities.
 - c. All supports for all pipes shall be done by contractor.
 - d. Making necessary holes/openings in walls (through core cutting only), providing sleeves and sealing them back to the satisfaction of Engineer in Charge.
 - e. Pressure gauges with syphon pipe shall be with half coupling tapping, isolation valves and piping, bleed, block valves etc complete.
 - f. Test certificates, UL/FM/VDS approved documents, Operating & maintenance Manuals of all equipment's / fittings, Warranty/Guarantee certificate duly signed and certified by bidder.
 - g. Any other point not listed above but required for successful completion of the FIRE FIGHTING system shall be in the scope of bidder.
- 1.3. The following shall be in the scope of bidder:
 - a. Contractor to get Final Fire NOC approval from statutory authorities, including submitting online application for Fire NOC, taking out necessary number of prints of drawings, submission to accredited agency, coordinating site visits, making any minor modification in drawings for the purpose, etc.
 - b. Supporting arrangements needed (indoor & outdoor) for the piping, valves and instrumentation, operating platforms / cross-overs etc in all work locations of site

- 1.4. Supply and application of painting shall be as per IS:5 for piping, fitting, valves, equipment, structural steel and auxiliary steel for supports. The painting should have warranty upto entire Defect Liability Period. In case of failure the contractor should repaint at their own cost.
- 1.5. Any item which may not have been specifically mentioned herein but are needed to complete the equipment / system shall also be treated as included and the same shall also be furnished and erected, unless otherwise specifically excluded as indicated.
- 1.6. FIRE FIGHTING System final flushing/ Hydrotesting to be witnessed by Engineer In Charge & test results should meet the requirements.
- 1.7. For routing piping, cabling etc. breaking / making of opening in wall along with re-packing or core packing, etc. shall be carried out by Contractor at no extra cost.
- 1.8. High Side of Fire Fighting system has been completed by NBCC upto the floor level. All works as per BOQ items needs to be executed and should be integrated with already laid piping networks.

2. TENDER DRAWINGS, DRAWINGS FOR APPROVAL.

The contractor shall prepare and submit the shop drawings to the Engineer in charge, of the entire Fire Fighting system after award of the contract and the same shall be approved by the Engineer in charge. No work shall be allowed to be executed without the approved shop drawings.

i) Tender Drawings: The architectural drawings appended with the tender documents are intended to show the areas to be provided with Fire Fighting system.

ii) Drawings for approval on award of the work

The contractor shall prepare & submit six sets of following drawings and get them approved from the Engineer-in-charge before the start of the work. The approval of drawings however does not absolve the contractor not to supply the equipment/ materials as per agreement, if there is any contradiction between the approved drawings and agreement.

a) FIRE FIGHTING system drawings showing the layout of entire piping, dia & length of pipes, valves and isometric drawings.

b) Electrical wiring diagrams for all electrical equipment and controls including the sizes and capacities of the various cables and equipment,

c) Drawings showing details of supports for pipes, cable trays etc.

d) Any other drawings relevant to the work.

3. SPECIFIC REQUIREMENTS / INSTRUCTION TO BIDDERS

- 3.1. All equipment supplied shall have capacities not less than those specified in the data sheets and necessary test certificates shall be furnished in this regard.

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

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Approved Makes and type of equipment/ components shall be supplied. The make, type reference of the equipment is subject to Engineer in charge approval.

- 3.2. Grouting of all equipment and supports, supply of grounding material such as cement, sand, necessary form work etc. is Bidder's responsibility.
- 3.3. No Separate payment will be made for necessary structural supports of piping.
- 3.4. The quantities of piping & valves, specialties etc. indicated in Bill of Quantities are indicative for the purpose of Bidder's guidance and shall not be binding to limit the scope of Contractor's work.
- 3.5. Bidder shall note that for piping, quantities of fittings like elbows, reducers, fabricated reducers / miters, compression fittings, flanges, nipples etc. are not defined. The price for supply, fabrication and erection of necessary fittings shall be included in the unit rates for respective pipe sizes. The rates for flanges, and hardware like bolts, nuts, washers and gaskets shall be included in prices quoted for pipes, equipment, valves and specialties as applicable.
- 3.6. No separate prices are called for painting. Price for supply and application of painting shall be included in the unit prices for piping, valves and equipment, structural steel work as applicable.
- 3.7. Initial inspection at works and final inspection and testing at site shall be carried out as per CPWD General Specification.
- 3.8. All charges for inspection, testing, radiography, dye penetrate testing, flushing, cleaning, hydro/air testing, purging with inert gases, integrity test for inert gas, commissioning including all consumables required for same shall be included in the unit rate for erection of piping/valves/equipment.
- 3.9. Minor civil works like wall opening, chipping of foundation, grouting of foundations, closing of holes shall be carried out at no extra cost.
- 3.10. In addition to the scope mentioned in Section B Clause 1.2 above, the CONTRACTOR shall supply and erect all required temporary pipes, fittings, flanges, valves and specialties and hangers and supports for testing and cleaning operations, as a part of the erection scope of contract for each of the systems listed above. The BIDDER shall consider this requirement while quoting unit prices for erection.
- 3.11. The construction of the FIRE FIGHTING system requires all CONTRACTORS to adhere to good daily housekeeping practices. During construction the CONTRACTOR shall every day, keep all work and storage areas used by them free from accumulation of waste materials. Scrap/ rubbish shall be removed from the site to the satisfaction of the client. The CONTRACTOR shall maintain a crew to carry out this function without any additional payment.
- 3.12. The contractor shall prepare and submit to the Engineer-in-charge for approval, final piping bill of materials as actually erected for purpose of reconciliation.

- 3.13. The surplus material with the CONTRACTOR for all materials brought by him shall be taken back by the CONTRACTOR except surplus from those materials for which the OWNER has given, in writing, clearance for procurement.
- 3.14. All the pipes shall conform to the relevant piping standards.
- 3.15. Slings/ wire ropes and other lifting, hoisting or pulling slings used for lifting various loads shall be invariably tested by a test load before carrying out actual erection.

4. SPECIFICATION – FIRE FIGHTING SYSTEM

4.1 M.S Pipes, Sprinklers, SS flexible pipe & Fittings

M.S Pipe and fittings specifications shall conform to code no 27.7 of DSR 2025 E&M for wet riser and sprinkler system and CPWD Part V Wet Riser & Sprinkler Systems – [2020](#)

Sprinklers specifications shall conform to code no 27.21 of DSR 2025 E&M for wet riser and sprinkler system and CPWD Part V Wet Riser & Sprinkler Systems – [2020](#)

SS Flexible pipe specifications shall conform to code no 25.25 of DSR 2025 E&M for wet riser and sprinkler system and CPWD Part V Wet Riser & Sprinkler Systems – [2020](#)

4.2 Pipe flow direction

All pipes shall have flow direction and system types. This will be done by standard stencils, prepared with letter sizes as conveyed. Minimum letter height is 1-1/4 inches for ducts and 3/4 inch for pipes. Stencil Paint: Exterior, oil-based alkyd gloss black enamel, except as otherwise indicated. Paint may be in pressurized spray-can form.

5. TESTING OF THE SYSTEM:

5.1 Method of Testing System:

Performance of Test results & notes on test instruments and capacity computation shall be as per **CPWD General Specifications for Electrical Works Part-V (Wet Riser & Sprinkler Systems) 2020** requirement. Tests on pipes and fittings shall be carried out in accordance with IS: 8329 and IS: 9523. The Engineer shall be permitted free access to the place of manufacture for the purpose of examining and witnessing the testing of pipes and fittings.

All leaks and defects in joints revealed during the testing shall be rectified to the satisfaction of the Engineer In Charge.

Piping required subsequent to the above pressure test shall be re-tested in the same manner.

System may be tested in sections and such sections shall be securely capped.

The Engineer shall be notified well in advance by the Contractor of his intention to test a section of piping and all testing shall be witnessed by the Engineer In Charge.

The contractor shall maintain a register at site in which all records of pressure test shall be entered.

The Contractor shall make sure that proper noiseless circulation of fluid is achieved through the system concerned. If proper circulation is not achieved due to air bound connections, the Contractor shall rectify the defective connections. He shall bear all the expenses for carrying out the above rectification including the tarring-up and re-finishing of floors, walls etc. as required.

The Contractor shall provide all materials, tools, equipment, instruments, services and labor required to perform the test, and shall ensure that the areas is cleaned up and spill over water is removed after the testing is completed.

All air trapped in the pipeline shall be removed. Each section of the pipe shall be slowly filled with the water & allow to stand the water for few hours with the ends closed.

All pipes or joints which are proved to be in any way defective shall be replaced or remade and re-tested as often as may be necessary until a satisfactory test shall have been obtained. Any work which fails or is proved by test to be unsatisfactory in any way shall be redone by the Contractor.

5.2 Start-up / System Testing:

It will be the responsibility of the tenderer to cause interim/stage inspection by the CFO during execution of the work as and when so called for by the Engineer In Charge and shall carry out any rectification / modification as may be suggested by the Fire Authority/Chief Fire Officer (CFO).

Soon after the work is completed, the contractor shall inform the CFO in writing with a copy to the Engineer In Charge for getting the complete system including all sub system and instrumentation, control etc. thoroughly inspected and tested for satisfactory performance. After satisfactory completion of tests of the systems by the CFO, the contractor shall be required to submit in built drawings on tracing cloth to the Architect which have been so approved.

The contractor shall also be responsible for getting the system and equipment tested and approved by other Statutory Authorities like the Area Fire Officer or the State Fire Services as may be required.

6. Commissioning of System:

System commissioning shall be as per CPWD General Specifications for Electrical Works Part-V (Wet Riser & Sprinkler Systems) 2020 requirement.

Before commissioning, the entire system shall be flushed to ensure that any earth /foreign matters which might have entered during installation are taken out. For this, pump may be operated and valves opened at different locations.

As soon as the work is complete, the system shall be commissioned and made available

for use. Requirement of FIRE FIGHTING system installations is equally important during occupation of the building. If the building is to be occupied in part, FIRE FIGHTING system of building completed shall be commissioned by isolating the system of under construction portion of the building.

The FIRE FIGHTING system shall be maintained and manned from the very first day of its commissioning.

Any defects noticed during the warranty period shall be promptly attended by the Contractor and availability of the system at all times is to be ensured.

7. Samples & catalogues:

Before ordering the material necessary for this work, the contractor shall submit to Engineer In Charge for approval, a sample along with the catalogues / technical data sheets. After that the contractor shall arrange inspection and testing at the manufacturer's factory as per approved quality assurance plan or assembly shop for final approval. No material shall be procured prior to the approval of the Engineer In Charge.

8. Shop drawings:

All the shop drawings shall be prepared on computer through licensed AutoCAD, based on Architectural drawings, site measurements and co-ordinated MEP Drawings. Contractor shall furnish, for the approval of the Engineer In Charge, **required sets of detailed shop drawings** of all equipment and materials including layouts for Pump room, Typical drawings showing exact location of supports, flanges, bends, tee connections, reducers, detailed piping drawings showing exact location and type of supports, valves, fittings etc; external insulation details for pipe insulation etc; electrical panels inside/outside views.

These shop drawings shall contain all information required to complete the Project as per specifications and as required by the Engineer In Charge. These Drawings shall contain details of construction, 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. Each shop drawing shall contain tabulation of all measurable items of equipment/materials/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 4 sets of drawings** shall be submitted after final approval along with CD.

Each item of equipment/material proposed shall be a standard catalogue product of an established manufacturer strictly from the manufacturers as per Make list. When the Engineer In Charge makes any amendments in the above drawings, the contractor shall supply two fresh sets of drawings with the amendments duly incorporated along with check prints, for approval. The contractor shall submit further 4 sets of shop drawings to the Engineer for the exclusive use by the Owner's site representative and all other agencies. No material or equipment may be installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/equipment/ installation.

Shop drawings shall be submitted for approval four weeks in advance of planned delivery and installation of any material to allow Engineer ample time for scrutiny. No claims for extension of time shall be entertained because of any delay in the work due to his failure to produce shop drawings at the right time, in accordance with the approved programme.

Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimensions. Where drawings are approved, said approval does not mean that the drawings supersede the contract requirements, nor does it in any way relieve the contractor of the responsibility or requirement to furnish material and perform work as required by the contract.

Where the contractor proposes to use an item of equipment, other than that specified or detailed on the drawings, which requires any redesign of the structure, partitions, foundation, piping, wiring or any other part of the mechanical, electrical or architectural layouts; all such re-design, and all new drawings and detailing required therefore, shall be prepared by the contractor at his own expense and gotten approved by the Engineer In charge. Any delay on such account shall be at the cost of and consequence of the Contractor.

Where the work of the contractor has to be installed in close proximity to, or will interfere with work of other trades, he shall assist in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer In charge's site representative, the contractor shall prepare composite working drawings and sections at a suitable scale, clearly showing how his work is to be installed in relation to the work of other trades. If the Contractor installs his work before coordinating with other trades, or so as to cause any interference with work of other trades, he shall make all the necessary changes without extra cost to the Owner.

9. Test certificate:

The contractor shall submit test certificates for all the material/system installed. These shall be issued by a government recognized inspection office certifying that all equipment, materials, construction and functions are in agreement with the requirements of these specifications, ISI and when ISI is not applicable other approved certifying agencies.

10. Guarantee:

At the close of the work and before issuance of final certificate of completion by Engineers at site the contractor shall furnish written guarantee indemnifying
 Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil AE (E) EE (E)

Engineer against defective materials and workmanship for a period of one year after completion. The contractor shall hold himself fully responsible for reinstallation or replacement, free of cost to Employer for the following:

Any defective work or material supplied by the contractor.

Any material or equipment supplied by Engineer in charge which is damaged or destroyed as a result of defective workmanship by the contractor.

Any material or equipment damaged or destroyed as a result of defective workmanship by the contractor.

11. DATA TO BE FURNISHED BY THE CONTRACTOR AFTER THE AWARD OF CONTRACT AND BEFORE INSTALLATION

- i. Schedule of drawings and documents to be submitted for review, approval and information with submission dates.
- ii. Quality assurance plan. (QAP).
- iii. Purchase specifications / requisitions for bought out items.
- iv. Measurement and record of settlement during hydro-test / construction.
- v. Procedure for installation, Operation & Maintenance manual for bought out items.
- vi. As built drawings
- vii. Detailed P & I diagram showing clearly the scope of supply of equipment, piping with line sizes and material specifications, valves, specialties, instrumentation and control and all accessories. This drawing or documents mentioned under following clauses shall include all design data and information furnished. The makes of all major components and controls shall be indicated.
- viii. Dimensioned general arrangement drawing showing all equipment with accessories, mounting details, etc.
- ix. FIRE FIGHTING System layout drawings include insulation giving sizes and lengths of all the pipes and the sizes and locations of all types of valves, and including isometric drawings for the entire piping including the pipe connections to the various equipments and insulation details wherever required.
- x. Line diagram and layout of all electrical control panels giving switchgear ratings and their disposition, cable feeder sizes and their layout,

- xi. Control wiring drawings with all control components and sequence of operations to explain the operation of control circuits.
- xii. Overall space and head room requirement with details of handling during erection, operation and maintenance.
- xiii. Catalogues furnishing detailed technical data for valves, Fire Extinguishers etc.
- xiv. Final List of Essential Spares.
- xv. 50 Nos. spares of each type of Sprinkler head shall be provided at the time of handing over to the department. Nothing extra shall be payable in this regard.
- xvi. Clean Agent, lubricating and oil control schematics.
- xvii. Method Statement.
- xviii. Procedure for performance testing.
- xix. Test Certificates for the materials.
- xx. Manufacturer's printed catalogue for each primer and finish paint material indicating brand name, composition, technical specifications, storage and handling instructions, directions for use, surface preparation requirements and safety information etc.

12. DOCUMENTS TO BE FURNISHED ON COMPLETION OF INSTALLATION

Three sets of the following documents shall be furnished to the department by the contractor on completion of work:

- i) Completion drawings as per schedule.
- ii) 3 sets of manufacturer's technical catalogues of all equipments and accessories.
- iii) Operation and maintenance manual of all major equipments, detailing all Adjustments, operation and maintenance procedure, Mandatory & Recommended spares list for each equipment for 5years

13. COMPLETION DOCUMENT/ HANDING OVER:

All commissioning and testing shall be done by the Contractor to the complete satisfaction of the Engineer-in-charge, and the job handed over to the Employer. Contractor shall also hand over to the Employer all operation & maintenance manuals, as erected drawings & Fire NOC with all items as per the terms of the contract.

The following documents shall be submitted by the Contractor in triplicate as part of the completion documents in the proforma prescribed by the Engineer In Charge.

- a) Welding procedure specification and Welder qualification report.
- b) As built drawings incorporating field modifications, if any.
- c) Contractor shall mark up completely and clearly one set of prints of piping drawings of Engineer with approved modifications/field runs carried out at site.
- d) Radiographic report along with radiographs, All NDT records
- e) All alignment protocols
- f) Pipeline hydro test record.
- g) Quality assurance documentation specific for the project.
- h) Contractor shall also submit a complete set of approved as built drawings, maintenance schedule and test certificates wherever applicable.
- i) A detailed list of inventory of FIRE FIGHTING system to be submitted to the Engineer in charge for his approval as per approved format.

CLEAN AGENT GAS BASED FIRE SUPPRESSION SYSTEM

Scope of work

The gas suppression system is to be provided for the ELV and UPS area complete as per the BOQ. The contractor shall submit the design calculation along with detailed drawing for GSS inline with relevant provisions of NFPA and CPWD Specification Part VIII: Gas Based Fire Extinguishing System for approval of Engineer-in-charge before execution of the work.

Clean Agent system

(i) General

Basis the design approved by Engineer-in-charge the bidder shall supply, install, test, commission and put in operation UL/FM/VDS approved CLEAN AGENT based fire suppression system. Fire suppression system containing the Hydraulic flow calculation with all the components to be used shall be designed with OEM approved software. The design shall be vetted from the OEM of Fire Suppression System. All the components viz. CCOE/PESO approved cylinder, CCOE/PESO approved valve assembly, actuators, EPA approved NFPA listed clean agent for fire suppression (FK-5-1-12, FM-200 or equivalent), discharge hose, gas release panel, pressure switches, discharge nozzle etc. shall strictly be as per system approved by UL/FM/VDS.

The Clean Agent Based Fire Suppression System shall meet NFPA 2001 (latest edition) standards and installed in compliance with all applicable requirements of the local codes and standards.

The system design should be based on the specifications contained herein, NFPA 2001 (latest edition) and in accordance with the requirements specified in the design manual of the OEM.

The Clean Agent Gas Based Fire Suppression System shall:

- Comply with NFPA 2001 latest standard
- have components as per the listing in the approval of UL / VDS / FM clean agent fire suppression system.
- have maximum operating pressure as per the NFPA 2001 standard.
- have zero ozone depletion potential (ODP)
- have a minimal life span in atmosphere as per EPA and NFPA guidelines.
- be efficient, effective and does not require excessive space and high pressure for storage;
- have Global Warming Potential (GWP) of the Gas not more than 1.0.

OEM's UL /Vds/FM certificates shall be submitted along with TDS. PESO approval for pressurized cylinders shall be furnished for seamless cylinders and valves separately. 100% online Stand-by cylinders of clean agent shall be provided for restoring the area protection after discharge of main bank of cylinders.

(ii) Design Condition

The designer shall consider simultaneous flooding of all voids within the protected volume. The system shall be designed in accordance with CPWD Specification Part VIII: Gas Based Fire Extinguishing System, NFPA-2001 (latest edition).

In order to extinguish a fire using clean agent, the concentration of agent delivered to each void shall be above the minimum design concentration. The following shall be considered while designing the system.

- Minimum design concentration shall be as per NFPA guidelines for respective clean agent.
- If the protected volume has a floor and / or ceiling void the spaces shall be included in the protected volume, employing a minimum design concentration not below that of the main room compartment.
- The discharge nozzles shall be located within the protected volume in compliance to limitations and with regard to spacing, floor and ceiling coverage, etc. The nozzles shall be positioned such that they would cover the entire area up to the extreme corners of the area under protection and the design concentration will be established in all parts of the protected volumes. Vendor needs to submit Acoustic calculation reports for all rooms with Electronic data storage to determine the sound decibel level in accordance with difference sound frequency with nozzle to storage distance as 1mtr.
- The average pressure at each nozzle should be as per OEM recommendation.

- The gas flow calculation shall be carried out on OEM supplied/vetted software. The software should support usage of seamless cylinders which have a different design compared to the standard containers used worldwide.
- The agent discharge time shall not exceed 10 seconds and not less than 5 seconds.
- The design concentration shall follow at minimum NFPA 2001 (latest edition) for under floor, room and ceiling space. Unless otherwise approved, room temperature for air-conditioned space shall be taken around 21°C. For non-air-conditioned space, the temperature shall be taken around ambient temperature.
- The system engineering company should carry out the piping Isometric design and validate the same with a hydraulic flow calculation generated by using the agent's design software. Appropriate fill density to be arrived at based on the same.
- The system shall be so designed that a fire condition in any one protected area shall actuate automatically the total flooding of clean agent in that area independently. The entire system shall incorporate inter-alia detection, audible and visual alarms, actuation and extinguishing.
- The Clean Agent shall be stored in seamless steel cylinders and super pressurized with dry nitrogen to provide additional energy to give the required rapid discharge. At the normal operating pressure the agent should be in liquid form inside the cylinder.

(iii) Components

All the components of Gas Based Fire Suppression System shall conform to prevailing guidelines issued by GoI time to time and should comply to Order of Govt. of India, Ministry of Finance, Department of Expenditure (PPD) F.No. 7/10/2021-PPD(1), dated 23.02.2023.

Cylinders

Each cylinder shall be seamless steel type manufactured from billets and tested in accordance with IS 7285 standard and approved by CCOE/PESO.

CCOE/PESO approved cylinder/valve assembly shall have suitable metallic protection for the valve enabling transportation of the filled cylinders safely.

The cylinders shall be super-pressurized with dry Nitrogen to 25 bar – 70 bar. The cylinder shall be capable of withstanding any temperature between -30 Deg C and 70 Deg C.

All cylinders shall be distinctly and permanently marked with the quantity of agent contained, the empty cylinder weight, the pressurization pressure and the zones they are protecting.

The seamless cylinders shall be UL / VDS / FM approved apart from PESO approval.

Cylinder Valve

The Valve assembly should be UL / VDS / FM approved apart from PESO approval and be mounted directly on the cylinder and should NOT have any adaptor in between the cylinder and Valve as per PESO requirements. PESO license copy to be submitted by bidder.

Each cylinder valve shall have a provision for fixing a supervisory pressure switch and a safety burst disc to protect the cylinder from over pressure.

Each valve is to be fitted with a pressure gauge for monitoring loss of pressure. The master cylinder valve is to be released electrically which is performed by means of a solenoid valve arrangement. The Electric actuation unit shall with manual lever assembly which shall be UL / VDS / FM/ approved.

Cylinder valve Actuators / Electric Actuator with Placement Indication Switch

In a single cylinder system, the cylinder shall have a UL / VDS / FM approved solenoid operated actuator and a manual actuator. Multi cylinder systems shall have the same fitted on to the master cylinder and pressure operated actuators fitted on each slave cylinder. All actuators shall be OEM manufactured and UL / VDS / FM approved.

Discharge Hoses

Each cylinder valve shall be provided with a plug in type discharge hose of with a test pressure of minimum 52 Bar. Each hose shall be UL / VDS / FM approved. Multi cylinder systems shall have an interconnect hose for each cylinder. All hoses shall be OEM manufactured and UL / VDS / FM approved.

Dischage Manifold

For Multiple cylinder systems, the manifold shall be fabricated at site with ASTM A106 Schedule 80 seamless pipe with ports provided to connect the check valves.

Check valves

The check valves shall be UL / VDS / FM approved. The check valves shall be threaded to the manifold on one end and discharge hose from cylinder on the other end. The manifold shall be fabricated based on the shop drawing from OEM.

Pipe & Fittings

All piping shall be ASTM A-106, Grade-B, Schedule 40 seamless pipes and all fitting shall be of ASTM A-105.

Gas Release Panel

Gas Release Panel shall be UL / VDS / FM approved with 8 hrs battery backup. Manual Release Switch and Manual Abort switch in conformance to the requirements put forth in NFPA 2001 shall be provided.

Re-Filling & Maintenance

In case of any leakage or accidental discharge of the agent, it should be possible to re-fill the cylinders from a UL / Vds / FM approved filling station and also having a valid PESO approved OEM filling station in India itself. The contractor should indicate the source of re-filling and the time that will be taken for re-filling and replacement.

Documentation

The system engineering company should prepare & submit along with the TDS, the piping Isometric drawing and support the same with a UL / VDS / FM approved hydraulic flow calculation generated using the agent's design software. The calculations shall validate the fill density assumed by the agency.

The agency shall submit copies of datasheets of UL / VDS / FM approved hardware used in the system. The agency shall also submit copy of PESO approval letter for the cylinder proposed to be used.

The agency shall also submit calculations to support the qty of agent considered for the system.

The successful vendor must submit, along with the supply invoice, a certificate of authenticity for the agent, duly checked and vetted by the OEM.

The system engineering company should provide, as part of the handing over, the As-built drawings and operation & maintenance manual.

Testing

The testing and commissioning of GSS shall be done as per the OEM standards, NBCS 2026, NFPA and relevant CPWD specifications etc. complete till the satisfaction of Engineer-in-charge.

Specification for C4 (HVAC)

GENERAL

The work shall be executed as per CPWD General Specifications for Heating, Ventilation & Air-Conditioning (HVAC) Works (2024), General Conditions of Contract, Special Condition of Contracts, Schedule of Work, Drawings and other documents connected with the work.

In case of if any discrepancy with respect to above mentioned document, the order of precedence mentioned in GCC shall be followed.

INTRODUCTION

The proposed building is GPOA Block 1 at Netaji Marg, New Delhi. The building is already installed with High side HVAC system like Chillers, Primary/Secondary pump sets, Cooling towers etc. The scope of work in the tender is Low side HVAC works including AHU's, Extending HVAC Piping, Ducting, Diffusers, VAV's, Ventilation Fans, Kitchen Exhaust fan, Air washer, Dry Scrubber, VRV etc. as per the BOQ including all required accessories and supports etc, necessary integration with existing High side HVAC system and testing & commissioning of the system as per CPWD HVAC 2024 Specification.

SCOPE OF WORK

The general character and the scope of work to be carried out under this contract are illustrated in the Specifications and Schedule of Quantities. The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Engineer in charge. The contractor shall furnish all labor, materials and equipment and specified otherwise, transportation and incidental necessary for Design, Supply, Installation, Testing, Commissioning, final testing, putting into operation, equipment capacity computation and handing over of the complete air conditioning system as described in the Specifications and as shown in the approved drawings. 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 which are necessary and customary to be performed under this contract.

Water Distribution

Chilled water vertical header is already routed from the Plant room area to the top of the building through masonry shafts wherever required. The contractor shall extend the necessary required pipe lines till the AHU's/FCU's etc. in each floor.

2 ways Modulating PIBCV valves will be provided on the individual AHU chilled water return lines to sense the actual room loads and vary the secondary pump flow accordingly. Each AHU will be provided with insulated condensate drain piping up to nearest floor drain.

All other types of valves, fitting, pressure gauge, temperature gauges etc. shall be provided as per CPWD HVAC 2024 Specification.

Air Distribution.

Dedicated AHU Rooms are provided as shown in the Architectural layout drawing. Typically, there are 92 numbers of AHUs and 1 CSU are provided as per room application. These AHUs are having capacity from minimum 5000 cfm to maximum 18500 cfm. These AHUs will be further ducted to supply and distribute the cool air. Initial duct of supply air duct (almost 3 mtr) will be acoustically lined to reduce air borne noise.

All return air ducts will be painted with fire rated paint to withstand for 2 hrs in fire.

All AHUs will be provided with Pre-filter (ISO coarse greater than 60%), Fine filter (ePM1 with PM efficiency 50-70%), chilled water coil, humidifier, UVGI lamps for cooling coil and Air , EC fans, etc as per BOQ.

In addition to this all-cooling coil are provided with UVGI lamp for surface disinfection of cooling/heating coils, drain pan, air filter, other services and disinfection of the air stream passing through the each AHU.

All areas like pantry, storeroom, electrical room, toilets, utility rooms etc will be ventilated as per NBCS 2026.

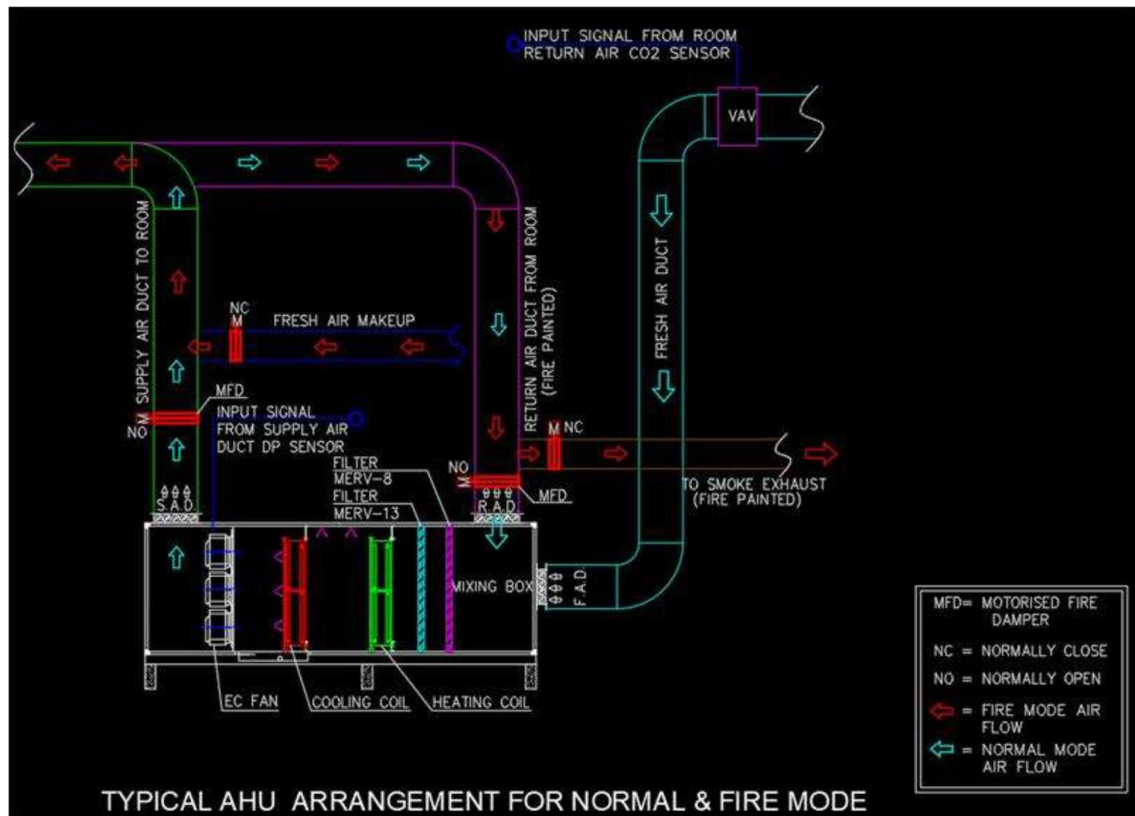
Kitchen will be ventilated using supply air through air washer. SISW fans kept with heavy gauge MS ductwork insulated with mineral wool insulation shall be used for kitchen exhaust. Kitchen exhaust will be passed through dry scrubber to clean out kitchen exhaust air and then discharged to the atmosphere.

Fire strategies.

Each floor of the building is divided into 6 (six) zones. Maximum 2 Nos. of AHU have been provided to cater each zone. Conditioned air will be confined within the zone only and no mixing of air will be happening across the zone. There are 4 No. of Fire Zones on each floor and air conditioning system has been planned to contain the air within the designated fire zone only. Electrical panel of each AHU will be connected to Fire Alarm system and in case of fire AHU will be shut down. An independent smoke extraction system from the floors have been provided which may require its extension basis the interior layout.

Entire building is divided into number of fire zones. All AHUs are provided with supply and return air ducting. Each supply air ducts shall be connected to fresh air make up fans and each return air ducts shall be connected to smoke spill fans with motorized fire dampers. In case of fire all AHUs in affected zone shall be automatically switched OFF and all fresh air & smoke spills fans in the affected zones shall be automatically switched ON. Fresh air shall be pumped in affected zone through supply air ducts and smoke shall be evacuated through return air ducts. Return air ducts shall be fire rated to with stand for 250 deg C for 2 Hrs as per NBCS 2026.

All AHUs in affected zone shall be OFF after receiving signal from fire panel.



Heat Load Calculations and Equipment Selection

The Agency/ contractor should give detailed heat load calculations, immediately after award of work as per requirement separately for all the seasons in which, the specified conditions are to be maintained.

The Agency/Contractor should also give the above heat load calculations for complete area separately, for the areas served by each AHU in a central air conditioning/ heating system for summer, monsoon and winter season before placing the order for procurement of AHU's.

The equipment selection and duct design shall be made based on the above heat load calculations wherever required.

The contractor shall also prepare duct design drawing and submit to department for approval.

The Contractor can refer and utilize the design done by the department/consultants, however, there shall be no commitment to provide the same to the contractor, nor the contractor shall be absolved of the responsibility of correct design and performance of the air-conditioning system provided by the contractor.

DESIGN CRITERIA FOR COOLING LOAD CALCULATION:

- a) Reference Architectural drawings (Latest) for GPOA Block 1, Master plans and subsequent revisions.
- b) Occupancy – as per Architectural Plans.
- c) Equipment & Lighting Load –As per actual data.
- d) Building Envelope as per architectural drawing.
- e) Outdoor Design Conditions

The outside design conditions shall be based on ASHRAE 2017 Outdoor Design Conditions @ 0.4 % occurrence New Delhi

- f) Indoor Design Conditions of all air-conditioned areas:

- i. For Office areas, Conference/Meeting rooms, work hall, Cafeteria are given below:

Dry bulb temperature (Summer & Monsoon): 24 ± 1 °C

Relative humidity (Summer & Monsoon): 50%-60%

In Winters, the above Indoor design conditions will be maintained at

Dry bulb temperature: 20 ± 1 °C

Relative humidity (Winter): 40%-60%

- ii. Server room / Data center:

Dry bulb temperature: 22 ± 2 °C

Relative humidity: Not exceeding 60%

- g) Duration of Operation:

- a. Office areas: 10 hours Operation
- b. UPS, ELV, CCTV Surveillance, Server room: 24 hours continuous operation

DESIGN PARAMETERS FOR EQUIPMENT AND ASSOCIATED ITEMS

a. Design Parameters For Air And Water Distribution System shall be as per CPWD HVAC 2024 Specification

b. Air Handling Units: Shall be designed as per BOQ and CPWD HVAC 2024 Specifications

TENDER DRAWINGS, DRAWINGS FOR APPROVAL.

Typical floor plan appended with the bid documents shall be referred for Heat Load Calculation, preparation of Ducting/ Piping layout and Schematic. Basis the approved Heat Load Calculation, Schematic and Ducting/ Piping Layout, the contractor shall furnish the shop drawings of all the equipment/ layouts and will

submit to the Engineer in charge for approval. No work shall be allowed to be executed without the approved shop drawings.

i) Tender Drawings

The drawings appended with the tender documents are intended to show the areas to be conditioned, AHU rooms. The equipment offered shall be suitable for installation in the spaces shown in these drawings.

ii) Drawings for approval on award of the work

The contractor shall prepare & submit required sets of following drawings and get them approved from the Engineer-in-charge before the start of the work. The approval of drawings however does not absolve the contractor not to supply the equipment/ materials as per agreement, if there is any contradiction between the approved drawings and agreement.

- a. Layout drawings of the equipment to be installed in various rooms.
- b. Drawings including section, showing the details of erection of AHU's, CSU etc. all the equipments as per BOQ including their foundations etc.
- c. Ducting drawings showing all the supply, return, fresh air, exhaust etc. ducts.
- d. Plumbing drawings showing the layout of entire piping, dia & length of pipes, valves and isometric drawings showing connections to various equipment.
- e. Coordinated Reflected Ceiling Plan incorporating all the HVAC component and all other E&M services shall be prepared by the agency/ contractor.
- f. Electrical wiring diagrams for all electrical equipment and controls including the sizes and capacities of the various cables and equipment,
- g. Dimensioned drawings of all electrical and control panels,
- h. Drawings showing the details of all insulations and vapor barrier works,
- i. Drawings showing details of supports for pipes, cable trays etc.
- j. Any other drawings relevant to the work.

AIR HANDLING UNITS

SCOPE

The scope of this section comprises the supply, erection, testing and commissioning of double skin construction air handling units, conforming to these Specifications and in accordance with requirements of drawings and of the Schedule of Quantities.

TYPE

The air handling units shall be double skin construction, draw-thru type in sectionalized construction consisting of blower section, coil section (Cooling & Heating), humidification section (where specified), filter section, and insulated drain

pan, mixing box (wherever the return air and fresh air are ducted) as shown on drawings and included in schedule of quantities.

CAPACITY

The air handling capacities and static pressure shall be as per Schedule of Quantities.

The capacity of the cooling/heating coil, the air quantity from the blower fan and static pressure of blower fan shall be as laid down in the tender documents. Where these parameters as calculated by the tenderer exceed the specified values, the coils and the blower fan shall satisfy these calculated values.

The coil shall be designed for a face velocity of air not exceeding 500 fpm.

The requisite static pressure demanded by the air circuit shall be developed by the fan at the selected operating speed. The static pressure value shall not in any case be less than 75 mm water gauge where (-ISO Coarse Grade with efficiency greater than 60% (confirming to ISO16890) & ISO ePM1 with PM efficiency (50%-70%) (confirming to ISO16890)) filters are also used and not less than 100 mm water gauge where absolute filters are also used. The fan motor HP shall be suitable to satisfy these requirements and the drive losses.

CASING

The casing of the air handling unit shall be of double skin construction, complying with EN 1886 or AHRI 1350 or ISHRAE standard for mechanical characteristics. The structure shall be made of Extruded Aluminium sections with polyamide thermal break profile for ensuring thermal bridging performance. The polyamide strip should be crimped to extruded aluminium sections for leak proof fitment. The structure shall be assembled using die cast Glass filled Nylon joints to make a sturdy, strong & self-supporting framework for various sections. The profile shall have built in coved aluminium profile having smooth curvature from inside to avoid dust accumulation.

Double Skin Panels shall be minimum min 48 ± 2 mm thick constructed as follows

- Outer skin: Pre-plasticized Galvanised Sheet Steel of 0.8 mm thickness with PVC guard film.
- Inner skin: Plain GI sheet of 0.8 mm thickness having 270 gsm zinc coating.

The outer and inner skin shall be sandwiched with self-extinguishing CFC – HFC free PUF insulation (density 40 kg/m³ with K factor not exceeding 0.02 Watt/mk). The panels shall be screwed to the structure using soft food grade gasket to make it leak proof. Air tight access doors/panels with die cast zinc hinges shall be provided for access to various sections for maintenance.

The door shall be fitted with double wall inspection window of 200 mm diameter and robust glass filled nylon handles operational from both sides with optional locking arrangement. Each section should have inspection doors with duly wired marine lights and on/off switch mounted on wall of the unit. The entire housing shall

be mounted on Rolled Formed channel made out of 270 gsm zinc coated heavy duty GSS channel frame work with provision for handling the units at site.

Drain Pan shall be constructed of 18 G 304 Stainless Steel with dual slope to facilitate immediate discharge of condensate. Specially designed drain pan with all round edges allow complete cleaning & avoid microbial growth as per ASHARE 62 standard. The drain tray will be insulated externally with 19 mm nitrile rubber & extended at least 300 mm beyond the coil. Necessary arrangement will be provided to slide the coil in the drain pan.

Mechanical performance of AHU casing shall be tested as per EN1886 or AHRI 1350 or ISHRAE standard by internationally renowned laboratory or certification body like AHRI/ Eurovent / Intertek / UL and should meet the following characteristics.

Mechanical Characteristics	As per EN 1886	As per AHRI 1350	As per ISHRAE Standard
Mechanical Strength	D1	CD 4	M1
Thermal Bridging	TB2	CB 2	TB 2
Thermal Transmittance	T2	CT 2	T 2
Air Leakage	L1	CL 2	CL 1

MIXING BOX

AHU's requiring mixing boxes as specified in Schedule of Quantities shall be complete with fresh and return air dampers.

DAMPER

Dampers shall be opposed blade type. Blades shall be made of double skinned aero-foil aluminum sections with integral gasket and assembled within a rigid extruded aluminium alloy frame. All linkages and supporting spindles shall be made of aluminium or nylon, turning in Teflon bushes. Manual dampers shall be provided with a Bakelite knob for locking the damper blades in position. Linkages shall be extended wherever specified for motorized operation. Damper frames shall be sectionalized to minimize blade warping. Air leakage through dampers when in the closed position shall not exceed 1.5% of the maximum design air volume flow rate at the maximum design air total pressure.

FAN WITH EC MOTOR

The complete EC Fan unit shall be of rugged bolted construction made of sheet steel, statically and dynamically balanced.

Fan: The fan section shall be equipped with a Single Inlet Centrifugal Impeller with High Efficiency Backward curved blades and external rotor EC (Electronically Commutated) motor, energy optimized for operation without spiral housing for high efficiency and favorable acoustic behaviour. The high efficiency backward curved

impeller with rotating diffuser, made of high-performance composite material / welded aluminum sheet material, with external rotor motor balanced together statically and dynamically according to DIN ISO 1940 Part 1.

The EC fan should be capable of being fitted in horizontal or vertical position in the AHU, depending on the application. Inlet cone shall be provided with a nozzle for volume flow measurement of the fan.

AHU manufacturer should supply cover plate for EC Fans in sufficient quantity for maintenance purpose.

Motor: the motor shall be permanent magnet external rotor motor with integrated electronics and suitable for continuous operation. The speed of the motor shall be variable depending on an external control signal. The fans shall be Modbus RTU compatible for communication with BMS (Building Management System). The fan in totality shall be of most efficient type so that the power consumption and noise level is minimal. The EC motor shall have a wide voltage input range: 3~380...480V, 50/60 Hz. The motor shall be minimum IP54 protection class, with Thermal class 155 (Insulation class F). The EC motor shall be provided with suitable protection from moisture & hot climate. The ball bearing shall be provided with long time lubrication for maintenance free operation.

The EC motor shall meet all necessary EMC (Electromagnetic Compatibility) directives. The EC motor should comply to applicable EMC standards: Interference Emission Standard EN 61000-6-3 / 2.

EC Motor shall be Integrated with VSD (Variable Speed Drive) for speed modulation of fans.

The EC motor shall have the following protective features integrated in the controller:

- Overvoltage protection
- Short Circuit protection
- Under voltage/ Over voltage detection
- Locked rotor protection
- Line fault detection
- Alarm relay 250V/2A
- Over temperature protection of electronic and motor
- External LED display shall be provided for indication of the status of the fan

COOLING AND HEATING COILS

Chilled water and Hot water coils shall have 12.5 to 15 mm dia (O.D) tubes made from seamless solid drawn copper minimum 0.5 mm thick with 0.15 mm thick sine wave aluminium fins firmly bonded to copper tubes assembled in 304 Stainless Steel frame. Face and surface areas shall be such as to ensure rated capacity from each unit and such that the air velocity across the coil shall not exceed 500 fpm. The chilled water coil shall be 6-row or 8-row deep coil and the hot water coil shall be 2 row deep per the bill of quantities. In case of 8 rows deep coils, it shall be made of 2x4 rows deep coils with a spacing of 200mm between the two coils, access

door and independent drain pan. The coil shall be pitched in the unit casing for proper drainage. The coil shall have copper header with chilled water supply & return connections protruding out of AHU casing by minimum 150 mm and fitted with dielectric coupling for connection with MS pipes. Each section of the coil shall be fitted with flow and return headers to feed all the passes of the coil properly. The headers shall be of copper and shall be complete with water in/out connections, vent plug on top and drain at the bottom. The coil shall be designed to provide water velocity between 0.6 to 1.8m/s in the tubes. Each coil shall be factory-tested at 21 kg per sq. m air pressure under water. Tube shall be mechanically expanded for minimum thermal contact resistance with fins. Fin spacing shall be 11 - 12 fins per INCH. The fins shall be evenly spaced and upright. The fins bent during installation shall be carefully realigned. Water pressure drop in coil shall not exceed 10 PSIG.

The cooling / heating coil shall be provided with hydrophilic coating.

Computerized cooling / heating coil selection output shall be submitted, and all Coils shall be AHRI certified. Stacked coils shall have an Intermediate drain pan made from 304 grade stainless steel, extending to the entire finned length of the coil. Cooling coils in stacks- section shall not be acceptable unless provided with an intermediate drain pan. The intermediate drain pan shall have drop tubes to guides condensate to the main drain pan.

Pre Filters (WHEREVER SPECIFIED IN BOQ)

Each unit shall be provided with a ISO 9001: 2015 factory assembled filter section containing 50mm thick disposable air filters having aluminium extruded mill finished frame. The filter shall have minimum efficiency of ISO coarse greater than 60%. The media shall be blended polyester in pleated construction or supported with HDPE mesh on one side and aluminium mesh on other side. Filter banks shall be easily accessible and designed for easy withdrawal and renewal of filter cells. Filter framework shall be fully sealed, constructed from aluminium alloy or aluminium extruded mill finished frame. Face velocity across these filters shall not exceed 500 FPM. Each filter shall carry certificate from manufacturer for the ISO 16890 Conformity and a sample test report. The filter area shall be made up of panels of size convenient for handling. The filter testing method shall be as per ISO 16890 latest edition. Design Parameters of Filters

Parameter	Filter
Type	Box Type or Flange Type
Grade	ISO Coarse Grade with efficiency greater than 60% (confirming to ISO16890)
Initial P (mm WG) - clean condition	7.5+/- 15%mm WC – Initial Pressure Drop

Final P (mm WG) - clogged condition	20mm WC – Final Pressure Drop
Casing	Aluminium Anodized
Sealing of medium	Epoxy or equivalent
Medium	The media shall be blended polyester in pleated construction or supported with HDPE mesh on one side and aluminium mesh on other side.
Test Method	The filter testing method shall be as per ISO 16890 latest editions.
Disposable	Yes
Test certificate from manufacturer	Yes

FINE FILTERS (WHEREVER SPECIFIED IN BOQ)

Each unit shall be provided with a factory assembled filter section containing 300mm thick bag type synthetic media type air filters having anodized aluminium frame. The filter shall have minimum MERV 13 Rating. Filter banks shall be easily accessible and designed for easy withdrawal and renewal of filter cells. Filter framework shall be fully sealed and constructed from aluminium alloy. Face velocity across these filters shall not exceed 500 fpm. Each filter shall carry test certificate from manufacturer. The filter area shall be made up of panels of size convenient for handling. The filter testing method shall be as per ASHRAE 52.1 latest edition. Design Parameters of Filters.

Parameter	Filter
Type	Flange/ Box type
Grade	ISO ePM1 with PM efficiency (50%-70%) (confirming to ISO16890)
Initial P (mm WG) - clean condition	7.5 ± 15% mm WC – Initial Pressure Drop

Final P (mm WG) - clogged condition	20mm WC – Final Pressure Drop
Casing	Aluminium Anodized
Sealing of medium	Epoxy or equivalent
Medium	The media shall be blended polyester in pleated construction or supported with HDPE mesh on one side and aluminium mesh on other side.
Test Method	The filter testing method shall be as per ISO 16890 latest editions.
Disposable	Yes
Test certificate from manufacturer	Yes

UVGI FOR AHU COILS and Air stream

A) General:

UVGI System (UVC) consisting of lamps, ballast and frames are to be designed with sufficient quantity with adequate capacity and installed in such an arrangement for prevention of microbial formation, remove/reduce microbial counts on surfaces viz. cooling coils/ drain pan/ filters prone to bio-fouling, killing of viruses, vegetative bacterias, mycobacterias, bacterial spores, fungal spores from the airstream passing through AHU. The UVGI system shall provide an equal distribution of UVC energy on the coil, in the drain pan, other surfaces and airstream to achieve designed exposure/kill rate. To maintain energy efficiency, the UVC energy produced shall be of the lowest possible reflected and shadowed losses. The use of UV design and sizing software is recommended for proper system sizing and configuration. This UVGI system configuration software shall calculate the number of lamps, calculated UV intensities and placement of lamps for proper configuration. UVGI systems are intended to operate continuously, 24 hours a day.

B) Selection Criteria :

- (i) The UVGI system shall be designed to cover the entire face area of the cooling coil/ drain pan/ filters, other surfaces and entire volume of the airstream passing through AHU to achieve UVC (254 nm wavelength) irradiation.
- (ii) The lamps shall not operate at wave length 200 nm or lower, to ensure no uncontrolled ozone is put out by the lamps.
- (iii) The face velocity of dehumidified air over the coil will not be more than 500 FPM.

- (iv) The UVGI system shall be designed to achieve log 2 deactivation of microbial growth on the cooling coil/ drain pan/ filters, other surfaces and killing viruses, vegetative bacterias, mycobacterias, bacterial spores, fungal spores from entire volume of the airstream passing through AHU. Subsequently, the UVGI system switching based on site requirement can be done to ensure that the microbial growth does not re-occur.
- (v) The number of lamps in an UVGI System shall be calculated to ensure the minimum Average Intensity of $100\mu\text{W}/\text{cm}^2$ on the surface of cooling coil is achieved and Minimum Dosage of $3000\ \mu\text{Watt-Second}/\text{cm}^2$ for AirStream is ensured to achieve kill rate at least 99.0% (Log 2)
- (vi) Selection criteria of UV lamps to achieve the delivery of designed intensity of Kill Rate based on the cross-section area of AHU through which air stream is passing, air velocity on UVGI, Contact time and Lamp Energy intensity. Individual Selection shall be provided for each unit based on above parameters for approval of Engineer In charge.
- (vii) The Lamps shall be high output type 800 mA minimum each to provide Rated Average Life of 16,000 Hrs. Lower intensity Lamp is not acceptable.
- (viii) The System shall be suitable for operation in air flow temperature of 2°C to 60°C & RH 0 to 100% condensing or non-condensing, and with water droplets due to carry over moisture from Cooling Coil.
- (ix) Selection criteria of UV lamps to achieve the required parameters shall be got approved from Engineer In charge.
- (x) An undertaking from manufacturer regarding rectification/replacement of UV Lamps during effective life as specified by manufacturer shall be provided by successful tenderer.

C) Specifications :

General:

- (i) The UVGI system shall be suitable to operate with 220-240 V, single phase A.C. supply. The power supply to the system shall be made available from AHU panel by contractor.
- (ii) The entire UVGI system shall be factory tested with test certificate from the reputed Lab. 3rd party test certificate shall be provided by contractor.
- (iii) The UVGI system shall be installed in front/ back of cooling coil with lamp facing coil to cover the drain pan.
- (iv) The selection and placement of the UVGI system shall ensure full irradiation of the entire face area of the cooling coil/ drain pan/ filters, other surfaces and entire volume of the airstream passing through AHU.

- (v) The UVGI System shall be free standing and be mounted in such a manner that lamps are in perpendicular plane to air flow.
- (vi) Each Lamp shall be provided with externally and readily visible indication to show lamp operation or failure, without the need to open access door, or shut down the System.
- (vii) The electronic driver shall be installed in the control panel outside the AHU to avoid any effect on the electronic components due to moisture and to avoid additional heat generated load in AHU.

UV Lamps: The UV lamps shall meet following criteria:

- (i) Lamp shall be High Output and efficient Quartz type.
- (ii) The lamp shall produce UVC as required to achieve the required parameters.
- (iii) The UV lamp shall not emit UV wavelength below 200 nm. OEM to give certificate for the same.

Support and framework:

- (iv) The entire framework and support inside AHU shall be fabricated out of Aluminum Alloy. All material used shall be UV resistant.
- (v) The framework shall be free standing and suitable for quick assembly.
- (vi) The reflectors shall be in Aluminum Alloy of high UV reflectivity and parabolic in shape.
- (vii) All parts should be corrosion resistant.
- (viii) Terminals shall be provided to interlock UVGI with AHU.

Control Panel : Shall consist of the following :

- (i) Electronic ballasts with high power factor of > 0.90 , High output Lamps required which will working on 800Ma.
- (ii) The ballasts shall be constant current output ballast over input voltage range of 110 to 270 VAC, single phase.
- (iii) Ballasts shall be electronic type, rated for greater than 15,000 starts, and conform to Sound Rating A.
- (iv) All electrical components such as Ballasts, Disconnect Switch, Fuse, Hour Meter etc. shall be housed in remotely mounted 18G CRS powder coated Electrical Box.
- (v) Microprocessor based control panel with LCD Display.
- (vi) Control panel shall record Individual Lamp run hours and generate alarm for timely and easy replacement of lamps.
- (vii) Individual lamp On/Off/Error Indicator

- (viii) Real Time Clock to have the exact time and duration of the system and individual lamps.
- (ix) Programmable Real time On/Off switching for system
- (x) Shall be BMS Compatible
- (xi) Ballast Protection Circuit
- (xii) Lamp change reminder on Display
- (xiii) ON/Off for incoming power - Mains Power
- (xiv) Electronic Ballast listed to UL 935

D) Safety:

- (i) Ballast Protection Circuit is provided in Control panel to ensure ballast is turned off for protecting it after 2 minutes if the lamp does not start.
- (ii) Fire resistant FRLS cables.
- (iii) Proper UV caution labels shall be applied to control panel and on the AHU sides and strategic points.
- (iv) The system shall be tested for Fire and Smoke Rating to UL 2043

E) Certificates:

The contractor shall provide manufacturer's test certificates and 3rd party test certificates from NABL accredited lab for main items like lamp, ballast, system etc.

F) Installation:

The UVGI lamps shall be mounted on a self-supporting rigid frame and the flow of air shall be perpendicular to the direction of air flow.

All safety and certification from UL/CE will be attached with the technical submittal of the system.

G) Testing & Commissioning:

The intensity of the UV Lamps across the coil will be measured using a calibrated radiometer.

ULTRA SONIC HUMIDIFIER

An ultrasonic humidifier uses a metal diaphragm vibrating at an ultrasonic frequency to create water droplets that silently exit the humidifier in the form of a cool fog. Ultrasonic humidifiers use a piezoelectric transducer to create a high frequency mechanical oscillation in a film of water. This forms an extremely fine mist of droplets about one micron in diameter, which is quickly evaporated into the air flow.

Unit must be provided with Single mist outlet pipe till 5 kg/hr capacity & minimum 2 nos of mist outlet for capacity more than 5 kg/ hr.

Water inlet connection and water storage tank made up of SS304L, minimum thickness of 1.5 mm.

ACCESSORIES

Each air handling unit shall be provided with manual air vent at high point in the cooling coil and drain plug in the bottom of the coil. In addition, the following accessories may be required at air handling units, their detailed specifications are given in individual sections, & quantities separately identified in schedule of Quantities.

Insulated butterfly valves, balancing valves, 'Y' strainer, union & condensate drain piping with 'U' trap up to sump or floor drain in air handling unit room, as described in section "Piping".

Thermometers in the thermometer wells & pressure gauge (with cocks) within gauge ports in chilled water supply and return lines as per the section "Instruments.

PAINTING

Shop coats of paint that have become marred during shipment or erection shall be cleaned off with mineral spirits, wire brushed and spot primed over the affected areas, then coated with paint to match the finish over the adjoining shop painted surface.

INSTALLATION

The air handling unit shall be so installed as to transmit minimum amount of vibration to the building structure. For each AHU Adequate number of vibration isolation shall be provided by use vibration isolation spring mountings only.

AIR WASHER

Specification shall be as per CPWD HEATING, VENTILATION & AIR-CONDITIONING (HVAC) 2024.

Scope

The scope of this section comprises the supply, erection, testing and commissioning of air washer conforming to these specifications and in accordance with the requirement of drawings and schedule of quantities.

Type

The air washers shall be Pad type as indicated on drawings and identified in Schedule of Quantities.

Capacity

The capacity of air washer shall be as shown on drawings and Schedule of Quantities.

Pad Type Air Washer

The air washer shall be draw through type with minimum 90% saturation efficiency with cellulose paper pads. The air washer shall be selected & designed for lowering inside temperature by 5 – 10°C dependent on ambient conditions.

Housing

Double skinned panels shall be 23-25 mm thick made of galvanized steel, pressure injected with foam insulation (density 40 kg / m³) with K factor not exceeding 0.02 watt / Mc shall be fixed to 1.5 mm thick aluminium alloy section structural framework with self drilling and tapping screws. Outer sheet of panels shall be made of galvanized preplasticised sheet of 0.8 mm thick, and inner sheet of 0.8mm thick galvanized pre-plasticised.

The entire framework shall be mounted on aluminium alloy or galvanized steel (depending on size and as per manufacturer's recommendation.) channel base of minimum 200 mm . The panels shall be sealed to the framework by heavy duty gaskets held captive in the framed extrusion. All panels shall be detachable or hinged. Hinges shall be made of die cast aluminium with stainless steel pivots, handles shall be made of hard nylon and be operational from both inside and outside of the unit. Units supplied with various sections shall be suitable for on-site assembly with continuous foam gasket. All fixing and gaskets shall be concealed.

Units shall have hinged, quick opening access door in the fan section and also in filter section where filters are not accessible from outside. Access doors shall be double skin type.

Re-circulation tank shall be fabricated from 18 G 304 Stainless Steel. The tank shall be complete with double brass strainers, makes-up connection with float, drain and overflow connections.

Fan

The fan section shall be equipped with double inlet (DIDW) centrifugal type blower with high efficiency backward aerofoil curved blades. The fan housing shall be of Galvanized sheet steel and the impellers shall be fabricated from heavy gauge Galvanized steel sheet as per approved manufacturers' standard. The side plates shall be die formed for efficient smooth airflow and minimum losses. Fan impeller shall be mounted on solid shaft supported to housing with angle iron frame and pillow block heavy-duty ball bearings on larger fans above 710 Dia. Fan housing and motor shall be mounted on a common extruded aluminum base mounted inside the fan section on anti-vibration mounts. The fan outlet shall be connected to casing with the help of fire retardant & anti-fungal fabric to avoid any vibration from the unit on to the ducts. All fans shall bear the AMCA seal for sound and performance and shall be tested in accordance with AMCA standard. The fan outlet velocity shall not exceed 10.2 m/s.

Motors

The motor shall be of high efficiency (IE -3) totally enclosed fan cooled squirrel cage induction motor with IP-55 protection, class F insulation & selected for quiet running. The motor shall be suitable for operation on 415+ 10%V, 3 phase, squirrel

- cage, totally enclosed fan cooled with IP-55 protection 50Hz. A.C supply. Motor R.P.M. shall not exceed 2880R.P.M. The fan motor combination shall be of most efficient type, so that power consumption and noise level may be minimized. The motor should be mounted on the same isolation base as the fan. The motor should be mounted on a base that is adjustable in two planes

Cooling Pads

Cooling Pads shall be of cellulose paper pads and of cross fluted configuration assembled in self supporting pads in a lightweight construction. The pads shall be able to redistribute the water and shall be impregnated with insoluble anti-rot salts, rigidifying saturants and wetting agents with built in eliminators. The velocity across the pads shall not exceed 350 fpm (1.8 m/s) and shall not allow carryover of water. Minimum thickness of Pads shall be 200 mm and minimum efficiency of pads 90%.

Water Distributor

A FRP distributor shall evenly distribute water on the Pads.

Filters

Filters section shall incorporate synthetic washable filters of at least 50 mm thickness in suitable aluminum frame. Velocity of air across the filters shall not exceed 500 FPM (or as indicated in the BOQ).

Eliminator

Eliminator plates shall be four bend made from 24 SWG galvanized sheet steel or PVC.

Interconnecting Pipes

Air washer shall be complete with interconnecting GI piping from pumps to air washer, valves, SWG, fittings, strainers etc.

Pumps

Specification for recirculation pumps shall be as listed in earlier section of the tender.

Painting

Shop coats of paint that have become marred during shipment or erection shall be cleaned off with mineral spirits, wire brushed, and spot primed over the affected areas, then coated with minimum 80 DFT paint to match the finish over the adjoining shop painted surface.

Testing

Efficiency of air washer shall be computed from the measurements of air flow and dry and wet bulb temperature of air entering and leaving the air washer and ambient temperatures.

The unit contains indirect evaporative cooling section, which lowers both dry bulb and wet bulb temperature of the incoming fresh supply air. This cooling is at

constant humidity level. A reservoir purges and drains during off cycles to prevent biological growth.

DRY SCRUBBER

SCOPE

The Dry scrubber unit shall be UL/CE certified and of the type as described in Schedule of Quantities.

TYPE

The unit shall provide efficiency of 90% or better for single pass based on ASHRAE test method at flow rates of 800 – 1300 CFM per module (supported by sample test report by a 3rd party laboratory). Multiple units can be joined together for increased volume. The system shall be suitable to connect to fan section with average velocity of not exceeding 500 FPM across air cleaner. (or as indicated in the BOQ)

The unit shall be designed and constructed and supplied by a manufacturer specializing in the research, design and manufacture of products specified in this section with a minimum of three years of documented experience, and capable of issuing complete catalogue data on the total product.

UNIT HOUSING

Housing shall be 16-gauge zinc coated GSS/Cold-rolled steel sheet with powder coating construction to protect against rust and corrosion. Each section shall include single door access, located one side of the unit. The access door shall be mounted on steel hinges and secured with adjustable, gasket sealed lever latches allowing for component access and removal. All doors shall be gasketed to prevent air and water leakage. Doors to charged high voltage components shall be equipped with electrical interlocks, for interconnection into the primary power supply, to prevent access when the components are energized. The housing shall be furnished completely assembled for ease of shipment and installation. Between each section, a permanent 1/8" thick gasket shall be installed to prevent leakage. The bottom drain pan under ESP section containing integral washing systems shall be pitched downward 1/4" per foot minimum toward a 3" NPT drain nipple.

The sections are to be mounted on a structural C-channel or floor mounting or ceiling suspension. Lifting lugs shall be incorporated in the base channel to allow for rigging, if ordered.

The external casing finish shall be a durable industrial grade semi gloss baked-on epoxy ester, not less than 3 mm minimum thicknesses.

CELL WASH MODULE

The Cells Wash module shall incorporate mechanical filtration. The stationary filter from the direction of airflow will be a metal mesh filters with single, gasketed access doors. Wash manifolds and headers are supplied to wash the module during the normal wash cycle.

ELECTROSTATIC PRICIPITATOR MODULE

The electronic air cleaner shall be the two-stage dual voltage plate type cells, rated at not less than 90% efficiency as per the ASHRAE test standards for dry particulate (supported by sample test report by a reputed laboratory for the make and model supplied for this project). The collection cells shall be in Single Pass arrangement to provide for maximum collection efficiency. The system shall be suitable to connect to fan section with average velocity of not exceeding 500 FPM across air cleaner.

IONISING COLLECTION CELL

Ionizing-Collecting cell(s) shall be of one-piece construction 14.23" inches deep in direction of airflow. All support framing, end plates and ionizer ground electrodes shall be 0.090-inch-thick aluminium. Both repelling and collector plates shall be 0.020-inch-thick aluminium, 9.125 inch deep in direction of airflow and rigidly retained in place with tubular spacers and tie rods. Spacing between plates shall be no less than 0.175 inch. Ionizing electrodes shall be 24-gauge stainless steel spiked design, ionization wires are not acceptable, rigidly supported both vertically and laterally. High voltage support insulators shall be of self-glazing Cordierite ceramic with all surfaces, including centre hole, glazed

to enhance dielectric strength and retard tracking. Insulators shall be mounted out of the airstream, to reduce contaminant build-up. All high voltage electrical connections within each tier of cells, shall be between cells and automatically made when cells are installed. All electrical connections between unit tiers and high voltage connections between power packs and cells shall be located on the access door end of the cabinet and manually connected for ease of service.

POWER SUPPLIES

Power supplies shall be 100% solid state, UL Listed. operate on 200 to 240 VAC, 50 HZ, 1 Phase input and provide a dual high voltage output of (+) 12 to 13 KVDC for the ionizer and (+) 6.0 to 6.5 KVDC for the collector. A regulated output of up to 2.7 to 5.5 MA shall be supplied to maintain the specified collection efficiency. Integrally mounted electrical interlocks shall be provided to prevent access to the high voltage components without first interrupting the primary input power. The power supply shall operate over a temperature range of -10°C /14°F to 60°C /140 °F, be self-protecting and accommodate an LED light indicating the performance status of the ionizing/collecting cell. High voltage output leads shall be sealed, and a bleed resistor incorporated to remove stored electrical charge where the power supply(s) are de-energized. Module of capacity above 3000 CFM shall be equipped with Pulse width modulating (PWM) to maintain the specified collection efficiency by maintaining a constant charge in the event of Low/High Voltage from source thus ensuring that the unit functionality is not affected with these voltage fluctuations. Power Consumption should not be more that 50 watts per ESP cell.

SYSTEM CONTROLS

Programmable Logic Controller (PLC) shall be housed in a NEMA-12 type enclosure. Controller shall be shipped for remote mounting and must be installed indoors, or

other means of weather protection provided if installed. Terminals shall be provided to interconnect the system fan and shall sequence the detergent wash, soak, rinse fan force dry and return to operation cycle. All sequence times shall be factory set. Control initiation shall be semiautomatic, push button initiated, or fully automatic by time clock, with semiautomatic push button override.

A remote mounted Sleep Mode Reset Switch (momentary contact push button type) shall be supplied to be installed at the kitchen hood location to re-energize the air cleaning system after the wash system has completed. The switch may optionally be installed on the panel of the ATS control enclosure.

The control cabinet shall be furnished with a factory installed and wired 7-day initiator clock with battery backup.

VARIBALE REFRIGERANT VOLUME/ FLOW SYSTEM

Variable Refrigerant Volume/Flow System and its component shall comply with relevant provision of CPWD HEATING, VENTILATION & AIR-CONDITIONING (HVAC) 2024

PIPING WORKS:

Piping work including all its components shall comply with relevant provisions of CPWD HEATING, VENTILATION & AIR-CONDITIONING (HVAC) 2024.

VALVES

Valves including all its components shall comply with relevant provisions of CPWD HEATING, VENTILATION & AIR-CONDITIONING (HVAC) 2024.

FLANGES

These flanges shall be of approved make. The supply of flanges shall form part of piping (not separately identified in Schedule of Quantities) and shall also include supply of bolts, washers, nuts and suitable asbestos fibre / rubber insertion gaskets (minimum 3 mm thick).

DRAIN PIPING

- i. All pipes to be used for drain from AHU and FCU drains pans and Chilled water pump glands, drain and fittings shall be UPVC pipe.
- ii. All pipe supports shall be mild steel, thoroughly cleaned and given one primary coat of red oxide paint before being installed.
- iii. Fittings shall be same material of pipe and pressure rating suitable for the piping system. Tee-off connection shall be through equal or reducing tees. Fittings shall form part of piping and are not separately identified in Schedule of Quantities.
- iv. For proper drainage of AHU and FCU Condensate, 'U' trap shall be provided in the drain piping.

- v. All condensate drain piping shall be insulated and painted as per the section "Insulation" as indicated in Schedule of Quantities.

AIR VENTING

Air valve shall be provided at the summit of piping system for air venting. Needle valve for 10mm air vent and ball valve for 15mm air vent of same size as air valves shall be incorporated. All such valves will be measured & paid.

PRESSURE GAUGES

Pressure gauges shall be of bourdon type with stainless steel construction of 150mm dia. and of range (0-10 bar) / (0-150 psi) as required and be complete with brass valves (3/8" Dia.) and SS tubing duly calibrated before installations

It shall be weather proof with an IP 55 enclosure

Pressure gauges shall have snubbers to suppress the effect of pressure pulses and pressure peaks for high fluctuating applications like pump discharge applications etc.

THERMOMETER

Direct reading 255 mm long industrial mercury filled thermometers shall be provided at the inlet and outlet of all heat ex-changers to read water entering and leaving temperature.

Thermometers shall be of stainless-steel construction with dial of 150mm dia and range up to 50°C, with 0.5°C least count and shall be calibrated before installation.

The thermometers shall be installed in separate brass oil wells of 1/2" size with a stem of minimum 3/4th of pipe. Thermometers for insulated piping shall be installed in extended neck to avoid damage or deformation of the insulation.

Air- Distribution: DUCTING, VAV BOXES & CONTROLLER, FIRE & SMOKE DAMPERS, DAMPERS & SPLITTERS, DIFFUSER AND GRILLS, LOUVERS, INSULATION, FIRE & SMOKE DAMPERS etc.

Air Distribution work including all its components shall comply with relevant provisions of CPWD HEATING, VENTILATION & AIR-CONDITIONING (HVAC) 2024.

Note:-

1. Factory Fabricated Duct: All the Factory fabricated duct shall be preferably Spiral Oval. However, wherever required rectangular/round spiral duct shall be provided as per the direction of Engineer-in-charge. **All the factory fabricated duct should be supplied with factory fitted Nitrile rubber insulation of thickness 19mm as stated in Schedule of quantity on the inside surface of the duct. Acoustic insulation of the duct shall be done at site. Such factory fabricated ducts shall be supplied without Nitrile Rubber Insulation.**
2. Steel Wire rope supports as per approved make list can also be accepted as an alternative for conventional rigid support system without any upward price implication.

AIR QUANTITY FLOW CONTROL

The VAV System shall function to supply variable air quantity in the air-conditioned area in response to the load variations including that due to variations in ambient conditions and filter cleanliness conditions, so as to maintain the inside designed temperature, RH and pressure conditions. The VAV shall have the provision to switch over to the manual mode as and when required.

Air Handling Unit Controls

Air handling Units shall be provided with EC fans with controller to modulate fan air quantity to maintain desired space conditions along with chilled / Hot water flow control and operation of Humidifier. UV lamp is provided to keep cooling/heating coil, filters, drain pan and airstream dry & disinfected.

AHU shall have optimum start control to ensure the desired space temperature whenever office is started.

AHU: shall have following controls:

- (i) Modulating PICV and 3 way valve
- (ii) Proportionate thermostat
- (iii) EC fan controller to control fan speed.
- (iv) Interlocking with fire panel to shut off AHU.
- (v) Suitable Controls for Humidifier operation.
- (vi) Suitable Controls for UV lamp/dampers/actuators etc. operation.
- (vii) Suitable Control for Fresh air dampers

INSPECTION, TESTING AND COMMISSIONING

The inspection, testing and commissioning of HVAC system shall be as per the CPWD Specification of HEATING, VENTILATION & AIR-CONDITIONING (HVAC) 2024.

RUNNING IN PERIOD & DATE OF ACCEPTANCE

The Running in period and Date of acceptance of HVAC system shall be as per the CPWD Specification of HEATING, VENTILATION & AIR-CONDITIONING (HVAC) 2024.

Specification for C5 (Audio Video System)

SCOPE:

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

This part constitutes of all components of the Audio-Video System and Public Address System works. This AV System consisting of Fully Digital IP Based Conference systems Controller, Modular Digital IP based Flush Mount audio conferencing Chairman Unit, Modular Digital IP based Flush Mount audio conferencing Delegate Unit, Operator Control PC with Conference server & Client software, Full Range Ceiling Speaker, Passive Column Array Loudspeaker, Soundbar with Camera, Power Amplifier, Digital Signal Processor, Digital Wireless Lapel Microphone, POE Powered 4K PTZ Camera, Professional Displays, Wireless Presentation System, Audio Video Control Processor, IP Encoder/ Decoder, Video Conferencing Solution with Codec and accessories as per BOQ shall be supplied & installed as per the approved scheme/layout. Public Address System consisting of Digital Power Amplifier, Ceiling Speaker and accessories as per BOQ shall be supplied & installed as per the approved scheme/ layout. The Audio-Video and PA System scheme/layouts shall be prepared by the agency in consultation with Engineer-in-charge and only after the approval of the same by Engineer-in-charge work shall be started.

Main contractor along with the Specialized Agency together shall be fully responsible towards successful commissioning of the system.

After the awarding of the Contract, the agency/ contractor executing the Audio-Video System and Public Address System works shall provide complete technical information in respect of all items consisting of the following for approval of Engineer in charge:

- (i) Details on makes and models being submitted such as model nos. and version nos.
- (ii) Datasheets and technical literature for the products being submitted

If any OEM-specific accessories and options are required especially items such as, but not limited to, items such as additional power supplies, transformers or auto-transformers for voltage levels, mounting arrangement, fixtures, set of proprietary cables and licenses etc. are required to complete the installation, the agency/ contractor shall supply the same without any extra cost to the client as required for the specific makes and models being supplied by them, irrespective of whether or not explicitly mentioned in the BoQ so as to make the system completely operational.

Based on the makes and models intended to be supplied from the acceptable list of makes and prior to the commencement of work, the Agency shall submit their technical proposal consisting of the following:

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

- (i) Shop drawings consisting of equipment layouts (furniture and RCP and all the other MEP services coordinated).
- (ii) Shop drawings consisting of schematic layouts.
- (iii) Shop drawings consisting of conduit layouts & cable routing plan.

Upon completion of work and prior to handover, the Bidder shall submit 3 sets of duly laminated as-built drawings and documentation as mentioned below:

- (i) Final equipment layouts (furniture and RCP and all the other MEP services coordinated) – AutoCad & PDF format, clear copy of which shall be permanently fixed inside respective Control room.
- (ii) Final schematic layouts - AutoCad & PDF format, clear copy of which shall be permanently fixed inside respective Control room.
- (iii) Final conduit layouts - AutoCad & PDF format, clear copy of which shall be permanently fixed inside respective Control room.
- (iv) Final cable routing plan – cable schedule, cable IDs, labelling and documentation, type of cable, no. of cables etc. - AutoCad & PDF format, clear copy of which shall be permanently fixed inside respective Control room.
- (v) Configuration details of all equipments/ switches /controllers and all other AV items and their passwords.

The Agency/ contractor, the OEMs/Manufacturers of products being supplied have to assure on paper that the products, including hardware and software applications/platforms/versions, that are being supplied are of the latest series/generation and not obsolete and that they will unconditionally provide the required support and all related upgrades, updates and security patches free of cost during warranty period and after warranty period as per O&M contract.

At the time of actual supply of equipment, the Agency/Contractor and OEMs/Manufacturers whose products are being supplied shall assure on paper that as on date the products, including hardware and software applications/platforms/versions, are neither declared 'End-of-Sale' or 'End-of-Support' and are not being phased out in any way. An Undertaking to that effect shall be submitted by the Agency/Contractor and OEMs/Manufacturer.

The OEMs will also ensure that the equipments provided should have a minimum shelf-life of seven years from the date of supply and should sufficiently cater for any eventuality arising out of the obsolescence within a seven-year period from date of supply, wherever applicable.

For all items supplied under this scope, all types of products shall be obtained in the name of the client/ Engineer in charge and shall be duly registered in the name of the client, e.g., for the purpose of, but not limited to, warranties, license subscriptions and their renewal upon expiry, their extension, special technical support during warranty and thereafter and other such. The same shall be handed over in hard copies and / or softcopies, as applicable, at the time of handing over.

O&M document may be referred for the details of replacement SLA and spares to be kept at site.

The Agency is advised to inform the Engineer-in-Charge or client, of any specific requirements related to their equipment such as heat dissipation, earthing or grounding, UPS, ventilation or any other required site pre-conditions, in writing before supply and commencement of work so as to incorporate the same at site by other agencies.

However, if the input power supply parameters, i.e., voltage levels and frequency required by the supplied equipment are different from those available at site, the Agency shall take necessary actions at its own cost so as to make the equipment installable, e.g., transformers, stabilizers, auto-transformers or any other protection equipment etc.

The Agency is advised to specifically use items only from the list of acceptable makes and provide information on compliance of performance specifications.

Make of components required to be used by Agency to complete the installation, if not mentioned anywhere, shall be required to be approved from Engineer-in-Charge in writing before installation

Video Conferencing Solution with CODEC

Minimum Technical Specification

1. The unit should be supplied with codec, 2 Nos. x tabletop microphone, touch panel for operations, complete sets of cables and connectors and should have the facility to connect at least one full HD PTZ 10x or more optical zoom camera. The codec, microphone and touch panel should be from same OEM for better interoperability and should be controlled using a single touch panel. Codec should be able to accept Video signal from 3rd party external Camera and Audio input from 3rd party external audio system.
2. Video Conferencing Solution must support IPv4 and IPv6 from Day 1
3. The device should have the latest video standards H.264, H.265
4. The device should have 60 fps with 1080p resolution
5. The device should have the ability to send and receive two live simultaneous video sources in a single call, so that the image from the main camera and PC or document camera can be seen simultaneously.
6. The device should be H.239 and BFCP compliant for content sharing
7. The device should have at adequate HDMI/HDCI/USB/DVI inputs to connect at least one No. full HD PTZ 10x optical zoom camera besides adequate HDMI/DVI/USB inputs to connect at least one No. laptop/PC/Document Camera for presentation.
8. The device should have atleast 2x HDMI Outputs to connect the displays
9. The device should have audio standards: G.711, G.722, G.722.1, 64 kbps MPEG-4 AAC-LD/G.719 or better standard must be supported.
10. The device should have audio features such as Noise Reduction, Automatic Gain control, Acoustic Echo Canceller, Active Lip synchronization
11. The device should have minimum 3 microphone inputs directly on the codec to connect 2 Table top microphones and 1 No. 3rd party external audio Input.
12. Required functionality may be offered through an external interface/ attachment.
13. The device should have 1x LAN/Ethernet--10/100/1000 Mbps full duplex.
14. The device should have bandwidth capability of H323/SIP up to 6 Mbps point-to-point.
15. The device should have password protected system menu and AES based encryption mechanism for secure video calling
16. ITU-T standards-based Encryption of the video call

- 17.The system should support wireless content sharing
- 18.The content sharing resolution should be minimum Full HD.
- 19.The system should support a USB Passthrough mode such that the system can work with any cloud based conferencing platform.
- 20.Remote software upload: via web server, HTTP, HTTPS
- 21.The video endpoint should be accompanied with Power Cable, LAN Cable, presentation HDMI Cable, Power adaptors.
- 22.Must have an intuitive Touch Screen/Panel for controlling the VC system.
- 23.The agency/ contractor shall integrate VC system with AV system for seamless use, e.g., with AV Touch Panel/Control device and other OEM's audio-conferencing system microphones for look-at-me feature, location presets etc.

Specification for C6 (IBMS)

1.0 INTEGRATED BUILDING MANAGEMENT SYSTEM (IBMS)

1.1 SCOPE

1.1.1 The scope of work includes Supplying, Installation, Testing and Commissioning of IBMS system consisting of IP based DDC Controllers with required number of IO points as per the BOQ, Sensors and Cabling. Proposed DDC Controllers shall be configured for standalone operation and shall be integrated through TCP/IP with existing Building Management System.

1.1.2 The IBMS system part of this tender shall be integrated with the existing IBMS system. All the required accessories including IO Cards or any other component required for proper integration shall be arranged by the contractor and cost of the same deemed to be included in the quoted rate of the contractor and nothing extra shall be payable in this regard. The contractor shall integrate the new equipments installed as part of this tender with the existing IBMS system and carry out necessary testing and commissioning.

1.1.3 The tentative IO Summary for the work is given below:

ANNEXURE - I BMS IO Summary - ENTRAL SECRETARIAT BUILDING							
S. No.	QTY	Description	Hardware Point Software integration				Software Integration
			AI	DI	AO	DO	
1		FAN START STOP COMMAND				1	
2		FAN ON/ OFF STATUS		1			
3		MANUAL OFF/ AUTO SWITCH				1	
4		FILTER STATUS		2			
5		FAN TRIP ALARM		1			

6		RETURN AIR TEMPERATURE	1				
7		RETURN AIR HUMIDITY SENSOR	1				
8		RETURN AIR CO2 SENSOR	1				
9		SUPPLY AIR TEMPERATURE	1				
10		SUPPLY AIR HUMIDITY SENSOR	1				
11		AUPPLY AIR PRESSURE SENSOR	1				
12		DUCT SMOKE SENSOR	1				
13		CHILLED WATER CONTROL VALVE CONTROL AND FEEDBACK	1		1		
14		FRESH AIR VAV					240
15		BYPASS DAMPER CONTROL & FEEDBACK	1		1		
16		SMOKE AIR DAMPER CONTROL & FEEDBACK		1			
17		HIMIDIFIER		1		1	
18		UV LAMP STATUS MONITORING		1			
TOTAL FOR One AHU			9	7	2	3	240

Note: Soft integration of PAC, VRF, VAV, UPS is in the scope of Contractor for this work.

- 1.1.4 This specification covers the requirement for design, engineering, manufacturing, testing at Vendor's/Sub-Vendor's works, supply, packaging, forwarding, delivery at site, unloading from carriers, storage at site, transport to site, loading, unloading, installation, commissioning, carrying out performance guarantee / acceptance tests at site of field instruments and Integrated Building Management System (IBMS).
- 1.1.5 Microprocessor based Integrated Building Management System (IBMS) with functions distributed both geographically and functionally over the field controllers shall be provided. IBMS shall comprise of Direct Digital Controllers (DDC), sensors and Cabling system.
- 1.1.6 It is not the intent to specify completely herein all details of design and construction of equipment or materials to be supplied or of services to be rendered. However, the equipment, materials and services shall conform in all respects to high standards of engineering design, workmanship and be capable of performing in continuous commercial operation in a manner acceptable to Engineer-in-charge who shall interpret the meaning of drawings and specifications and shall have the power to reject any work or material which in his judgement are not in full accordance therewith.
- 1.1.7 The IBMS software shall be designed and developed to the following standards as reference:
ECBC 2017, UL 916, NBCS 2026, ASHRAE/ANSI-135(2004)
- 1.1.8 Besides, adherence is required to industry standards and certifications such as UL, ULC and BTL certification of products and EN compliance.
- 1.1.9 The IBMS system offered shall be completely modular in structure and freely expandable at any stage with 3 level architecture.
- 1.1.9.1 Management Level: Management level and operation shall include visualization, data analysis and exchange of data. At the management level, it shall be possible for communication to flow in all directions, across networks and via direct connections.
- 1.1.9.2 Automation Level: Automation level is the level at which the actual processing takes place based on the logic written on the Direct Digital Controller (DDC). The processes are carried out at the DDC controllers for stand-alone control of all operations. Automation Level data exchange needs to happen through peer-to-peer

communication.

1.1.9.3 Field Level: Field Level shall comprise of Individual room controllers for autonomous room by room comfort control, based on application specific logic written on the controllers.

1.1.10 A hierarchical topology is required to assure reasonable system response times and to be able to manage the flow and sharing of data without unduly burdening the internal Intranet/data communication network.

1.1.11 Maximum acceptable response time from any alarm occurrence (at the point of origin) to the point of annunciation shall not exceed 2 seconds for network connected user interfaces.

1.2 SYSTEM DESCRIPTION

1.2.1 The IBMS shall comprise of a network of interoperable, stand-alone IP digital controllers communicating on BACnet/IP communication network.

1.2.2 Microprocessor based Direct Digital Controller (DDC) shall interface with sensors, actuators and environmental control systems (i.e. HVAC units - AHUs, and ventilation units) and utilities such as electrical systems, LV systems etc. and carry out followings functions:

- 1) Individual input/output point scanning, processing and control.
- 2) Centralized operation of the services (remote control).
- 3) Dynamic graphic details of building services.
- 4) Energy Management through optimization of all connected electrical and mechanical plants.
- 5) Alarm Detection and early recognition of faults.
- 6) Time, event and holiday scheduling as well as temporary scheduling.
- 7) Prevention of unauthorized or unwanted access.
- 8) Communication interface and control.
- 9) Suggestive preventive maintenance for all equipment as well as own error Diagnosis.
- 10) Building maintenance & report generation.
- 11) Optimum support of personnel.

12) Data Visualization Tool

1.2.3 These controllers shall be capable of functioning on a stand-alone mode i.e. in case of loss of communication with the central control station, these shall function independently. These shall have microprocessor built-in as standard. The local access to these shall be either through an in-built display with keypad for each outstation or through a portable operator terminal. The controller shall be capable of executing advanced control algorithms like Proportional + Integral + Derivative control. These shall also execute logic function based on time and/or event. Totalization and averaging functions shall be an inherent feature of the controller.

1.2.4 Each stand-alone intelligent IP DDC controller shall have a 32-bit microprocessor or better, on board Ethernet connectivity supporting BACnet/IP protocol.

1.2.5 All DDC controllers shall have 32-bit microprocessor and with minimum 12-bit A/D resolution on the analogue inputs and shall be connected via IEEE standards-based TCP/IP on BACnet/IP protocol. Communication between controllers shall be such that, controllers can communicate between themselves without having to first communicate with the Monitoring room. The communication between the different subnets shall be through the router (integration) units rather than through the control stations. No proprietary LAN shall be allowed.

1.3 PROGRAMMABLE CONTROLLER

1.3.1 Direct Digital Controller (DDC) - Hardware

- 1) DDC controller shall be True IP based type and shall have on board RJ 45 Ethernet Port to directly connect with network switch.
- 2) Controllers shall be capable of fully "stand- alone" operation, i.e., in the event of loss of communication with other DDCs or network or IBMS server station, they shall be able to function on their own.
- 3) The DDC shall communicate with peers and management station clients over BACnet/IP protocol on Ethernet.
- 4) The controllers shall consist of 32-bit microprocessors. And it shall have minimum 32 MB internal RAM for data storage.

- 5) The memory available to the controller board as working space for storage of the operating system software and data files shall be decided on the basis of number of points being controlled by them.
- 6) It shall have built in BACnet router eliminating the need for additional BACnet routers for the system.
- 7) The controllers shall be UL/CE listed & BTL Marked.
- 8) It shall have adequate non-volatile / Flash Memory with capacity to store all I/O data of that particular DDC for minimum 10 Days.
- 9) Controllers shall have Proportional control, Proportional plus Integral (PI) Control, Proportional plus Integral plus Derivative (PID) Control, Two Position Control and Time Proportioning Control and algorithms etc., all in its memory and all available for use by the user, i.e. all the control modes shall be software selectable at any time and in any combination. The analog output of Proportional Control, PI Control, and PID Control shall continuously be updated and output by the program shall be provided. Between cycles the analog output shall retain its last value. Enhanced integral action in lieu of Derivative function shall not be acceptable.
- 10) The controllers shall have a resident real time clock for providing time of day, day of week, date, month and year. These shall be capable of being synchronized with other clocks in the network. DDC using clocks generated by software or timers for clocking shall not be accepted.
- 11) Each DDC shall have Nickel Cadmium Lithium battery to support complete operation of the RAM for upto 30 days in the event of a power failure to the DDC. A low battery voltage status will generate an alarm condition.
- 12) Back-up power shall support the clock. Upon power restoration all clocks shall be automatically synchronized.
- 13) The controller shall have A/D converters, memory and capacity to accommodate input/output (I/O) hardware points (with expansion board or module) as per I/O requirement. However, DDCs with a lower capacity of I/Os may be adequate for locations with relatively less input/output points. IBMS Sub-Contractor shall submit DDC I/O points' configuration, i.e., no. of I/Os in each DDC for approval.

- 14) If the controllers provided by the contractor have the configurable plug in expansion module, then the following minimum specifications shall have to be met:
- In addition to the basic outstation a minimum of two slots shall be provided for the insertion of plug-in expansion module.
 - The module shall provide for analog or digital, input or output, hardwired connections to the installed plant.
 - The quantity and combination of these cards shall be determined by the requirements of the plant in that location with the concurrence of the Engineer-in-charge.
- 15) Controllers shall have 10 bit A/D resolution and be capable of handling DC voltage (using 500 ohm resistor for I to V conversion) resistance or open and closed contacts inputs in any mix, if required.
- 16) Analog (Universal) inputs/outputs of the following minimum types shall be supported:
- 0-1 volts.
 - 4-20mA or 0-10 volts.
 - 0-5 volts,
 - 2-10 volts.
 - RTD (Ohms)
- 17) Digital input / output types to be supported shall be, but not limited to the following:
- Normally-open contacts.
 - Normally-closed contacts.
- Modulating outputs shall be true proportional outputs and not floating control type.
- 18) Controller packaging shall be such that complete installation and check out of field wiring can be done prior to the installation of electronic boards.
- 19) All board terminations shall be made via plug-in connectors to facilitate troubleshooting, repair and replacement. Soldering of connections shall not be permitted.
- 20) Controllers shall be equipped with diagnostic LED indicators with indication for Power On, Bus Error and all the input & output. All LED's shall be visible without opening

the casing.

- 21) It shall be possible for the controllers to accept regulated uninterrupted power supply to maintain full operation of the controller functions (control, logging, monitoring and communications) in the event of a localized mains failure.
- 22) Controllers requiring fan cooling are not acceptable.
- 23) There shall be the facility for accessing controller data information locally, via a portable plug-in keypad display which can be common to all controllers and normally removed to prevent unauthorized tampering. Alternatively each controller shall have a keypad and display integral with its casing for local interrogation and adjustment. In either case, access to the system thus provided shall be restricted by passwords in the same way as at the main IBMS Server terminal.
- 24) In case the Portable Operator Terminal (POT) is required to program the controllers, sockets shall be provided for same. POT plug in connection on to the controller shall not interrupt or disable normal controller operation or bus connection activity in any way.
- 25) The controllers shall be housed in vandal proof metallic enclosures to protect them from tampering by any unauthorized personnel. All controllers used in plant room spaces and external application shall be housed in minimum IP55 rating enclosures.
- 26) It shall be possible to add new controllers to the system without taking any part of the system off-line.
- 27) Direct Digital Controller - Capabilities
 - 1) Controller shall have a self-analysis feature and shall transmit any malfunction messages to the IBMS server station to facilitate trouble-shooting and ensure the shortest possible down time of any failed controller. Controllers without such safety feature shall be provided with custom software diagnostic resident in the EEPROM.
 - 2) Controllers shall have resident in its memory and available to the programs, a relevant library of algorithms, intrinsic control operators, arithmetic, logic and relational operators for implementation of control sequences.

- 3) In the event of failure of communication between the controllers and/or IBMS server station terminal, alarms, reports and logs shall be stored at the controllers and transmitted to the terminal on restoration of communication.
- 4) In the event of memory loss of a controller or the expiration of back-up power, on start-up of the unit the necessary data-base shall be downloaded automatically and without operator instruction. Controllers requiring a manual intervention for the re-boot of software are not desired.
- 5) Where information is required to be transmitted between controllers for the sharing of data such as outside air temperature, it shall be possible for global points to be allocated such that information may be transmitted either on change of incremental value or at specific time intervals.
- 6) Controllers must be able to perform the following energy management functions as a minimum.
 - a. Time & Event programs
 - b. Holiday Scheduling
 - c. Maximum and Distributed power demand
 - d. Optimum start and stop program
 - e. Night purge
 - f. Load reset
 - g. Zero energy band
 - h. Duty cycle
 - i. Enthalpy analysis and control
 - j. Run Time Totalization
 - k. Sequencing and Optimization
 - l. Exception scheduling
- 7) Controllers shall have Adaptive Control capability whereby the control software measures response time and adjusts control parameters accordingly to provide optimum control. The software shall allow self-tuning of the variable control loops (all or any of P, P+I, P+I+D) of the AHU's and chiller system so as to provide the most efficient and optimized controls at different load conditions. The energy management programs shall update their parameters based on past experience and current operating conditions.

- 8) Alarm lockout shall be provided to prevent nuisance alarms. On the initial start-up of air

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handler and other mechanical equipment a "timed lockout" period shall be assigned to analog points to allow them to reach a stable condition before activating alarm comparison logic.

- 9) Run time shall be accumulated based on the status of a digital input point. It shall be possible to total either ON time or OFF time. Run time counts shall be resident in non-volatile memory.
- 10) It shall be possible to accommodate Holiday and other planned exceptions to the normal time programs. Exception schedules shall be operator programmable up to one year in advance.

1.4 DATA COMMUNICATION

1.4.1 The communication shall be via a dedicated Ethernet communication network on BACnet/IP over Ethernet standards. No other BACnet networking standard shall be acceptable. Controller microprocessor failures shall not cause loss of communication of the remainder of any network.

1.4.2 Each controller shall have equal rights for data transfer and shall report in its predetermined time slot. There shall be no separate device designated as the communications master.

1.4.3 The communication network shall be such that.

- 1) Every controller must be capable of communicating with all other controllers.
- 2) Network connected devices with no messages to transmit shall indicate "No failure" message each cycle. Lack of this message after successive retries shall constitute a communication or device failure.
- 3) Each controller is to be provided with a communication watchdog to assure that an individual controller does not permanently occupy the bus. If a controller is detected as occupying more time than usual, then it shall be automatically shut down and an alarm sent to the Control Station.
- 4) Error recovery and communication initialization routines are to be resident in each network connected device.
- 5) The communication protocol shall incorporate CRC (Cyclic Redundancy Check) to detect transmission errors. Parity bit error checking shall not be acceptable.

1.4.4 Single or multiple stand-alone controller failures shall not cause loss of

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communication between active control panels connected on the communication network. Full communication shall be sustained as long as there are at least two operational stand-alone control panels active on the communication network.

- 1.4.5 The communication network shall include provision for automatically reconfiguring itself to allow all operational equipment to perform as efficiently as possible in the event of single or multiple failures.

Specification for C7 (ICT)

SCOPE :

This part constitutes of all active and passive components of the ICT works. This active and passive network consisting of all type of switches and other active components, conduits, cable trays and floor raceways, cabling & other active/passive items as per BOQ shall be supplied & installed as per the approved layout. The ICT layouts shall be prepared by the agency in consultation with Engineer-in-charge and only after the approval of the same by Engineer-in-charge work shall be started.

Main contractor along with the Specialized Agency together shall be fully responsible towards successful UAT and/or FAT and related processes/activities concerning items supplied and executed by them.

After the awarding of the Contract, the agency/ contractor executing the ICT works shall provide complete technical information in respect of all items consisting of the following for approval of Engineer in charge:

- (i) Details on makes and models being submitted such as model nos. and version nos.
- (ii) Datasheets and technical literature for the products being submitted
- (iii) Manufacturer's Authorization in the prescribed format

If any OEM-specific accessories and options are required especially items such as, but not limited to, items such as additional power supplies, transformers or auto-transformers for voltage levels, mounting arrangement, fixtures, set of proprietary cables and licenses etc. are required to complete the installation, the agency/ contractor shall supply the same without any extra cost to the client as required for the specific makes and models being supplied by them, irrespective of whether or not explicitly mentioned in the BoQ so as to make the IT/ICT system for passive part completely operational as per the Functional Requirement of IT Infrastructure Solution provided in this document.

Based on the makes and models intended to be supplied from the acceptable list of makes and prior to the commencement of work, the Agency shall submit their technical proposal consisting of the following:

- (i) Shop drawings consisting of equipment layouts (furniture and RCP and all the other MEP services coordinated).
- (ii) Shop drawings consisting of schematic layouts.
- (iii) Shop drawings consisting of conduit layouts & cable routing plan.

Upon completion of work and prior to handover, the Bidder shall submit 3 sets of duly laminated as-built drawings and documentation as mentioned below:

- (i) Final equipment layouts (furniture and RCP and all the other MEP services coordinated) – AutoCad & PDF format, clear copy of which shall be permanently fixed inside respective IT/ICT networking and server rack.
- (ii) Final schematic layouts - AutoCad & PDF format, clear copy of which shall be

permanently fixed inside respective IT/ICT networking and server rack.

- (iii) Final conduit layouts - AutoCad & PDF format, clear copy of which shall be permanently fixed inside respective IT/ICT networking and server rack.
- (iv) Final cable routing plan – cable schedule, cable IDs, labelling and documentation, type of cable, no. of cables etc. - AutoCad & PDF format, clear copy of which shall be permanently fixed inside respective IT/ICT networking and server rack.
- (v) Configuration details of L2/L3 switches/Routers/controllers and all other networking items and their passwords.
- (vi) Agency/ contractor shall provide Heat maps for Wi-Fi Access Points As-built documentation for passive items such as the Jack panel details, i.e, which cable is terminated on which I/O in which room/area and corresponding port on jack panel and cable details in rooms shall be provided by the Agency/ contractor.
- (vii) The OFC core punching details with color code on LIU at ELV rooms shall be provided by the Agency/ contractor

The Agency/ contractor, the OEMs/Manufacturers of products being supplied have to assure on paper that the products, including hardware and software applications/platforms/versions, that are being supplied are of the latest series/generation and not obsolete and that they will unconditionally provide the required support and all related upgrades, updates and security patches free of cost during warranty period and after warranty period as per O&M contract.

At the time of actual supply of equipment, the Agency/Contractor and OEMs/Manufacturers whose products are being supplied shall assure on paper that as on date the products, including hardware and software applications/platforms/versions, are neither declared 'End-of-Sale' or 'End-of-Support' and are not being phased out in any way. An Undertaking to that effect shall be submitted by the Agency/Contractor and OEMs/Manufacturer.

The OEMs will also ensure that the equipments provided should have a minimum shelf-life of seven years from the date of supply and should sufficiently cater for any eventuality arising out of the obsolescence within a seven-year period from date of supply, wherever applicable.

For all items supplied under this scope, all types of products shall be obtained in the name of the client/ Engineer in charge and shall be duly registered in the name of the client, e.g., for the purpose of, but not limited to, warranties, license subscriptions and their renewal upon expiry, their extension, special technical support during warranty and thereafter and other such. The same shall be handed over in hard copies and / or softcopies, as applicable, at the time of handing over.

O&M document may be referred for the details of replacement SLA and spares to be kept at site.

The Agency is advised to inform the Engineer-in-Charge or client, of any specific requirements related to their equipment such as heat dissipation, earthing or grounding,

UPS, ventilation or any other required site pre-conditions, in writing before supply and commencement of work so as to incorporate the same at site by other agencies.

However, if the input power supply parameters, i.e., voltage levels and frequency required by the supplied equipment are different from those available at site, the Agency shall take necessary actions at its own cost so as to make the equipment installable, e.g., transformers, stabilizers, auto-transformers or any other protection equipment etc.

The structured cabling system consisting of CAT6A components and fiber optic components shall be tested for satisfactory channel performance such as CAT6A and OS2 using Penta Scanner, network analyzer and OTDR, test reports shall be submitted for each link and the same shall have to be duly certified by the manufacturer or their authorized partners for a period of 25 years minimum.

The Agency is advised to specifically use items only from the list of acceptable makes and provide information on compliance of performance specifications in the prescribed format.

Make of components required to be used by Agency to complete the installation, if not mentioned anywhere, shall be required to be approved from Engineer-in-Charge in writing before installation

TECHNICAL SPECIFICATIONS FOR ICT

TECHNICAL SPECIFICATIONS FOR ACTIVE COMPONENTS – NETWORKING SWITCHES, WIFI, WAN, SECURITY & UNIFIED COMMUNICATIONS [BoQ ITEMS - 1 TO 22]

a) Functional Requirement of IT Infrastructure Solution

	Functional Requirement of IT Infrastructure Solution
S/N	Description
1.1	Scope
1	Contractor / specialized agency shall carry out complete supply, installation, testing, commissioning and UAT for the equipment as mentioned in the C16 sub-head BoQ. Contractor / specialized agency shall also carry out comprehensive maintenance and operation as per the items / details given in ICT sub-head of O&M document.
2	The bidder needs to take into account the following high level features and confirm compliance to the detailed technical specifications. The bidder should provide all necessary software, hardware and associated peripheral devices required to make the solution work strictly as per functional requirements provided herein. The specifications given are minimum requirements and the bidders can quote

	products/solutions of higher technical specifications to meet the requirements. These documents together constitute the overall requirements of the solution.
1.2	LAN – Core and Access Switches
1	Total solution would cover Supply, Delivery, Installation, Configuration, Integration, Test, Install, Commission, Operationalization, Warranty, Maintenance, Support/Services and Facilities Management Services of Local Area Network components installed in CCS123 buildings.
2	The proposed solution should be highly secure, scalable and resilient.
3	The scope of this tender is to provide connectivity by networking all the offices, departments, blocks and floors using Core Switches and Access Switches on a Fiber Backbone with 10 Gigabit or higher speed uplinks between equipment. It covers the supply, installation, and testing, commissioning, training, warranty and maintenance support of the Network Equipment, Software and Services. The technical specifications of the switches to be supplied are provided in the tender document.
4	Hierarchical Architecture with Redundant Core Switches configured in the Active-Active mode in order to achieve the higher switching and backplane capability
8	The design should be free of Spanning Tree and employ Layer-3 at access level.
9	The solution should be able to create Layer 3 logical separation for IOT, Guest and Employees
10	All the switches proposed must support all Layer-3 dynamic routing protocols and must be compatible with the proposed NAC/AAA solution.
11	All the Core switches shall facilitate high capacity, non-blocking switching with installed redundant power supplies, fans and redundant CPUs from Day 1 in order to achieve higher performance with network resiliency. Access Switches shall be proposed with redundant power supplies.
12	The proposed solution should be scalable for future upgrades to higher speed network operations and should be open ended and should integrate equipment from different OEMs.
13	The Successful Bidder should supply and install all passive / associated components, software(s) etc. that may be necessary to carry out the complete job as per the functional requirements specified in this tender. The Bidder should mention the make / brand of the components in the Technical Bid.
14	The Successful Bidder should provide and operationalize critical high-end components as mentioned in Bills of Quantity (BoQ) or Schedule of Quantity (SoQ) in redundant manner for both the segments (Internet and Intranet) with required

	interfaces, software licenses, hardware capacity and services as mentioned in the technical specifications.
15	The Successful Bidder should provide routers in redundant mode for Internet segment with required interfaces, software licenses and hardware capacity as mentioned in the technical specifications.
16	The fiber optic transceivers of the Networking Switches should be from the same OEM. The fiber optic transceivers of the Routers should be from the same OEM. The fiber optic transceivers of the Wireless Controller should be from the same OEM.
17	The active networking components to be supplied under the GPOA-1 scope should completely integrate with the main components, i.e., NoC/SoC related servers, controllers, applications & application server(s) installed at CCS-NoC/SoC, e.g., with Centralised Network Management, Software Defined Network, NAC/AAA, Campus LAN Security and any other such equipment installed at CCS-NoC/SoC without any loss of functionality, features or inter-operability. It shall be the responsibility of the Successful Bidder to provide all types of support and activities such as supply and integration of hardware and/or software involving and using APIs, SDKs, SNMP traces, software, upgrades, licences, services, application development, integration of equipment Management Information Blocks (MIBs), development of software, software patches, migration path to make the supplied equipment/items operate and integrate seamlessly with equipment installed at NoC and SoC of the respective N1 segments.
1.3	Wireless Solution
1	Bidder needs to provide a Wi-Fi system to provide high speed, secure Wi-Fi network access inside the buildings across all floors as well as in lobbies, corridors and other designated locations to all the authenticated users based on well-defined access policies.
2	The system should support seamless roaming within the building for users with mobile devices such as laptops, smart phones and tablets.
3	The network should support the user devices with 2.4 GHz as well as 5 GHz frequency band at the same time. The wireless access points proposed should support latest 802.11ax standard and should be backward compatible with previous standards. The Wireless Controllers shall be centrally located at CCS-NoC/SoC Server Room at Upper Basement of CCS1.
4	The access points proposed should support 4x4 MU-MIMO with 4 spatial streams

5	The access points will be powered using PoE/PoE+
6	The Wireless controllers proposed should be highly scalable and should be deployed in 1:1 redundant fashion. Wireless network is to be part of Internet air gapped network only; wireless is not to be provided in Intranet network.
7	It should be possible to manage the Wi-Fi network from a central location, through the wireless management system. The management system should support unified wired and wireless network management, and BYOD (Bring your own device) solution.
8	The entire Wi-Fi network should be fully secure and the successful bidder should implement multiple authentication mechanisms.
9	Every user should get access to only those services for which they are authorized.
10	The successful bidder has to configure the system on Rule based Access Rights.
11	Data communication between devices should take place in encrypted form to ensure end-to-end security of user information/ data along with implementation of Wireless Security Standards such as WPA and WPA2.
12	A Secure Guest Portal would be configured for Guest User Access
13	The Bidder has to ensure compliance with all Regulatory and Legal guidelines issued by Department of Telecommunications from time to time. At no point government or its agencies would be responsible for any non-compliance arising from non-adherence on behalf of the successful bidder.
14	Both wireless and wired LAN should form part of the same software defined networking fabric to allow uniform policy provisioning across wired and wireless LAN.
15	Bidder shall provide complete network diagram including detailed technical documentation.
16	The Architecture of the system should support scalability to support future expansions – subsequent project phases and increased user density.
17	The bidder shall carry out survey of the buildings to ascertain number of Access Points and their positioning to ensure maximum coverage as desired and excellent signal strength. Based upon the actual product being submitted for approval during commissioning, the Bidder shall submit WiFi heat maps for most optimum locations of Access Points
18	All active and passive components required for setting up Access Points and Core infrastructure including structured cabling, converters, injectors, poles, frames, mounts, other accessories, etc. would be in scope of the bidder.

19	All components should be able to communicate with each other on open protocols and devices/software should be inter-operable with components of other OEMs.
1.4	Centralized Network Management Solution (Software Defined Networking)
1	Bidder should Supply, Install and Operationalize software defined Centralized Network Management & Monitoring solution for provisioning, monitoring and management of wired and wireless LAN. The proposed software defined networking solution will form part of both Internet and Intranet Network. Each of these air-gapped networks will have its own SDN controller and management platform.
2	The solution should provide a central point of control for configuration management, Incident management and policy provisioning consistently throughout the LAN (wired and wireless)
3	The solution shall include all components such as sets of server(s), software(s), application(s), operating systems, software tools and any other such items so as to provide centralised NMS, SDN functionality in entirety.
4	The solution should have the ability to smoothen the network traffic in an efficient manner to prevent overload and congestion during peak hours and critical exigencies.
5	Provide better visibility on monitoring traffic, flow and resources on the network centrally.
6	Automated fault management mechanisms to keep the services and applications running at an optimum level and minimize downtime.
7	Ability to create network segments based on employees or group of employees (user wise, Department wise, office wise etc.) each with different set of policies and control the traffic based on requirement. The solution should be capable of delivering micro-segmentation to assign host to groups and apply policy based on those groups from this centralized management solution.
8	The solution should provide functionality to create and implement security policy from a centralized location. The solution should allow policy design as per differing user roles and profile. Deployment of policies for any User and device for any application should be automated across the wireless and wired network via a single network fabric
9	The solution should allow user mobility within the offices i.e. wherever user move within LAN, policies and IP address shall remain intact.
10	The proposed solution should provide true automation (Zero touch provisioning - Network devices should be dynamically discovered, on-boarded, and automated from their factory-default state to fully integrated in the network) by allowing automated

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	provisioning of underlay and overlay network to create software defined network fabric.
11	The proposed solution should eliminate manual troubleshooting and provide guided remediation to quickly resolve the issues by collecting streaming telemetry information from underlying network. The solution should employ Artificial Intelligence and Machine learning to automate the process of issue resolution and performance enhancement to keep user experience at its optimal performance.
12	The proposed solution should facilitate creation of network fabric, user access policies, AAA, SNMP, DHCP, DNS etc. Successful Bidder should ensure that the required infrastructure services like AAA, DNS, DHCP and Directory Services are supplied as part of the overall solution to meet the functional and technical requirement mentioned as part of the RFP.
13	The proposed solution should continuously check for policy compliance to ensure that the device is operating as per the user intent/policy configured during the fabric provisioning. Any change in the configuration should also generate a SNMP trap and initiate a compliance check.
14	The proposed solution for software defined networking; assurance and analytics should be on-premise.
15	The proposed solution should employ single dashboard to provide functionality like zero touch provisioning, policy enforcement, inventory, assurance and analytics across wired and wireless solution.
16	The solution should not tunnel the traffic destined to host located on the local switch to the centralized SDN controller and should support local traffic switching in such cases.
17	All components should be able to communicate with each other on open protocols and devices / software should be inter-operable with components of other OEMs.
	Solution can be offered as a dedicated appliance (as a set of standalone servers) or a virtualization-solution-based-platform using technologies / deployments such as VMWare or VMDK or KVM or Hypervisor or similar platforms deploying HCI architecture. In either case, collectively, the solution shall be proposed with full redundancy on all critical hardware resources such as power supplies, fans, LAN/ network ports, mechanisms of memory error check and correction and data integrity.
1.5	Campus LAN Security

1	AAA solution should be provided for improved visibility and accurate device identification to see exactly who and what is on network at all times in order to help lower the number of unknown endpoints, and the potential threats they carry on network. Solution should be deployed in HA mode for both Internet and Intranet segments.
2	Proposed AAA solution should help reduce risk and contain threats by dynamically controlling network access. Proposed solution should provide with following capabilities:
3	a. Perform posture assessments to endpoints connected to the network. Provide the ability to create powerful policies that include, but are not limited to, checks for the latest OS patch, antivirus and antispymware packages with current definition file variables
4	b. The solution should support device profiling and zero-day device profile feed service for updated profiles for the latest devices to reduce the number of unknown endpoints and potential threats on network.
5	c. Highly scalable IT exchange for security tools to automatically share contextual data in real time and send alerts. These alerts will provide instant visibility and help perform actions on users and devices such as faster detection, quarantining, investigating, blocking access, and automatically stopping threats.
6	d. Implement software-defined segmentation based on enterprise roles
7	e. Streamlined BYOD and enterprise mobility
8	f. Centralized and unify network access policy management over wired, wireless and VPN
9	g. Upon detecting an evident threat on an endpoint, the solution should be able to instruct the AAA solution to contain the infected endpoint automatically. The containment may involve moving the device to a remediation domain for repair or removing it completely. The AAA solution should automatically update the endpoint's access policy to one that is more restricted, thus effectively quarantining the endpoint from the network. The endpoint can then be remediated or completely blocked from accessing the network.
10	Proposed solution should include platform that provides first line of defense against threats on the Internet, by analyzing and learning from Internet activity patterns, and automatically uncovers attacker infrastructure staged for current and emerging threats. It should proactively blocks malicious requests before they reach the enterprise campus network or endpoints. This solution will form part of the Internet segment only.
11	It should prevent devices from connecting to malicious sites in the first place, before a malware file is downloaded or an IP connection is even established. Solution should

	be able to stop phishing and malware infections earlier, identify already infected devices faster, and prevent data exfiltration.
12	Solution should help IT security administrators protect from advanced attacks and provide following benefits:
13	a. Reduce the time to detect and contain threats
14	b. Increase visibility into internet activity across all locations and users
15	c. Gain visibility into cloud apps (if any) used across the enterprise
16	d. Mitigate remediation costs and breach damage
17	Solution should provide a full-featured Network threat analyzer capability to detect threats emerging from inside the network (i.e., ones that have not passed through a perimeter FW/IPS). This includes the ability to establish "normal" traffic baselines through flow analysis techniques and the ability to detect deviations from normal baselines. This solution should form part of both Internet and Intranet segments.
18	The solution should be able to combine/stitch the flow records coming from different network devices like routers/switches/firewall that are associated with a single conversation and present them as a single bi-directional flow record. Solution should have the capability to track every communication and map behavior deviations instantaneously to malware execution patterns. It should provide high fidelity alters for both systems generated and user defined events.
19	The proposed security solution should be able to isolate the root cause of an incident within seconds and conduct efficient triage for fast mitigation.
20	The solution should reduce risk by seeing when and how users and devices are connecting to network, including:
21	a. Conversations within your network
22	b. Communications extending out of the network
23	c. Information passing between distributed branch offices
24	d. Visibility into C2C sessions and data being exfiltrated to unrecognized IP addresses and machines
25	The solution should ensure compliance with network segmentation policies, enterprise-wide visibility, and enhanced network management.
26	The solution should be capable of performing traffic analytics to predict with a high level of accuracy whether or not an encrypted flow session is likely to be hiding threat vectors without decrypting the traffic. The switches proposed at core level should be able to deliver this functionality.

1.6	Collaboration Solution
1	The UC Platform should provide services like Presence, Instant Messaging, VoIP, Video over IP, Video Conferencing and collaboration using Content Sharing. All the services should be enabled on the UC Platform by the same OEM
2	The Unified Communication Platform should be fully redundant solution with No single point of failures & should provide 1:1 redundancy.
3	UC Platform should provide integrated telephony solution for Video conferencing devices, Analog & IP Phones, PSTN gateways over IP architecture.
4	The platform should natively support tenant partitioning to comply with TRAI regulations for not allowing VoIP (CUG calls) and PSTN calls to be bridged. No third party application should be quoted for managing tenant partitioning.
5	The Unified Communications Platform should support Unified Gateways with Trunk Interface for Service Provider over FXO, E&M, ISDN PRI and SIP
6	Platform should provide open API, which will help to develop customized IP applications, which will integrate with call processing.
7	The system should support complete encryption capabilities with the ability to encrypt all traffic (media and call control signaling) between IP phones, softphones, call controllers, gateways and all other associated endpoints using a strong encryption algorithm (AES, IPSec and SRTP, for example).
8	It should be possible to securely register UC Clients (IP Phones, Video Devices) on Internet without creating a VPN Tunnel
9	The Video Conference Platform should support WebRTC for users to join using Web browser
10	The UC Platform should support Ad-Hoc and Scheduled Video Conferences
11	The proposed solution should have the capability to give certain users their respective Personal ID for Video Conference
12	Some users shall be provided a Personal Video Conference Unit. . The personal unit should register with the proposed IP PBX for unified communication.
13	All the conference rooms should be equipped with state-of-the-art Video Conferencing device. The VC Codec, Cameras, MCU, Gatekeeper should be preferably from the same OEM.
14	An unified communication solution is desired, therefore, the Video Conferencing devices proposed for various conference and meeting rooms should register to the proposed IP PBX without any intermediate solution so as to ensure two way audio/video calls between IP Phones, Video IP Phones, Soft Clients with a single dial

	plan. The solution should be interoperable with the UC and VC setup available at NIC.
15	It should be possible for Users to use their personal Devices like Android Phones, Apple Phones, Windows Desktop, Apple Desktop to install single UC Client with which Users can perform all UC Functionalities like IM, VoIP Calling, PSTN Calling, Video Calling and Collaboration. The solution should include licenses, resources etc. to support all users as per the Tender Bill of Quantities from Day 1.
16	The Successful Bidder should provide a separate UC platform for Internet segment and Intranet segment. Both shall be in High Availability mode – Internet segment as well as Intranet segment.
17	The IP PBX, IP Phones, Video IP Phones, Soft client, VC devices should be IPV4 and IPV6 compliant Day 1.
18	The proposed UC solution should meet all the functional requirements mentioned above along with technical specifications mentioned in the RFP.
19	IP-Pbx communication platform shall be a server(s) based common central facility for CCS1, CC2 and CC3 buildings and all future CCS buildings. 100% air-gapped, physically-network-separated SIP IP PBXs, common for all CCS buildings will be deployed in 1:1 High Availability mode for PUBLIC (N1, Internet) and PRIVATE (N2, Intranet) network segments. Two sets of systems shall be deployed at locations as follows: 1. BNR-1-N1 - at Upper Basement of CCS1 (Primary for N1) 2. BNR-1-N1 - at Upper Basement of CCS3 (Secondary for N1) Corresponding TDM (PRI and/or FxO and/or FxS) Voice Gateways shall be deployed as follows: 1. TSP1 - at Upper Basement of CCS1 (Primary for N1) 2. TSP2 - at Upper Basement of CCS3 (Secondary for N1) Future CCS buildings shall have their own TDM (PRI and/or FxO and/or FxS) Voice Gateways that shall be installed at TSP1-CCS1 and TSP2-CCS3 and will connect to the above IP-Pbxs.
20	The CCS buildings shall be provided with TDM (PRI and/or FxO and/or FxS) Voice Gateways in 1:1 HA mode, with each voice gateway equipped to terminate 16 x E1 PRI Lines.

b) Technical Specifications

1. Technical Specifications – Access Switch Type 1

Sr. No	Minimum Technical Specification
1	General Features:
2	Switch should be 1U and rack mountable in standard 19" rack.
3	Switch should have internal hot-swappable Redundant Power supplies installed from Day 1.
4	Switch should have minimum 2 GB RAM and 2 GB Flash.
5	Switch should support stacking using dedicated stacking ports or standard on-board Ethernet ports, in addition to the required uplink ports. Should support for minimum 160 Gbps of stacking throughput with 8 switches in single stack.
6	Performance:
7	Switch shall have minimum 176 Gbps or more of switching fabric and 130 Mpps (64 byte packet) of forwarding rate.
8	Switch shall have minimum 32K MAC Addresses and 1000 VLANs.
9	Should support minimum 12K or more IPv4 routes
10	Switch shall have 1K or more multicast routes and 1K Switch Virtual Interfaces
11	Switch should support at least 1K sflow/netflow/jflow entries.
12	Switch should have 4MB or more packet buffer.
13	Functionality:
14	Switch should support IEEE Standards of Ethernet: IEEE 802.1D, 802.1s, 802.1w, 802.1x, 802.3ad, 802.3x, 802.1p, 802.1Q, 802.3, 802.3u, 802.3ab, 802.3z & 1588v2/NTP.
15	Switch must have full scale functionality like static routing, RIP, PIM, OSPF, VRRP, PBR and QoS features from Day 1
16	Switch must have support for advance Layer 3 protocols like VRF, VXLAN and OSPFv3 from Day 1.
17	Switch shall have 802.1p class of service, marking, classification, policing and shaping and eight egress queues.

18	Switch should support management features like SSHv2, SNMPv2c, SNMPv3, NTP, RADIUS and TACACS+.
19	Switch should support IPv6 Binding Integrity Guard, IPv6 Snooping, IPv6 RA Guard, IPv6 DHCP Guard, IPv6 Neighbor Discovery Inspection and IPv6 Source Guard.
20	Switch should support 802.1x authentication and accounting, IPv4 and IPv6 ACLs and Dynamic VLAN assignment and IEEE 802.1AE (MACSec – 128) on all the ports
21	The switch should support IPv4 Source Guard, DHCP Snooping, Dynamic ARP inspection, IP Source Guard
21b	The switch should support Protocol Independent Multicast (PIM), Source-specific Multicast (SSM) and IPv6 MLD Snooping
22	Switch must have the capabilities to enable automatic configuration of switch ports as devices connect to the switch for the device type or equivalent solution.
23	Switch shall have modular OS.
24	Interfaces:
25	Switch shall have 48 nos. 10/100/1000 Base-T ports. The switch shall have an open module slot/fixed on-board ports to provide flexible uplink options. The switch should be provided with 4 nos. SFP+ uplinks ports from Day 1.
26	All 48 ports should support PoE (802.3af) and PoE+ (802.3at) with each port capable of providing minimum 30 watts PoE power
27	Certifications:
28	Switch shall conform to UL/IEC/CSA/EN 62368-1 or relevant TEC / BIS Standards for Safety requirements of Information Technology Equipment.
29	Switch shall conform to EN 55022 Class A/B or CISPR22 Class A/B or CE Class A/B or FCC Class A/B or relevant TEC / BIS Standards for EMC (Electro Magnetic Compatibility) requirements.
30	Operating Temperature : 0°C to +45°C

2. Technical Specifications – Access Switch Type 2

Sr. No	Minimum Technical Specification
1	General Features:
2	Switch should be 1U and rack mountable in standard 19" rack.

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3	Switch should have internal hot-swappable Redundant Power supplies installed from Day 1.
4	Switch should have minimum 2 GB RAM and 2 GB Flash.
5	Switch should support stacking using dedicated stacking ports or standard on-board Ethernet ports, in addition to the required uplink ports. Should support for minimum 160 Gbps of stacking throughput with 8 switches in single stack.
6	Performance:
7	Switch shall have minimum 400 Gbps or more of switching fabric and 295 Mpps (64 byte packet) of forwarding rate.
8	Switch shall have minimum 32K MAC Addresses and 1000 VLANs.
9	Should support minimum 12K or more IPv4 routes
10	Switch shall have 1K or more multicast routes and 1K Switch Virtual Interfaces
11	Switch should support at least 1K sflow/netflow/jflow entries.
12	Switch should have 4MB or more packet buffer.
13	Functionality:
14	Switch should support IEEE Standards of Ethernet: IEEE 802.1D, 802.1s, 802.1w, 802.1x, 802.3ad, 802.3x, 802.1p, 802.1Q, 802.3, 802.3u, 802.3ab, 802.3z & 1588v2/NTP.
15	Switch must have full scale functionality like static routing, RIP, PIM, OSPF, VRRP, PBR and QoS features from Day 1
16	Switch must have support for advance Layer 3 protocols like VRF, VXLAN and OSPFv3 from Day 1.
17	Switch shall have 802.1p class of service, marking, classification, policing and shaping and eight egress queues.
18	Switch should support management features like SSHv2, SNMPv2c, SNMPv3, NTP, RADIUS and TACACS+.
19	Switch should support IPv6 Binding Integrity Guard, IPv6 Snooping, IPv6 RA Guard, IPv6 DHCP Guard, IPv6 Neighbor Discovery Inspection and IPv6 Source Guard.
20	Switch should support 802.1x authentication and accounting, IPv4 and IPv6 ACLs and Dynamic VLAN assignment and IEEE 802.1AE (MACSec – 128) on all the ports

21	The switch should support IPv4 Source Guard, DHCP Snooping, Dynamic ARP inspection, IP Source Guard
21a	The switch should support Protocol Independent Multicast (PIM), Source-specific Multicast (SSM) and IPv6 MLD Snooping
21b	Switch must have the capabilities to enable automatic configuration of switch ports as devices connect to the switch for the device type or equivalent solution.
22	Switch shall have modular OS.
23	Interfaces:
24	Switch shall have 48 nos. 10/100/1000 Base-T ports (out of the 48 ports, 8 ports should be mGig ports supporting speeds of 1G/2.5G/5G for connecting 802.11ax capable Access Points. The switch shall have an open module slot/fixed onboard ports to provide flexible uplink options. The switch should be provided with 4 nos. SFP+ uplinks ports from Day 1.
25	All 48 ports should support PoE (802.3af) and PoE+ (802.3at) with each port capable of providing minimum 30 watts PoE power
26	Certifications:
27	Switch shall conform to UL/IEC/CSA/EN 62368-1 or relevant TEC / BIS Standards for Safety requirements of Information Technology Equipment.
28	Switch shall conform to EN 55022 Class A/B or CISPR22 Class A/B or CE Class A/B or FCC Class A/B or relevant TEC / BIS Standards for EMC (Electro Magnetic Compatibility) requirements.
29	Operating Temperature : 0°C to +45°C

3. Technical Specifications – Server Farm Switch

Sr. No	Minimum Technical Specification
1	General Features & Performance :
2	It shall be a chassis based switch with at least 4 payload slots for line cards and additional two slots to accommodate two nos. of switch processor.
3	The switch will have redundant CPUs or Supervisor Modules installed from Day-1. Switch should support Non-Stop Forwarding and Stateful Switchover to ensure information exchange between supervisor engines allows the standby supervisor engine to take over in sub-second time if the primary supervisor fails.

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4	Switch should have non-blocking per-slot throughput from Day 1.
5	Shall support In Service Software Upgrade (ISSU) or Hit less update to provide an upgrade of the entire chassis or an individual task/process without impacting hardware forwarding
6	Switch should have redundant power supply and redundant fans installed from Day 1.
7	Switch should support field replaceable components such as Supervisor, Line cards, Power-supply and Fan trays.
8	Should have minimum 8 GB DRAM and minimum 8 GB Flash
9	The switch will have at least up to 8 Tbps switching capacity.
10	Forwarding rates: The switch should have minimum total 3 Bpps or minimum 900Mpps forwarding rates on a per slot basis.
11	IPv4 Routing entry support : 200K or more
12	IPv6 Routing entry support : 32K or more
13	Multicast Routing entry support : 6K or more
14	MAC addresses support: 64K or more
15	VLANs ID: 4K or more
16	ACL & QOS entry support : 3K or more
17	Packet buffer : 100 MB or more
18	The device should be IPv6 ready from Day 1
19	Must support BGP, VRF, VXLAN, OSPF Routed Access, Policy-Based Routing (PBR), PIM SM, and Virtual Router Redundancy Protocol (VRRP) from Day 1
20	STP, PVLAN or equivalent, IPv6 First Hop /Access Security, Link Aggregation Protocol (LACP)
21	STP, Trunking, Private VLAN (PVLAN) or equivalent, Q-in-Q or equivalent, Shaped Round Robin (SRR) scheduling or equivalent, Committed Information Rate (CIR)/equivalent and eight egress queues per port
22	Should have IEEE 802.1AE encryption in hardware. The proposed 10G SFP+ line card and 40G line card should support this in hardware.
23	OS should have support for Management automation via Netconf/Yang or equivalent

24	Should support Streaming Telemetry, Netflow/Sflow/Jflow/Clearflow, SPAN/RSPAN or equivalent
25	Interfaces
26	The Switch will be populated with:
27	1) Adequate line cards for installing 48 x 10G SFP+ ports. 2) At least one line card for installing 24 x 40G QSFP+ ports
28	1 x Console port
29	Scalability
30	Should have blank slot for future expansion
31	Chassis should support additional 40G/100GE QSFP+ port line card for future expansion
32	Certification:
33	The switch should be CE Marking, UL / EN 62368-1; and ROHS5 or relevant TEC / BIS compliance / certification

4. Technical Specifications – Core Switch

Sr. No	Minimum Technical Specification
1	General Features & Performance :
2	It shall be a chassis based switch with at least 4 payload slots for line cards and additional two slots to accommodate two nos. of switch processor.
3	The switch will have redundant CPUs or Supervisor Modules installed from Day-1. Switch should support Non-Stop Forwarding and Stateful Switchover to ensure information exchange between supervisor engines allows the standby supervisor engine to take over in sub-second time if the primary supervisor fails.
4	Switch should have non-blocking per-slot throughput from Day 1.
5	Shall support In Service Software Upgrade (ISSU) or Hit less update to provide an upgrade of the entire chassis or an individual task/process without impacting hardware forwarding

6	Switch should have redundant power supply and redundant fans installed from Day 1.
7	Switch should support field replaceable components such as Supervisor, Line cards, Power-supply and Fan trays.
8	Should have minimum 8 GB DRAM and minimum 8 GB Flash
9	The switch will have at least up to 8 Tbps switching capacity.
10	Forwarding rates: The switch should have minimum total 3 Bpps or minimum 900Mpps forwarding rates on a per slot basis.
11	IPv4 Routing entry support : 200K or more
12	IPv6 Routing entry support : 32K or more
13	Multicast Routing entry support : 6K or more
14	MAC addresses support: 64K or more
15	VLANs ID: 4K or more
16	ACL & QOS entry support : 3K or more
17	Packet buffer : 100 MB or more
18	The device should be IPv6 ready from Day 1
19	Must support BGP, VRF, VXLAN, OSPF Routed Access, Policy-Based Routing (PBR), PIM SM, and Virtual Router Redundancy Protocol (VRRP) from Day 1
20	STP, PVLAN or equivalent, IPv6 First Hop /Access Security, Link Aggregation Protocol (LACP)
21	STP, Trunking, Private VLAN (PVLAN) or equivalent, Q-in-Q or equivalent, Shaped Round Robin (SRR) scheduling or equivalent, Committed Information Rate (CIR)/equivalent and eight egress queues per port
22	Should have IEEE 802.1AE encryption in hardware. The proposed 10G SFP+ line card and 40G line card should support this in hardware.
23	OS should have support for Management automation via Netconf/Yang or equivalent
24	Should support Streaming Telemetry, Netflow/ Sflow/ Jflow/ Clearflow, SPAN/ RSPAN or equivalent
25	Interfaces
26	The Switch will be populated with:

27	1) Adequate line cards for installing 96 x 10G SFP+ ports. 2) At least one line card for installing 24 x 40G QSFP+ ports
28	1 x Console port
29	Scalability
30	Should have blank slot for future expansion
31	Chassis should support additional 40G/100GE QSFP+ port line card for future expansion
32	Certification:
33	The switch should be CE Marking, UL / EN 62368-1; and ROHS5 or relevant TEC / BIS compliance / certification

5. Technical Specifications – Wireless Controller

Sr. No	Feature	Minimum Technical Specification
1	Hardware	Wireless controller should support 8000 AP and 50000 clients from Day 1. If the same scale cannot be met by single controller then multiple controllers with redundancy should be provided from Day 1.
2		The controller shall support 40 Gbps of throughput capacity
3		The controller appliance should have 4 x 10 Gig SFP+ and 2 x 40 Gig QSFP+ interfaces from Day 1
4		Wireless Controller shall support link aggregation and load sharing between Access Point to WLC links
5		The controller shall support hardware encrypted data plane between Access Point and Controller

6		The controller shall be proposed with complete feature set including licensed features
7	High Availability	The controllers shall be deployed with dual 1+1 redundancy (High Availability) mode. High Availability mode shall allow geographically dispersed installation between Controllers.
8		The controller failover shall not trigger client de-authentication and re-association
9		The controller shall support hot WLC software patching for fixing bugs
10		The controller shall support hot AP software patching for fixing bugs
11		The redundant Controller shall sync Access Point and Client Status, including DHCP IP lease status
12	Software	Access Point shall be able to proactively distribute Client connection before and after association and tracking client condition in real time using data packet RSSI
13		The controller shall support Inter-Controller Wireless Roaming
14		The controller shall maintain per-user Application usage details and shall be able to export it for network analytics.
16	RF management	The controller shall be able to support multiple RF Management profile per group of APs, including Transmit Power Control and Dynamic Channel Assignment on both 2.4GHz and 5Ghz
17		The controller shall be able to identify and avoid interferers with network performance impact analysis report
18	Application Recognition and Control	The controller shall support per-user and per-WLAN based application recognition and control that throttle usage by rate-limiting
19	WIPS	WIPS should detect and protect an Ad-hoc connection when a connected user tries forming a network with other system without an AP.
20		WIPS should detect if a user attempts to impersonate a management frame.
21		WIPS should detect and take appropriate containment action if a smartphone user uses tethering to connect other device.
22		WIPS solution should provide compliance and audit reporting.

23		WIPS solution should provide visualization with location intelligence on map.
24		WIPS functionality should be available on both centralized and distributed traffic forwarding mode from AP.
25		WIPS solution should provide global alarm consolidation for ease of use.
26		WIPS solution should provide complete threat library with location intelligence and historical rogue reporting.
27		The controller/solution shall provide Device Profiling using multiple profiling methods to reduce false-detection
28		The system shall provide secure on-boarding service for both employee and guest based on standard-based security protocol. Proposed system shall not use public cloud as user data repository
29		The controller/solution shall be able to embed custom web portal page (HTML) to fully customize user experience without additional cost or extra box
30		The controller/solution shall provide rule-based rogue classification and automatically run rogue mitigation action
31	BYOD & Security	The controller/solution shall be able to detect employee device connection to Rogue Access Point and contain it automatically. It should also support protection from Honeypot or Evil twin.
32		The system shall support control plane encryption on both IPv4 and IPv6
33		The Controller's image upgrade shall be done through secure, encrypted transport
34		The controller shall be able to provide unique pre-shared keys to the devices that do not support the 802.1x security protocol
35		The controller/solution shall support identification & mitigation of threats inside encrypted traffic
36	Network	The controller shall support mapping of specific VLANs to single SSID, depending on Access Point location and user

6. Technical Specifications – Indoor Access Point

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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Sr. No	Minimum Technical Specification
1	Access Point shall support 4x4 MIMO on both radio interfaces
2	Access Point shall be able to be powered up using PoE
3	Access Point shall support packet capture and sensor capabilities
4	Access Point shall support application visibility and control
6	Access Point shall support integrated BLE5/4 radio
7	Access Point shall support Console port that uses Standard Port (RJ-45) type connection
8	Access Point should have 1x 100/1000/2500 Mbbps Multi-gigabit Ethernet (RJ-45) – IEEE 802.3bz
9	Access Point should have USB port for future requirement.
10	Must have at least 3 dBi Antenna gain on each radios
11	Must support data rate up to 5Gbps.
12	Must support minimum of 20dbm of transmit power in both 2.4Ghz and 5Ghz radios. And should follow the local regulatory Norms.
13	Must support AP enforced load-balance between 2.4Ghz and 5Ghz band.
14	Must incorporate radio resource management for power, channel and performance optimization
15	Must have -97 dB or better Receiver Sensitivity.
16	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.
17	Must support Management Frame Protection.
18	Should support locally-significant certificates on the APs using a Private/Public Key Infrastructure (PKI)
19	Access Points must support encrypted user data and management traffic between controller and Access point for better security.
20	Must support the ability to serve clients and monitor the RF environment concurrently.

21	Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.
22	Must be plenum-rated (UL2043).
23	Must support 16 WLANs per AP for SSID deployment flexibility.
24	Access Point Must continue serving clients when link to controller is down. It should also have option to authenticate user through Radius server directly from Access Point during link unavailability to controller.
25	Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.
26	802.11e and WMM
27	Must support QoS and Video Call Admission Control capabilities.
28	Access point should be wi-fi 6 certifiable.

7. Technical Specifications – Internet Router

Sr. No	Feature	Minimum Technical Specification
1	Architecture	The Router should support multi-core Processor, internal redundant field replaceable power supply (from Day 1) with 1+1 or N+1 power supply redundancy. The Router Should have capabilities of seamless field upgrade/replacement (without interrupting running processes and services).
		Router should have a physical separation between control and data planes processor. Router should support inline hardware accelerated encryption for high-throughput IPsec and MACsec
		Router should have minimum 64 GB of on-board/inbuilt DRAM/RAM for data plane + control plane processes and 32 GB storage from Day 1.
		The router shall support following type of interfaces from Day 1– 1GE, 10GE, 40GE, and 100GE ports
2	Performance	Router should have minimum IP forwarding throughput of 500 Gbps

		Router should support minimum 4M IPv4 & 4M IPv6 routes
		Router should support minimum 6K or more ACLs per system
		The router should support 250 Gbps of IPSEC Bandwidth
		Router should be scalable to support up to 4000 tunnels & VRF level segmentation with min support for 8000 VRF segments
3	Protocol Support	Router should support IGMP v1/v2/v3 and PIM multicast routing
		Router should support static Routes, RIP/RIPv2, OSPFv2, OSPFv3, BGP4, MBGP, BFD, Policy based routing, IPv4 and IPv6 tunneling from Day 1
		Router should support Network Address Translation (NAT), MPLS, L2TPv3, Performance Routing (PfR) and Policy-Based Routing (PBR)
		The Router should support Zone Based Firewall feature or an external appliance for the same functionality can be provided.
		Router should Support Traffic Optimization feature built in the router operating system or an external appliance for the same functionality can be provided.
		Shall have 802.1p class of service and marking, classification, policing and shaping.
		Should support advanced encryption algorithms like AES-256 and AES-GCM
		The router should be able to support Hierarchical QoS. QoS should be supported both at Physical and sub-interface level
4	Manageability	Router should be able to do deep packet inspection and identify applications at layer-7 and we should be able to define QoS and access control based on application.
		Router should support SSHv2, SNMPv2c, SNMPv3 and NTP

		Routers should support AAA using RADIUS and TACACS+
		Should have extensive support for IP SLA or equivalent and best path selection for metrics like delay, latency, jitter, packet loss to assure business-critical IP applications from Day 1.
		Router should support monitoring of network traffic with application level insight with deep packet visibility into web traffic, RTP-Based VoIP traffic.
		Router should have traffic load balancing capability on dual WAN Links based on based on advanced criteria, such as reachability, delay, loss, jitter and bandwidth utilization.
		Router shall have capability to add on demand IPSec VPN tunnels dynamically established multipoint-to-multipoint IPSEC based spoke-to-spoke VPN tunnels matching traffic conditions
5	Interface	4 x 10G SFP+ and 4 x 1G Copper interfaces from Day 1
		6 x 40G QSFP+ interfaces from Day 1
6	Environmental	Operating temperature: 0 to 40 degrees
		Humidity – 10% to 85% Non-Condensing
7	Certification	Router shall conform to UL/IEC/CSA/EN 62368-1 or relevant TEC / BIS Standards for Safety requirements of Information Technology Equipment.
		Router shall conform to EN 55022 Class A/B or CISPR22 Class A/B or CE Class A/B or FCC Class A/B or relevant TEC / BIS Standards for EMC (Electro Magnetic Compatibility) requirements.
		Router/Router's Operating System should be tested and certified for EAL 3/NDPP or above under Common Criteria Certification or under Indian Common Criteria Certification Scheme (IC3S) by STQC for security related functions.
		Router should be IPv6 Certified/IPv6 logo ready

8. Technical Specifications – AAA Solution for Campus LAN

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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Sr. No	Minimum Technical Specification
1	The Solution should provide a highly powerful and flexible attribute-based access control solution that combines authentication, authorization, and accounting (AAA); posture; profiling; BYOD, and guest management services on a single platform. Solution can be offered as a dedicated appliance (as a set of standalone servers) or a virtualization-solution-based-platform using technologies / deployments such as VMWare or VMDK or KVM or Hypervisor or similar platforms deploying HCI architecture. In either case, collectively, the solution shall be proposed with full redundancy on all critical hardware resources such as power supplies, fans, LAN/network ports, mechanisms of memory error check and correction and data integrity.
2	Solution should include all required licenses to perform above mentioned capabilities for 12000 endpoints from Day 1 and scalable to 50000 end points for future.
3	It should allow to authenticate and authorize users and endpoints via wired, wireless and VPN with consistent policy throughout the enterprise
4	Should provide complete guest lifecycle management by empowering sponsors to on-board guests
5	Should deliver customizable self service portals as well as the ability to host custom web pages to ease device and guest on-boarding, automate endpoint secure access and service provisioning, and enhance the overall end-user experience inside business-defined workflows
6	Should enforce security policies by blocking, isolating, and repairing noncompliant machines in a quarantine area without requiring administrator attention
7	Should offer a built-in monitoring, reporting, and troubleshooting console to assist helpdesk operators and administrators streamline operations
8	Should allow to get finer granularity while identifying devices on your network with Active Endpoint Scanning
9	Should utilizes standard RADIUS protocol for authentication, authorization, and accounting (AAA).
10	Should support a wide range of authentication protocols, including PAP, MS-CHAP, Extensible

	Authentication Protocol (EAP)-MD5, Protected EAP (PEAP) and EAP-Transport Layer Security (TLS).
11	Should offer a rules-based, attribute-driven policy model for creating flexible and business-relevant access control policies. Provides the ability to create fine-grained policies by pulling attributes from predefined dictionaries that include information about user and endpoint identity, posture validation, authentication protocols, profiling identity, or other external attribute sources. Attributes can also be created dynamically and saved for later use
12	Should provide a wide range of access control mechanisms, including downloadable access control lists (dACLs), VLAN assignments, URL redirect
13	Should have predefined device templates for a wide range of endpoints, such as IP phones, printers, IP cameras, smartphones, and tablets.
14	It should allow Administrators to create their own device templates. These templates can be used to automatically detect, classify, and associate administrative-defined identities when endpoints connect to the network. Administrators can also associate endpoint-specific authorization policies based on device type.
15	The Solution should have capability to collect endpoint attribute data via passive network telemetry, querying the actual endpoints, or alternatively from the infrastructure via device sensors on switches.
16	Solution should allow end users to interact with a self-service portal for device on-boarding, providing a registration vehicle for all types of devices as well as automatic supplicant provisioning and certificate enrolment for standard PC and mobile computing platforms.
17	Should support full guest lifecycle management, whereby guest users can access the network for a limited time, either through administrator sponsorship or by self-signing via a guest portal. Should include guest portal customize from Day 1
18	Should verify endpoint posture assessment for PCs/Laptops connecting to the network. Should be a persistent client-based agent to validate that an endpoint is conforming to the client's posture policies. Should provide the ability to create powerful policies that include but are not limited to checks for the latest OS patches, antivirus and antispysware software packages with current definition file variables (version, date, etc.), registries (key, value, etc), and applications.
19	Should allow administrators to quickly take corrective action (Quarantine, Un-Quarantine, or Shutdown) on risk-compromised endpoints within the network. This will help to reduce risk and increase security in the network.
20	Should enable administrators to centrally configure and manage profiler, posture, guest, authentication, and authorization services in a single web-based GUI

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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	console, greatly simplifying administration by providing consistency in managing all these services.
21	Should include a built-in web console for monitoring, reporting, and troubleshooting to assist help-desk and network operators in quickly identifying and resolving issues. Should offer comprehensive historical and real-time reporting for all services, logging of all activities and real-time dashboard metrics of all users and endpoints connecting to the network.
22	Should support consistent policy in centralized and distributed deployments that allows services to be delivered where they are needed
23	Solution should have capability to determine whether users are accessing the network on an authorized, policy-compliant device.
24	Solution should have capability to establish user identity, location and access history, which can be used for compliance and reporting.
25	Solution should support the following endpoint checks for compliance for windows endpoints: Check process, registry, file & application Check operating system/service packs/hotfixes check for Antivirus installation/Version/ Antivirus Definition Date check for Antispyware installation/Version/ Antispyware Definition Date Check for windows update running & configuration
26	Solution should be able to integrate with the following MDM vendors like: Airwatch, Good, Mobileiron, Zenprise,etc
27	Solution should support receiving updated endpoint profiling policies and the updated OUI database as a feed from the OEM database.
28	Should support Identity source sequences, which defines the order in which the solution will look for user credentials in the different databases. Solution should support the following databases: •Internal Users, Internal Endpoints, Active Directory, LDAP, RSA, RADIUS Token Servers, Certificate Authentication Profiles
29	Solution should support 3rd party integration for sharing Contextual awareness and other endpoint related data such that it can Publish, subscribe and work as broker as well.

30	Solution should have profiling capabilities integrated into the solution in order to detect headless host. The profiling features leverage the existing infrastructure for device discovery. Should support the use of attributes from the following sources or sensors: * Profiling using MAC OUIs * Profiling using DHCP information * Profiling using RADIUS information * Profiling using HTTP information * Profiling using DNS information / Nessus * Profiling using NetFlow information / OnGuard Agent * Profiling using SPAN/Mirrored traffic
31	Should support integration with troubleshooting & Monitoring Tools

9. Technical Specifications – TCP/IP BASED EPABX (IP-Pbx)-VOICE COMMUNICATION SYSTEM FOR PUBLIC NETWORK (INTERNET N1) SEGMENT

Sr. No	Minimum Technical Specification
	General Specifications
1	The network will have SIP based call control architecture with call control functionality centralized or distributed across multiple nodes across WAN for enhanced redundancy. The IP PBX platform should be enabled to connect/support 12000 devices/extensions including licenses from Day 1 with future scalability to connect/support 30000 devices/extension by just adding additional licenses, i.e., without requiring a complete revamp or replacement of platform.
2	A comprehensive IP based solutions based on a Server Gateway Architecture.
3	Support for integrated telephony solution for Video conferencing devices, Analog & IP Phones, PSTN gateways over IP architecture.
4	The solution should offer users the ability to use their UC clients and IP Phones outside of the enterprise (Internet) to make audio and video calls along with IM/Presence with or without VPN.

5	The solution should allow for business to business (B2B) video calls using SIP, H.323 with other organizations without bypassing existing firewalls.
6	The solution should allow provisioning of gateways with redundant power supplies.
7	Communications Call Control Solution can be offered as a dedicated appliance (as a set of standalone servers) or a virtualization-solution-based-platform using technologies / deployments such as VMWare or VMDK or KVM or Hypervisor or similar platforms deploying HCI architecture. In either case, collectively, the solution shall be proposed with full redundancy on all critical hardware resources such as power supplies, fans, LAN/network ports, mechanisms of memory error check and correction and data integrity.
	System Architecture
7	The call control system should be fully redundant solution with NO single point of failures & should provide 1:1 redundancy. Both the server(s) or sets of server(s) should do call processing all the time and act as backup in case of the failure of one server.
8	The proposed system should be capable of integrating with ACD, IVR.
9	The call control system should support IPv4 and IPv6 from Day 1.
10	The system should natively support tenant partitioning so as to comply with TRAI regulations for not allowing VoIP (CUG calls) and PSTN calls to be bridged. Any third party applications to manage tenant partitioning should not be quoted in the architecture.
11	The proposed call control server should provide support for standards based SIP IP Phones (Wired & Wireless), Analog Phones, Video Phones, Video Conferencing endpoints and soft clients to provide centralized management and unified dial plan.
12	Conference Bridge—provides software conference bridge resources that can be used by IP EPABX.
13	The system should support an inbuilt reporting tool for calls. Reports that are provided include Calls on a user basis, Calls through gateways, Simplified Call Quality.
14	Should support signaling standards/Protocols – IP, SIP, MGCP, H.323
15	CODEC support - G.711, G.729, G.729ab, g.722, iLBC

16	The system should provide the ability to perform tasks in bulk i.e. Add, Remove, Update users, phones, gateways, dial plan etc.
17	The system should support creation of users and their authentication locally and via integration with LDAP.
18	The system should support an inbuilt reporting tool for calls. Reports that are provided include Calls on a user basis, Calls through gateways, Simplified Call Quality.
19	The system should support call admission control to configure number of calls that can be active between locations – inter-cluster and intra-cluster.
20	Call preservation – redundancy and automated failure – on call-processing failure. In progress PSTN calls at each of the locations should not be interrupted in the event of any WAN failure or call control server failure.
21	Open API should be provided when required which will help to develop customized IP applications which will integrate with call processing.
Security	
22	All the appliances in the call control system should have dual redundant and hot swappable power supply and fans for high availability.
23	All appliances in the call control system should have hot swappable storage media to ensure high availability.
24	Support for configuration database (contains system and device configuration information, including dial plan)
25	Having inbuilt administration web based administration. No additional thick client for administration on the Admin PC. Should also support HTTPS for management.
26	Access to the system should be secure for the purpose of access over IP network. The protection of signalling connection over IP by means of authentication, Integrity and encryption should be carried out using TLS.
27	There should be provision of defining password aging, one time passwords. Provision shall be available to bar unauthorized user to connect to the system. The system should monitor and report the following types of security \ violation login Violations, authorization code violation Station security code violations etc.
28	IP Phones should not support direct, external initiated, connections via HTTP, telnet, FTP, TFTP or any other protocol as means to prevent distributed Denial of Service attack exploitation, except those required for routine firmware upgrades.

29	Role Based Account Management to define different levels of administrator access depending on specific function responsibility
30	The system should support complete encryption capabilities with the ability to encrypt all traffic (media and call control signaling) between IP phones, softphones, call controllers, gateways and all other associated endpoints using a strong encryption algorithm (AES, IPSec and SRTP, for example).
31	All management traffic between the remote console/session and control server should be encrypted (SSH for Direct Command Line Sessions, Interface, HTTPS (SSL) for Web Sessions, SFTP for File Transfer Etc.).
32	Should support SSL for LDAP directory integration.
33	All Hardware & Software with license required for providing above Security measures must be incorporated.
	System Capabilities Summary
34	The System should have IP capability for interfacing & Communicating with Voice, Video and Data infrastructure
35	The architecture should support a minimum of 12000 devices/extensions from Day 1 with future scalability as above.
36	The architecture should support single Server Clustering to provide scalability to offer support for 12000 IP devices and also to provide redundancy. All the 12000 users shall be managed in a single database which is managed centrally, i.e., not multiple databases.
37	The System should support Alternate Call Routing
38	The System should have GUI support web based management console
39	System backups: The management system should have the provisioning for taking manual as well as scheduling of automatic periodic backup of complete system & data.
40	The System should support Audio message-waiting indicator (AMWI)
41	The System should have Automated bandwidth selection
42	Should support SNMP v1, v2c, v3
43	It should be possible to monitor the call control system i.e. system performance, device status, device discovery, CTI applications, voice messaging ports etc.
	IM & Presence

44	Solution should provide a "presence" application for users, so that they can see the availability status of their contacts in their contact list.
45	The common supported status for this application should be available, busy, idle, away etc.
46	Should support the users to see other user's IP phone's on/off hook states
47	The instant messaging application should support manual setting of user status to: Available, Away, Do Not Disturb (DND) etc.
48	Shall provide support for open protocols like XMPP.
49	Presence based desktop application shall allow escalation of Instant Message to Audio call and further to Video call
50	Should support management of contact list and personal settings from Presence based desktop application
51	Should support click to call, click to Video and click to conference features.
52	The Soft Client should have soft phone capability and should support desktop and iPad based point to point video calls.
	Video Telephony Support
53	The call control system should provide integrated video telephony features to the users so that user with IP Phone / Soft phone and video telephony end point should be able to place video calls with the same user model as audio calls.
54	The users should be able to transfer video calls as audio calls
55	Call-Server should provide a common control agent for signalling, configuration, and serviceability for voice or video end points.
56	Call control system should handle CODEC and video capabilities of the endpoints, bandwidth negotiation to determine if video/audio call can take place.
	End user Features required
57	Extension mobility
58	Call forward all
59	Message-waiting indicator (MWI)
60	Privacy
61	Device mobility

62	Do not disturb
63	Hunt groups
64	Dial-plan partitioning
65	Distributed call processing
66	Deployment of devices and applications across an IP network
67	"Clusters" of Call-Servers for scalability, redundancy, and load balancing
68	Inter-cluster scalability to 100+ sites or clusters through H.323 gatekeeper
69	Fax over IP—G.711 pass-through and Fax Relay
70	Forced authorization codes and client matter codes (account codes)
71	H.323 interface to selected devices
72	Hotline and private line automated ring-down (PLAR)
73	Interface to H.323 gatekeeper for scalability, CAC, and redundancy
74	Language support for client user interfaces (languages specified separately)
75	Multi-Level Precedence and Pre-emption (MLPP)
76	Multi-location—dial-plan partition
77	Multiple ISDN protocol support
78	Multiple remote Call Server platform administration and debug utilities
79	Pre-packaged alerts, monitor views, and historical reports with Real Time Monitor Tool (RTMT).
80	Real-time and historical application performance monitoring through operating system tools and Simple Network Management Protocol (SNMP)
81	Remote terminal service for off-net system monitoring and alerting
82	Real-time event monitoring and presentation to common syslog
83	Trace setting and collection utility
84	Cluster wide trace setting tool.
85	Trace Collection tool.
86	Multisite (cross-WAN) capability with inter-site CAC

87	Video calls to be placed with the same user model as audio calls.
88	Call-Server should support new video end points.
89	SIP Video endpoints which should inherit the functionality of audio calls which gives the user the same call model for both video and audio calls.
90	Call-Server should have the infrastructure to handle codec and video capabilities of the endpoints, bandwidth negotiation to determine if video/audio call can take place, single point of administration, management of media devices such as gateways and MCUs.
91	Call-Server should provide a common control agent for signalling, configuration, and serviceability for voice or video end points.

10. Technical Specifications – Voice Gateway

Sr. No	Minimum Technical Specification
1	Hardware Features
2	Voice Gateway should be from the same OEM as IP telephony
3	Should provide 2 x 10/100/1000 interfaces
5	Shall support variety of Voice interfaces like FXO, FXS, BRI, Channelized PRI (E1), E&M / WAN interfaces like V.35 Sync Serial (2 Mbps)/Async Serial/ E1 G.703/ Fast Ethernet/ Gigabit Ethernet/ ISDN BRI/ Channelized / Clear channel E1
6	The Voice Gateway should provide 16 E1/PRI on Day 1, inclusive of support for 200 SIP Trunks and relevant licenses and resources installed from Day 1 Single or Multiple Gateways should provide minimum 16 x E1 ports from Day 1 to terminate 16 PRI lines. 2 such Gateways should be provided for CCS-123 building – one at TSP1-CCS1 and another at TSP2-CCS3 and shall operate in HA mode.
7	It should support embedded hardware encryption acceleration, voice/ video-capable digital signal processor (DSP) slots or equivalent.
8	The gateway should be able to support at least 1000 IP Phones in survivability mode.
9	It should support embedded Voice/ video-capable digital signal processor (DSP) slots or equivalent feature.
10	Protocol Support

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11	Optionally, the Gateway shall support shall support Routing protocols like RIP ver1 &2 OSPF ver2.
12	Optionally, the Gateway shall support Multicast routing protocols support: IGMPv1, v2, PIM-SM and PIM-DM, DVMRP.
13	Optionally, the Gateway shall support shall support Ipv6 features: DHCPv6, Ipv6 QoS, Ipv6 Multicast support, RIP and OSPFv3 for Ipv6.
14	Shall support IP Accounting features
15	Should support cRTP to compress voice (RTP) streams
16	QoS Features
17	Shall support the following
18	Classification and Marking: Policy based routing, IP Precedence, DSCP, MPLS
19	Congestion Management: RED, Priority queuing, Class based weighted fair queuing
20	Traffic Conditioning: Committed Access Rate/Rate limiting
21	Per VLAN QoS.
22	Resource Reservation Protocol (RSVP)
23	Security Features:
24	Shall support the following
25	AAA support using Radius and/or TACACS
26	GRE
27	IPSec
28	PAP and CHAP authentication for P-to-P links
29	Multiple privilege level authentication for console and telnet access
30	Time based & Dynamic ACLs.
31	Management
32	Shall have support for management thru Telnet, SSH, Secure Web based management thru HTTPS and SNMP v1, v2c, v3 and Out of band management through Console and external modem for remote management

33	Should provide a provision to analyze IP service levels for IP applications and services by using active traffic monitoring (the generation of traffic in a continuous, reliable, and predictable manner) for measuring network performance
34	Should support flow-based traffic analysis of applications, hosts, performance-based measurements on application and network latency, quality of experience metrics for network-based services such as voice over IP (VoIP) / video.
35	Should have the ability to monitor events and take informational, corrective, action when the monitored events occur or when a threshold is reached.

GENERAL

TECHNICAL SPECIFICATIONS FOR PASSIVE COMPONENTS

GENERAL

Separate colour coded system for CAT6A cables, IOs and Patch Cords shall be followed by the Agency/ contractor for identifying different types of traffic and devices to be connected as per details that shall be finalized and conveyed to them at the time of installation.

Penta Scanner Test Reports - For the S/FTP CAT6A cabling system installed, for every node installed the bidder shall conduct/carry out tests at site after installation and commissioning for the following parameters:

- Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR for 4-connector channel.

The Structured Cabling System (SCS) with respect to CAT6A Cabling System consisting of Jack Panel, S/FTP CAT 6A cables, Face Plate, I/O Point and Patch Cable shall be from same manufacturer. From Rack to Work Station "Mix and Match" products i.e. Jack Panel, S/FTP CAT 6A cables, Face Plate, I/O Point and Patch Cable are not allowed. Subject to compliance of the provisions stated in this clause, contractor is at liberty to install multiple manufacturer SCS in the building.

The Structured Cabling System (SCS) with respect to Fiber Optics Cabling System must consist of individual components provided by the same manufacturer; "Mix and Match" products are not allowed. Bidder to provide the same make for all the components for "FO Structured Cabling System". Subject to compliance of the provisions stated in this clause, contractor is at liberty to install multiple manufacturer SCS in the building.

Bidder shall conduct/carry out and submit OTDR Test Reports, i.e., Performance/Loss Test Reports for Fiber Channel Conformance of each termination/link installed, and these shall be duly certified by OEM

S/FTP CAT 6A CABLE & COMPONENTS

1. Specification for S/FTP CAT6A LSZH based Complete Cabling System

Technical Requirements & Standards Compliance
Channel Performance

The Category 6A/ Class EA S/FTP SCS shall comply with the following standards: a) ISO/IEC 11801-2 : 2017 or later b) EN 50173 : 2018 or later c) ANSI/TIA-568.2-D d) IEC 60603-7-51 e) IEEE 802.3 applications as outlined in section 2
The Category 6A/ Class EA S/FTP system should support the following IEEE Ethernet applications: a) 802.3e - 1BASE5 b) 802.3i - 10BASE-T c) 802.3u - 100BASE-TX, 100BASE-T4 d) 802.3y - 100BASE-T2 e) 802.3z - 1000BASE-X f) 802.3ab - 1000BASE-T g) 802.af - Power Over Ethernet (15.4W) h) 802.3at - Power Over Ethernet Enhancements (25.5W) i) 802.3az - Energy Efficient Ethernet j) 802.3bt – Type 4
It is critical that guaranteed worst-case values are provided to ensure the SCS can support 10G transmissions without risk. "Average value" or "Typical Value" is not acceptable as they do not account for lower performance channels. The proposed Category 6A S/FTP SCS, when configured as a worst-case 100-meter channel shall provide performance headroom over limits specified by Cat6A
NEXT - Minimum 3dB above the standards; Should support a minimum of 4 connector Channel with a minimum 3 dB guaranteed NEXT

The manufacturer shall provide warranty for the Category 6A channel cable, components, and applications for a period of 5 years.
The 5-year warranty shall be a transferable warranty and shall include component replacement policy in case of manufacturing defect
The Category 6A system should support channels that are shorter than 15 meters for 4 connector channels without any minimum length requirements validated by ETL/UL 4 connector report.

2. Specification for CAT6A LSZH S/FTP Horizontal Cable

Technical Requirements & Standards Compliance
The cable should meet ANSI/TIA 568.2-D Category 6A Specifications
Cable Reel/box should have unique number to track the test report of cable in the reel/box. The test parameters shall include NEXT, PSNEXT, Return Loss, Attenuation, ELFEXT and PSELFEXT.
The cable should consist of Eight 23 AWG copper conductors. Copper Clad Aluminum or any other combinations are not allowed
The cable should be round shape.
The nominal Jacket thickness should be in the range of .024 Inches to 0.030 inches
The nominal Outside diameter should be between 0.285 inches and 0.295 inches
The cable should support the installation temperature: 0 to +60 degree C. It should support Operating temperature of 0 to +60 degree C
The cable shall be available in Low-Smoke, Zero Halogen (LSZH) compatibility and The LSZH version must comply with the following Fire Safety standards: ISO/IEC 60332-3-22: Vertical Flame Spread ISO/IEC 60754-2: Acidity ISO/IEC 61034-2: Smoke Density EN50575 CPR Cable EuroClass Fire Performance: B2ca EN50575 CPR Cable EuroClass Smoke Rating: s1

EN50575 CPR Cable EuroClass Droplets Rating: d1
EN50575 CPR Cable EuroClass Acidity Rating: a1
3rd Party verification of the Fire Safety/ Environmental tests listed above must be provided as part of TDS submission

3. Specification for Shielded CAT6A Patch Panel/Jack Panel

Technical Requirements & Standards Compliance
It shall be a Shielded CAT6A 24 (1U size) or 48 (2U size) Port Patch Panel
The ganged adapter style patch panel will utilize increments of six or one RJ-45 style jacks in a common molded component.
The ganged adapters shall have RJ45 jack in the front and Insulation Displacement Connector (IDC) at the rear of the module.
Termination managers must be provided with the panel. These termination managers provide proper pair positioning, control, and strain relief features to the rear termination area of the panel.
ETL/UL component test certificates shall be provided to show compliance to ISO/IEC 11801 Amendment 2 or ANSI/TIA568.2-D testing for Cat 6A patch panel. Documents to be submitted along with the TDS.
When configured in worst-case 100-meter channels with full cross-connects and consolidation points with the other products proposed in this tender, the panel shall be capable of delivering the minimum guaranteed channel performance
The patch panel type shall be a 1U (24 port) or 2U (48 port) panel capable of supporting 24 or 48 unshielded modular 8-pin connectors compliant with IEC 60603-7-51 while meeting the Channel Performance as specified in ISO/IEC 11801-2 : 2017
The panel shall be available in 24-port and 48-port configurations with universal A/B labeling and 110 connector terminations on rear of panel allowing for quick and easy installation of 22 to 24 AWG cable
The panel shall be equipped with a removable or fixed rear mounted cable management bar and front labels
The panel shall be UL Listed
Operating Temperature Range = 0°C to +60°C

Storage Temperature Range = 0°C to +70°C
Humidity = 95% (noncondensing)
Nominal Solid Conductor Diameter = 0.025 to 0.020 in (0.64 to 0.51 mm) (22 to 24 AWG)
Nominal Stranded Conductor Diameter=0.025 to 0.020 in (0.64 to 0.51 mm (22 to 24 AWG)
Insulation Types = All plastic insulates (including PVC, irradiated PVC, Polyethylene, Polypropylene, PTF Polyurethane, Nylon, and FEP)
Insertion Life = 750 minimum insertions of an FCC 8-Position Telecommunications Plug

4. Specification for Shielded CAT6A Information Outlets

Technical Requirements & Standards Compliance
The 8-pin modular (RJ-45) jacks shall comply with IEC 60603-7-51
The Category 6A outlets shall be backward compatible with Category 6 and 5E cords and cables.
The Category 6A outlets shall be of a universal design supporting T568 A & B wiring.
The information outlet shall have a Current Rating of minimum 1.5 A at 20°C
The information outlet must support 90 degree or 180 cable termination. As some mounting hardware does not allow for cable entry directly from the rear, this capability is necessary.
ETL/UL component test certificates shall be provided to show compliance to ISO/IEC 11801-2 : 2017 or ANSI/TIA 568.2-D testing for Cat 6A IOs. Documents to be submitted along with TDS.
The information outlet will have insertion life of 750 cycles minimum.

5. 1, 2 & 4 Port Shuttered Face Plate

Technical Requirements & Standards Compliance
Shall be available in 1 port, 2 port and 4 port.

Color: As decided by Engineer-in-charge
Material shall be high impact, flame retardant, UL-rated 94 V-0, thermoplastic.
Flammability Rating: UL 94 V-0 Safety Standard: UL Listed
Shall be compatible with CAT 5e/CAT 6/CAT 6A information outlets.
Shall have inbuilt shutter or hinged dust cover to prevent dust to accumulate on the information outlets which are not in use.

6. Specification for CAT6A LSZH S/FTP RJ45 Patch Cords

Technical Requirements & Standards Compliance
Cords shall be equipped with 8-pin modular plugs on each end.
All cords shall be round, and consist of copper conductors, tightly twisted into individual pairs.
Nominal cordage diameter shall be from 0.285 inch to 0.295 inch.
Plugs shall be designed with an anti-snag latch to facilitate easy removal during move, add and change processes.
The LSZH version must comply with the following Fire Safety standards: ISO/IEC 60332-3-22: Vertical Flame Spread ISO/IEC 60754-2: Acidity ISO/IEC 61034-2: Smoke Density EN50575 CPR Cable EuroClass Fire Performance: B2ca EN50575 CPR Cable EuroClass Smoke Rating: s1 EN50575 CPR Cable EuroClass Droplets Rating: d1 EN50575 CPR Cable EuroClass Acidity Rating: a1
3rd Party verification of the Fire Safety/ Environmental tests listed above must be provided as part of TDS submission

The patch cords will have insertion life of 750 cycles minimum.

FIBER OPTIC CABLE & COMPONENTS

7. Technical Specifications for SM Fiber Optic Cable - 6 core/ 12 core

Technical Requirements & Standards Compliance
Outer sheath LSZH (as per IEC 60332-3, IEC 60754-2, IEC 61034-2, UL 1666, UL 1685) & UV Resistance, Indoor/Outdoor
6 -core/ 12 core Single mode steel armoured cable shall be as per ANSI/ICEA S-83-596 or Telcordia GR-409 (Indoor) and Telcordia GR-20 (Outdoor), Fiber Type – G.652.D, G.657.A1, (OS2), Zero/Low Water Peak and ANSI/TIA-568-D
Meet Gigabit & 10 Gigabit Ethernet performance requirement specified by IEEE 802.3z (1000 Base-X) & IEEE 802.3ae (10G Base-X)
Suitable for using in the building shaft, outdoor buried and Aerial laying
Gel- free with loose tube construction
Water blocked construction to prevent water absorption and consequent damages
Optical Parameters – SM, (these values are after jacketing of cables) a) Attenuation @ 1310nm(max) ≤ 0.5 dB/Km b) Attenuation @ 1550nm(max) ≤ 0.5 dB/Km
Optical Fibers Cable shall be of uni-tube construction
Fiber cable shall be RoHS Compliant.
Mechanical Test specifications shall comply with IEC 60794-1.
Tensile load should be 2000 to 2700 Newton

8. Technical Specifications for Rack Mounted LIU/FO Shelf – 12/24 Cores

Technical Requirements & Standards Compliance

The same Panel should accommodate 2/ 4x 6F coupler plates for a total of 12/ 24 Fiber Termination or as per solution provided by manufacturers in preferred make list.
The width shall be 19 inches and height of 1U (1.75 inches)
The shelf/LIU shall be sliding.
The Shelf shall be able to Support splice trays to splice Stackable tray for 12/24 Splices

9. LC – LC Single mode LSZH Patch Cords

Technical Requirements & Standards Compliance
Single mode (OS2), Zero/Low water peak, LC to LC, Fiber Duplex patch cords
Standards Compliance: G.652.D, G.657.A1 and OS2 Regulatory Compliance: RoHS 2015/863 or RoHS 3 Jacket: Low Smoke Zero Halogen (LSZH) compliant to IEC 60332-3, IEC 60754-2, IEC 61034-2, UL 1666, UL 1685 Cable Qualification Standards: ANSI/ICEA S-83-596 or Telcordia GR-409 Optical Components Standard: ANSI/TIA-568-D
General Specifications: Connector Color: Blue Connector Interface: LC Operating Temperature: 0 degree Celsius to +60 degree Celsius
Connector Optical Performance Insertion Loss, maximum: 0.75 dB Return Loss, minimum: 26.0 Db

10. Single Mode Simplex Fiber Pigtail

Technical Requirements & Standards Compliance
Single mode (OS2), Zero/Low water peak, LC to LC, Fiber Pigtail

Standards Compliance: G.652.D, G.657.A1 and OS2
Regulatory Compliance: RoHS 2015/863 or RoHS 3
Jacket: Low Smoke Zero Halogen (LSZH) compliant to IEC 60332-3, IEC 60754-2, IEC 61034-2, UL 1666, UL 1685
Cable Qualification Standards: ANSI/ICEA S-83-596 or Telcordia GR-409
Optical Components Standard: ANSI/TIA-568-D
General Specifications:
Connector Color: Blue
Connector Interface: LC
Operating Temperature: 0 degree Celsius to +60 degree Celsius
Cable Retention Strength, Max: 1.00 lb @ 0 degree, 1.00 lb @ 90 degree
Ferrule Geometry: Pre-radiused
Ferrule Material: Zirconia
Connector Optical Performance
Insertion Loss, maximum: 0.75 dB
Return Loss, minimum: 26.0 dB

11. Extended Product Warranty & Application Assurance for Structured Cabling System (SCS) components consisting of CAT6A and Fiber Optic Cable and related components and accessories

Standard Compliance
The Extended Product warranty and Application Assurance shall be for 25 years from the date of Completion.
The Extended Product Warranty shall cover all passive Registered SCS components (i.e., cable and connectivity components that make up the passive data and telecommunications signal transmission infrastructure).
The Registered SCS compliant links/channels will meet or exceed the applicable requirements of the TIA 568.2-D series, and ISO/IEC 11801: 2002 standards for cabling links/channel configurations specified in these standards;

Under the Extended Product Warranty, the OEM will either repair or replace the defective Registered SCS product at its own cost. An undertaking from the OEM in this regard shall be submitted by the agency along with the TDS.
Application Assurance:
The Application Assurance shall cover the Registered SCS compliant channels to support operations of the application(s) that the system was designed to support, as well as additional application(s) defined below. The supplier warrants that the Registered SCS will be free from defects that prevent operation of the specific application(s) for which the Registered SCS was initially designed as long as the design is in compliance with the SCS Performance Specifications for said applications and is in compliance with all other terms and conditions of this warranty.
That all Passive Components in the Registered SCS meet or exceed the relevant component specification of the TIA 568.2-D series and ISO/IEC 11801: 2002 standards;

12. TECHNICAL SPECIFICATIONS FOR 19" FLOOR STANDING NETWORKING ENCLOSURES (15U TO minimum 42U USABLE HEIGHTS)

Technical Requirements & Standards Compliance
Construction - Frame of sturdy frame section construction, consisting of 9 x folded rolled hollow frame section punched in 25mm DIN pitch pattern. All profile edges shall be radiused. The corners shall be stiffened with welded zinc die-cast corner connectors, Front and rear doors shall be perforated. Cabinet color should be Black and light grey
The Thickness of the CRCA sheets used for Doors is 1.5mm and for Side Panels is 1.5mm
Fully adjustable 19" equipment mounting angles
The cabinet design confirming to DIN 41494 or EIA 310D standards
Top and Bottom Covers and Side panels shall be of sheet steel and Primary Dip Coat = 20-30 Microns Power Coat = 80-120 Microns
Vertical 19" metric panel mounts and door trims shall be of sheet steel and powder coated
The Top cover with min. 4 cut out of diameter 100mm or more for cable entry. Bottom cover with 4 cut out of diameter 100mm or more for cable entry. All cut outs blanked with plastic caps
Perforation - for full / split perforated doors the style should be "Honeycomb" type of perforation for maximum air circulation and stiffness. Front and rear doors should have min. 75% perforation for better air circulation

Cabinet shall be capable of dismantling and reassemble at the site
Locks options – options shall be available such as slam lock - common key or unique key, Swing handle lock, Digital Keypad operated locks, Biometric locks
Side panels – must contain slam latches for locking purpose and option of providing slam locks, or screw fitted for removal, if required
Two pairs of 19" Equipment mounting angles with mounting holes conforming to IEC 2973
Front glass door made of toughened glass, tinted with easily detachable hinges
Two pairs of slotted vertical cable channel shall be provided at front and back for managing cables
Lockable industrial grade castors with foot brakes
Finish – cabinet shall be black or grey epoxy powder-coated of durable quality. The Powder coating of the racks is as per Nano coated, electro-dip coat primed to 20 microns, and power coated with texture polyester with 80 to 120 microns for long lasting paint against corrosion
Load bearing capacity of racks – minimum 1000 Kg equipment load should be mountable.
Product must be UL listed and certified for use in Information Technology or Communication Equipment
EIA standard pattern design with 12-24 tapped holes (EIA-310-E compliant) or EIA standard pattern design with 3/8" (9.5mm) square punches for Cage Nuts for mounting
Each rack should have two Copper Bar Earth Kits/strips which should be mounted vertically in the rear side of the rack.

MANUFACTURER'S AUTHORIZATION (MAF)**MAF Letter Format (On OEM Letter head with seal)**

Date:

To,

<<< NAME OF CLIENT/ORGANIZATION>>

Subject: Manufacturer's Authorization Certificate

Tender Ref.: << PLEASE SPECIFY SPECIFIC TENDER REF.NO.>>

Dear Sirs,

This is with reference to the above mentioned Tender.

We hereby authorize <<NAME AND ADDRESS OF INTEGRATOR>> to offer our range of product in their tender bids. Being authorized <<NAME AND ADDRESS OF INTEGRATOR>> may make techno-commercial and commercial proposal for this tender

Upon being awarded the work <<NAME AND ADDRESS OF INTEGRATOR>> are authorized to install and commission our range of products falling under <<SECTION/PRODUCT CATEGORY>> of this tender.

We as Original Electronic Manufacturers will provide all the techno-commercial and service support necessary to <<NAME AND ADDRESS OF INTEGRATOR>> for this project during the commissioning phase of the equipment and until hand-over.

We also confirm that the items would be serviceable during the warranty period and O&M contract period as specified in this NIT.

Thanking and assuring best of our services at all times.

Yours faithfully (Seal
& Signature)

User Acceptance Testing (UAT):

The UAT is to be carried out after installation of active components and passive components and in close co-ordination with Contractor/Specialized Agency at the GPOA BLOCK 1 building and keeping in mind and considering the types of active networking components that are installed at GPOA BLOCK 1 building. The Contractor/Specialized Agency should extend all cooperation to the Contractor/Specialized Agency or any other agency at GPOA BLOCK 1 for UAT purpose. Since below procedure of UAT applies for both components, it is responsibility of both agencies for their part to get it checked for compliance for UAT. With regards to scope of Passive Networking components for GPOA BLOCK 1, the Active Networking related part of UAT provided below is only for a broad understanding and for providing perspective. As the performance of active networking components depends upon connectivity provided by Passive Networking infrastructure, the UAT is the joint responsibility of the Contractor(s)/Specialized Agency(ies) towards acceptance of network for its satisfactory performance and operation.

- a) The contractor through the specialized agency will be responsible for developing a User Acceptance Test (UAT) Plan to include testing of end-to-end Solution Functionality which includes the interfaces, Role Based Authorizations, Software defined networking functionalities like Automation, Analytics, Assurance capabilities & uniform policy provisioning across wired and wireless LAN etc. The plan will be approved by CPWD in consultation with NIC. Indicative UAT plan is provided at the table below. These tests cases are non-exhaustive in nature and may be expanded. Any additional tests/procedures as deemed suitable to demonstrate the asked technical and functional requirement should be added to the UAT plan. Detailed network design document for ICT sub-head C7 is attached herewith for reference and for necessary compliance.
- b) For each Test Case and/or Test Scenario, the prerequisites as well as the setup procedures also need to be documented.
- c) The Test Plan is required to ensure conformance to the functional, technical and/or performance specifications as specified in the RFP. The UAT Plan needs to be approved by the Engineer-in-charge in consultation with NIC.
- d) Since the implementation of the project involves Software and Hardware components, different types of acceptance test shall be conducted at different levels. The UAT plan for testing the technical specifications and functional requirements for each system/subsystem as part of acceptance test are mentioned in this section.
- e) Test plans and test procedures for Validation Testing and acceptance test provided hereby

are not exhaustive in nature and Engineer-in-charge reserves the right to add additional tests as deemed suitable.

- f) The Test procedures shall ensure that each test is comprehensive and shall verify all the features of the equipment to be tested.
- g) The Test procedures shall be modular to allow individual test segments to be repeated upon request
- h) The Bidder shall submit a Test Schedule for the Purchasers approval within four weeks after the finalization of submission of High level and Low level design document. The test schedule shall list the tests to be carried out, dates, location and the approximate test duration.
- i) After complete installation of the ICT Sub-Head equipment, UATs shall be conducted by NIC in confirmation to the network design. Final acceptance certificate will be issued by the Engineer-in-charge in consultation with NIC.
- j) The support for conducting a successful UAT will be provided by the contractor w.r.t. to man, material and resources
- k) Any change/modification suggested in the installed ICT equipment in UAT report which is not as per the design shall be carried out by the contractor through the specialized agency. Nothing extra shall be paid for this.

Test No.	Test Description	Test Purpose	Pass/Fail Result
1	Physical Device Checks		
1.1	Hardware and Software Checks		
1.1.1	Initial Start-up test	To check if power supplies, fans, line card modules etc. for all the active components are working. Network is installed, configured along with proper cabling.	Pass ☐ Fail ☐
1.1.2	Device Health Check	To verify operation of all hardware components including fans and power-supplies. This is to ensure that all hardware supplied is operating in a healthy state.	Pass ☐ Fail ☐
1.1.3	Software Checks	Verify Operating System versions on the network devices; verify if it is the recommended image from the OEM for that particular device.	Pass ☐ Fail ☐

1.1.4	Licensing Verification	Verify Licensing on all the devices as per the BoQ/SOR to meet the specified functional and technical requirements	Pass ☐ Fail ☐
1.2	Basic Network Configuration Test (Underlay Connectivity)		
1.2.1	Device Discovery	To ensure all underlay devices have IP reachability and are discoverable over the network	Pass ☐ Fail ☐
1.2.2	Interface Configuration IP	Verify that the correct IP address has been configured on the relevant interfaces. Confirm IP connectivity over directly connected links.	Pass ☐ Fail ☐
1.2.3	Routing Protocol Verification	To verify the Routing Protocol configuration and topology for the network. This test assumes that all switch hardware is operational and the basic tests have been successfully completed.	Pass ☐ Fail ☐
1.2.4	Power over Ethernet	Verify that an Access Point could be powered from a Switch	Pass ☐ Fail ☐
1.2.5	Link and Interface Checks	Verify that all uplink interfaces from the Access Switches and Access point devices are operational and running error free with right speeds.	Pass ☐ Fail ☐
2	Testing – NMS/SDN Controller		
2.1	Device Discovery Configuration verification	To verify the Device Discovery Configuration is correct for zero touch device discovery and configuration. All the network switches, Access points and controller should be automatically discovered.	Pass ☐ Fail ☐
2.2	Device Inventory Verification	To verify the device Inventory is displayed and functional. Discovered devices to be displayed correctly with appropriate device roles.	Pass ☐ Fail ☐
2.3	Network Topology Verification	To verify the network topology is displayed and functional. Topology to be auto-rendered by the application.	Pass ☐ Fail ☐
2.4	Software Management Verification	To verify that the application stores all the software images according to image type and version for the devices in the network. To verify that the platform allows to view, import, and delete software images and also push software images to the devices in the network. To also verify that software upgrade can be scheduled for any given point of time.	Pass ☐ Fail ☐
2.5	Plug-n-Play Verification	To verify that the platform provides Zero-touch provisioning for new device installation (switches, access points etc.). To verify that the platform allows off-the-shelf devices to be provisioned simply by connecting them to the network.	Pass ☐ Fail ☐
2.6	Policy Creation and Verification	To verify policy application (segmentation and application QoS policy) from the platform. To verify integration between the proposed platform and AAA solution for security	Pass ☐ Fail ☐

		policy application. To verify policy creation and application from the platform for different user groups based on user role and to also verify that this policy follows the user consistently across wired and wireless network.	
2.7	Assurance Data Test	The objective of this test is to check if the platform successfully displays assurance data: Network Health statistics of the devices deployed in the network are being displayed Detailed health statistics of the device (including CPU, memory utilization, failures, HA etc.) Detailed Client health statistics such as wireless client connectivity times, roaming times, RSSI, Authentication Failures, Client onboarding statistics, SNR are being displayed Displaying the issues that are detected and for each of the issues recommendations and guided remediation are being shown Display the path of an application or service from the client through all devices and to the server to quickly get key performance statistics for each device and identify issues along the network path	Pass ☐ Fail ☐
2.8	Reporting Test	The objective of this test is to check if platform successfully generates data and reports for: Network, Client health Application Performance Top users and Top issues Inventory Software Images installed on network devices Advanced WIPS reporting Any other report as specified as part of functional or technical specifications	Pass ☐ Fail ☐
2.9	NMS/SDN platform failover test	The objective of this test is to check that single node failure doesn't affect the operational status of the platform	Pass ☐ Fail ☐
3	Overlay Provisioning		
3.1	Overlay Provisioning Verification	To verify overlay fabric is automatically provisioned, devices are added to the fabric and host onboarding happens as per the defined policy To verify overlay protocols are functioning as per the expected results	Pass ☐ Fail ☐
3.1	Access to Intranet and Internet Services	To verify the users have access to Intranet and Internet services based on the policies defined	Pass ☐ Fail ☐
4	Failover and Resiliency Testing – Wired		

4.1	Access Switch Uplink Failure	Verify that the end client has seamless connectivity to the network in case of a uplink failure from access switch	Pass ☐ Fail ☐
4.2	Access Switch failure in the stack	Verify that the end client has continuous connectivity to the network from redundant I/O port available at the desk	Pass ☐ Fail ☐
4.3	Core Switch and Server Farm Switch Failure	Verify that the end client has seamless connectivity to the network in case of failure of single core switch or single server farm switch. Bidder to also test different failure scenarios like (supervisor engine failover, power supply failover etc.)	Pass ☐ Fail ☐
4.4	Internet and Intranet Router Failure	Verify that the end client has seamless connectivity to the network in case of a failure of single Intranet/Internet Router. Bidder to also test different failure scenarios like (supervisor engine failover, power supply failover etc.)	Pass ☐ Fail ☐
5	Wireless Verification		
5.1	WLC Device Verification	To verify devices hardware status. WLCs in HA should be properly installed and power up To ensure software version is correct (as per recommended by the OEM)	Pass ☐ Fail ☐
5.2	AP Connectivity	To verify that AP is able to get an IP address and join WLC	Pass ☐ Fail ☐
5.3	AP Provisioning	To verify APs are able to join AP group and broadcast SSID accordingly, RF Profile applied.	Pass ☐ Fail ☐
5.4	Dot1x Connectivity SSID	To verify that dot1x client authenticates successfully over wireless and is able to pass traffic as per the defined policy (Department might create multiple SSIDs for different group of users – for e.g. VIP user SSID. In such cases, the test should be carried out for all the configured corporate SSIDs)	Pass ☐ Fail ☐
5.5	Guest Connectivity SSID	To verify that client authenticates successfully and is able to pass traffic as per the defined policy (Internet access only).	Pass ☐ Fail ☐
5.6	Client Roaming	To verify client roaming at the WIFI coverage area is working properly. Verify that client keeps network connectivity during the roaming (from one AP to another AP with overlapping wireless coverage)	Pass ☐ Fail ☐
5.7	Corporate Nomadic Roaming	To verify client keeps same policy roaming between different floors within the same Tower in the cluster	Pass ☐ Fail ☐
6	AAA Solution Verification		
6.1	AAA node/appliance failover verification	To ensure all the AAA services are up and running and Node failure is functioning. After the failed node has been restored the node should again take over the role of primary AAA node	Pass ☐ Fail ☐

6.2	AAA License Verification	Ensure that required AAA License are up to date as per the requirement	Pass ☐ Fail ☐
6.3	AAA Services Testing	Testing of following services: 802.1x authentication of wired and wireless clients Uniform policy provisioning across wired and wireless network without dependency on underlying VLANs and IP Addresses (providing user mobility) Device Onboarding Device Profiling Device Posturing services Quarantine Rouge and Non Compliant devices Guest Login and Guest user creation using Guest Portal working as per requirement	Pass ☐ Fail ☐
6.3	Admin Activity Logs	Ensure admin activity logs contains the username of external user source such as AD and also the details of change made should be visible in the configuration change audit report.	Pass ☐ Fail ☐

Note: The above test cases are non-exhaustive in nature and the bidder has to submit a comprehensive UAT plan.

Specification for C8 (KITCHEN EQUIPMENTS)

1. General Requirements

1.1 All stainless steel items, fixtures, equipment, racks, work tables, exhaust hoods, drain-through gratings, supports, frames and associated components covered under this NIT shall be manufactured, fabricated, supplied, installed and commissioned in accordance with the specifications, drawings, dimensions and instructions of the Engineer-in-Charge.

1.2 Unless specifically stated otherwise, all exposed and structural components of the items shall be fabricated from Stainless Steel (SS) Grade 304, 18/8 grade, of approved make and quality.

1.3 The Contractor shall use stainless steel sheets of the specified gauge/thickness. The material shall be new, free from rust, pitting, cracks, laminations, dents, scratches and other manufacturing or surface defects.

1.4 All fabrication shall be carried out with proper workmanship. Cutting, bending, folding, welding, grinding, finishing and polishing shall be executed in a neat and workmanlike manner. Exposed surfaces shall have a uniform and smooth finish, free from sharp edges, burrs, projections, visible weld marks and other defects.

1.5 All joints shall be properly aligned and securely welded using suitable stainless steel welding techniques. Welded joints shall be ground smooth and finished/polished to match the adjoining surface, wherever the joint is exposed.

1.6 All dimensions mentioned in the specifications shall be read in conjunction with the approved drawings and site requirements. Wherever the expression "wherever applicable" is used, the corresponding specification shall be applicable to the relevant component based on its design, construction and intended use.

1.7 The Contractor shall submit material certificates/test certificates, wherever required by the Engineer-in-Charge, confirming the grade, thickness and quality of stainless steel used in the work. The Engineer-in-Charge shall have the right to inspect the material at any stage and reject any material not conforming to the specified requirements.

2. Stainless Steel Racks (SS Racks)

2.1 All stainless steel racks of various sizes and configurations shall be fabricated from SS 304, 18/8 grade, 18 SWG stainless steel sheet, wherever applicable.

2.2 The rack shall be designed and fabricated to provide adequate strength, rigidity and stability for its intended use. The shelves, supports, frames, legs, bracing members and other components shall be proportionately designed to withstand the intended loading without excessive deflection or deformation.

2.3 Shelves shall be fabricated from SS 304, 18/8 grade, 18 SWG stainless steel sheet, wherever applicable. The shelves shall be properly supported and securely fixed to the rack frame.

2.4 All corners and edges shall be neatly finished. Exposed corners shall preferably be rounded or suitably treated to eliminate sharp edges and ensure safe operation.

2.5 Rack frames and supports shall be properly welded, ground and finished. The completed rack shall be rigid, level and free from rocking or instability.

2.6 The rack shall be supplied complete with all necessary supports, brackets, legs, stiffeners, welding, finishing and other incidental components required for a complete and functional installation.

3. Stainless Steel Work Tables

3.1 The work table shall be fabricated with a tabletop made from 16 SWG SS 304 grade stainless steel sheet.

3.2 The tabletop shall be adequately supported from below to prevent sagging, deformation or vibration during normal use. The supporting framework shall be of suitable SS 304 construction and adequately stiffened.

3.3 The sides of the tabletop shall be turned down/folded by approximately 38 mm and 12 mm, wherever applicable, as indicated in the approved drawings/design.

3.4 All folds, bends and returns shall be executed accurately and shall have smooth, continuous surfaces without cracks, sharp projections or distortion.

3.5 The work table shall be fabricated to provide a rigid, stable and hygienic working surface. The tabletop shall be level and shall have a smooth, uniform finish suitable for the intended application.

3.6 All welded joints and fabrication joints visible after installation shall be properly ground, dressed and polished. The finished table shall be free from burrs, sharp edges, weld spatters, dents and other surface imperfections

3.7 The work table shall include all necessary legs, supports, cross members, bracing, adjustable/suitable feet, fixing arrangements and other accessories required for a complete installation, wherever applicable.

4. Stainless Steel Racks – Shelves

4.1 The racks and their shelves shall be manufactured from SS 304, 18/8 grade, 18 SWG stainless steel sheet, wherever applicable.

4.2 The shelves shall be adequately reinforced and supported to ensure that they remain level and structurally stable under the specified service load.

4.3 The fabrication shall ensure proper alignment and uniform spacing of shelves as shown in the approved drawings or as directed by the Engineer-in-Charge.

4.4 All exposed surfaces, edges, bends and corners shall be smoothly finished and polished. No sharp edges or projections shall be permitted.

5. Stainless Steel Exhaust Hood

5.1 The exhaust hood shall be fabricated from 18 SWG SS 304 grade stainless steel sheet, wherever applicable.

5.2 The hood shall be fabricated to the dimensions and configuration indicated in the approved drawings and shall be suitable for the intended kitchen/exhaust application.

5.3 The fabrication shall include all necessary bends, stiffeners, supports, brackets, flanges, joints, hangers and other components required for proper installation and structural stability.

5.4 All joints shall be properly welded and finished. Exposed welds shall be ground smooth and polished to provide a neat and hygienic appearance.

5.5 The hood shall be rigid and free from vibration, distortion and leakage at joints. All edges shall be smoothly finished and shall not have sharp or hazardous projections.

5.6 The Contractor shall coordinate the fabrication and installation of the exhaust hood with the associated exhaust ducting, supports and other services, wherever applicable, so that the complete system functions satisfactorily.

6. Drain Through Grating

6.1 The drain-through grating shall be fabricated using SS 304 grade stainless steel components of the specified sizes and thicknesses.

6.2 The internal frame shall be fabricated from 1" × 1" SS square pipe and shall be adequately supported using 3/4" SS 304 square pipe of 16 SWG, wherever applicable.

6.3 The outer frame shall be fabricated from 25 × 25 × 3 mm SS 304 angle.

6.4 The grating shall be designed and fabricated to provide adequate strength and rigidity for the anticipated service and pedestrian/loading conditions. The spacing and arrangement of supporting members shall be as per the approved drawings or as directed by the Engineer-in-Charge.

6.5 The grating shall be properly aligned with the drain channel and shall be installed in a manner that permits effective drainage and prevents obstruction to the flow of wastewater.

6.6 All joints shall be securely welded. Welded portions shall be ground smooth and finished appropriately. The completed grating shall be free from sharp edges, projections, welding defects and other irregularities.

6.7 The grating and frame shall be properly seated, levelled and secured in position, with adequate provision for removal and maintenance wherever required by the design.

7. Material Quality and Compliance

7.1 All items covered under this NIT shall be executed strictly in Stainless Steel Grade 304 (18/8 grade), unless a specific alternative grade is expressly approved in writing by the Engineer-in-Charge.

7.2 The specified gauge/thickness of stainless steel shall be strictly adhered to. The Contractor shall not use thinner sheets or sections than those specified in this NIT, drawings or approved schedules.

7.3 The use of SS 202, SS 201, inferior grade stainless steel, mild steel, galvanized steel or any other substitute material in place of specified SS 304 shall not be permitted.

7.4 The Contractor shall ensure that stainless steel materials used at site are properly protected against contamination by carbon steel, mild steel or other incompatible materials during storage, fabrication, transportation and installation.

7.5 All stainless steel surfaces shall be adequately protected during fabrication and installation to prevent scratches, dents, staining, corrosion or contamination. Protective coverings shall be removed only after completion of the work and cleaning of the finished surfaces.

7.6 The Engineer-in-Charge or his authorized representative shall have the right to inspect the materials, fabrication and finished items at any stage. Any item or component found not conforming to the specified grade, gauge, dimensions, workmanship or finish shall be rejected and shall be replaced by the Contractor at no extra cost to the Department.

7.7 The Contractor shall be fully responsible for ensuring that the material supplied and incorporated in the work conforms to the specified SS 304, 18/8 grade requirements. Compliance shall be supported by manufacturer's certificates, material test certificates or other documentary evidence, as directed by the Engineer-in-Charge.

8. Workmanship, Testing and Acceptance

8.1 All fabrication and installation works shall be carried out by skilled and experienced personnel using suitable tools, machinery and equipment

8.2 The completed items shall be inspected for material grade, sheet thickness, dimensions, alignment, level, rigidity, weld quality, surface finish, workmanship and overall functionality.

8.3 The Contractor shall rectify, at his own cost, any defects, deficiencies, dimensional discrepancies or workmanship issues identified during inspection.

8.4 Measurement and payment shall be made only for work that has been completed, installed and accepted by the Engineer-in-Charge in accordance with the provisions of the NIT, approved drawings and applicable CPWD specifications.

9. Strict Compliance Clause

The above specifications regarding Stainless Steel Grade 304, 18/8 grade, specified sheet thickness/gauge, section sizes, fabrication details, workmanship and surface finish shall be strictly adhered to by the Contractor. No deviation, substitution or reduction in material specification shall be permitted without prior written approval of the Engineer-in-Charge/competent authority. Any work executed in contravention of these requirements shall be liable for rejection and shall be dismantled/replaced by the Contractor at no additional cost to the Department.

Preferred Make List

Note:

1. The material shall be procured as per preference of Make in India Policy and Government of India circulars as per details given below;
 - (i) Notification of Ministry of Electronic and Information Technology, GOI vide File No.1(10)/2017-CLES dated 06.12.2019.
 - (ii) Ministry of Commerce and Industry Order No. P-45021/2/2017-PP(BE-11) dated 04.06.2020.
 - (iii) Order of Govt. of India, Ministry of Finance, Department of Expenditure (PPD) F.No.6/18/2019- PPD dated 23.07.2020 and 24.07.2020.
 - (iv) As per Office Memorandum No. DPE/7(4)/2017-Fin.(Part-I) dated 30.07.2020 issued by Ministry of Heavy Industries & Public Enterprises, Government of India.
 - (v) Gazette Notification No.CG-DL-E-07092020-221592 dated 07.09.2020 of Ministry of Electronics and Information Technology
 - (vi) Order of Government of India, Ministry of Commerce and Industry Order No. P-45021/2/2017-PP(BE-11) dated 16.09.2020.
 - (vii) Certificate to be furnished by Agency and their specialized agency under Rule 144(XI) in the general Financial Rule 2017 of GOI, Ministry of Finance, Department of Expenditure vide Order Nos.F.18/37/2020-PPD dated 08.02.2021 and F.12/1/2021-PPD(Pt.) dated 02.03.2021.
 - (viii) Order of Govt. of India, Ministry of Finance, Department of Expenditure (PPD) F.No. 7/10/2021-PPD(1), dated 23.02.2023.**
 - (ix) And any other guidelines issued in this regard by Government of India at the time of procurement of the items.
2. The material shall be procured from the List of manufacturers mentioned in the Preferred Make List only. In case of non availability of materials of requisite specifications mentioned in item nomenclature and Technical Specifications from the Manufacturer mentioned in the Preferred Make List, the decision of Engineer-in-charge in regard to alternate Manufacturer shall be final and binding on the contractor.

3. Makes/ Models of all the items must be got approved from the Engineer in charge well before placing any order to the OEM/ its authorized dealer. The contractor/ agency is required to submit all relevant test certificates documents and along with the proposal. The decision of Engineer-in-charge is binding in this regard and no variation is acceptable. For the items not specified in the Preferred make list, the approval of the Engineer-in-charge shall be final.
4. Procurement of item with aesthetic value and visibility shall be on prior approval of Architect and Engineer in charge for specific area of application.
5. In case of products not indicated in this list, BIS/ IS marked products shall be preferred.

C1 - Electrical Installation

Sr No.	Material/ Item	Preferred Make
1.	MS Black Stove Enamelled ERW Conduits (ISI) and its accessories ISI marked/ Flexible Conduit	AKG/ BEC/ Steelkraft/RM Con
2.	PVC Conduit & Accessories (ISI marked).	Precision/ BEC/ AKG/Supreme/Astral
3.	HFFR PVC Insulated Copper Conductor Wires/ Stranded Flexible Wires.	Finolex/ RR Kabel/ Havells/ Polycab/ Lapp India/ KEI/ Bonton/ Ravin Cable/ Rallison/ Batra Hanley
4.	Television Cable	Finolex, RR Kabel, Havells, Polycab, Lapp India, KEI, Bonton, Ravin cable
5.	Anchor Fastners	Hilti/ 3M/ Fischer/ Wurth
6.	Modular Switches with accessories, Socket Outlets, Modular Base plate and Cover plate, GI Box, Wiring Accessories, Call bell, TV Point	Schneider (Unica Pure)/ Legrand (Arteor)/ MK Honeywell (Blenz Pro)/ LK (Englaze)/ Havells (Murano)/ ABB(Ivie)
7.	Ceiling Rose	Anchor/ CPL/ Havells/ Legrand
8.	Industrial PVC Plug & Socket- Indoor	Legrand/ Schneider/ LK/ Siemens/ Hensel

Sr No.	Material/ Item	Preferred Make
9.	Lighting Controller, Button Keypad	Lutron/ Dynalite- Signify/ Crestron/ ABB/ Schneider/ Legrand/ OSRAM
10.	Sensor (Occupancy Sensor/ Day Light etc)	Honeywell/ Philips / Legrand / Lutron/ Schneider/ ABB/ Crestron
11.	Distribution Boards (MCB/MCCB DBs) and Cable End Loose Wire Box	Legrand-Ekinox 3/ Schneider-Acti9/ Hager-Novello+/ LK -AU/Siemens-Betaguard/ ABB-Itus
12.	MCB/ RCCB/ SPD/ RCBO/ and all other accessories	Legrand-DX3/ Schneider-Acti9/ Hager - NCN/ LK- AU/Siemens-Betaguard/ ABB-SB Series
13.	MCCB	Schneider - NSX/ CVS/ Siemens - 3VA/3VM/ LK- D'sine/ Legrand- Dpx3/ ABB - Tmax
14.	ACB	Schneider - Masterpact Nw/ Siemens - 3wl/ LK - U Power Omega/ Legrand-Dmx3/ ABB -Emax
15.	Sandwiched Type Bus Duct/ Rising mains, Tap Off Box, End Feed Unit	Schneider/ Legrand/ LK/ Siemens/ ABB/ C&S, AnantPowerTech (Advance)
16.	Wire mesh Cable Trays and its supports and accessories	OBO/ Legrand/ CommScope-Systimax/ Siemon/ Panduit-PanNet/ Belden
17.	Hot dipped Galvanized Cable Trays and its supports and accessories	Indiana (Vadodara)/ MEM/ Pilco/BEC/ STEELWAYS/ Profab (PUK)/ Super Steel Industries/ RM Con
18.	Cable Management System (Wire Trunking) Raceway [under floor and surface], Floor Junction Box, Crossover Box, Cover/Lid	OBO/ Legrand/ MK (Honeywell)/ Indiana/ MEM/ Pilco/ BEC/ STEELWAYS/ Profab (PUK)/ Fraser/ Super Steel Industries / RM Con
19.	Chemical Earthing	OBO/ JMV/ ABB/ DEHN
20.	GI Pipe	Sail/Tata/Jindal (Hissar)
21.	XLPE Insulated PVC Sheathed AL/ CU Conductor Armored/	Finolex/ Polycab/ KEI/ Havells/ Bonton/ RR Kabel/ Ravin Cable/ Rallison/

Sr No.	Material/ Item	Preferred Make
	Unarmored 1.1KV Grade Power Cable.	Grandlay/ Paramount/ Batra Henley/ Gloster
22.	Cable Gland/ Cable Lugs	Comet/ Dowell's/ Jainson/ Hmi/ Raychem/ Steipwel/ Baliga/ Skytone/ Gloster
23.	LT Power Distribution Panels/ APFC Panel (TTA)	Siemens - Siepan 8 PU, Schneider - Block Set, ABB - Artuk, Lauritz Knudsen - Ti, Legrand- XL3 (Preferred/ Approved / Authorized Switchgears Panel OEM Builders Only, Drawings of Panel Shall Be Submitted by OEM Only For Approval.)
24.	LT Power Distribution Panels (Other than TTA)	Adlec Mundka/ Associated Switchgears and Projects Ltd./ Sudhir Genset Ltd./ Control and Switchgears Pvt. Ltd./ Neptune/ Tricolite/ Milestone/ SPC Electrotek/Advance Panels and Switchgears (P) Ltd./ Control Well Switchgear
25.	Panel Gas Suppression System	Regulus / Firetrace / Sevo / Firetrex
26.	Control Cable	Finolex/ Rr Kabel/ Havells/Polycab/ Lapp India/ Belden/ Ravin Cable/ Batrahenleys/Bonton/ Rallison/ Paramount
27.	AC Power Contactor/ DC Power Contactor/ Auxiliary contactors	L&T/ Siemens/ ABB/ Schneider/ Legrand
28.	Panel Accessories/ Selector Switches (ASS/ VSS)/ Auxiliary Relays/ Rotary Switch/ Push Buttons/ Indicating Lamps	As Per OEM Standard.
29.	LT Current/ Potential Transformer (Cast Resin Epoxy Coated)	Automatic Electric/ Gilbert & Maxwell/ Kappa

Sr No.	Material/ Item	Preferred Make
30.	Multifunction and digital electronic meter (A/ V/ PF/ HZ/ KWH) with LED Display.	Schneider (Conserv)/ Legrand/LK/ Siemens/ ABB/ Neptune/ Secure
31.	Single phase preventer	Siemens/ Schnieder/ Abb/ LK /Legrand
32.	HRC Fuse and Fuse Fitting	ABB/ GE/ Siemens/ LK/ Schneider/ Legrand
33.	Interior Light Fixtures	Endo/ Lighting Technology/ Philips (signify)/ Regent
34.	UPS	Emerson (Vertiv) / Schneider (APC) / Eaton
35.	Sealed Maintenance Free Batteries	Exide/ Amar Raja/ Hitachi/ Panasonic
36.	Battery Charger	Max. Power/ Caldyne/ Volstat/ HBL/ Amar Raja

C2- FIRE ALARM & PA SYSTEM

Sr No.	Material/ Item	Preferred Make
1.	Detectors/ Devices & Modules	Honeywell-Notifier/ Siemens/ Simplex/ Bosch/ Johnson Control / Edward
2.	Main Control Panel, Intelligent Interface Unit	Honeywell-Notifier/ Siemens/ Simplex/ Bosch/ Johnson Control/ Edward
3.	Smoke Aspiration System	Xtralis/ Honeywell-Notifier/ Bosch/ Siemens/ System Sensor/ Securiton/ Johnson Control/ Edward
4.	CPVC/UPVC Pipes	Finolex/Prince/Supreme/Ashirwad/Astral
5.	HFFR PVC Insulated Copper Conductor	As per Internal EI Make List
6.	PUBLIC ADDRESS SYSTEM CONSOLE AND ALL ACCESSORIES	Ateis/ Bosch/ Harman/ Biamp/ Atlas Ied/ Honeywell/ Optimus/ Sennheiser/ Bose/ Crestron/ Extron
7.	P.A. SPEAKERS/ HORNS/ AMPLIFIERS (EN 54 APPROVED)	Ateis/ Bosch/ Harman/ Biamp/ Atlas Ied/ Honeywell/ Optimus/ Sennheiser/ Bose/ Crestron/ Extron
8.	Any other item	As per the make list of other subhead

C3-Fire Fighting System

Sr No.	Material/ Item	Preferred Make
1.	M.S. Pipes	SAIL/Tata/Jindal Hissar/ Prakash Surya
2.	M.S. Fittings	MS Fitting (Calcutta)/ Echjay/ Tube bend/ VS Engineering / JK Forging /Metline Industries
3.	Clamps/ Pipe Hangers Support	Hilti/ Fisher/ Easyflex/ Hi tech/ Diamond
4.	Anchor Fastener	Hilti/ 3M/ Fischer/ Wurth
5.	Welding Rods	Advani/L&T/ESAB/ Manglam/ Ador/ cosmos/ Super Bond(S)
6.	Sprinklers	HD Fire/ Tyco/ NewAge (Mumbai)/ NewAge (Surendranagar)/ Viking/ Victaulic

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

Sr No.	Material/ Item	Preferred Make
7.	Sprinkler Flexible Pipe	HD Fire/ Tyco/ Safex/ NewAge (Mumbai)/ NewAge (Surendranagar) Victaulic
8.	Paint/ Primer	Asian Paint/ Nerolac / Berger/
9.	Clean Agent Gas Based Fire Suppression System	Utc Fire & Security (Kidde) Sevo/ Tyco (Johnson Controls)/Viking/ Minimax/ Siemens/Honeywell
10.	FK-5-1-12 Or Equivalent Gas Cylinder Filled Listed And CCOE Approved (Seamless Cylinders Duly Approved By PESO/CCOE).	3M/ Corpusa/ Honeywell/Siemens/Sevo/ Viking Minimax
11.	Electrical Actuator/ Manual Actuator/ Pneumatic Actuator/ Discharge Hoses/ Actuation Hoses/ Manifold Check Valves/ Nozzles/ Low Pressure Switch/ Nitrogen Pilot Cylinder And Valve Assembly & Pressure Gauge/ Discharge Pressure Switch	Ansul/ Tyco/ UTC/ Siemens/ Honeywell/ Sevo/ Viking/ Minimax
12.	Seamless Pipes For Clean Agent	Indian Seamless / Maharashtra Seamless/Tata/ Jindal Hissar
13.	Any other item	As per the make list of other subhead

C4- HVAC

Sr No.	Material/ Item	Preferred Make
1.	Air Handling Units, Air Washer	Systemair/ Flaktgroup/ Carrier/ Edgetech/ Trane/Citizen/ ZECO/Waves/VTS
2.	Filters (Pre/ Fine/ HEPA)	Dyna Filters/American Air Filter/Camfil/Thermodyne
3.	Dry Scrubber	Trion/ Ryd Air/Humidin/ ESPAIR/ ZECO/ Edgetech/Envaisor

Sr No.	Material/ Item	Preferred Make
4.	UV Lamp/ UVGI	Alfaa UV/ Aeropure/ Sanuvox/ Ruks Engineers Ltd / Honeywell / Trane / Bonphul/ UVHEAL
5.	Ultrasonic Humidifier	Carel/Daspass/ Radipcool/ Stulz
6.	Cabinet Fans	Systemair/Kruger/Greenheck/ Nicotra /Wolter
7.	Centrifugal Fans, Axial Fans	Systemair /Kruger/Greenheck/ Nicotra/ Wolter
8.	Inline Fans	Systemair /Kruger/Greenheck/ Humidin / Ostberg Fans/Wolter /Nicotra Airflow /Caryaire
9.	EC Fan	ziehl-abegg/ Rosenberg /Ebm-papst/ Kruger
10.	PLC Hardware System	Siemens/ L&T/ Schneider/ ABB
11.	Hi-Wall Units- Water Cooled	Daikin/ Carrier/ Trane/ Media/ Kubic/Bhutoria
12.	DX Units and VRF, UV Protective Coating, Y Joints, Centralized Remote Controller	Daikin/ Toshiba/Blue Star / Mitsubishi Electric / LG / VOLTAS / SAMSUNG
13.	Copper Refrigerant Piping	Mandev / Mexflow / Rajco
14.	HFFR PVC Insulated Copper Conductor	As per Internal EI Make List
15.	Medium Class PVC Conduit	Precision/ BEC/ AKG/Supreme/Astral
16.	M.S. Pipes	SAIL/Tata/Jindal Hissar
17.	G.I. Pipes	Sail/Tata/Jindal (Hissar)
18.	M.S. Fittings	MS Fitting (Calcutta)/ Echjay/ Tube bend/ VS Engineering / JK Forging /Metline Industries
19.	Clamps/ Pipe Hangers Support	Hilti/ Fisher/ Easyflex/ Hi tech/ Diamond
20.	Anchor Fastener	Hilti/ 3M/ Fischer/ Wurth
21.	Welding Rods	Advani/L&T/ESAB/ Manglam/ Ador/ cosmos/ Super Bond(S)
22.	Closed Cell Nitrile Rubber Insulation/ EPDM Insulation	Armacell / K- Flex/ A-Flex/ ALP aeroflex/ supreme
23.	Fibre Glass Insulation	Owens Corning / U. P. Twiga/ Lloyd
24.	Glass Wool Insulation, Mineral Wool Insulation	Roxul-Rockwool/Rockwoolindia/Lloyd/Owens Corning

Sr No.	Material/ Item	Preferred Make
25.	Al. Sheets	Hindalco / Balco / Nalco
26.	Aluminum Tape	Johnson/Birla-3M/Nippon Industries
27.	Butterfly Valves	Zoloto/ Honeywell / Audco /Emerald /Rapid Control/Advance/ Castle Valve
28.	Ball Valve	Zoloto/ Honeywell / Audco /Emerald /Rapid Control/Advance/ Castle Valve
29.	Balancing Valves	Advance/Honeywell/Danfoss/T&A /Flowcon/Sant
30.	2-Way/3-Way Modulating Valves And Thermostat	Johnson Controls/Siemens/Honeywell/Danfoss/ Oventrop/ Belimo/ Flowcon
31.	Y-Strainers	Advance/Honeywell/Emerald/ Sant
32.	PICV Valves	Danfoss /Siemens/Ta /Belimo/ Flowcon/ Oventrop/ Honeywell
33.	CPVC/UPVC Pipes	Finolex/Prince/Supreme/Ashirwad/Astral
34.	Auto Air Vent	Anergy/RapidControl/SKS/Sant Industries /Honeywell
35.	Pipe Supports/ Vibration Isolators/ Duct Flexile Connections	Resistoflex/Kanwal(Easyflex)/Cori/Flexionics/
36.	GSS Factory Fabricated Ducts all type i/c spiral and oval/ Duct Flanges	Ecoduct /Zeco/ Ductofab/ Asawa / Dustech / Rolastar/ Waves
37.	G.I. Sheets	Sail/Tata/Jindal
38.	M.S. Sheets	Sail/Tata/Jindal
39.	Flexible Duct	Twiga/Atco/Kimmco / Sevenstar
40.	Fire Paint	Flamebar / AMEETUFF / 3M / Promat / JAY & CO-Cischem
41.	Grills/ Diffusers/Slot Diffuser/ Fire Dampers/ Louvers/ Volume Control Dampers/ Back Draft Dampers	Systemair/Caryaire/Cosmos/Trox/ Ruskin Titus India Pvt, Ltd./Greenheck
42.	VAV Boxes	Trox/Trane/Johnsoncontrols / Honeywell / Systemair/ Cosmos

Sr No.	Material/ Item	Preferred Make
43.	Motorized Actuator For Valves, Damper and VAV Box	Belimo/Honeywell/Siemens/ Danfoss / Johnson Controls
44.	Starbond/Lag Protective Coating	Paramount Polytreat/Pidilite
45.	Precision AC	Emerson/ Bluebox/ Flaktgroup/ Stulz

C5- Audio Video System

Sr No.	Material/ Item	Preferred Make
Audio Video System		
1.	Audio Conference System – Controller, Audio Conference System - Chairman Unit, Audio Conference System - Digital Interface Unit, Audio Conference System - Delegate Unit with Dual Buttons, Audio Conference System - Digital Interface Unit, Audio Conference System - Operator PC, Audio Conference System - Conference Cable 2m, Audio Conference System - Conference Cable 25m	BOSCH, TELEVIC, Brahler, DIS (SHURE), Sennheiser
2.	Computer, Server	Dell, HP, Lenovo
3.	Full Range Ceiling Speakers	Harman, Yamaha, Bose, Electrovoice, Tannoy, Fohhn, JBL, Martin Audio, Shure, TOA
4.	Passive Column Array FOH Speakers	Harman, Yamaha, Bose, Tannoy, Fohhn, Renkus-Heinz, JBL, Alpha Acoustic, Shure, TOA
5.	Soundbar With Camera	Bose, Kramer, Polycom, Crestron, Cisco
6.	Digital Amplifier	Harman, Yamaha, Bose, Electrovoice, Extron
7.	Digital Signal Processor	Xilica, BSS, Biamp, Extron

8.	Wireless Lapel Microphone	Sennheiser, Shure, Electrovoice
9.	Cable Cubby	Lightware, Extron, Crestron, Kramer, AMX
10.	4K PTZ Camera	Lumens, Sony, Panasonic, Cisco,
11.	UHD LED- LCD, OLED Display	Sony, Samsung, LG
12.	LED Video Wall	LG, Samsung, Delta, Barco, Christie, Sony, Panasonic
13.	Wireless Presentation System	Barco, Kramer, Crestron, Extron
14.	Audio Video Control Processor and Touch Panel	Extron/ Crestron/ Kramer/AMX
15.	AV Matrix Switcher	Extron, Crestron, AMX, Kramer
16.	AV over IP Encoder & Decoder	Extron, Crestron, AMX, Kramer
17.	Multiformat Transmitter, Receiver	Extron, Crestron, AMX, Kramer
18.	HDMI to USB Converter	Extron, Crestron, AMX, Kramer
19.	Network Switch, Networking Enclosure, CAT 6A Cable	As per ICT Makelist
20.	Video Conferencing Codec	Cisco, Polycom, Crestron
21.	HDMI-HDMI Patch Cord	Belden, Lightware, Extron, Siemon, Crestron
22.	HDMI Cable With High Speed Of 18GBPS Or better	Belden, Lightware, Extron, Siemon, Crestron, CommScope-SYSTIMAX
23.	USB Type C Cable	Kramer, Lightware, Extron, Crestron, Manhattan, Belden
24.	Speaker Cable, Microphone Cable	Manhattan, Krystal, Belden, Kramer, Extron, Legrand
25.	Camera Controller/Switcher	Compatible with Digital Audio Conferencing and Camera
26.	Any Other Item	As per the make list of other subhead

C-6 IBMS

Sr No.	Material/ Item	Preferred Make
	BMS ACCESSORIES	
1	OPERATION WORKSTATION HARDWARE/Server	DELL, HEWLET PACKARD, IBM, COMPAQ
2	OPERATION WORKSTATION SOFTWARE	HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
3	DDC CONTROLLERS (IP BASED)	HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
4	SYSTEM INTEGRATION UNITS	HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
5	TEMPERATURE SENSOR	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
6	IMMERSION TEMPERATURE WITH THERMOWELL	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
7	PRESSURE SENSOR	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
8	DIFFERENTIAL PRESSURE SWITCHES	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
9	ULTRASONIC TYPE BTU METER WITH MATCH PAIR SENSORS	LANDIS & GAYER, KAMSTRUP
10	T+ RH SENSORS (COMBO SENSOR)	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
11	INDOOR AIR QUALITY SENSORS	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
12	DIFFERENTIAL PRESSURE TRANSMITTERS	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER

Sr No.	Material/ Item	Preferred Make
13	OUTSIDE TEMPERATURE + HUMIDITY SENSOR	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
14	LEVEL SWITCHES	DYWER, FILPRO, KELE, LEVECON, SONTAY
15	DDC CONTROLLER ENCLOSURE (INDOOR-IP54, OUTDOOR-IP66)	ARROW ENGINEERS, NEW ELECTRICALS, POWER CONTROL ENGINEERING, RITTAL, SCOOT ENGINEERING, SHRINATH ENTERPRISES, STERLING & WILSON, SQUARE "D" AUTOMATION, ZENITH ENGINEERING
16	HYDROGEN SENSOR	DYWER, GREYSTONE, HONEYWELL, KELE, AMBETRONICS
17	AIR VELOCITY SENSOR (MULTI PROBEMULTIPOINT)	KELE, SONTAY, TSI -USA
18	WATER HARDNESS ANALYZER	HACH, HONEYWELL, LUMEX, POLYMETRON, THERMO, FORBES MARSHALL
19	P.H./ CHLORINE ANALYZER	HACH, HONEYWELL, KELE, POLYMETRON, SIEMENS, SONTAY, THERMO
20	TDS & DO SENSOR	HACH, HONEYWELL, KELE, POLYMETRON, SIEMENS, SONTAY, THERMO
21	CO2 DUCT MOUNTED & WALL MOUNTED	DYWER, GREYSTONE, HONEYWELL, JOHNSON CONTROLS, SIEMENS, SCHNEIDER
22	CO SENSOR	Dwyer ,VCP, Greystone
23	COMMUNICATION CABLES/ SIGNAL CABLE/ CONTROL/ POWER CABLE (INDIGNONS)	CALIPLAST, FINOLEX, KENTER, NEOLEX, POLYCAB, TECHNOFLEX

Sr No.	Material/ Item	Preferred Make
24	COMMUNICATION CABLES/ SIGNAL CABLE/ CONTROL CABLE(IMPORTED)	AT & T, BELDON, COMSCOPE, FUSION POLYMERS, NORDEX, SOUTHWEST WIRE & CABLE
25	OPTIC FIBER CABLE	AVAYA, AMP, LAPP, BELDON/ Siemon/ Commonsense/ Penduit
26	MS/ GI CONDUITS – ISI EMBOSSED	As per electrical makelist
27	CABLE TRAYS OF PERFORATED TYPE WITH TOP COVER	As per electrical makelist
28	PVC CONDUITS	As per electricalmakelist
29	NETWORKABLE LASERJET COLORPRINTER	CANNON, EPSON, HEWLETT PACKARD
30	LED DISPLAY	As per AV Subhead
	DATA CENTRE LV SERVICES	
1	SMOKE ASPIRATION SYSTEM	XTRALIS-VESDA, NOTIFIER,BOSCH, Siemens, system sensor,Securiton
2	DIGITAL WATER LEAK DETECTION SYSTEM	TTK, TYCO (TRACETEK), ELSA,C-systems
3	DIGITAL RODENT REPELLENT SYSTEM	MASER ELECTRONICS, C-system,RSCAT
4	5Networking Enclosures, Racks of Various Sizes-15U UPTO 42U	As per the ICT make list
5	Networking switches- Access Switches, Distribution Switches, Core Switches, Server Farm Switches and their components such as 1 G SFP, 10G SFP+AND 40G QSFP+Transceiver and Modules and other Accessories such as Power Supplies, Fans, Stacking Cables and other passive components	As per the ICT make list
6	Network Management System	As per the ICT make list
7	Firewall and its Accessories	Checkpoint, Cisco, PALOALTO or Equivalent Make

C7- ICT & IPBX

Sr No.	Material/ Item	Preferred Make
1	S/FTP Cat6A Cable and Its Components Such as Io, Patch Panels, Face Plates and All Their Accessories	CommScope-Systimax, Siemon, Panduit-Pannet, Belden
2	Single Mode Fiber & Multi Mode Optic Cables of Various Core Capacities and Their Accessories – Wall Mounted or Rack Mounted Lius, Patch Cords and Pigtails and Other Accessories	CommScope-Systimax, Siemon, Panduit-Pannet, Belden
3	Networking Enclosures, Racks of Various Sizes – 15U Up To 42U	APW-Vero, President, Rittal, Panduit-Pannet, Netreck, Valrack
4	AAA Solution, Networking Switches – Access Switches, Distribution Switches, Core Switches, Server Farm Switches and Their Components Such As 1Gbps SFP, 10Gbps SFP+, 40Gbps QSFP+ & 100Gbps, QSFP28, Transceivers and Modules and Other Accessories Such as Power Supplies, Fans, Stacking Cables.	Cisco, Extreme Networks, HPE (Aruba)
5	Wireless Controllers, Wireless Access Points and Their Accessories	Cisco, Extreme Networks, HPE (Aruba)
6	Internet Router, Intranet Router and Their Accessories and Optic Transceivers	Cisco, Extreme Networks, Hpe (Aruba), Nokia, Erricson
7	Network Management System	Cisco, Extreme Networks, Hpe (Aruba)
8	IP Based PBX Communication Solution, IP Phones, Softphones, Voice Gateway, Communications	Avaya, Cisco,

Sr No.	Material/ Item	Preferred Make
	Software and Mobility Client, Desktop Client Software	
9	Industry Standard Intel Platform Server Hardware	Dell, Hp, Lenovo Or As Per Ip-Pbx Communication System Platform Oem
10	Any Other Item	As per the make list of other subhead

C8 – Kitchen Equipment

Sr No.	Material/ Item	Preferred Make
1.	Weighting Scale	AczetPvt. Ltd, Satwik, Phoenix
2.	Pre Rinse Shower	T & S Brass and Bronze Works, KLRCO, Fisher, JB
3.	Insect Killer	Technocrat, PCIL, Mid Link
4.	Waste Bin	Nilkamal, PROBBAX, Frontier
5.	Paper Roll Holder	Any Local Make
6.	Air Curtain	Technocrat, Euronics, Mid Link
7.	Hose reel	T & S Brass and Bronze Works, KLRCO, Fisher
8.	Water Geyser	Racold, Crompton, Bajaj
9.	Spiral Dough Mixer	SINMAG, Hobart, DIOR
10.	Cam Shelving	CAMBRO, METRO, HUPFER
11.	Post	CAMBRO, METRO, HUPFER
12.	Shelves	CAMBRO, METRO, HUPFER
13.	Sack Pallet	Nilkamal, Supreme, Sintex
14.	S.S Ready made drums	Direct Purchase
15.	Walk In Chiller	RINAC, Blue Star, Celfrost

Sr No.	Material/ Item	Preferred Make
16.	Vegetable Cutting Machine	Gajanan Canteen Equipment, Rishabh, COSMOS
17.	Tilting Commercial Wet Grinder	Gajanan Canteen Equipment, Rishabh, COSMOS
18.	Potato Peeler	Gajanan Canteen Equipment, Rishabh, COSMOS
19.	Coconut Scraper	Gajanan Canteen Equipment, Rishabh, COSMOS
20.	Rack Conveyor Type Dish Washer	IFB, Electrolux, HOBART
21.	Under Counter Refrigerator	JB/ICEMAKE/TRUEFROST
22.	Four Door Refrigerator	JB/ICEMAKE/TRUEFROST
23.	Deep Freezer	Bluestar/ICEMAKE/TRUEFROST
24.	Microwave oven	LG/SAMSUNG/BOSCH
25.	Rice Boiler/Stock Pot Stove/Masala Trolley/Chapati Plate cum Puffer/Chapati Rolling Table/Parantha Plate/Work Table with sink or without sink/Two Burner Raindian/Chapati Machine/work tables/Exhaust Hoods/Drain through grating/Conveyor Toaster/Sandwich griller/Milk Boiler/Trolleys/Counters/Hot Bain Marie/SS Rack/Dunnage Rack/Pulverizer/Dough Kneader/Vegetable Cutting Machine/veg washer/Pot Racks/Idli steamer/Dosa Tawa/Single burner range/Dish Landing table/Two sink unit/All Tables/Pot Rack/Wet Grinder	JB Equipments/SR Enterprises/Ingenius Overseas Pvt. Ltd.
26.	Dishwasher	Hobart/IFB/LG/BOSCH
27.	Induction plate	Prestige/Bajaj/Havells

Schedule of Quantity (E&M work)					
Name of work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.					
S. No.	ITEM DESCRIPTION	QUANTITY	UNIT	Rate	AMOUNT
	C1-EI & FANS, ELECTRICAL PANELS, UPS, LIGHTING FIXTURE				
	WIRING				
1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm HFFR (IS-17048) PVC insulated copper conductor single core cable in surface / recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm HFFR (IS-17048) PVC insulated copper conductor single core cable etc. as required Group C	2,640	Point	2101	55,46,640
2	Wiring for group controlled (looped) light point/fanpoint/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm HFFR (IS-17048) PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm HFFR (IS-17048) PVC insulated copper conductor single core cable etc. as required Group C	10,550	Point	1246	1,31,45,300
3	Wiring for twin control light point with 1.5 sq.mm ZHFR insulated copper conductor single core cable in surface / recessed steel conduit, 2-way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. ZHFR insulated copper conductor single core cable etc. as required. (steel Conduit included in scope)	100	Point	2242	2,24,200
4	Supplying and drawing following sizes of HFFR (IS-17048) PVC insulated copper conductor, single core				

	cable in the existing surface/recessed steel/ PVC conduit / Raceway as required.				
4.1	3 x 1.5 sq.mm	29,700	Meter	104	30,88,800
4.2	3 x 4 sq. mm	70,620	Meter	222	1,56,77,640
4.3	3 x 6 Sq.mm	4,760	Meter	326	15,51,760
4.4	6 x 1.5 sq. mm wire	4,500	Meter	195	8,77,500
4.5	6 x 4 sq. mm wire	42,370	Meter	424	1,79,64,880
4.6	9 x 1.5 sq. mm wire	500	Meter	311	1,55,500
4.7	9 x 4 sq. mm wire	14,120	Meter	616	86,97,920
5	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
5.1	20 mm	29,680	Meter	254	75,38,720
5.2	25 mm	79,850	Meter	289	2,30,76,650
5.3	32 mm	56,990	Meter	360	2,05,16,400
6	Supplying and fixing 25 mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc. as required.	11,016	Meter	60	6,60,960
7	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc. as required.				
7.1	1 or 2 Module	244	Each	354	86,376
7.2	3 Module	5,358	Each	384	20,57,472
7.3	6 Module	352	Each	462	1,62,624
7.4	8 module	3,924	Each	517	20,28,708
8	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box				

	including connections but excluding modular plate etc. as required.				
8.1	5/6 A switch	17,288	Each	121	20,91,848
8.2	15/16 A switch	5,174	Each	176	9,10,624
8.3	3 pin 5/6 A socket outlet	12,660	Each	136	17,21,760
8.4	6 pin 15/16 A socket outlet	5,174	Each	219	11,33,106
8.5	TV antenna socket outlet	244	Each	168	40,992
9	Supplying & fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc. as required.	23	Each	807	18,561
10	Supplying and fixing 20 A, 240 V, SPN Industrial type socket outlet, with single pole, Netural and earth, plastic enclosed plug top alongwith 20 A "C" curve, DP, MCB, in sheet steel enclosure, on surface or in recess, for the plastic socket outlet and complete with connections, testing and commissioning etc. as required.	238	Each	1806	4,29,828
11	Supplying and fixing 32 A, 240 V, SPN Industrial type socket outlet, with single pole, Netural earth, plastic enclosed plug top alongwith 32A "C" curve, DP, MCB, in sheet steel enclosure, on surface or in recess, for the plastic socket outlet and complete with connections, testing and commissioning etc. as required.	10	Each	3206	32,060
12	Supplying and fixing 63 A, 415 V, TPN Industrial type socket outlet, with 3 pole, Netural & earth, plastic enclosed plug top alongwith 63 A "C" curve, FPMCB, in sheet steel enclosure, on surface or in recess, for the plastic socket out let and complete with connections, testing and commissioning etc. as required.	10	Each	9426	94,260

13	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	2,000	Each	47	94,000
	MCCB, MCB & DB'S				
14	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
14.1	4 way (8 + 12), Double door	422	Each	4377	18,47,094
14.2	6 way (8 + 18), Double door	54	Each	5299	2,86,146
14.3	8 way (8 + 24), Double door	5	Each	6337	31,685
14.4	12 way (8 + 36), Double door	120	Each	9634	11,56,080
14.5	16 way (8 + 48), Double door	42	Each	11802	4,95,684
15	Supplying and fixing Cable End Box (Loose Wire Box) suitable for following triple pole and neutral, sheet steel, MCB distribution board, 415 Volts, on surface/ recess, complete with testing and commissioning etc.as required.				
15.1	For 4 way, Double door TPN MCBDB	422	Each	1177	4,96,694
15.2	For 6 way, Double door TPN MCBDB	54	Each	1223	66,042
15.3	For 8 way, Double door TPN MCBDB	5	Each	1448	7,240
15.4	For 12 way Double door TPN MCBDB	120	Each	2648	3,17,760
15.5	For 16way, Double door TPN MCBDB	42	Each	3139	1,31,838
16	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.)				
16.1	4 way (8+ 12), Double door	258	Each	7951	20,51,358
17	Supplying and fixing Cable End Box (Loose Wire Box) suitable for triple pole and neutral, sheet steel, Vertical MCB distribution board, 415 Volts, on surface/ recess, complete with testing and commissioning etc. as required.	258	Each	1271	3,27,918
18	Supplying and fixing single pole 5 A to 32 A rating, 240 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
18.1	Single pole	12,072	Each	285	34,40,520
19	Supplying and fixing of following rating, 415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
19.1	5 to 32 Amp TPN MCB	575	Each	1301	7,48,075
19.2	5 to 32 Amp. TP MCB	1,032	Each	1070	11,04,240
19.3	63 A TPN MCB	262	Each	2281	5,97,622
20	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.				
20.1	25A	533	Each	3137	16,72,021
20.2	40A	46	Each	3452	1,58,792

21	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, Ics=100% Icu and Operational Voltage 690V etc. as required.				
21.1	100 A,30KA,FP MCCB	152	Each	8127	12,35,304
22	Supply installation testing and commissioning of Surge Protection Devices (SPD) in existing distribution boards. 1.2KV Protection level, Class 's', (Imax-15-20KA, 8/20μS) Four Pole. Complete as required.	258	Each	2397	6,18,426
	RISING MAINS & BUS TRUNKING				
23	Supplying, installing by suspension on ceiling / fixing on wall, testing and commissioning of following capacity Sandwich Type Rising Mains for use on 3 phase 4 wire 415 volts, 50Hz A.C. supply with metal clad enclosure having IP-54 rating after fixing the tap off boxes and all accessories, made of 1.6mm thick steel sheet duly powder coated in convenient sections complete with 4 Nos aluminium bus bars having current density of 130 A/sq.cm at nominal current rating, necessary joints, elbow joints & expansion joints and bends, fire barrier at each floor, provision of tapping at every meter, adopter box and copper flexible for joints, continuous earthing with 2 Nos aluminium strip of suitable size (one on each side) including, G.I. clamping brackets, suspenders, angle iron bracket, steel fasteners, connecting to earthing system etc. as required				
23.1	500 A, Isc= 30 kA for 1 sec	238	Meter	17152	40,82,176
24	Supplying, installation, testing & commissioning of following capacity Plug In/ tap off box on the existing sandwich Type bus trunking/ rising mains for use on 3 phase 4 wire 415 volts, 50Hz A.C. supply made with 1.6mm thick sheet steel enclosure (IP54) duly powder coated with provision of MCCB/ACB (but without MCCB/ACB) complete etc. as required				

24.1	125 A, Isc= 15kA for 1 sec	152	Each	9104	13,83,808
25	Supplying, installation, testing & commissioning of following capacity End Feed Unit for the existing sandwich Type bus trunking/ rising mains for use on 3 phase 4 wire 415 volts, 50Hz A.C. supply made with 1.6mm thick steel sheet enclosure (IP54) duly powder coated with provision of MCCB/ACB (but without MCCB/ACB) complete with necessary joints including clamping brackets, angle iron bracket, steel fasteners, connecting to earthing system etc. as required				
25.1	500 A, Isc= 50kA for 1 sec	8	Each	16806	1,34,448
	CABLE TRAYS AND RACEWAY				
26	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				
26.1	100 mm width X 50 mm depth X 1.6 mm thickness	6,050	Meter	754	45,61,700
26.2	150 mm width X 50 mm depth X 1.6 mm thickness	8,250	Meter	803	66,24,750
26.3	300 mm width X 50 mm depth X 1.6 mm thickness	12,220	Meter	1062	1,29,77,640
27	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "bends" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				
27.1	100 mm width X 50 mm depth X 1.6 mm thickness	300	Each	1252	3,75,600
27.2	150 mm width X 50 mm depth X 1.6 mm thickness	100	Each	1368	1,36,800

27.3	300 mm width X 50 mm depth X 1.6 mm thickness	330	Each	1977	6,52,410
28	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				
28.1	100 mm width X 50 mm depth X 1.6 mm thickness	125	Each	1427	1,78,375
28.2	150 mm width X 50 mm depth X 1.6 mm thickness	30	Each	1486	44,580
28.3	300 mm width X 50 mm depth X 1.6 mm thickness	100	Each	2294	2,29,400
29	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Reducer" (galvanisation not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				
29.1	150 mm width X 50 mm depth X 1.6 mm thickness	35	Each	2049	71,715
29.2	300 mm width X 50 mm depth X 1.6 mm thickness	144	Each	2991	4,30,704
30	Supply and installation of following under floor metal trunking / raceway coated with min. 275 GSM, with all accessories like couplers, clamps, end caps etc made out of pre galvanized steel sheet. Trunking should be clamp with G I strip clamps at Every 1.5 meter on floor including chasing of floor and tiles, cleaning wherever necessary, fixing the raceways, minor civil work with providing sealing at joints at junction box, earthing complete as required. Raceway and all accessories should be provided in compliance of confirmation to standard EN 50 085-2-2 & complete as required as per detail specification.				
30.1	300 mm wide x 38 mm height, 3 compartment min. 1.6 mm thick	3,630	Meter	2562	93,00,060

30.2	225 mm wide x 38 mm height, 3 compartment min.1.6 mm thick	2,200	Meter	1991	43,80,200
30.3	150 mm wide x 38 mm height, 2 compartment min.1.6 mm thick	6,200	Meter	1490	92,38,000
30.4	100 mm wide x 38 mm height, 1 compartment min. 1.6 mm thick	650	Meter	997	6,48,050
30.5	50 mm wide x 38 mm height, 1 compartment min.1.6 mm thick	2,550	Meter	670	17,08,500
31	Supplying , fabricating and installation of following sizes SS 304 junction boxes top cover / clamps / hangers for light fixtures/ for floor-wall junction boxes etc made out of various gauge sheet /Angle/Flat/rod/ channel/box section etc with all necessary accessories like bend, junction boxes, coupler, supporting clamps, elbows, hardware, anchor fasteners etc and providing 25mm/32mm holes duly covered with rubber cover as required. All the necessary fabrication required will be included in the scope of contractor. Scope also includes powder coating of each items on all the sides complete in all respect as instructed by engineer incharge.	10,000	kg	661	66,10,000
32	Supplying & Fixing of following adjustable height floor junction box made out of pre galvanized sheet min. 1.6mm thick base, cover & min. 2.0 mm thick for Lid with Electrostatic polyster epoxy coating or 275 GSM coating mass. with suitable depth Trap lid to be provide to acodomate the specified flooring. The base of junction box should have pre punched / champhered knockouts on all four sides to accomodate trunking from a minimum 50mm to maximum 400mm width & 38mm height. The system must have smooth curved die cast pillars for ease of pulling cables. The cover plate & frame should be capable to adequate load bearing capacity min. 5kN as per EN 50082-2-2.Necessary separating retainers shall be provided for segration of Power, Data & Multi media cables. Cover of junction box should be fixed either by 4 nos. of screws on support or with hinged facilitate frame as per requirement or informed by engineer in charge.				
32.1	150mm (L) x 150mm (W) x 50 – 80 (H) / 60- 75 (H) / 65 - 90(H)	520	Each	2111	10,97,720

32.2	225-250mm (L) x 225-250mm (W) x 50 – 80 (H) / 60- 75 (H) / 65 - 90(H)	2,440	Each	2778	67,78,320
32.3	300mm (L) x 300mm (W) x 50 – 80 (H) / 60- 75 (H) / 65 - 90(H)	745	Each	4722	35,17,890
32.4	400mm (L) x 400mm (W) x 50 – 80 (H) / 60- 75 (H) / 65 - 90(H)	1,050	Each	7069	74,22,450
	EARTHING				
33	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 Meter long etc. with charcoal/ coke and salt as required.	20	Each	8351	1,67,020
34	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 Meter long etc. with charcoal/ coke and salt as required.	30	Each	15004	4,50,120
35	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe from earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	716	Meter	1638	11,72,808
36	Providing and fixing 25 mm X 5 mm G.I. strip in 40 mm dia G.I. pipe from earth electrode including connection with G.I. nut, bolt, spring, washer excavation and re-filling etc. as required.	716	Meter	755	5,40,580
37	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	716	Meter	1246	8,92,136
38	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	996	Meter	287	2,85,852

39	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing along with existing surface/ recessed conduit/submain wiring/ cable as required.	55,500	Meter	50	27,75,000
	MV CABLE AND CABLE LAYING				
40	Supply, loading, transportation unloading and storages at site , shifting from storage place to site of following sizes of XLPE insulated FRLSH sheathed, Aluminium conductor armoured power cable of 1.1 KV grade conforming to IS amended upto date and as per specifications.All cables shall be tagged. Complete as required.				
40.1	4C x 16 Sq.mm Al Cable	300	Meter	275	82,500
40.2	4C x 25 Sq.mm Al Cable	4,200	Meter	326	13,69,200
40.3	3.5C x 240 Sq.mm Al. Cable	300	Meter	2125	6,37,500
40.4	3.5C x 400 Sq.mm Al. Cable	3,000	Meter	3344	1,00,32,000
41	Supply, loading, transportation unloading and storages at site , shifting from storage place to site of following sizes of XLPE insulated FRLSH sheathed, Copper conductor armoured power cable of 1.1 KV grade conforming to IS amended upto date and as per specifications. All cables shall be tagged. Complete as required.				
41.1	4C x 6.0 Sq.mm CU. Cable	10,750	Meter	596	64,07,000
41.2	4C x 10.0 Sq.mm CU. Cable	9,200	Meter	977	89,88,400
42	Laying and fixing of one number XLPE insulated and FRLSH sheathed power cable of 1.1 KV grade of following size on cable tray as required.				
42.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	24,450	Meter	53	12,95,850

43	Above 185 sq. mm and upto 400 sq.mm (clamped with 40x3mm MS flat clamp)	3,300	Meter	226	7,45,800
	MV CABLE JOINTING & END TERMINATION				
44	Supplying and making indoor end termination with brass compression gland and Heavy Duty copper lugs for following size of PVC insulated and PVC sheathed / XLPE Copper conductor cable of 1.1 KV grade Complete as required.				
44.1	4C x 6.0 Sq.mm CU. Cable	840	Each	383	3,21,720
44.2	4C x 10.0 Sq.mm CU. Cable	725	Each	407	2,95,075
45	Supplying and making indoor end termination with brass compression gland and Aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE Aluminium conductor cable of 1.1 KV grade Complete as required.				
45.1	4C x 16 Sq.mm Al Cable	32	Each	366	11,712
45.2	4C x 25 Sq.mm Al Cable	540	Each	373	2,01,420
45.3	3.5C x 400 Sq.mm Al. Cable	32	Each	1713	54,816
45.4	3.5C x 240 Sq.mm Al. Cable	24	Each	1160	27,840
46	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required.	7,320	Mtr	54	3,95,280

47	UPS INPUT PANEL TTA PANEL (WITH GAS SUPPRESSION SYSTEM) Supply, erection, testing and commissioning of 415V, 3 phase 4 wire 50 c/s UPS INPUT PANEL fully compartmentalized cubical type, as per the standards IEC61439-1&2 as tested assembly (TTA) ,tested for impulse voltage 8 KV,IP 42 fabricated CRCA sheet steel of 2 mm thick for frame work and covers, 3 mm thick for gland plates i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having required capacity extensible type FP bus bars of high conductivity, DMC / SMC bus bars of high conductivity, DMC/ SMC bus bar supports, with short circuit withstand capacity of 50KA for 1 Sec., bottom base channel of MS section not less than 100 mm x 50 mm x 5 mm thick, fabrication shall be done in transportable sections, Form of separation shall be form 4b with metallic separation only entire panel shall have a common copper earth bar of size 25 mm x 5 mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of bus bars, interconnection, interlocking between feeders etc.				
	with indication lamps, push buttons necessary accessories, complete with following incoming and outgoing switchgears with protection and metering etc. as per specification and schematic diagram complete as required, with incoming & outgoing cable entry from bottom/top , wiring with 2.5sq. mm. FRLSH insulated copper conductor , cable alleys, PLC cable gland i/c providing following switch gears Supply, Installation, testing & commissioning of Inert type Novec-1230/FM200 or equivalent Fire Detection Tube based Gas suppression system for electrical panel. It includes all the require accessories/equipments				
	to complete the panel protection, as per detail specification.All ACBs should have $I_{cs}=I_{cu}=I_{cw}$ for 1 secAll MCCBs shall be rating for 50kA ($I_{cs}=I_{cu}$). All MCCBs above 63A should be provided with Copper Spreader TerminalsMarshalling Bay To Be Provided for BMS OperationApproval shall be taken for each panel before fabrication.				

	Incomer 1000A FP EDO ACB (50kA) with microprocessor based O/L, S/C, Instantaneous, E/F - 2 Nos. All incoming breaker should be communicable for status monitoring & Controlling through Modbus over TCP/IP RYB on, off trip indication lamp - 2 set. SPD type II, min. 50KA, FP - 2 nos. Multi Function Meter with RS 485 port.- 2 nos. C.T. 1000A/5A, CLASS 1.0, 5VA- 6 nos. Bus Coupler 1000A FP EDO ACB (50kA) with microprocessor based with O/L, S/C & inbuilt E/F Protection.as a buscoupler - 1 no. Busbar 1250A FP Al busbar (50kA)				
	Outgoing: 400A FP MCCB (50kA) microprocessor based with inbuilt E/F Protection. - 7 nos. Multi Function Meter with RS 485 port -7 nos. on, off trip indication lamp. - 7 set. C.T. 400A/5A, CLASS 1.0, 5VA- 21 nos. Complete as required as per specification.	1	Set	1111047	11,11,047
48	UPS OUTPUT PANEL TTA PANEL (WITH GAS SUPPRESSION SYSTEM) Supply, erection, testing and commissioning of 415V, 3 phase 4 wire 50 c/s UPS OUTPUT PANEL at Substation fully compartmentalized cubical type, as per the standards IEC61439-1&2 as tested assembly (TTA) ,tested for impulse voltage 8 KV,IP 42 fabricated CRCA sheet steel of 2 mm thick for frame work and covers, 3 mm thick for gland plates i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having required capacity extensible type FP bus bars of high				

conductivity, DMC / SMC bus bars of high conductivity, DMC/ SMC bus bar supports, with short circuit withstand capacity of 36KA for 1 Sec., bottom base channel of MS section not less than 100 mm x 50 mm x 5 mm thick, fabrication shall be done in transportable sections, Form of separation shall be form 4b with metallic separation only entire panel shall have a common copper earth bar of size 25 mm x 5 mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of bus bars, interconnection, interlocking between feeders etc.				
with indication lamps, push buttons necessary accessories, complete with following incoming and outgoing switchgears with protection and metering etc. as per specification and schematic diagram including provision to be made for interfacing with BMS etc. complete as required, with incoming & outgoing cable entry from bottom/top and bus-duct entry from top, wiring with 2.5sq. mm. FRLSH insulated copper conductor , cable alleys, PLC cable gland i/c providing following switch gears Supply, Installation, testing & commissioning of Inert type Novec-1230/FM200 or				
equivalent Fire Detection Tube based Gas suppression system for electrical panel. It includes all the require accessories/equipments to complete the panel protection, as per detail specification. All ACBs should have $I_{cs}=I_{cu}=I_{cw}$ for 1 sec All MCCBs shall be rating for 50kA ($I_{cs}=I_{cu}$). All MCCBs above 63A should be provided with Copper Spreader Terminals Approval shall be taken for each panel before fabrication.				
Incomer 400A FP MCCB (50kA) microprocessor based with inbuilt E/F Protection. - 7 nos. All incoming breaker should be communicable for status moniroting & Controlling through Modbus over TCP/IP RYB on, off trip indication lamp - 7 set. SPD type II, min. 50KA, FP - 7 no. Multi Function Meter with RS 485 port.- 7 nos. C.T. 400/5A, CLASS 1.0, 5VA- 7 set. Busbar 2500 A 3P + 2N Al busbar (50kA)				

	Outgoing : 400A FP MCCB (50kA) microprocessor based with inbuilt E/F Protection. - 10 no. Multi Function Meter with RS 485 port -10 nos. ON/OFF trip indication lamp. - 10 set. C.T. 400A/5A, CLASS 1.0, 5VA- 30 nos. Complete as required as per specification.	1	Set	1613124	16,13,124
49	KITCHEN PANEL Supply, erection, testing and commissioning of 415V, 3 phase 4 wire 50 c/s , LT Panel cubical type, IP 43 fabricated CRCA sheet steel of 2 mm thick for frame work and covers, 3 mm thick for gland plates i/c cleaning & finishing complete with 7 tank process for powder coating in approved shade, having required capacity extensible type FP bus bars of high conductivity, DMC / SMC bus bars of high conductivity, DMC/ SMC bus bar supports, , bottom base channel of MS section not less than 100 mm x 50 mm x 5 mm thick, fabrication shall be done in transportable sections, entire panel shall have a common copper earth bar of size 25 mm x 5 mm at the rear with 2 Nos. earth stud, solid connections from main bus bar to switch gears with required size of bus bars, interconnection, interlocking between feeders etc.				
	with indication lamps, push buttons necessary accessories, complete with following incoming and outgoing switchgears with protection and metering etc. as per specification and schematic diagram including provision to be made for interfacing with BMS etc. complete as required , wiring with 2.5sq. mm. FRLSH insulated copper conductor , cable alleys, cable gland i/c providing following switch gears All MCCBs above 63A should be provided with Copper Spreader Terminals Marshalling Bay To Be Provided for BMS Operation Approval shall be taken for each panel before fabrication.				

	Incomer 250A FP MCCB TM Based (36kA) with inbuilt E/F Protection- 1 nos.. All incoming breaker should be communicable for status moniroting through Modbus over TCP/IP. RYB on, off trip indication lamp - 1 set. SPD type II, min. 36KA, FP - 1 no. Multi Function Meter with RS 485 port.- 1 no. C.T. 250/5A, CLASS 1.0, 5VA- 3 nos. Busbar 350A AL. busbar (36kA)				
	Outgoing : 5 to 32 Amp TPN MCB - 8 No. 63 Amp TPN MCB - 8 No Complete as required as per specification.	1	Set	368552	3,68,552
50	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	36	Each	315	11,340

51	Linear Ceiling Suspended Light Fixture for Baffle Ceiling(Workhall) Supply Installation,Testing and Commissioning of IP 40 Pendant ceiling LED linear downlight with opal prismatic diffuser with housing made with extruded aluminium casing profile having minimum thickness 1.4 mm and end caps matching color of the fixture and stainless steel adjustable length suspension kit with wide beam angle with Minimum delivered luminous flux 2200lm/m (with diffuser), CCT :4000K with SDCM<3, Minimum luminaire efficacy 120lm/W (with diffuser and driver), suitable for achieving UGR≤19, Lamp life ≥50,000hrs as per L80/B50, CRI ≥90 with R9>70, Integral switched ON/OFF Driver suitable for operation on 220-240V AC supply, THD≤10%, Power factor 0.9 or above, Power factor 0.9, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all mounting and installation accessories complete as required.Luminaire dimensions Linear: L: As per the drawing, W: 40-60mm, H:60-80mm, Mean Height and size: To be decided on site (Luminaire to be provided with adjustable length of suspension cable) Exact lengths of items in RMT shall be provided in maximum available length module with minimum available residue that matches nearest to the indicated quantity in the drawing, Finish: Sample shall be submitted for finish selectionLocation: WorkHall and as required.	7,769	Meter	4664	3,62,34,616
52	Linear Ceiling Suspended Light Fixture for Baffle Ceiling(Minister & Secretary) Supply Installation, Testing and Commissioning of 28 Watt, IP40 DALI Dimmable :4000K with SDCM <3, Minimum luminaire efficacy 80 lm/W (with diffuser and driver), beam angle > 70 degree, suitable for achieving UGR≤16, Lamp life ≥50,000hrs as per L80/B50, CRI ≥ 90 with R9>70, Pendant ceiling LED linear downlight with antiglare alluminum dark reflector, made with extruded aluminium casing profile having minimum thickness 1.3 mm.and end caps matching color of the fixture and stainless steel adjustable length suspension kit suitable for operation on 220-240V AC supply, integral switched DALI Dimmable power supply and control unit , THD ≤10%, Power factor 0.9, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all	96	Each	11686	11,21,856

	mounting and installation accessories complete as required. Luminaire dimensions Linear: L: 1150-1250 mm, W: 65-80mm, H:70-100mm, Mean Height and size: To be decided on site (Luminaire to be provided with adjustable length of suspension cable) , Finish: Sample shall be submitted for finish selection Location: Minister and Secretary and as required.				
53	Linear Ceiling Suspended Light Fixture for Baffle Ceiling(AS/JS) Supply, Installation, Testing and Commissioning of 22 Watt, IP40, CCT :4000K with SDCM <3, Minimum luminaire efficacy 100 lm/W (with diffuser and driver), beam angle > 60 degree, suitable for achieving $UGR \leq 16$, Lamp life $\geq 50,000$hrs as per L80/B50, CRI ≥ 90 with R9>70, Pendant ceiling LED linear downlight with antiglare aluminum dark reflector, housing made with extruded aluminium casing profile having minimum thickness 1.5 mm. and end caps matching color of the fixture and stainless steel adjustable length suspension kit suitable for operation on 220-240V AC supply, integral switched ON/OFF power supply driver, THD $\leq 10\%$, Power factor 0.9, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all mounting and installation accessories complete as required. Luminaire dimensions Linear: L: 1150-1250 mm, W: 30 50mm, H:70-90mm, Mean Height : To be decided on site (Luminaire to be provided with adjustable length of suspension cable) , Finish: Sample shall be submitted for finish selection Location: AS/JS and as required.	300	Each	7904	23,71,200

54	Linear Ceiling Suspended Light Fixture (Batten) Supply, Installation, Testing and Commissioning of surface mounted/ Pendant ceiling suspended IP20 LED linear batten luminaire of industrial grade with painted metal housing for durability with frosted polycarbonate lens for even and low glare lighting with uniform colour quality, with high quality polycarbonate diffuser stainless steel adjustable length suspension kit with Minimum delivered luminous flux is 2000lm, Minimum luminaire efficacy 100lm/W, Lamp life $\geq 50,000$hrs as per L70/B10, CRI ≥ 70, UGR≤ 19, as required, CCT :4000K with SDCM <3 with Integral switched ON/OFF Driver suitable for operation on 220-240V AC supply with THD $\leq 10\%$, Power factor 0.9 or above, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all mounting and installation accessories complete as required. Luminaire dimensions: L:1150- 1200mm, W: 20-45mm, H: 30-50mm, Mean Height: To be decided on site (Luminaire to be provided with adjustable length of suspension cable), Finish: Sample shall be submitted for finish selection Location: Miscellaneous	652	Each	2313	15,08,076
55	Recessed Circular Downlighter with dark Reflector (Minister, Secretary, Conference Room) Supply Installation, Testing and Commissioning of COB based 14 Watt, IP40 DALI Dimmable, CCT :4000k with SDCM <3, Minimum luminaire efficacy 110 lm/W (with reflector and driver), beam angle >60 degree, suitable for achieving UGR≤ 19, Lamp life $\geq 50,000$hrs as per L80/B50, CRI ≥ 90 with R9>70, recessed downlighter with antiglare alluminum dark reflector, made with die cast aluminium, all necessary mounting kit suitable for operation on 220-240V AC supply, non-integral switched DALI Dimmable power supply and control unit, THD $\leq 10\%$, Power factor 0.9, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all mounting and installation accessories complete as required. Luminaire dimensions : Shape : Round: Cut out Dia: 70mm-100 mm, Depth/Height : 50-100mm, MH: To be decided on site Finish: Sample shall be submitted for finish selection. Location: Minister, Secretary and conference room as required	1,516	Each	3934	59,63,944

56	Recessed Circular Downlighter with dark Reflector(AS/JS) Supply Installation,Testing and Commissioning of COB based 14 Watt, IP40 CCT :4000K with SDCM <3, Minimum luminaire efficacy 110 lm/W (with reflector and driver), beam angle >60 degree, suitable for achieving UGR≤19, Lamp life ≥50,000hrs as per L80/B50, CRI ≥ 90 with R9>70, recessed LED downlighter with antiglare alluminum dark reflector, made with die cast aluminium, all necessary mouting kit suitable for opeation on 220-240V AC supply, non-integral switched ON/OFF power supply and control unit , THD≤10%, Power factor 0.9, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all mounting and installation accessories complete as required.Luminaire dimensions Round: Dia: 70mm-100 mm, Depth/Height : 50-100mm, MH: To be decided on site Finish: Sample shall be submitted for finish selectionLocation: AS/JS room as required.	1,352	Each	3242	43,83,184
57	Recessed Circular Downlighter with prismatic diffusor (Common Areas) Supply, Installation,Testing and Commissioning of 14 Watt, IP40 CCT :4000K with SDCM <3, Minimum luminaire efficacy 100 lm/W (with reflector and driver), beam angle >120 degree, suitable for achieving UGR≤19, Lamp life ≥50,000hrs as per L80/B50, CRI ≥ 90 with R9>70, recessed downlighter with prismatic diffusor, made with die cast aluminium, all necessary mouting kit suitable for opeation on 220-240V AC supply, non-integral switched ON/OFF power supply and control unit , THD ≤10%, Power factor 0.9, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all mounting and installation accessories complete as required. Luminaire dimensions: Shaped: Round, Cut out Dia: 120mm-140 mm, Depth/Height: 40-60mm, MH: To be decided on site Finish: Sample shall be submitted for finish selection Location: Common Area as required.	3,578	Each	1861	66,58,658

58	Circular Ceiling Suspended Light Fixture for Acoustic Baffle ceiling (Day Car Room) Supply Installation, Testing and Commissioning of 70 Watt, IP40, CCT :4000K with SDCM<3, Minimum luminaire efficacy 90 lm/W (with diffuser and driver), wide beam angle, suitable for achieving UGR≤19, Lamp life ≥50,000hrs as per L80/B50, CRI ≥ 90 with R9>70, Ceiling suspended Circular LED light with prismatic diffuser with homogeneous light distribution entire surface, made with extruded aluminium housing, suitable for operation on 220-240V AC supply, integral switched ON/OFF power supply driver, THD ≤10%, Power factor 0.9, SPD 2KV, along with 2 m open end cable, with all mounting and installation accessories complete as required. Luminaire dimensions Circular: Dia:1150 mm-1200 mm, height/depth: 70-80mm, Mean Height: To be decided on site Finish: Sample shall be submitted for finish selection	166	Each	28255	46,90,330
59	Curvi-Linear Ceiling Suspended Light Fixture for Baffle Ceiling with DALI dimmable, CCT 4000K (Conference Room) Supply Installation, Testing and Commissioning of 2500 lumen/meter, IP40 DALI Dimmable, CCT :4000K with SDCM <3, Minimum luminaire efficacy 90 lm/W (with diffuser and driver), wide beam angle, suitable for achieving UGR≤19, Lamp life ≥50,000hrs as per L80/B50, CRI ≥ 90 with R9>70, ceiling suspended curved linear LED downlight with opal prismatic diffuser, made with extruded aluminium casing profile having minimum thickness 2.5 mm, stainless steel adjustable length suspension kit suitable for operation on 220-240V AC supply, integral switched DALI Dimmable power supply and control unit, THD ≤10%, Power factor 0.9, SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box, with all mounting and installation accessories complete as required. Luminaire dimensions Shape : As per drawing, Linear: L: As per Drawing, W: 50 60mm, H:70-90mm, Mean Height: To be decided on site (Luminaire to be provided with adjustable length of suspension cable), Finish: Sample shall be submitted for	2,080	Meter	9748	2,02,75,840

	finish selection Location: Conferences and as required.				
60	Task Light (Minister, Secretary) Supply, Installation, Testing and Commissioning of 64 Watt DALI Dimmable and tunable, Ceiling Suspended LED Pendant/Task Light with opal prismatic diffuser IP40 Tunable CCT: 4000K-5700K with SDCM <3, Minimum luminaire efficacy 100 lm/W (diffuser and driver), wide beam angle, suitable for achieving UGR≤19, Lamp life ≥50,000hrs as per L80/B50, CRI ≥ 90 with R9>70, , housing made with extruded aluminium casing profile , stainless steel adjustable length suspension kit suitable for operation on 220-240V AC supply, integral switched Dimmable and tunable power supply and control unit , THD ≤10%, Power factor 0.9, SPD 2KV, along with 2 m open end cable, with all mounting and installation accessories complete as required. Luminaire dimensions : Shape : Linear: L: 2300-2500 mm-, W: 280-320mm, H: 30 -35mm, Mean Height: To be decided on site (Luminaire to be provided with adjustable length of suspension cable), Finish: Sample shall be submitted for finish selection Location: Minister, Secretary.	48	Each	17984	8,63,232
61	Task Light (AS/JS) Supply, Installation, Testing and Commissioning of 32 Watt, DALI Dimmable and tunable, Ceiling Suspended LED Pendant/Task Light with opal prismatic diffuser IP40 CCT : 4000K-5700K with SDCM <3, Minimum luminaire efficacy 100 lm/W (diffuser and driver), wide beam angle, suitable for achieving UGR≤19, Lamp life ≥50,000hrs as per L80/B50, CRI ≥ 90 with R9>70, , housing made with extruded aluminium casing profile , stainless steel adjustable length suspension kit suitable for operation on 220-240V AC supply, integral switched Dimmable and tunable power supply and control unit, THD ≤10%, Power factor 0.9, SPD 2KV, along with 2 m open end cable, with all mounting and installation accessories complete as required. Luminaire dimensions: Shape: Linear: L: 1150- 1250 mm-, W: 280-320mm, H: 30-35 mm, Mean Height: To be decided on site (Luminaire to be provided with	50	Each	8131	4,06,550

	adjustable length of suspension cable), Finish: Sample shall be submitted for finish selection Location: AS/JS.				
62	Recessed 2 Feet x 2 Feet LED Light Fixture (Misc.) Supply, Installation, Testing and Commissioning of IP40 Recessed ceiling LED panel with matt opal diffuser, square recessed luminaire housing in Aluminium material for installation in false ceiling. with Minimum delivered luminous flux is 2400 lm, Minimum luminaire efficacy 120lm/W, Lamp life L80/B10 $\geq 50,000$hrs, CRI ≥ 80 with R9>70, UGR≤ 19, CCT :4000K with SDCM≤ 3, Remote/integral switched ON/OFF Driver suitable for operation on 220-240V AC supply, THD $\leq 10\%$, Power factor 0.9 or above, SPD 2KV, all mounting and installation accessories. SPD 2KV, along with 2 m open end cable, secondary cable and conduit from junction box to the Luminaire alongwith all mouting accessories etc. complete as required. Luminaire dimensions: L:595mm, W:595mm, H : Up to 55mm. Finish: Sample shall be submitted for finish selection Location: Misc. Place	180	Each	3352	6,03,360
63	Supply, installation, testing & commissioning of Passice Infrared (PIR) technology-based Occupancy sensor having high performance, non regulating programmable type, suitable for connected load up to 10 amp. For mounting height up to 2.8 mtr. and for 5 m diameter coverage area along with necessary fixing arrangements i/c programming at site etc. complete as required. Occupancy sensor can suitable to detect presence & movement both type detection	400	Each	4896	19,58,400

64	Supply Installation, Testing and Commissioning of 3 Channel DALI and Tunable Controller interface between DALI & KNX wired system. DALI outputs allowing it to control up to 192 DALI devices. The DALI control signals can be programmed to operate in tandem with the One internal switched output, which will automatically isolate the power circuit when all associated DALI channels are at 0%. The device is DIN-rail mountable integral DALI bus power supply, removing the need for an additional external device. Supply: 100-240V 50/60Hz. Control & status data, Control of up to 192 DALI devices per channel Setting the colour temperature for luminaires with DALI Device. Suitable for operation in emergency lighting systems Individual, group or central addressing- - Effect control for dynamic lighting effects and circadian effect as per latest NBC as required	64	Each	41822	26,76,608
65	Supply Installation, Testing and Commissioning of Automation DB is suitable for Lighting automation with Complete set of MCB, RCCB, Surge protection etc	64	Each	11170	7,14,880
66	Supply Installation, Testing and Commissioning of 6/8/12 Button keypad with Proximity Sensor with backlit effect and switch for Manual control of Mood/Scenes/ switching	118	Each	31176	36,78,768
67	SITC bus DALI power cable conductor solid bare copper wire, 1.5 sqmm formation 2 core twisted around central filler easy strip jacket LSZH outer jacket LSZH compound HM2 construction 2x1.5 sqmm.	18,000	Meter	40	7,20,000

68	S//FTP CAT6A CABLING COMPONENTS Supply, Laying & Termination of specified make LSZH S/FTP CAT6A cable in existing/prelaid surface/recessed steel/PVC conduits or pipes or floor raceways or cable trays, but without the cost of steel/PVC conduits or pipes or floor raceways or cable trays. The cable is to be drawn from individual workstation area/device/IO to the nearest distribution rack or networking rack. It shall be within the scope of contractor to carry out and submit scanner readings for all IOs for meeting the requirements of relevant EIA/TIA standards as per CAT6A cabling requirements. The contractor shall submit a detail IO maps, labelling and documentation related to terminations. It shall be inclusive of grounding and bonding and all the necessary mounting accessories and hardware complete as required for a complete installation.	18,000	Meter	107	19,26,000
	UPS				
69	Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) at operating temperature 0 to 40 0C, Relative humidity 0 to 95%, Online double conversion true sine wave Uninterrupted hot swappable (allow for the replacement or addition of battery modules without shutting down the entire system) modular Power Supply (UPS) system with N+1 modules (N denotes total number of modules required for rated capacity). The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. UPS shall have inbuilt phase sequence correction. The UPS systems offered are to be of the latest technology with Digital Control Microprocessor based for				
	reliable operation using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter (3 Level) with PWM (Pulse Width Modulation). The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >96% while operating on battery mode and delivering quality				

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

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	power to the 100% non-linear loads. Current total harmonic effect(ITHD) on the input grid shall be < 5% at 50 %load. (The required LC (inductor (L) and a capacitor (C)) filters shall be included in UPS cost), extreme power factor kit to be included to limit the input power factor (PF) to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1), however UPS shall be suitable to				
	take load at 0.7 lagging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC : 3Phase 400V +/-20%, 50 Hz +/-5 Hz, AC Output voltage: 3Phase 415 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins, Sine wave output. Non condensing, noise level less than 60db at 1 meter distance, protections: Input Under voltage over voltage, abnormal out voltage, battery over charging, output over current, short circuit protection, battery deep discharge protection, 10KV surge. UPS must comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI)-type UPS. . Communication RS232/RS485/SNMP port open protocol for BMS integration, all hardware &				
	software for IoT Communication as per approved by Engineering in charge. Required battery racks and interconnecting copper conductor cables of suitable size and connectors and all required accessories are inclusive of the cost). This system must provide a means for logging and alarming of all monitored points plus email notification. Forced air-cooling with integral inbuilt fans with redundancy (if one fan fail UPS should be able to handle at least 80% of the load, Noise Level 65 DB at 1 meter distance. The system shall be in compliance IEC 62040- 1,2 & 3, IS: 16242 and CPWD Specification. Display Panel (minimum) (In-build 5 inch or more LC Display / LED) to display : a) Input: Voltage, current, Frequency. b) Bypass: Voltage, Frequency. c) Output: Voltage, frequency, Current. d) Battery:				

	Voltage, Capacity. e) Load: KVA, KW, Percentage. f) Temperature: STS, Inverter, PFC. g) Event Logging & Statistical Data (On LCD/LED): UPS should capture and display up to 3000 events like: Over temperature / DC Bus Fail / Fan Fail / Fuse Fail / Overload / Short-circuit / Device Fail / Inverter Fail / Rectifier Fail / Bypass Fail, etc. h) Statistical Data: No. of power failures / Transfers to Bypass / Total Running time, etc. i) Mains Mode of Operation / Battery Mode of Operation / Bypass feeding the load / UPS Fault / Battery charging and discharging, overload, battery voltage and battery capacity. j) Audible Alarms : Mains Failure, Battery Low Alarm, UPS Overload, Fault, Shutdown, Input Over, Under Voltage, Output Over, Under Voltage, Battery Over, Under Voltage, Over Load and short circuit, Over Temperature. The UPS should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location, UPS parallel operation will also be required etc				
69.1	200KVA (Each Power module shall be < 50 KVA)	6	Set	2375417	1,42,52,502
	In Building Solutions(IBS)				
70	Supply Installation Testing & Commissioning of 2 way Splitter, 698-3800 MHz, PIM: -150 dBc (2X43 dBm), 100W/Port, N(F) Connector, Inner Conductor: CU, VSWR: 1.3	840	Each	410	3,44,400
71	Supply Installation testing & Comissioning of 3 way Splitter, 698-3800 MHz, PIM: -150 dBc (2X43 dBm), 100W/Port, N(F) Connector, Inner Conductor: CU, VSWR: 1.3	170	Each	475	80,750
72	Supply Installation testing & Comissioning of 6dB Coupler, 698-3800 MHz, PIM: -150 dBc (2X43 dBm), 100W/Port, N(F) Connector, Inner Conductor: CU, VSWR: 1.3	295	Each	432	1,27,440

73	Supply Installation testing & Comissioning of 10dB Coupler, 698-3800 MHz, PIM: -150 dBc (2X43 dBm), 100W/Port, N(F) Connector, Inner Conductor: CU, VSWR: 1.3	53	Each	482	25,546
74	Supply Installation testing & Comissioning of 15dB Coupler, 698-3800 MHz, PIM: -150 dBc (2X43 dBm), 100W/Port, N(F) Connector, Inner Conductor: CU, VSWR: 1.3	28	Each	504	14,112
75	Supply Installation testing & Comissioning of Combiner,4:4, 698-3800 MHz, PIM: -160 dBc (2X43 dBm), 100W/Port, Din(F) Connector, Isolation: 40dB, VSWR: 1.3	23	Each	8926	2,05,298
76	Supply Installation testing & Comissioning of 1/2" N(M) Connector, DC-4000 MHz, PIM: - 153 dBc (2X43 dBm), 500W @ 2GHz, Inner Conductor-Copper-Silver Plated, Durability: 500 Cycles,VSWR: 1.3, Capex	5,445	Each	188	10,23,660
77	Supply Installation testing & Comissioning of 7/8" N(M) Connector, DC-4000 MHz, PIM: - 153 dBc (2X43 dBm), 500W @ 2GHz, Inner Conductor-Copper-Silver Plated, Durability: 500 Cycles, VSWR: 1.3, Capex	415	Each	287	1,19,105
78	Supply Installation testing & Comissioning of 7/8" D(M) Connector, DC-4000 MHz, PIM: - 153 dBc (2X43 dBm), 500W @ 2GHz, Inner Conductor-Copper-Silver Plated, Durability: 500 Cycles, VSWR: 1.3, Capex	80	Each	413	33,040
79	Supply Installation testing & Comissioning of 1/2" Din(M) Connector, DC-4000 MHz, PIM: - 153 dBc (2X43 dBm), 500W @ 2GHz, Inner Conductor-Copper-Silver Plated, Durability: 500 Cycles, VSWR: 1.3, Capex	10	Each	200	2,000

80	Supply Installation testing & Commissioning of 1/2" Corrugated Coaxial RF Cable - FRLSZH, 80 - 3800 MHz	17,901	Meter	310	55,49,310
81	Supply Installation testing & Commissioning of 7/8" Corrugated Coaxial RF Cable - FRLSZH, 80 - 3800 MHz	8,073	Meter	338	27,28,674
82	Supply Installation testing & Commissioning of IBS-Weather Proofing Kit	113	Each	181	20,453
	Total of C1 - EI & FANS, ELECTRICAL PANELS, UPS, LIGHTING FIXTURE				39,05,36,408
	C2 - FIRE ALARM SYSTEM AND PUBLIC ADDRESS SYSTEM				
1	Supplying, installation, testing and commissioning of micro processor based intelligent addressable main fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 640 character graphics/ 10 Inch ColorLCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5 % V, 50 hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger having capacity to charge upto 200AH. The panel shall have facility to connect printer to printout log and facility to have seamless integration with analog/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories. The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications. The Panel Shall be seamlessly integrated with the existing FAS system installed.				

1.1	Ten Loop Panel.	2	Nos	476893	9,53,786
2	Supplying, installation, testing & commissioning of central graphical fire alarm management system to centrally monitor and operate the fire alarm system complete as required.	1	Nos	210264	2,10,264
3	Supplying, installation, testing & commissioning of repeater panel with 320 character/ Touch screen LCD display with inbuilt reset, acknowledge and silence switches complete as required.	1	Nos	113734	1,13,734
4	Supplying, installation, testing & commissioning of intelligent analog addressable photothermal detector complete with mounting base complete as required.	2,149	Nos	3004	64,55,596
5	Supplying, installation, testing and commissioning Addressable High Sensitivity Photo Detector with sensitivity level of 0.02% to 2% Obs/Feet. The detector shall have the optic block to amplify signals from smoke, but diminish stray internal reflections that can cause false alarms. The detector shall have twin bi-colour LED for 360 deg viewing. Addressing shall be with user friendly rotary decimal switches for all Server rooms and any other critical rooms.	100	Nos	35271	35,27,100
6	Supplying, installation, testing & commissioning of response indicator on surface/recessed MS Box having two LED, metallic cover complete with all connections etc as required.	700	Nos	306	2,14,200
7	Supplying, installation, testing & commissioning of fault isolator complete with base as required.	120	Nos	3434	4,12,080
8	Supplying, installation, testing & commissioning of intelligent addressable thermal detector with rate of rise cum fixed temperature thermistor at 8.3 Deg/C per	141	Nos	2866	4,04,106

	minute, with Twin LED, complete with base as required for pantry rooms/cafetria etc				
9	Supplying, installation, testing & commissioning of addressable fire control module complete as required.	99	Nos	3156	3,12,444
10	Supplying, installation, testing and commissioning of Addressable Relay Module for AHU, Fire Suppression & other Third Party Outputs. The relay module shall provide contact rated at 24v DC, 2A. The device shall have an LED which shall blink in normal state & get steady on activation to monitor the health status of the device. Addressing shall be with user friendly rotary decimal switches. Module shall be supplied with mounting plate from OEM for ease of installation & maintenance.	156	Nos	4549	7,09,644
11	Supplying, installation, testing and commissioning approved make Addressable Monitor Module for Sprinklers, Panic Bars & other Third Party Inputs. The monitor module shall monitor potential free contacts. The device shall have an LED which shall blink in normal state & get steady on activation to monitor the health status of the device. Addressing shall be with user friendly rotary decimal switches. Module shall be supplied with mounting plate from OEM for ease of installation & maintenance.	135	Nos	4204	5,67,540
12	Supplying, installation, testing & commissioning of intelligent addressable duct detector including suitable Photo detector complete with base as required.	40	Nos	8183	3,27,320
13	Supplying, installation, testing & commissioning of intelligent interface unit BACnet/ Modbus protocol i.e. supplying communication links between building management system and fire alarm control panel complete as required.	1	Nos	196207	1,96,207

14	Supplying, installation, testing & commissioning of minimum 24 zone, voice alarm controller with USB, MP4 player (including minimum 24 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required.	2	Nos	132115	2,64,230
15	Supplying, installation, testing & commissioning of 1.5/3/6W metal box ceiling/wall speakers complete as required.	112	Nos	1891	2,11,792
16	Supplying, installation, testing & commissioning of ceiling/wall mounted loud speaker, 3/1.5 Watt in ABS enclosure complete as required.	1,842	Nos	2555	47,06,310
17	Supply, Installation, Testing & Commissioning of 1X500W Class-D Amplifier, which can provide automatic re-settable overcurrent, overload, overheating, overvoltage, under-voltage and DC protection and High Efficiency Class D Power Amplifier, 500W, 100V/70 Output, with 100 - 240 VAC input and 24 VDC backup power Supply	14	Nos	224585	31,44,190
18	Supplying, installation, testing & commissioning of Voice command keypad 6 zone, with microphone assembly complete as required.	2	Nos	85450	1,70,900
19	Supplying & laying of 2x1.5 sqmm fire survival armoured cable, 600/1000V rated with annealed copper conductor having glass mica fire barrier tape covered by an extruded layer of Cross Linkable Ethylene Propylene Rubber (EPR) insulation and LSZH inner bedding, steel wire armouring & LSZH outer sheath complete as required.	24,550	Meter	386	94,76,300
20	Supplying & laying of 2x1.5 sqmm fire alarm armoured cable, 600/1000V rated with annealed copper conductor having XLPE insulation, steel wire	19,500	Meter	192	37,44,000

	armouring & FRLS/HFFR outer sheath complete as required.				
21	Supplying and fixing 25 mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc. as required.	1,000	Meter	60	60,000
	Total of C2 - FIRE ALARM SYSTEM AND PUBLIC ANNOUNCEMENT SYSTEM				3,61,81,743
	C3 - FIRE FIGHTING				
	PIPE WORK				
1	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 1239/Class -II of IS: 3589 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required : Note:- Forged Steel fittings (15mm to 50mm) as per ASTM A 105 3000CL, end connection Socket welded as per ASME B16.11. Fittings of 50 mm dia & above shall be as per ASTM A 234 Gr. WPB all fittings shall be BW fittings type as per specifications. Colour/shade of Paint shall be as per specification/drawings and as directed by Engineer In Charge.				
1.1	100 mm dia	1,050	Meter	3077	32,30,850
1.2	80 mm dia	1,294	Meter	2277	29,46,438
1.3	65 mm dia	1,294	Meter	1955	25,29,770

1.4	50 mm dia	1,462	Meter	1557	22,76,334
1.5	40 mm dia	2,285	Meter	1259	28,76,815
1.6	32 mm dia	2,016	Meter	1039	20,94,624
1.7	25 mm dia	7,350	Meter	920	67,62,000
	AUTOMATIC SPRINKLER SYSTEM				
2	Supply, Installation, testing and Commissioning of UL Listed/FM Approved 15 NB, 68 deg., K-Factor 5.6 (80), Pendant type, Standard Response, Quartzoid bulb sprinkler with adjustable rosette plate, teflon tape, solution with required accessories etc. complete as per specification/drawings and as directed by Architect / Engineer in charge. Note : Finish/ colour shall be as per specification/drawings and as directed by Architect / Engineer in charge.	2,870	Each	599	17,19,130
3	Supply, Installation, testing and Commissioning of UL Listed/FM Approved 15 NB, with 68°C. temperature rating for Sprinkler bulb and 57°C. for Cover Plate, K-Factor 5.6 (80), Pendant type, Standard Response, Quartzoid bulb sprinkler adjustable royal flush Concealed sprinkler, teflon tape, lock tite solution with required accessories etc. complete as per specification/drawings and as directed by Engineer In Charge. Note : Finish/ colour shall be as per specification/drawings and as directed by Architect / Engineer in charge.	3,318	Each	1553	51,52,854
4	Supply, Installation, Testing and Commissioning of Sprinkler test and Drain Valve (50mm dia) consisting with sight glass, GI pipe with all required fittings as per drawing and as directed.	76	Set	12255	9,26,478

5	Supplying, installation, testing & commissioning of sprinkler flexible pipe (UL Listed) of stainless steel complete with 15 NPT on reducer thread with maximum working pressure of 175 PSI test pressure of 875 PSI (Burst) with branch line (Inlet) 25mm NPT male thread to sprinkler head (Outlet) 15mm NPT female thread with reducer, nipple, 2 side brackets, center bracket, stockbar of following sizes complete as required.				
5.1	1200 mm	4,074	Set	1800	73,33,200
	Sprinkler Monitoring				
6	Providing and fixing flow switch in following sizes MS pipe including connection etc as required				
6.1	100 mm dia	38	Each	8069	3,06,622
6.2	150 mm dia	38	Each	9644	3,66,472
	FIRE EXTINGUISHER SYSTEM				
7	Supply, Installation, testing and Commissioning of Carbon Dioxide (CO2) type Fire Extinguisher conforming to IS:15683, with ISI marked approved fitted with required accessories including wall suspension brackets as per specification/drawings and as directed by Architect / Engineer in charge . a) 4.5 kg	101	Each	4992	5,04,192
8	Supply, Installation, testing and Commissioning of ABC Dry Chemical powder Mono-Ammonium Phosphate (MAP)-90% (stored pressure) type - 6 kg, Squeeze grip Fire Extinguisher conforming to IS:15683, with ISI marked approved fitted with required accessories including wall suspension brackets as per specification/drawings and as directed by Architect / Engineer in charge .	101	Each	2528	2,55,328
	GAS SUPPRESSION SYSTEM				

9	CLEAN AGENT BASED FIRE SUPPRESSION SYSTEM Assumed Areas to be protected:-Note:- 1-System to be designed with Individual Risk with Main + Standby System 2-100% online Stand-by cylinders of clean agent shall be provided for restoring the area protection after discharge of main bank of cylinders. 3-Clean Agent Gas based suppression system shall be halon Free.	900	Cu. meter	7338	66,04,200
	Design, Supply, Installation, Testing & Commissioning of CCOE/PESO Approved UL/ FM/ VDS Listed agent FK-5-1-12 or equivalent, Cylinder and Valve Assembly: As per approved design, seamless cylinder capacity, Liquid at site (fill density not more than 0.89Kg/ litre), pressurised to 25 / 42 bar along with Hydraulic UL/ VD Flow Calculations for the Suppression areas, and vetting of the Software from the OEM Factory Engineer as per specification/drawings and as directed by Architect / Engineer in charge. Below compliance are mandatory to comply with PESO, Gas cylinder rule and compressed gas cylinder rule. PESO License for Valve & PESO License for Cylinder				
	The fire suppression agent FK-5-1-12 or equivalent . The Hydraulic software report should have the dead volume agent quantities reflected for UPS Room as per UL 2166 testing and approval standard as per specification/drawings and as directed by Architect / Engineer in charge .				
	OEM supplied Tank Bracket Assembly complete with C Channel Stand and Supports for above Cylinder as per specification/drawings and as directed by Engineer In Charge. MS Fabrication floor support for cylinder stand 150mm above floor level with 1 coat of primer and 2 coat of Black Enamel Paint.				

UL/ VDS Listed Discharge hose with Manifold Check Valve (Check Valve if More than one Cylinder in Bank) for above Cylinders, complete with Listed Adapters & Accessories as required as per specification/drawings and as directed by Engineer In Charge.				
UL/ FM/ VDS Listed Electrical Actuator with placement indicator switch for Master Cylinder as per NFPA requirement and as per specification/drawings and as directed by Engineer In Charge.				
UL/ VDS Listed Pneumatic Actuator Shipping Assembly with actuation hose & Elbow as per specification/drawings and as directed by Engineer In Charge.				
UL/ VDS Listed Nozzles of required sizes, 360 Deg / 180 Deg Throw, selection as per approved hydraulic flow calculations. The sound pressure developed by discharge of total number of nozzles in each area needs to be submitted considering the distance between server rack and nozzle distance as 1 mtr. Software calculations for sound pressure to be submitted. - as per specification/drawings and as directed by Architect / Engineer in charge.				
Warning Sign Board of size 150mm X 400mm with Marking "GAS DISCHARGE. DO NOT ENTER". Shall Operate on 24 V DC, Driven Through Gas Release Panel. (for use outside room) as per specification/drawings and as directed by Architect / Engineer in charge .				
UL/ VDS Listed Cylinder Low Pressure Switch as per specification/drawings and as directed by Engineer In Charge.				
UL/ VDS Listed Cylinder Discharge Pressure Switch on the piping after discharge hose as per specification/drawings and as directed by Engineer In Charge.				
Piping & Manifold and its support as required, made of Sch 80; ASTM A106 Gr B, as per flow calculations for the specific hazard volume and stand to hold, position & Support the Manifold and Piping properly including Pressure testing for piping with nitrogen as per NFPA 2001 as per specification/drawings and as directed by Engineer In Charge.				

Distribution Pipe Seamless Pipe made of Sch 40 ASTM A106 Gr B of required sizes including all the support and fittings for pipes like U Clamps, Elbows, Sockets, Reducers, Tees, Flanges, Fasteners etc. as per specification/drawings and as directed by Engineer In Charge.				
UL/ VDS/FM Listed Nitrogen Pilot Cylinder for actuation of main cylinder in case the main cylinders are kept within the risk room / multiple bank to be operated with one actuation. The Pilot cylinder shall be PESO approved and the pilot cylinder valve also needs to be PESO approved.				
UL/ VDS/ FM listed single zone gas release panel facility to connect manual abort/ release switch. The panel shall provide potential free contacts for first knock, second knock, trouble/ fault/ VDS status. The Panel shall be including 2 Core x 1.5 mm ² , Multistranded AT Copper, ZHFR Armoured cable, RED in Colour. The cable shall be laid on surface with GI saddle-spacers every 0.3 meters. Complete with GI Junction Box, lugs, cable compression glands, cable tags and Ferruling, required fittings, jointing, bracing, clamping, fastening. The panel shall be complete red color housing, monitored power supply unit, battery charger and batteries as per specification/drawings and as directed by Architect / Engineer in charge.				
Manual abort stations, shall be fitted with transparent hinged covers to avoid possibility of accidental operation. The abort will be monitored simultaneously by the fire alarm or BMS system as per specification/drawings and as directed by Architect / Engineer in charge .				
Manual release station , shall be fitted with transparent hinged covers to avoid possibility of accidental operations. The Release switch shall be monitored simultaneously by the fire alarm or BMS system as per specification/drawings and as directed by Architect / Engineer in charge.				
Conducting Room Integrity Test : Door Fan test to meet the Requirements of the NFPA 2001, and predicting the efficacy of the Protected Area Enclosure from the perspective of Fire Suppression as per specification/drawings and as directed by Engineer In Charge.				

	Total of C3 - FIRE FIGHTING				4,58,85,307
	C4 – HVAC				
1	AHRI / EUROVENT CERTIFIED RECIRCULATING TYPE AIR HANDLING UNIT				
	Supply, Installation, Testing & Commissioning of factory fabricated, horizontal, draw-through, double skin chilled water Air Handling Units (AHUs), AHRI 430 / EUROVENT certified, complete with mixing box, filter section, cooling coil section, heating coil section (where specified), humidifier section, fan section, UVGI section, access doors, fresh air and return air connections with opposed blade dampers, stainless steel drain pan, limit switch, auto air vent, drain valve, provision for installation of differential pressure switches, temperature sensors and all accessories required for complete installation. The unit shall be suitable for continuous operation and shall be supplied complete with lifting lugs, vibration isolation arrangement, mounting accessories, interconnecting hardware and factory wiring. Mechanical performance of AHU casing shall comply with EN 1886 / AHRI 1350.				
	The Air Handling Unit casing shall be tested and certified by an internationally recognized certification body such as AHRI, Eurovent, Intertek or UL in accordance with EN 1886 and/or AHRI 1350 standards. The casing shall comply with Mechanical Strength Class D1, Thermal Bridging Class TB2, Thermal Transmittance Class T2 and Air Leakage Class L1 or better. Documentary evidence of certification shall be submitted for approval prior to manufacture.				

The AHU casing shall be of heavy-duty double skin construction comprising minimum 48 ±2 mm thick factory-injected polyurethane foam (PUF) insulated panels having insulation density not less than 40 kg/m³, enclosed between 0.8 mm thick pre-painted galvanized steel outer skin and 0.8 mm thick galvanized steel inner skin. The panels shall be mounted on extruded aluminium thermal break framework with corrosion-resistant fasteners and airtight neoprene gaskets. The complete casing shall be rigid, self-supporting, thermally insulated and designed to minimize air leakage and thermal bridging while allowing easy access for maintenance.				
The AHU shall be provided with a factory-fabricated insulated mixing chamber suitable for mixing 10% treated fresh air and 90% return air. The mixing chamber shall incorporate fresh air, return air and mixed air sections complete with low leakage aluminium opposed blade volume control dampers, nylon bearings, manual locking quadrants and provisions for motorized actuators compatible with the Building Management System (BMS). The construction shall ensure uniform air mixing with minimum pressure loss before entering the filter section.				
The filter section shall be designed for a maximum face velocity of 500 FPM and shall consist of two-stage filtration comprising washable ISO Coarse (G4) pre-filters followed by ISO ePM1 (F7 equivalent) fine filters conforming to ISO 16890. Disposable commissioning filters shall also be supplied for initial operation. The filter frames shall be corrosion resistant with positive sealing arrangements to prevent air bypass.				
The cooling coil shall be of minimum six-row deep chilled water construction manufactured from seamless ½-inch OD copper tubes mechanically expanded into hydrophilic aluminium fins with stainless steel end plates and heavy-duty headers suitable for a minimum working pressure of 16 bar. The coil shall be selected for a maximum face velocity of 500 FPM and a chilled water entering and leaving water temperatures of 6.7°C and 12.2°C respectively. The coil shall be factory tested hydrostatically and designed to provide the scheduled cooling capacity				

	while maintaining low air-side pressure drop and uniform air distribution.				
	The fan section shall consist of AMCA certified backward curved direct driven EC Fans, statically and dynamically balanced, selected for 100% duty at the specified operating point with minimum fan efficiency of 65%. The fan shall be selected to deliver the scheduled air quantity against the specified external static pressure with maximum outlet air velocity not exceeding 1800 FPM. The complete fan assembly shall be mounted on anti-vibration isolators and flexible canvas connections shall be provided between the AHU and ductwork to minimize transmission of vibration and noise. The fan section shall be designed to ensure uniform airflow across the cooling coil with maximum sound pressure level not exceeding 75 dBA measured at a distance of 1.5 metres from the unit.				
	The fan shall be directly coupled to high efficiency Electronically Commutated (EC) Motor of minimum IE4 efficiency class suitable for 415V $\pm 10\%$, 50Hz, 3-Phase AC supply. The EC motor shall have built-in electronic speed control, maintenance-free sealed bearings, IP55 enclosure, Class-F insulation, thermal overload protection and shall be suitable for continuous operation. The motor shall be capable of speed modulation through 0-10V DC or Modbus/BACnet communication for integration with the Building Management System (BMS) and shall provide maximum operating efficiency over the entire speed range.				
	Each AHU shall be provided with an independent floor-standing or wall-mounted IP55 electrical control panel suitable for indoor installation. The panel shall comprise MCCB/MCB incomer, PLC controller with sufficient digital and analog I/O points, SMPS, control transformer, auxiliary relays, contactors, terminal blocks, selector switches, indicating lamps, control fuses, surge protection devices, POT for manual speed control of EC fans, internal power and control wiring, earthing terminals, cable glands and all accessories required for complete operation. Individual outgoing feeders shall be provided for EC fans, UVGI system, ultrasonic humidifier, PICV actuator, three-way valve actuator, fresh air damper actuator, fire damper actuator and two spare outgoing feeders of minimum 10A rating. The panel shall have provision to receive BMS commands, Fire Alarm System interlocks and				

	shall provide fan run status, trip status, dirty filter alarm and common fault indication. Single point power supply and BMS communication shall be terminated at the AHU panel by the respective agencies.				
	AHU should have humidifier section along with suitable capacity of ultrasonic humidifier and control panel. Unit must be provided with Single/ Double mist outlet pipe as per the manufacturers standard. Water inlet connection and water storage tank made up of SS304L, minimum thickness of tank is 1.5 mm & internal Piping for selected humidifier modules. Single point connection from plumbing agency will be feed to AHU. Humidifier to be sized for Min. 1 Kg/hr for 100 Fresh Air CFM				
	The AHU shall be provided with a factory-installed Ultraviolet Germicidal Irradiation (UVGI) system comprising UV-C lamps, electronic ballasts, stainless steel mounting brackets and protective guards designed for continuous operation. The UVGI system shall be installed downstream of the cooling coil to prevent microbial growth on the cooling coil, drain pan and adjacent internal surfaces while simultaneously disinfecting the passing air stream. The system shall be designed using manufacturer-approved UV sizing software to ensure minimum average UV intensity of 100 $\mu\text{W}/\text{cm}^2$ on the coil surface and a minimum UV dose of 3000 $\mu\text{W}\cdot\text{s}/\text{cm}^2$ in the air stream to achieve a minimum microbial kill efficiency of 99%. The UV lamps shall have a minimum rated life of 9000 operating hours and shall be provided with safety interlocks to automatically switch OFF when the access door is opened.				
	The AHU shall be provided with a factory-fabricated SS304 stainless steel drain pan of minimum 18-gauge thickness extending beneath the entire cooling coil section. The drain pan shall be of double-sloped construction to ensure complete drainage without water stagnation and shall be externally insulated with 19 mm thick closed-cell nitrile rubber insulation to prevent condensation. The drain pan shall be complete with threaded drain connection, automatic air vent, cleanout arrangement and all accessories necessary for proper condensate disposal.				

	Each AHU shall be completely factory assembled and tested prior to dispatch. Factory tests shall include casing leakage test, mechanical strength test, thermal performance verification, airflow performance test, vibration test, noise level measurement, cooling coil hydrostatic pressure test, electrical functional test and overall operational performance test. Certified factory test reports along with AHRI/Eurovent certification, coil test certificates, motor test certificates and electrical panel inspection reports shall be submitted for review and approval before shipment.				
	The scope of work shall include transportation, unloading, shifting, lifting, positioning, alignment, fixing on foundation or support structure, installation of anti-vibration isolators, duct connections, chilled water piping connections, drain piping connections, electrical power and control connections from AHU control panel to EC Fans, UVGI, Humidifier, PICV, earthing, insulation touch-up, testing, balancing and complete commissioning of the AHU system. The contractor shall carry out all necessary functional tests, performance testing, airflow balancing and demonstrate satisfactory operation of the equipment under actual operating conditions in the presence of the Engineer-in-Charge. All tools, tackles, consumables and temporary arrangements required for successful installation and commissioning shall be deemed to be included in the scope. Note:- The variation in SP rise more than 20% will only be considered for Extra item, if there is change in layout w.r.t tender drawing.				
1.1	Selected AHU Airflow: 5,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 10 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	6	Nos	924060	55,44,360
1.2	Selected AHU Airflow: 6,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 12 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	24	Nos	947170	2,27,32,080
1.3	Selected AHU Airflow: 7,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 14 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	31	Nos	1003919	3,11,21,489
1.4	Selected AHU Airflow: 8,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 16 TR, 6-	31	Nos	1037866	3,21,73,846

	Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,				
1.5	Selected AHU Airflow: 9,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 18 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM	5	Nos	1123714	56,18,570
1.6	Selected AHU Airflow: 10,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 20 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	10	Nos	1264472	1,26,44,720
1.7	Selected AHU Airflow: 11,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 22 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	22	Nos	1387636	3,05,27,992
1.8	Selected AHU Airflow: 12,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 24 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	6	Nos	1415645	84,93,870
1.9	Selected AHU Airflow: 13,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 26 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	11	Nos	1496440	1,64,60,840
1.10	Selected AHU Airflow: 14,000 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 28 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	3	Nos	1639088	49,17,264
1.11	Selected AHU Airflow: 15,500 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 31 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	3	Nos	1702986	51,08,958
1.12	Selected AHU Airflow: 18,500 CFM, External Static Pressure - 45 mm wg, Cooling Capacity: 37 TR, 6-Row Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	2	Nos	1852054	37,04,108
2	AHRI / EUROVENT CERTIFIED TREATED FRESH AIR TYPE AIR HANDLING UNIT (TFA)				

	Supply, Installation, Testing & Commissioning of factory fabricated, horizontal, draw-through, double skin chilled water Air Handling Units (AHUs), AHRI 430 / EUROVENT certified, filter section, cooling coil section, heating coil section (where specified), fan section, UVGI section, access doors, stainless steel drain pan, limit switch, auto air vent, drain valve, provision for installation of differential pressure switches, temperature sensors and all accessories required for complete installation. The unit shall be suitable for continuous operation and shall be supplied complete with lifting lugs, vibration isolation arrangement, mounting accessories, interconnecting hardware and factory wiring. Mechanical performance of AHU casing shall comply with EN 1886 / AHRI 1350.				
	The Air Handling Unit casing shall be tested and certified by an internationally recognized certification body such as AHRI, Eurovent, Intertek or UL in accordance with EN 1886 and/or AHRI 1350 standards. The casing shall comply with Mechanical Strength Class D1, Thermal Bridging Class TB2, Thermal Transmittance Class T2 and Air Leakage Class L1 or better. Documentary evidence of certification shall be submitted for approval prior to manufacture.				
	The AHU casing shall be of heavy-duty double skin construction comprising minimum 48 ±2 mm thick factory-injected polyurethane foam (PUF) insulated panels having insulation density not less than 40 kg/m³, enclosed between 0.8 mm thick pre-painted galvanized steel outer skin and 0.8 mm thick galvanized steel inner skin. The panels shall be mounted on extruded aluminium thermal break framework with corrosion-resistant fasteners and airtight neoprene gaskets. The complete casing shall be rigid, self-supporting, thermally insulated and designed to minimize air leakage and thermal bridging while allowing easy access for maintenance.				
	The filter section shall be designed for a maximum face velocity of 500 FPM and shall consist of single stage filtration comprising washable ISO Coarse (G4) pre-filters. Disposable commissioning filters shall				

	also be supplied for initial operation. The filter frames shall be corrosion resistant with positive sealing arrangements to prevent air bypass.				
	The cooling coil shall be of minimum eight-row (four + four) deep chilled water construction manufactured from seamless ½-inch OD copper tubes mechanically expanded into hydrophilic aluminium fins with stainless steel end plates and heavy-duty headers suitable for a minimum working pressure of 16 bar. The coil shall be selected for a maximum face velocity of 500 FPM and a chilled water entering and leaving water temperatures of 6.7°C and 12.2°C respectively. The coil shall be factory tested hydrostatically and designed to provide the scheduled cooling capacity while maintaining low air-side pressure drop and uniform air distribution.				
	The fan section shall consist of AMCA certified backward curved direct driven EC Fans, statically and dynamically balanced, selected for 100% duty at the specified operating point with minimum fan efficiency of 65%. The fan shall be selected to deliver the scheduled air quantity against the specified external static pressure with maximum outlet air velocity not exceeding 1800 FPM. The complete fan assembly shall be mounted on anti-vibration isolators and flexible canvas connections shall be provided between the AHU and ductwork to minimize transmission of vibration and noise. The fan section shall be designed to ensure uniform airflow across the cooling coil with maximum sound pressure level not exceeding 75 dBA measured at a distance of 1.5 metres from the unit.				
	The fan shall be directly coupled to high efficiency Electronically Commutated (EC) Motor of minimum IE4 efficiency class suitable for 415V ±10%, 50Hz, 3-Phase AC supply. The EC motor shall have built-in electronic speed control, maintenance-free sealed bearings, IP55 enclosure, Class-F insulation, thermal overload protection and shall be suitable for continuous operation. The motor shall be capable of speed modulation through 0-10V DC or Modbus/BACnet communication for integration with the Building Management System (BMS) and shall provide maximum operating efficiency over the entire speed range.				

Each AHU shall be provided with an independent floor-standing or wall-mounted IP55 electrical control panel suitable for indoor installation. The panel shall comprise MCCB/MCB incomer, PLC controller with sufficient digital and analog I/O points, SMPS, control transformer, auxiliary relays, contactors, terminal blocks, selector switches, indicating lamps, control fuses, surge protection devices, internal power and control wiring, earthing terminals, cable glands and all accessories required for complete operation. Individual outgoing feeders shall be provided for EC fans, UVGI system, PICV actuator, three-way valve actuator, fresh air damper actuator, fire damper actuator and two spare outgoing feeders of minimum 10A rating. The panel shall have provision to receive BMS commands, Fire Alarm System interlocks and shall provide fan run status, trip status, dirty filter alarm and common fault indication. Single point power supply and BMS communication shall be terminated at the AHU panel by the respective agencies.				
The AHU shall be provided with a factory-installed Ultraviolet Germicidal Irradiation (UVGI) system comprising UV-C lamps, electronic ballasts, stainless steel mounting brackets and protective guards designed for continuous operation. The UVGI system shall be installed downstream of the cooling coil to prevent microbial growth on the cooling coil, drain pan and adjacent internal surfaces while simultaneously disinfecting the passing air stream. The system shall be designed using manufacturer-approved UV sizing software to ensure minimum average UV intensity of 100 $\mu\text{W}/\text{cm}^2$ on the coil surface and a minimum UV dose of 3000 $\mu\text{W}\cdot\text{s}/\text{cm}^2$ in the air stream to achieve a minimum microbial kill efficiency of 99%. The UV lamps shall have a minimum rated life of 9000 operating hours and shall be provided with safety interlocks to automatically switch OFF when the access door is opened.				
The AHU shall be provided with a factory-fabricated SS304 stainless steel drain pan of minimum 18-gauge thickness extending beneath the entire cooling coil section. The drain pan shall be of double-sloped construction to ensure complete drainage without water stagnation and shall be externally insulated with 19 mm thick closed-cell nitrile rubber insulation to prevent condensation. The drain pan shall be complete with threaded drain connection, automatic air vent,				

	cleanout arrangement and all accessories necessary for proper condensate disposal.				
	Each AHU shall be completely factory assembled and tested prior to dispatch. Factory tests shall include casing leakage test, mechanical strength test, thermal performance verification, airflow performance test, vibration test, noise level measurement, cooling coil hydrostatic pressure test, electrical functional test and overall operational performance test. Certified factory test reports along with AHRI/Eurovent certification, coil test certificates, motor test certificates and electrical panel inspection reports shall be submitted for review and approval before shipment.				
	The scope of work shall include transportation, unloading, shifting, lifting, positioning, alignment, fixing on foundation or support structure, installation of anti-vibration isolators, duct connections, chilled water piping connections, drain piping connections, electrical power and control connections from AHU control panel to EC Fans, UVGI, PICV, earthing, insulation touch-up, testing, balancing and complete commissioning of the AHU system. The contractor shall carry out all necessary functional tests, performance testing, airflow balancing and demonstrate satisfactory operation of the equipment under actual operating conditions in the presence of the Engineer-in-Charge. All tools, tackles, consumables and temporary arrangements required for successful installation and commissioning shall be deemed to be included in the scope.				
2.1	Selected AHU Airflow: 8,000 CFM, External Static Pressure - 20 mm wg, Cooling Capacity: 56 TR, 8-Row (4+4) Chilled Water Cooling Coil, Coil Face Velocity: 500 FPM,	10	Nos	1408117	1,40,81,170
	PIPING WORKS				
3	INSULATED CHILLED WATER PIPING (Nitrile rubber insulation)-for Risers and AHU rooms				

	a) Supplying, laying/ fixing, testing and commissioning of following nominal sizes of chilled water piping inside the building (with necessary clamps, vibration isolators and fittings but excluding valves, strainers, gauges etc.) duly insulated with following closed cell elastometric nitrile rubber of minimum 45 Kg / cu m density, thermal conductivity 0.037 W/MK or better at 20 deg mean temperature class 'O' insulation applied by suitable adhesive complete including repairing of damage to building etc. as per specifications and as directed by Engineer In Charge. Note:- The Pipes of sizes 150mm & below shall be M.S. 'C' class as per IS : 1239 and pipes size above 150mm shall be welded black steel pipe heavy class as per IS: 3589, from minimum 6.35mm thick M.S. Sheet for pipes upto 350 mm dia. and from minimum 7mm thick MS sheet for pipes of 400 mm dia and above. Note - Insulation shall be Anti-Microbial type, UL approved & must have factory laminated black woven glass cloth.				
	All required nessary fittings like bends, tee, reducer etc. shall be as of the same OEM of pipe with same pressure rating. Note - All Tee-off connections reducers, bends (upto 150mm dia) shall be ready made factory fabricated MS 'C' Class fittings. 200mm & above shall be site fabricated of the same material & thickness of pipe. Drilling and tapping of the walls of the main pipe shall not be restored to site fabricated fittings, these are allowed only in case of non-availability and prior permission has to be taken for the same.				
3.1	150mm dia.(32 mm thick insulation)	48	Meter	5089	2,44,272
3.2	125mm dia. (32 mm thick insulation)	96	Meter	4456	4,27,776
3.3	100mm dia. (32 mm thick insulation)	300	Meter	3556	10,66,800
3.4	80mm dia(32 mm thick insulation)	1,287	Meter	2656	34,18,272
3.5	65mm dia(32 mm thick insulation)	1,485	Meter	2139	31,76,415

3.6	50mm dia(32 mm thick insulation)	633	Meter	1859	11,76,747
4	INSULATED VALVES				
	Supplying, fixing, testing and commissioning of following valves, strainers, gauges in the chilled/Hot water plumbing duly Insulated to the same specifications as the connected piping and adequately supported as per specifications.				
4.1	BUTTERFLY VALVE (MANUAL) with C I body SS Disc, Nitrile Rubber Seal & O- Ring PN 16 pressure rating for chilled water/hot water circulation as specified				
4.1.1	125mm dia.	16	Each	8505	1,36,080
4.1.2	100mm dia.	50	Each	7482	3,74,100
4.1.3	80mm dia.	136	Each	5419	7,36,984
4.1.4	65mm dia.	110	Each	5086	5,59,460
4.1.5	50mm dia.	12	Each	4627	55,524
4.2	PICV - Supplying, Installation, Testing and Commissioning of following sizes electronic, self-balancing, pressure independent type dynamic balancing valve with integrated 2 way modulating control valve in a single body. The actuator shall be capable of accepting upto 10V DC and upto 20mA electric signal and shall provide similar transduced feedback output to control system. Maximum close off pressure shall not be less than 6 Bar for upto 50 mm valves and 7 Bar for 65 mm & above. Valves should have pressure rating of 25 Bar minimum. The Actuator shall be supplied along with its Actuator panel. Application- At CHW Water Coil outlet for Flow modulation as per Load requirement, and also switching to Heating Flow Requirements in Winters				
4.2.1	125mm dia.	8	Each	153790	12,30,320
4.2.2	100mm dia.	25	Each	121015	30,25,375
4.2.3	80mm dia.	68	Each	71582	48,67,576
4.2.4	65mm dia.	55	Each	56243	30,93,365

4.2.5	50mm dia.	6	Each	36431	2,18,586
4.3	Y - STRAINER of Ductile CI Body flanged ends with stainless steel strainer for chilled / hot water circulation including insulation as specified.				
4.3.1	125mm dia.	8	Each	23384	1,87,072
4.3.2	100mm dia.	25	Each	15798	3,94,950
4.3.3	80mm dia.	68	Each	10661	7,24,948
4.3.4	65mm dia.	55	Each	8644	4,75,420
4.3.5	50mm dia.	6	Each	6459	38,754
4.4	Ball Valve- Supply, Installing, testing and commissioning of PN-16 pressure rating ball valve, bronze forged body, chrome plated bronze ball and control level etc. in position complete as per technical specifications with all the necessary mounting accessories as required for complete installation. As per specification/drawings and as directed by Engineer In Charge.				
4.4.1	25mm Dia	328	Each	1725	5,65,800
4.5	SITC of Automatic Air vents including fittings & socket complete as required .				
4.5.1	15 mm dia. With 15 mm ball valve.	328	Each	2022	6,63,216
5	Providing & fixing of following sizes UPVC drain water piping with fittings, support and insulated with 9 mm thick closed cell elastomeric nitrile rubber insulation complete as required.				
5.1	32mm dia (AHU room drain)	1,500	Meter	528	7,92,000
5.2	25 mm dia (VRF drain)	500	Meter	361	1,80,500
	Aluminium Cladding				

6	Supply & installation 0.63mm aluminium sheet cladding for chilled water piping along with all accessories as required for complete installation. As per specification/drawings and as directed by Engineer In Charge.	1,750	SQM	1404	24,57,000
7	Providing and fixing in position industrial type pressure gauges with gun metal / brass valves complete etc. as required.	328	Each	1491	4,89,048
8	Providing & fixing in position industrial type mercury thermometers complete etc. as required.	328	Each	1132	3,71,296
	AIR DISTRIBUTION WORKS				
9	Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal SPIRAL OVAL Shape ducting with inside lining of 13 mm thick Nitrile Rubber complete with Couplers, neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per SCMNA standard , approved drawings and specifications of following sheet thickness complete as required. (Ducting shall be Lead Free Content) ROHS compliant sheet in matt finish zero spangles skin passed should be considered. Notes: The Duct with TDF Flanges shall be accepted with following: For reinforcement of Duct shall be followed as per IS 655:2006 table number 23. Permissible Duct leakage shall be followed for duct construction mention in CPWD Specification . Steel Wire rope supports as per approved make list can also be accepted as an alternative for conventional rigid support system without any upward price implication.				
9.1	Thickness 0.63 mm sheet	22,500	SQM	1591	3,57,97,500
9.2	Thickness 0.80 mm sheet	18,750	SQM	1782	3,34,12,500
9.3	Thickness 1.00 mm sheet	10,125	SQM	1888	1,91,16,000

9.4	Thickness 1.25 mm sheet	210	SQM	2413	5,06,730
10	Supply and spraying of Powder coating in factory on existing G.S.S Spiral oval duct with Hybrid Epoxy polyester coating of thickness 80-150 micron & pencil hardness 2H with approved Colour.	25,792	SQM	812	2,09,43,104
11	Supplying, installation, balancing and commissioning of fabricated at site GSS sheet metal rectangular /round/oval 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.ROHS complaint sheet in matt finish zero spangles skin passed should be considered.Ducting shall be Lead Free Content.				
11.1	Thickness 0.63 mm sheet	1,500	SQM	1213	18,19,500
11.2	Thickness 0.80 mm sheet	3,375	SQM	1415	47,75,625
11.3	Thickness 1.00 mm sheet	750	SQM	1851	13,88,250
11.4	Thickness 1.25 mm sheet	2,250	SQM	2063	46,41,750
12	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.	200	SQM	7580	15,16,000
13	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.Colour: Approval shall be obtained from Interior consultant. As per specification/drawings and as directed by Architect & Engineer In Charge	950	SQM	9623	91,41,850

14	Supplying & fixing of powder coated extruded aluminium Return Air Grills with louvers but without volume control dampers complete in confirmation to SMACNA/IS and as per specifications complete etc. as required. Colour: Approval shall be obtained from Interior consultant. As per specification/drawings and as directed by Architect & Engineer In Charge	1,100	SQM	6285	69,13,500
15	Supplying, Fixing, installation, testing and commissioning of supply air diffusers of powder coated aluminium with aluminium volume control dampers with anti smudge ring & removable core in confirmation to SMACNA/IS and as per specifications complete etc. as required. Colour: Approval shall be obtained from Interior consultant. As per specification/drawings and as directed by Architect & Engineer In Charge	50	SQM	12841	6,42,050
16	Supplying, Fixing, installation, testing and commissioning of Return air diffusers of powder coated aluminium without volume control dampers with anti smudge ring & removable core in confirmation to SMACNA/IS and as per specifications complete etc. as required. Colour: Approval shall be obtained from Interior consultant. As per specification/drawings and as directed by Architect & Engineer In Charge	50	SQM	8595	4,29,750
17	Supply & fixing of Extruded Aluminium powder coated Floor Grille of size 600 mm x 600 mm as per approved shade along with Al powder coated in black finish collar damper . The supply air grill shall have provision to close or open damper manually from outside. Colour: Approval shall be obtained from Interior consultant. As per specification/drawings and as directed by Architect & Engineer In Charge.	35	Each	7955	2,78,425

18	Supplying, Fixing, testing and commissioning of fire dampers of minimum 120 minutes fire rated in supply air duct/main branch and return air path as and where required of required sizes i/c control wiring, the damper shall be motorized and spring return so as to close the damper in the event of power failure automatically and open the same in case of power being restored. The spring return action shall be inbuilt mechanism and not externally mounted. The damper shall also be closed in the event of fire signal and, in confirmation to IS and as per specifications complete etc. as required.				
18.1	Fire damper	600	SQM	11355	68,13,000
18.2	Actuator	770	Each	10645	81,96,650
19	Supplying, fixing acoustic lining on wall and ceiling of AHU rooms with 50mm thick, density 32 kg/cu.m resin bonded glass fiber insulation friction fixed in 610mm x 610 mm frame work made of 25X50X50X25 mm made out of 0.6mm thick GI sheet U shaped channel and covered with reinforced fiber glass tissue and finished with 0.80 mm perforated aluminium sheet etc. complete as required and as per specifications.	15,875	SQM	1057	1,67,79,875
20	Duct Thermal Insulation Supplying and fixing of Class O closed cell Elastomeric Nitrile rubber insulation with factory laminated 200 GSM black woven glass cloth, fixed using manufacturer approved solvent free Low VOC adhesive with all joints sealed air tight. The joints shall be sealed with 150 mm wide and 6mm thick strip of Class O Nitrile rubber insulation, complete as per specifications and as required. Rates to include two coats of manufacturer approved UV paint for mechanical & weather protection covering for all exposed to atmosphere ducts and within vertical shafts, and additional sealing with self adhesive tape at all longitudinal and transverse joints				
20.1	19 mm	5,500	SQM	810	44,55,000
21	Supply and fixing of acoustic lining of supply air duct and plenum with 15mm thick Open cell nitrile rubber	3,000	SQM	1035	31,05,000

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion = Nil

AE (E)

EE (E)

	insulation with density of 140 to 180 kg/cum as per specifications.				
22	Supply Fabrication , and erection of 2 Hours at 250 Deg C Fire rated canvas cloth of minimum 300 mm width, secured to a galvanized sheet metal on either side by a double lock seam Double canvas connection made out of fire retardant canvas cloth with Zip, required necessary fixing arrangements including nuts & bolts Etc. As per specification/drawings and as directed by Engineer In Charge.	300	SQM	2747	8,24,100
23	Supply, installation, testing and commissioning of Motorized (Modulating Type) duct mounted GI damper and necessary control wire (minimum 1.5 sqmm) for integration within AHU room / Equipment as per specification/drawings and as directed by Engineer In Charge. It shall be seamlessly integrated with IBMS using open protocol system as required. GI damper may be without AMCA certification. However, OEM's Self Certification is required for leakage Class I.				
23.1	Damper	60	SQM	18377	11,02,620
23.2	Modulating type Actuator 24 V with 220/24 V step down transformer in IP 55 enclosure	154	Each	21837	33,62,898
24	Supply, Installation, Testing & Commissioning of VAV boxes of following capacities & the capacities of the units with the below specification are as follows as per technical specifications with all the necessary mounting accessories as required for complete installation .as per specification/drawings and as directed by Engineer In Charge. The quoted price shall be inclusive of the digital thermostat ,G.I.Box & control cabling along with M.S.Conduit for each VAV unit required for the functioning of the VAV system				

	b)The casing shall be minimum 25 mm thick with insulation sandwich between double skin type of 22SWG Galvanized sheet steel construction, with a completely sealed, easily removable.VAVs shall be pressure independent type & low velocity type. VAV Boxes shall be slow reacting type capable of delivering variable air volume type by the action of opposed blade volume control damper. VAV boxes shall be supplied with end flanges for attachment to flanged duct ends and shall be complete with all internal Acoustic treatment.The noise level from the VAV boxes shall not exceed 35dbA at 1.5 m distance				
	c). VAVshall be electronically controlled networkable controller type complete with 16 G GSS low leakage damper, actuator, Microprocessor unit, wall/ ceiling mounted thermostat with ON/OFF Switch, control transformer, unit hanger brackets etc.				
	d).VAV Boxes shall also be able to reset any air flow between zero and the maximum air quantity that the boxes can handle without changing orifices or other parts, but the boxes shall be factory set at 10%of the maximum flow as minimum flow.				
	e).The thermostat and the entire control mechanism shall be fully compatible with BMS System through LON Works/ Bacnet/Modbus protocol. Data like temperatures, set points, damper position shall be monitored through BMS system				
	f).The VAV shall be suitable to operate on 230V,single phase electrical supply.Damper actuator shall be able to accept 4-20mA command signal from IBMS console and correspondingly modulate the damper position. Actuator shall also be able to provide position signal (4-20 mA) to IBMS console				
24.1	50-990 cfm	80	Each	17661	14,12,880
24.2	1000- 1990 cfm	80	Each	22238	17,79,040
24.3	2000 - 2990 cfm	60	Each	25100	15,06,000
24.4	3000 - 4990 cfm	20	Each	26469	5,29,380

25	Supply & Application of silicon & water based high-build Fire Retardant Coating for GI ductworks. Paint would be applied with optimum thickness to attaining a Fire Rating up to minimum 2 Hours for 250 deg C. Compliance with HVAC Technical Specifications: Fire including non-combustibility Class0 and fire propagation Class1 surface spread of flame & materials in accordance with Building Regulations.(paint shall be done only to outside of the duct). As per specification/drawings and as directed by Engineer In Charge.	30,000	SQM	1220	3,66,00,000
26	PRECISION AIR CONDITIONER				
	a) Supply, Installation, testing and commissioning of Floor Mounted, Bottom discharge, Dual fluid PAC units for high density application, equipped with most advanced industry technology to operate at higher return air temperatures , guaranteeing precise control of temperature and relative humidity in UPS and server rooms. #Note: 1) Supplier shall submit computerised unit selection output. Installation also include Lifting, shifting, assembling & positioning of the equipment comprising of the following and complete as per specification/drawings and as directed by Engineer In Charge.and shall be complete				
	b) The units shall be selected on the basis of following parameters & must be with extended fan- 26 °C (78.8°F)/35% RH of return air- 6.7°C (44°F) /12.2°C (54°F) of chilled water temperature- Minimum COP at Sensible Capacity shall not be less than 2.5- Each unit shall be provided with PRESSURE INDEPENDENT BALANCING CUM CONTROL VALVE- DX coil along with out door unit & its MS stand unit with Refrigerant 410a- For air cooled ambient is 43.2 °C (109.7°F). The intended design shall be to achieve the highest reliability of the system at lowest possible PUE				

c).The unit shall comprise of 20-100% stepless capacity modulating circuits with Digital/Inverter/Combination of Fixed and variable Scroll Compressors, Fibre glass corrosion resistant In-floor EC fans, Evaporator cooling Coils of dual fluids, Microprocessor controllers,G4 Filter, Internal power and Control wiring,Humidifier,Heaters, Power and Control contactors, water leak detectors and other Electrical accessories.				
d). The Indoor unit shall comprise of Composite Material / Fibre glass corrosion resistant In-floor EC fans, Evaporator cooling Coil , Microprocessor controllers, G4 Filter, Internal power and Control wiring, Humidifier, Heaters, Power and Control contactors and other Electrical accessories.				
e). The control algorithm shall be for traditional return air logic and also be developed for containment applications, that meets the cooling and air flow needs of the servers while ensuring only necessary kilowatts are invested in targeted cooling. The unit should have the capability to modulate air flow, taking inputs from the remote sensors placed in cold aisle at top of the racks at multiple locations, according to the airflow taken by the servers.The control shall be done in order to have minimum differential pressure between inlet and outlet of the containment.The capacity shall be modulated according to the supply temperature in order to optimize server inlet temperature. The system done by multiple units shall work with efficient cascade way, trying to maximise energy efficiency always working where EC Fans are more effective.				
f).The unit shall be suitable for operation on 415 Volts,50Hz,3Phase,4Wire AC supply.Each unit should be having individual display panel,which shall display date, time,actual &set values,operating conditions,signal faults,collelctive faults, limiting values and PAC wellness alarm/service alarm to reduce the down time and unit memory shall hold the 400 most recent events with ID number, time and date stamp for each event				
Operation & Control Features - P / PI / PID - All three Control logics for temperature control Relative / Compensated / Predicttive method for humidity control Temperature & Humidity graphs for the system (Avg. value of all the connected units) & for each single unit Record of Peak & Low				

	temperature/humidity of the current day Choice of display: Graphical / Simple / Graphical Comma / Simple Comma Display shows SET / ACTUAL / SET+ACTUAL Values Records total run hours for all main components Team Mode operation for synchronising upto 16 units in room by any of the unit controller				
	Sequencing & Stand-by rotation Cascading, Lead-Lag functions 16 days record of controlled parameters Unit memory shall hold 100 recent alarms with date and time for each alarm Unit memory shall hold 100 recent alarms with date and time for each alarm Status report of last 400 event logs 3 types of access; User, Service & Advanced to protect all settings Auto restart after a power failure-Graphical display of status of operation of all major components like Fan, Heater & Humidifier on screen in an idle mode Contains key contact info for local service including names and phone numbers 254 types of Alarms / Warnings. - Monitoring card should be able to support any one of the protocol (Bacnet/Modbus/SNMP) Each unit Controller should be capable of controller, monitoring, sharing set points and alarms upto 32 units.-Each Unit controller should have feature of avoiding fighting of operation modes for multiple units thus saving upto 15% power at larger sites Onboard unit diary provides maintenance history				
	h).Team Mode feature for PAC units controller for synchronising the Multiple No. of units to work as single system for different room as per Layout- Load sharing mode feature-Cascading Effect- Sequencing of Below Units				
26.1	10 TR of minimum Sensible Cooling Capacity @25000 CFM		Each	1335272	26,70,544

26.2	18 TR of minimum Sensible Cooling Capacity @ 9000 CFM	2	Each	2065893	41,31,786
27	Supply and installation of table type MS-Galvanized(Hotdipped) stand of size suitable to mounting of 10/18 TR PAC UNIT, of @700 mm height & min 6 nos legs with accessories. The stand should be capable of taking static and dynamic load of PAC UNIT. Final Height offered for stand shall be as per Rasied floor diamentions. As per specification/drawings and as directed by Engineer In Charge.	4	Each	30233	1,20,932
28	Supplying, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s), minimum two compressors (with individual separate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condenser fan shall be capable to operate at different speed with respect to load. The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 °C. The unit shall be suitable to work on 400V +/- 10%, 3				
	Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kW ISEER 7.4, Capacity > 40 and <70 ISEER 7.5, Capacity				

	> 70 ISEER 7.6 for Super ECSBC Building) Note :- Additional required qty. of refrigerent shall be in the scope of agency.				
	For Cooling or Heating or Both				
28.1	18 HP	10	Each	389862	38,98,620
29	Supplying, Installation, Testing and Commissioning of following minimum capacity High wall type Indoor unit equipped with and comfort washable synthetic media pre filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, outer cabinet, cord less remote control, drain pan, necessary accessories etc., suitable for operation on 230 V $\pm$ 10%, 50 Hz, single phase AC supply, complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 deg C DB and 19 deg C WB temperature. (Make will be same as of Outdoor)				
29.1	1.6 TR	72	Each	22027	15,85,944
29.2	2.0 TR	8	Each	22674	1,81,392
30	COPPER REFRIGERANT PIPING				
	Supplying, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastometric nitrile rubber tubular sleeves sections of 19 mm thick insulation as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :				

30.1	6.4 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	270	Mtr.	256	69,120
30.2	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	160	Mtr.	346	55,360
30.3	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	420	Mtr.	487	2,04,540
30.4	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	230	Mtr.	615	1,41,450
30.5	19 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	30	Mtr.	739	22,170
30.6	22.2 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	600	Mtr.	904	5,42,400
30.7	28.58 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	850	Mtr.	1157	9,83,450
31	Supplying, Installation, Testing and Commissioning of Y/T/Multi Joints. Joints shall be of same Original Equipment Manufacturer (OEM) make as of ODUs and IDUs				
31.1	Indoor units	70	Each	4535	3,17,450
32	Supply and laying, testing & commissioning of following sizes of Copper conductor control cables through conduit on existing tray including fixing clamps & proper connections to equipments etc. complete as required. As per specification/drawings and as directed by Engineer In Charge.				
32.1	2CX 1.5 Sq.mm	2,000	Mtr.	139	2,78,000
33	SITC of PC compatible centralised remote controller (CRC) for the entire VRF indoor and outdoor equipment configuration for above systems. CRC shall be compatible on BACnet/ Modbus BMS protocol. As per specification/ drawing and as directed by Engineer-in-charge.	1	Each	120057	1,20,057
34	KITCHEN FAN SISW FAN				

a).Supply, Installation, testing & Commissioning of Fan-SISW backward curved centrifugal fan with necessary supports arrangement,sq cage induction motor,GSS frame support work,belt drive with required size pullys and belts, spring type vibration isolator, base frame along complete installation include Lifting, shifting, assemblling & positioning of the equipment comprising of the following and complete as per specification/drawings and as directed by Engineer In Charge				
b).Fan Scroll shall be galvanised with min. 220 gsm Galvanised zinc coating with non stick paint. Complete fan,blade shall be powder coated with non stick paint.Fan must be with side discharge & provided with spring type vibration isolators, cawl piece, etc Entire fan assembly shall be suitable for Kitchen exhaust application. Motor shall be outside the air stream -Class F Type Exhaust fans shall be with insect mesh at to exhaust air & belt gaurd. Fan performance rating data shall be tested accordance with AMCA Standard 210-85 (AMCA certification requird for Air Performance & Sound). The Fan must be selected for minimum power consupction & Maximum efficiancy at respective duty point.				
c).Fan motor shall be class IE3 and suitable to 415+/-10%V,50 hz,3 phase AC supply.Fan shall be suitable for Kitchen exhaust. Fan total efficiency shall not be less than 70%. However; If OEM is not able to meet 70% efficiency for any specific case, 65-70%fan efficiency can be excepted subject to detail technical justifications from Vendor/OEM." Max. noise level shall be 78 dBA at 3 meter in hemispherical reverberant room condition.				
d)SISW Fan be provided with seperate wall / floor mounted electrical panel of 415+-10%,50Hz,3Phase AC supply, with all necessary power & control circuit breakers, contactors, SPPR, auto/manual selector switches,earthing and internal power & control cabling, terminations with necessary lugs and glands, etc. - Incomer MCCB/ MCB of suitable electrical rating. The panel shall be of min. IP 65 protection/Weather Proof and must have arrangmnet to receive BMS & fire signal input. (Note:- Single point power supply and BMS connectivity shall be done by external agency).				

	e).Fan Static Indicated below are tentative,Contractor shall submit Fan static calculations based on approved shop drawings before ordering the unit. Any rise in static required shall be offer by contractor without any additional cost. Note- "The Variation in Static Pressure Rise more than 20% will only be consider for Extra item, If there is change in layout w.r.t Tender drawing.				
34.1	3000 CFM @ 80 mm Total Static	1	Each	156562	1,56,562
34.2	8000 CFM @ 80 mm Total Static	1	Each	231783	2,31,783
35	AIR WASHER				
	a).Supply, Installation, testing & Commissioning of cellulose paper celdek pad type air washer. Air washer shall be provided with filter section, fan section, limit switch, drain connections, stainless steel drain pan, auto purge valve, drain valve and shall be mounted on C Channel frame and Spring Mounts , wherever required for complete installation also include Lifting, shifting, assemblling & positioning of the equipment comprising of the following and complete as per specification/drawings and as directed by Engineer In Charge.and shall be complete				
	b). Unit must in Double skin air washer at 350 FPM velocity across pads giving 90% adiabatic saturation efficiency.Double skinned panels shall be 23+2 mm thick made of galvanized steel,presure injected with PUF insulation (density40kg/m3) with K factor not exceeding 0.02 watt /m2k shall be fixed to aluminium alloy twin box section structural frame work with stainless steel screws.Inner & Outer sheet of panels shall be made of galvanized pre plasticised sheet of 0.8mm thick. The blower section shall be constructed in double skin construction similar to wet section and shall include DIDW Backward Curved belt driven Fan.				
	c).The cooler shall be complete with 12" thick Celdek pad, SS304 1.6mm thk.250 mm deep Sump,water pump 2Each. (1w+1s),cover pipe,distribution pipe,distribution pan, filters at air inlet,water piping,make up water with ball valve,drain and over flow connection,VCD at outlet and fire proof flexible connections between Fan outlet & unit casing,complete in all respects as per				

specifications.Filters section shall in corporate 10 micron synthetic washable filters of at least 50 mm thickness in suitable aluminium frame.Velocity of air across the filters shall not exceed 500 FPM.The eliminator plates shall be fabricated from PVC as specified in data sheet. The eliminator section shall have minimum 4 pass.The Unit shall be provided with Starter panel, earthing and power&control) cabling 10 Rmt each, terminations with necessary lugs and glands,etc.The above scope shall also include Lifting,shifting,disassembling and reassembling of unit at site.As per technical specifications with all the necessary mounting accessories as required for complete installation				
c).Air washer fan capacity shall be selected at 100% of fan speed, fan outlet velocity should not exceeding 2000 FPM & min fan efficiency should be 70%. Max. noise level of the unit shall be 75 dBA at 1.5 mete				
d). Fan shall be provided with IE-3 Motor suitable for 415 +10%, 50 Hz, 3 Phase AC supply. The Fan must be selected for minimum power consupcion & Maximum efficiancy at respective duty point.				
e).Air washer be provided with seperate wall / floor mounted electrical panel of 415+10%,50Hz,3Phase AC supply, for power supply distribution for equipment listed below with all necessary power & control circuit breakers, contactors, SPPR, auto/manual selectorswitches,earthing and internal power & control cabling, terminations with necessary lugs and glands, etc. - Incomer MCCB/ MCB of suitable electrical rating-Individual outgoing feedersof suitable rating for Fan Motors,water pump & 2spares feeders with10 amps rating The panel shall be of min. IP 65 protection/Weather Proof and must have arrangmnet to receive BMS & fire signal input. (Note:- Single point power supply and BMS connectivity shall be done by external agency).				
f).Fan Static Indicated below are tentative, Contractor shall submit Fan static calculations based on approved shop drawings before ordering the unit. Any rise in static required shall be offer by contractor without any additional cost. Note- "The Variation in Static Pressure Rise more than 20%will only be consider for Extra item, If there is change in layout w.r.t Tender drawing.				

	Outdoor Air Temp.				
	DB - 43.2.0 °C (109.7°F)				
	WB - 29.4 °C (84.9°F)				
35.1	3000 CFM @ 65 mmwc Total static	1	Each	334718	3,34,718
35.2	6000 CFM @ 65 mmwc Total static	1	Each	446290	4,46,290
36	DRY SCRUBBER FOR KITCHEN EXHAUST				
	a).Supply, Installation, testing & Commissioning of industrial grade electrostatic air cleaner ,complete as per technical specifications with all the necessary mounting accessories as required for complete installation.Dry scrubber–Electrostatic Air cleaner as per specifications, suitable for following capacities. The Air filtration efficiency should be 90% & units shall be offered singular/multiple module as per OEM to staked one above other or side by side as per site requirement. Finishing - Power coated, Features-Short circuit, arc protection with auto power restore for power pack.As per specification/drawings and as directed by Engineer In Charge. No. of ESP cells to be selected from manufacturer's standard range to meet total exhaust CFM.				
	b). Operating voltage - 220 Vac+/-10%, 50 Hz (Single phase) Cell - Ionizing voltage - 12 KVdc Collector voltage - 6 KVdc One cell comprising of 9 ionizing wires and 25 collection plates Controls-Auto cut-off when door is opened. Indicator lights for fault, normal or wash function. Pre-filter - Aluminium mesh, washable Dry contact for BMS. Unit must be of Auto wash type.				
36.1	3000 CFM	1	Each	471484	4,71,484
36.2	8000 CFM	1	Each	717376	7,17,376

37	Supplying and fixing 50 mm thick aluminium foil faced resin bonded fibre glass insulation (on duct) of density 24 kg/cu.m or mineral wool insulation(non combustible) of density 44 kg/cu m after applying two coats of cold setting adhesive (CPRX compound) sealing all joints with self adhesive aluminium tape & covering with 0.63mmx19mm GI wire mesh netting butting all joints and laced with GI wire complete as per specifications and as required. (for indoor applications).	200	Sq.mtr.	548	1,09,600
38	Supplying and fixing Installation, Testing and commissioning of 50mm thick aluminium foil faced resin bonded fibre glass insulation (on duct) of density 24 kg/cu.m or mineral wool insulation(non combustible) of density 44 kg/cu m after applying two coats of cold setting adhesive (CPRX compound) sealing all joints with self adhesive aluminium tape & covering with 0.63mmx19mm GI wire mesh netting & butting all joints and laced with GI wire complete and finally covered with one layer of tar felt stuck with hot bitumen as per specifications and as required. (for outdoor applications)	100	Sq.mtr.	629	62,900
39	Supplying & laying 3C x 2.5 sq. mm XLPE insulated PVC sheathed Cu conductor armoured cable of 1.1 KV grade on surface/Cable tray i/c end termination etc. as required.	5,000	Mtr.	273	13,65,000
	Total of C4 - HVAC				47,12,84,828
	C5 - AUDIO VIDEO SYSTEM				

1	Supplying, Installation, Testing and Commissioning of Fully Digital IP Based Conference systems Controller Audio processing device responsible for routing, controlling and processing the audio with built in (or using external OEM certified DSP / product of approved make) intelligent adaptive acoustic feedback suppressor, echo cancellation, minimum 5 or more band parametric equalizers for optimal speech intelligibility as required, support loop-through connection with cable redundancy, 1 No. ethernet port without power, 3 Nos. ethernet Port each capable of delivering loop power requirement, 1 No. Ethernet Port capable of delivering power requirement of one to connect device/equipment in control room for proper functioning of systems as per OEM Design with other necessary accessories to make system complete and as directed by Engineer In Charge. The device shall have One audio input for inserting external analogue audio signal in the system, shall have mix-minus facility for connecting the conference system to video conferencing equipment and shall have two audio outputs for mix-minus and to connect an external sound reinforcement system. The device should support industry standard audio protocols like Dante/ AES etc.and Ethernet (IEEE802.3) standards. The device should be BIS certified if applicable or CE/ UL/ FCC certified.	24	Set	333962	80,15,088

2	Supply, installation, testing & commissioning of Modular Digital IP based Flush Mount audio conferencing Chairman Unit inclusive of : (a) Chairman Unit : Unit with Pluggable 300 mm gooseneck / screw connections microphone with dual Color LED illuminator ring for Microphone Request-to-speak and Microphone On status ; Microphone button with LED indicators showing microphone ON state and request-to-speak ; Priority Button for temporarily muting delegates ; Microphone Socket Module with pluggable or screw connection socket for microphone and Low Level Loudspeaker Module. Microphone Bandwidth : 200 – 15 KHz ; Microphone Transducer type : Condenser ; Microphone Directional pattern : Cardioid or Unidirectional ; Microphone Signal to noise ratio/dynamic range : 67 dB or better ; Microphone Nominal level : 82 dB SPL or better. (b) Under table Interface : (b) Under table Interface : IP Based Digital Interface Unit (DIU) for connecting to each Chairman unit. DIU may be shared with multiple delegate unit; Interface units integrated with Chairman units are also acceptable. Necessary mounting arrangements or installation in furniture. Connectivity/Ports : 2x RJ45 ports for system communication and power. The device should be BIS certified if applicable or CE/ UL/ FCC certified.	24	Set	259504	62,28,096

3	Supply, installation, testing & commissioning of Modular Digital IP based Flush Mount audio conferencing Delegate Unit for dual delegate inclusive of : (a) Delegate Unit with Pluggable 300 mm gooseneck / screw connections microphone with dual Color LED illuminator ring for Microphone Request-to-speak and Microphone On status ; Dual Microphone button with LED indicators showing microphone ON state and request-to-speak (Each delegate unit shall be shared by two user with independent request to speak microphone button), Microphone Socket Module with pluggable or screw connection socket for microphone and Low Level Loudspeaker Module. Microphone Bandwidth: 200 – 15 KHz; Microphone Transducer type: Condenser; Microphone Directional pattern: Cardioid or Unidirectional; Microphone Signal to noise ratio/dynamic range: 67 dB or better; Microphone Nominal level: 82 dB SPL or better. (b) Under table Interface : IP Based Digital Interface Unit (DIU) for connecting to each Delegate unit. DIU may be shared with multiple delegate unit; Interface units integrated with Delegate units are also acceptable. Necessary mounting arrangements or installation in furniture. Connectivity/Ports : 2x RJ45 ports for system communication and power. The device should be BIS certified if applicable or CE/ UL/ FCC certified.	288	Set	210017	6,04,84,896

4	Supply, installation, testing & commissioning of Operator Control PC with Conference server & Client software for Conference systems management, camera control and Microphone Management software. Microphone management facility : which shall facilitate management of delegate request list switching ON and OFF of individual microphones from single / multiple points ; Setting and control of the volume levels of individual microphones and loudspeakers in the delegate / chairman units. Camera shall automatically focus the delegate speaking ; Software interface shall also provide meeting data such as current speakers ; request lists and other information to video screens or video projectors. The PC should have - Processor - minimum i7 or better min.2.4 GHZ or better ; RAM :16 GB DDR4 RAM; Minimum 500GB HDD ; Operating System - as per Conferencing System OEM requirement.	24	Set	332334	79,76,016
5	Supply and laying of 2 m Conference Cable patch cord ; compliant with safety and environmental standards ; network communication and power transports in single piece. It shall be of make, as recommended by the conference system OEM.	312	Each	8637	26,94,744
6	Supply and laying of 25 m Conference Cable patch cord; compliant with safety and environmental standards; network communication and power transports in single piece. It shall be of make as recommended by the conference system OEM.	48	Each	36138	17,34,624
7	Supply, installation, testing & commissioning of Full Range Ceiling Speaker : with 1x 4.5"- 6.5" Driver size, Continuous Power 20 Watts; Nominal Impedance 6/8/16 Ohm or 100V with	144	Each	14026	20,19,744

	tapping; Frequency Range (-10 dB) 85 Hz - 17Khz ; Frequency response : 95 Hz - 15 KHz ; Sensitivity @1W/1m : 75 dB SPL or better; Maximum SPL @ 1m : 92 dB SPL or better; Steel formed Backcan or ABS Plastic or as per OEM; Front steel mesh Grill powder coated or as per OEM ; Dispersion Angle 100 degree or better.				
8	Supply , Installation, Testing & Commissioning of Passive Column Array Loudspeaker : having 12 or more drivers ; size 1.5"-3.5" or 2" - 4" mid/high frequency drivers ; vertical dispersion capability 12 - 30 degrees ; horizontal 120 - 145 degrees ; Frequency Range (-10 dB): 100 Hz - 14 kHz ; Frequency response : 155 Hz - 12 KHz ; Sensitivity @1W/1m : 88 dB SPL ; Maximum SPL : @1m 113dB SPL ; Minimum Power : 300 Watts or more peak power @ 4/6/8/12/16 Ohm Impedance ; Enclosure : Extruded aluminum or reinforced ABS or as per OEM ; Grille : Painted or Powder Coated Steel or Aluminum grille or as per OEM ; with other necessary accessories to make system complete.	48	Set	83809	40,22,832
9	Supply, installation, testing & commissioning of Four Channel Class D Power Amplifier with Dante and built in DSP; 300W at each channel 4-8 Ohms and 70/100V; 4 Analog balanced Input and output; 8 Digital Input and output on Cat6; Gain: 32 dB or better; 20 Hz – 20 kHz Frequency response; Channel Separation (Crosstalk) > ±80 dB; THD: 0.35% or THD+N < 0.04% ; Dynamic Range/Signal to noise ratio ≥ 100 dBA; LED Indicators on front side, Control Port: LAN or RS -232.	24	Set	316816	76,03,584
10	Supply, installation, testing & commissioning of Modular or Fixed Digital Signal Processor : with AEC currently configured with 8 Mic/ Line Inputs ; 8 Line Outputs ; AEC 8 x mic/line with AEC ; built in 4x4 Dante or Digital audio networked audio or AES-67 ; Sampling Rate : 48kHz; A/D-D/A Converters : 32/24 -bit ; THD+N : 0.002% or better ; EIN < ±127dBu ; Dynamic Range : 105-108dB ; USB input : 2 x 2 USB Audio or Stereo Audio.	24	Set	372422	89,38,128

12	Supply, Installation, Testing and Commissioning of dual channel Digital Wireless Microphone complete set with handheld and lapel transmitter ; AF Frequency response : 20 Hz-20 kHz ; Dynamic range : >130 dB ; Sampling : 24 bit/48 kHz ; Latency: 1.9ms or less ; Digital Wireless Handheld Microphone operating on UHF bandwidth ; No. of Channels : 90 channels or more ; Audio ; RF Power : 80 mW or max operating range upto 100 meter ; RF/ AF ; OLED display; AES 256 encryption; LAN port for control and Monitoring through third party control system ; Pick up Pattern : Omni directional/Uni directional ; Automatic frequency management.	24	Set	238945	57,34,680
13	Supply, Installation, Testing and Commissioning of Cable Manager : table mount modular multi-Connection Solution with retractable or sliding Lid with cable pass through using 1 x HDMI ; 1 x USB-A ; 1 x USB-C ; 2 x LAN port/socket. It should have 2 x Universal AC Power Outlet & 1 x USB-C, 1 x USB-A charging outlet ports and should have rectangular shape, FCC certification. Additionally, requisite ports as may be required for establishing connectivity with devices at other end such as host computers, laptops, sound bars, displays etc. shall be provided as per site requirements.	228	Set	112638	2,56,81,464
14	Supply, Installation, Testing & Commissioning of 110" or more 4K (3,840 x 2,160) UHD large screen Active LED /Backlit LED / Micro LED display : brightness: minimum 500 nits or higher ; resolution : minimum 3840 x 2160 ; Direct LED or VA or Edge/NewEdge LED/Micro LED, built in wi fi and bluetooth ; built in speaker minimum 20W or better; Connectivity : HDMI Port-3 Nos. with one port of 4K @ 60 Hz, USB-1 No., RS 232- 1 No., RJ 45- 1 No, Display Port-1 No., Audio In-1 No., Processor Quad cores, Operating System : WebOS/Windows or as per OEM standard, customizable start up logo, BIS certification, complete with wall mount bracket & Table Top Bracket, controller/required hardware and accessories complete as required.	24	Set	2336901	5,60,85,624

16	Supply, Installation, Testing & Commissioning of approx. 86/85" 4K (3,840 x 2,160) UHD professional display : Brightness : 400 nits or higher ; Direct LED or VA or Edge/NewEdge LED ; 24/7 Operation ; Minimum 8 GB Memory as per OEM ; Connectivity : HDMI Port-3 Nos. with one port of 4K @ 60 Hz, USB-1 No., RJ 45- 1 No.; Wi-Fi with In-Built Bluetooth ; 20W Speakers ; Viewing angle 178 degree ; customizable start up logo, BIS certification ; Processor and built in operating system as per OEM standard; Apple AirPlay (optional) & Chromecast (optional) complete with wall mount bracket, controller/required hardware and accessories complete as required.	78	Set	346919	2,70,59,682
17	Supply, Installation, Testing & Commissioning of approx. 65" 4K (3,840 x 2,160) UHD professional display : Brightness : 400 nits or higher ; Direct LED or VA or Edge/NewEdge LED ; 24/7 Operation ; Minimum 8 GB Memory as per OEM ; Connectivity : HDMI Port-3 Nos. with one port of 4K @ 60 Hz, USB-1 No., RJ 45- 1 No.; Wi-Fi with In-Built Bluetooth ; 20W Speakers ; Viewing angle 178 degree ; BIS certification ; customizable start up logo, Processor and built in operating system as per OEM standard; Apple AirPlay (optional) & Chromecast (optional) complete with wall mount bracket, controller/required hardware and accessories complete as required.	146	Set	119635	1,74,66,710
18	Supply , Installation, Testing & Commissioning of Wireless Presentation System wireless presentation from laptop, tablet, smartphone etc with Resolution : 4K(3840x2160)@60Hz ; Ports : HDMI Input Port-1 No.,USB 2.0 - 1 No.; Ethernet(RJ 45)-1 No., HDMI Output port supporting 4K@60 Hz -1 No; Wireless : Miracast, Local Wi-Fi -Secured and Isolated Wiresless Hotspot, Authentication Support : WPA-PSK, all necessary regulatory compliace; Simultaneous screen sharing : Minimum 2 ; Compatible Operating system : Windows 10 and later, macOS 10 and later, Linux, Android 4.2 and later, IOS-10 and later complete with wall mout bracket,	24	Set	308156	73,95,744

	necessary hardwares and accessories complete as required.				
19	Supply , Installation, Testing & Commissioning of Audio Video Control Processor equipped with at least 3 x bidirectional RS232 ; 2 x IR / Serial ; 4 or more x Relays ; 4 or more x GP/IO for controlling room functions ; at least 1 Ethernet monitoring and control port ; IR Sensor : Should have inbuilt or external IR sensor/learner to learn IR commands ; Onboard RAM Minimum 2 GB; Flash Memory Minimum 8 GBLEDs : Should have Status LED to check for Control/Connection status, complete in all respect as required.	24	Set	298352	71,60,448
20	Supply, installation, testing & commissioning of 10" IPS/TFT color screen Touch panel; screen resolution 1024 X 600 or 1280 X 800 or better; brightness 350cd/m2; contrast ratio 700:1 or 800:1 ; Aspect Ratio 16:9 or 16:10 or 17:10; Ethernet Communication RJ45 port; inbuilt speaker & mic (optional); etc. Should be supplied with table mount as well as wall mount kit. Should have appropriate app, etc.	24	Set	300404	72,09,696
21	Supply, Installation Testing & Commissioning of AV over IP 4K Encoder 4K 60 4:4:4 with 2 x HDMI and 1 x USB-C input and 1 x HDMI output, Auto Video 4K scaler, Switching between the three inputs can be performed automatically using auto-switching (input detect) mode, programmatically via a control system, or through a web browser, HDMI loop-through: display any of the three locally connected sources, standard PoE power, HDMI 2.0 & HDCP 2.2, AES-128/256 Encryption, Audio : Analog Stereo 2-channel, HTTPS Secure API, 802.1x Authentication for Network access control, SSH Network Protocol, , Auto Discover all endpoints on the network, VLAN tagging, LLDP Support, QoS Support, USB 2.0 over IP (KVM), RS-232 over IP, IR over IP, A single	216	Set	182378	3,93,93,648

	Gigabit LAN Port for PoE Power, 4K UHD Video, Latency not more than 17 ms, and Control, High Dynamic range (HDR), it should support Dante / AES 67 from day one.				
22	Supply , Installation, Testing & Commissioning of AV over IP Decoder 4K60 Chroma Sub-Sampling :4:4:4 supports Dante / AES67 over Gigabit Ethernet, Bit Rates 50 to 800 Mbps, Video Codec: JPEG2000 based visually lossless video compression algorithm, VLAN Tagging, Video out : 1x HDMI with HDMI 2.0 & HDCP 2.2, AES-128/256 Encryption & Sacling Supports a wide range of resolutions and rates up to 4K, Streaming protocols include IP, UDP, TCP, IGMP, and IGMP, Built-in videowall function, Auto Video 4K Scaler, Analog Stereo 2-channel, Dynamic OSD text overlay capabilities, Analog to digital Conversion: 24 bit, 48 kHz; Control: USB 2.0 over IP (KVM), RS-232 over IP, IR over IP and CEC over IP, Compliance: CE, FCC, RoHS, WEEE.	168	Set	138670	2,32,96,560
23	Supply, Installation, Testing and Commissioning of HDMI to USB Converter with 1x HDMI input, 1x HDMI output, 1x analog audio input, and 1x USB 3.0 output. Supports 4K resolution and 1080p@60fps uncompressed USB capture for high-quality video streaming and conferencing. Compliant with UVC (USB Video Class) and UAC (USB Audio Class) standards for seamless integration with video capture and streaming applications. Features HDCP 2.2 content protection. Compliant with UL, CE, FCC, RoHS/WEEE standards (BIS if applicable).	24	Set	73746	17,69,904
24	Supply, Installation, Testing and Commissioning of Networking Switch(Managed Layer 2 Switch) having 48 Nos. x 10/100/1000 Base T PoE Ports ; all ports capable of providing PoE as per 802.3at with switch having POE capabilities on all ports with each port capable of providing minimum with total power budget of 740 Watt or more, Additional 4 Gigabit copper/SFP ports ;QOS Support ; IPV4/IPV6 Support ; Advance Security Management ; Switching Capacity in Gigabits per Second : 104 Gbps or more ; 1 Gbps Non-blocking ports and Internet Group Management Protocol : IGMP V2/V3 ; Mac, windows, Linux;	24	Set	227392	54,57,408

	Spanning Tree Protocol : Standard 802.1; Internet Group Management Protocol (IGMP) : versions 1, 2, and 3 snooping ; IGMP limits bandwidth-intensive multicast traffic to only the requesters ; supports 2K multicast groups.				
25	Supply, Installation, Testing and Commissioning of Video Conferencing Solution with Codec supporting multiple HDMI/HDCI Inputs and outputs, inclusive of facility to connect 1x Full HD 10x or more PTZ Camera, touch panel, minimum 3x Mic Inputs with 2x table top microphone supplied from Day 1, integrated wireless content sharing and full set of accessories complete as required and as per technical specifications	24	Set	996919	2,39,26,056
26	Supply, Installation, Testing & Commissioning of POE Powered 4K PTZ Camera : with 20x optical zoom ; Sensor : 1/2.8" MOS/CMOS; approx. 8MP or more; Video Format : 4K ; Outputs: HDMI , USB & Ethernet (H.264/H.265 streaming video over IP) ; Optical Zoom : 20x ; Horizontal Viewing Angle : 58 degree or more ; Panning Angle : +170° ~ -170° ; Pan Speed : 2deg-100 deg/second; Tilting Angle : +90° ~ -20° ; Tilt Speed : 2 deg - 60 deg/second or more; Auto Focus; Gain Control ; White Balance ; Exposure Control Auto/Manual ; Preset Positions : 255 ; Control Interface : RS-232 or RS-422 or Ethernet ; Control Protocol : VISCA or PELCO D or ONVIF ; Video Stream : RTSP / RTMP etc. ; BIS certification.	72	Set	382550	2,75,43,600
27	Supply , Installation, Testing & Commissioning of Soundbar : having CAMERA with Auto Framing for automatically framing meeting participants. Max Resolution : 4K@30Hz ; Video Formats : 4K@30fps ; 1080p@30fps ; 720p@30fps etc. ; 4K Camera ; 4x digital zoom ; Horizontal Angle of View:110° ; AUDIO : Microphone- Four Element Microphone Array ; Acoustic Echo Cancellation ; Automatic Noise Reduction ; Pickup Distance : 15 feet or more ; Speaker Output Power : 20W or 80 dB SPL or better @ 1000 Hz @1 Meter or better; INPUT/OUTPUT INTERFACE :: USB interface : 1 x USB-B or USB-C supporting speeds as per USB 3.0.	78	Set	178804	1,39,46,712

28	Supply, Installation, Testing & Commissioning of 19" wide mounting frame Networking Enclosures of following size and capacity complete with all accessories. Power to the rack mounted equipment shall be provided by way of 2 Nos. of 19" rack mounted power distribution strips, each consisting of minimum 8 Nos. of 5/15A power sockets and each inclusive of 20Amps MCB. It shall be inclusive of minimum 04 nos. of vertical cable managers and 12 nos. of 19" 1U size horizontal cable managers. It shall be inclusive of termination of earthing for which a separate signal grounding for all the equipment racks, other than electrical or building earthing shall be provided; Each rack shall have two Copper Bar Earth Kits/strips which should be mounted vertically in the rear side of the rack. Racks shall be inclusive of all the necessary mounting accessories and hardware complete as required for a complete installation. 36U, 800mmW x 800mmD, floor mounted, 4 x 90cfm fans	24	Set	70183	16,84,392
29	S//FTP CAT6A CABLING COMPONENTS Supply, Laying & Termination of specified make LSZH S/FTP CAT6A cable in existing/prelaid surface/recessed steel/PVC conduits or pipes or floor raceways or cable trays, but without the cost of steel/PVC conduits or pipes or floor raceways or cable trays. The cable is to be drawn from individual workstation area/device/IO to the nearest distribution rack or networking rack. It shall be within the scope of contractor to carry out and submit scanner readings for all IOs for meeting the requirements of relevant EIA/TIA standards as per CAT6A cabling requirements. The contractor shall submit a detail IO maps, labelling and documentation related to terminations. It shall be inclusive of grounding and bonding and all the necessary mounting accessories and hardware complete as required for a complete installation.	10,920	Meter	107	11,68,440

30	Supply and Laying of Unshielded Twisted Pair Cable Conductor: Copper wire; Size: 4 Pair (AWG23); Construction: Unshielded; Core Stranding: 2 cores twisted to a pair.	4,320	Meter	65	2,80,800
31	Supply and Laying of 1.8 mtrs HDMI-HDMI Patch Cord of Cable type - data cable ; AWG 24-28 ; Jacket - PVC ; black or grey ; Connector 1/2 - HDMI A gold plated contacts ; Contact 1/2 - gold-plated ; Connector 1/2 : molded plastic sleeve complete as required	888	Set	1944	17,26,272
32	Supply and Laying of 9.1/10. mtrs HDMI-HDMI Patch Cord of Cable type - data cable ; AWG 24-28 ; Jacket - PVC ; black or grey ; Connector 1/2 - HDMI A gold plated contacts ; Contact 1/2 - gold-plated ; Connector 1/2 : molded plastic sleeve complete as required	506	Set	9718	49,17,308
33	Supply, Installation, Testing and Commissioning of HDMI Face Plates	50	Set	2159	1,07,950
34	Supply, Installation, Testing and Commissioning of 2.7/3m USB Male to Male Full-Featured Type-C cable for USB 3.1 Gen2 ; 100Watt / 5A charging and eMarker ; 4 Lane Displayport Alt mode ; 4K@30fps Video and Audio.	180	Set	15116	27,20,880
35	Supply, Installation, Testing and Commissioning of 10 Meter USB Active to Active Female Full-Featured Type-C Active Extension Cable for USB 3.1 Gen2 ; 100Watt / 5A charging and eMarker ; 4 Lane Displayport Alt mode ; 4K@30fps Video and Audio.	204	Set	19435	39,64,740
36	Supply and Laying of 2 core 1.5 sqmm copper conductor loudspeaker cable ; PVC insulated; core twisted ; outer jacketed ;	14,580	Meter	119	17,35,020
	Total of C5 - AV System				41,71,51,490

	C6 - Integrated Building Management System				
	CENTRAL CONTROL SERVER				
1	Supplying Installation Testing Commissioning of Central Control Server System comprising of Intel® Xeon® CPU E5-2640 x64 (or better) compatible with dual and quad core processors, Windows 11 (Professional, Enterprise, Ultimate, 64 bit), Windows Server 2013 R2 (Standard, Enterprise, 64 bit) 16 GB or more, Video card and monitor capable of displaying at 1024 x 768 resolution or better, Latest Microsoft Licence Version Operating System Loaded with MS OFFICE 2019 Professional, Word, EXCEL, Power Point, Outlook Express, Microsoft Team official version lifetime licences suitable for running BMS software complete etc. as required.	1	Each	186434	1,86,434
	PC System				
2	Supplying Installation Testing Commissioning of Client PC System comprising of PC Hardware with minimum 11th Gen Intel® I7 processor CPU E5-2640x64 (or better), compatible with dual and quad core processors minimum 3.1 GHz and 8GB or higher RAM, Hard Drive Space of 256 GB SSD or better, Video card and monitor capable of 1920 x 1080 pixel resolution or better with Ethernet adapter (10/100/1000 Mbps with RJ-45 connector) with 2 GB or higher Graphics card suitable for BMS System complete etc. as required.	1	Each	90698	90,698
	LaserJet printer				
3	Supplying Installation Testing Commissioning of LaserJet printer having printing resolution 1200 x 1200 dpi, (dot/inch) or better, 21 to 30 ppm printing speed (LaserJet) complete etc. as required.	1	Each	22674	22,674
	LED Display				
4	Supplying, Installation, Testing and Commissioning of following size LED display (LED monitor)				

	industrial grade with 3840x2160 resolution or better, USB playback, bluetooth and miracast connectivity, 4X HDMI 2.0, DP 1.2, HDR 10/10+, brightness: 500-nits or better, Video wall mode should be available, contrast ratio: 1200:1, OPS slot, viewing angle (H/V): 170°/ 170°, response time less than 12ms, Display control shall be on monitor screen and programmable with remote (remote shall be supplied with system), Key Board, Optical Mouse, etc. as required.				
4.1	32 inch or larger	1	Each	39590	39,590
	Software for Building Management System				
5	Supplying Installation Testing Commissioning of Necessary Software (UL listed) Packages containing Building Management with Capability of Collection, Storage, Processing and Controlling all the Data. Software shall support Open Standard Protocols like XML, BACnet, Modbus, Lon works etc. and without the use of Proprietary Protocols, with Enterprise Level Database Like MS SQL complete Lifetime Licenced & capable to collect, store & access all points from Fire Alarm Systems, IT Systems, Automation Systems, HVAC System, Lift, Energy management, Water Management System, etc. to create & monitor historical & event data, event management data, alarm management data & reporting data, Email Alerts for Critical alarms for all the systems. The scope includes additional software required by BMS software (to enable a standard Web browser) to be resident on the DDC/client machine (manufacture-specific browsers shall not be acceptable). User log-on identification and password shall be required & a minimum three-layered security system (User interface Level, Application Level and Data Base Level) to be deployed for safety. The supplied computer software shall employ objectoriented technology (OOT) for representation of all data and control devices within the system. This data shall reside on a server for all database access (Systems requiring proprietary database and user interface programs shall not be acceptable). All components and controllers supplied under this contract shall be true “peer-to-peer” communicating devices (Components or controllers requiring “polling” by a Master / Global / Host to pass data shall NOT be acceptable). Physical connection of BACnet/MODBUS devices shall be via Ethernet at all				

	levels. The License must be provided by default. The BMS software shall be complete in all respect to cater the following different numbers of points managed in the installation.				
5.1	For Upto 5000 point included	1	Each	246899	2,46,899
	DDC CONTROLLERS				
6	Supplying Installation Testing Commissioning of IP Based DDC controller capable of fully “stand- alone” operation i.e. In the event of loss of communication with other DDC’s or Control Station, they shall be able to function on their own. The controllers shall consist of dual/quad core 32 bit microprocessors with EPROM based operating system on BACNET. The network Topology shall not allow single point failure. Each DDC on field level shall have embedded TCP/IP (10/100Mbps) connectivity so that it can be hooked into the Local Area Network (LAN) provided by the client or on dedicated network . Each DDC can be accessed from the Graphical User Interface (GUI) or from a standard Web browser (WBI) by connecting the server alongwith inbuilt web browser. All controllers shall accept 230V+/- 10%, 50Hz Uninterrupted power supply provided by end user. Controller shall support DHCP addressing over Local Area Network (LAN) so that the static IP requirements get reduced however a single static IP shall be provided for system so that it can be hosted on to internet in consultation with end user. The microprocessor based DDC’s shall be provided with power supply, analoge to Digital and Digital to analoge converters with memory and capacity to accommodate input/output (I/O) hardware points (with or without an expansion board). Each DDC should have own board and shall accept 0-10 V /4-20mA input signal having Minimum 20% spare capacity considered for expansion. Each DDC on field level should have minimum 128MB RAM & 64MB Flash memory. Following type of All controllers should be mandatorily BTL approved with B-BC profile complete etc. as required.				
6.1	DDC Controller-Type-I (Support upto 32 Points)	160	Each	46861	74,97,760
	Enclosure for DDC				

7	Supplying Installation Testing Commissioning of following sizes Powder coated wall mounted lockable and secure enclosure for DDC panel made of 16 SWG sheet steel IP - 55 rated with proper internal mounting accessories for DDC such as DIN Rails, terminal block for cable terminations, well dressed for all internal cabling, ferruling, tagging etc. The DDC panels shall have power supply and connections for other peripheral equipment, switchgear protections, isolation transformer, earthing, relays, fuses, auxiliary power output socket & lamp etc. as required.				
7.1	800mmX1000mmX200mm	160	Each	18643	29,82,880
	Integration Unit				
8	Supplying Installation Testing Commissioning following type 3rd party Integration unit to provide the interface between Ethernet LAN and the 3rd party field control devices or any other devices which need to be integrated. These shall also provide supervisory capability of functions over the devices connected to it. The purpose of using these units should be limited to integrate the devices only. The Unit must have two onboard Ethernet port, minimum 2/3 on board RS485 ports. The Integration unit should have inbuilt 4GB memory for program storage. The Unit must communicate over TCP/IP with communication speed of 10/100MBPS. The Integration unit should be capable of handling multiple protocol simultaneously such as Bacnet, Modbus, SNMP restricted to single protocol. All integrators should be mandatorily BTL listed. The integration unit shall be housed in suitable size sheet steel enclosure made of 1.6mm thick CRCA sheet, lockable front door with glass, arrangement for cable entry and duly powder coated complete etc as required.				
8.1	Integrator for 5000 Points	1	Each	226744	2,26,744
	Field Devices				
9	Supplying Installation Testing Commissioning of following Field Devices including connection etc. as required				

9.1	Duct CO2 Sensor, 0-2000ppm, 0-10V/4-20mA Output.	160	Each	9876	15,80,160
9.2	Differential pressure switch for filters & Blowers	480	Each	2570	12,33,600
10	Supply, Installation, Testing and Commissioning of Piezo-Resistive Duct pressure sensor with multiple settable ranges as per site requirements with all erection hardwares as required, as per technical specifications with all the necessary mounting accessories as required for complete installation.	160	Each	9107	14,57,120
11	Supply of Duct mount type Combined Temp. & Humidity Sensor. These shall be suitable for duct installation and accuracy shall be at least 3%. The measurement range of sensor shall be 0-50 Deg C & 0-100% RH with all erection hardwares including isolation valves as required for the field instruments along with all necessary mounting accessories etc.	320	Each	8854	28,33,280
12	Supply, Laying & Termination of Signal/instrumentation signal cable - 2 Core x 1.0 sq mm PVC insulated, Annealed Tinned Copper, twisted, shielded, armoured FRLS cable.	96,726	Meter	81	78,34,806
13	Supply, Laying & Termination of Serial Communication cable - 2 Core x 1.5 sq mm PVC insulated, Annealed Tinned Copper, twisted pair, shielded, armoured FRLS cable.	6,000	Meter	103	6,18,000
14	Supply, Laying & Termination of - 3 Core x 1.5 sq mm, ATC conductor multistranded, PVC insulated, shielded, twisted pair, armoured FRLS cable for Powering DDC, Actuators & Sensors.	350	Meter	116	40,600

15	S//FTP CAT6A CABLING COMPONENTS Supply, Laying & Termination of specified make LSZH S/FTP CAT6A cable in existing/prelaid surface/recessed steel/PVC conduits or pipes or floor raceways or cable trays, but without the cost of steel/PVC conduits or pipes or floor raceways or cable trays. The cable is to be drawn from individual workstation area/device/IO to the nearest distribution rack or networking rack. It shall be within the scope of contractor to carry out and submit scanner readings for all IOs for meeting the requirements of relevant EIA/TIA standards as per CAT6A cabling requirements. The contractor shall submit a detail IO maps, labelling and documentation related to terminations. It shall be inclusive of grounding and bonding and all the necessary mounting accessories and hardware complete as required for a complete installation.	80,360	Meter	107	85,98,520
16	Supply, Installation, Testing & Commissioning of Shielded CAT6A patch panel pre-fully-loaded with 24 ports in 1U form factor, with universal A/B labeling and terminations on rear of panel allowing for quick and easy installation of S/FTP CAT6A cable, inclusive of patching / termination of S/FTP CAT6A cables & grounding and bonding at all 24 ports. It shall be inclusive of all the necessary mounting accessories and hardware complete as required for a complete installation	64	Each	17132	10,96,448
17	Supply, Installation, Testing & Commissioning of single Shielded CAT6A I/O of 10Gbps speed of specified make with different colours for differentiating Data, Voice & Wifi and other services inclusive of termination of S/FTP CAT6A cable at each I/O as required as per drawing. The IO shall be mounted inside singlex or duplex or quad faceplate as applicable and using suitable backbox assembly. It shall be inclusive of grounding and bonding and all the necessary mounting accessories and hardware complete as required for a complete installation.	881	Each	349	3,07,469

18	Supply, Installation, Testing & Commissioning of faceplate of following configuration inclusive of shutters/hinged dust covers and corresponding GI backbox assembly. GI backbox assembly shall be provided for outlets installed at wall or at furniture, wooden or any partition at workstation area/device for flush mounting. For exposed mounting, PVC backbox assembly shall be provided. It shall be inclusive of all the necessary mounting accessories and hardware complete as required for a complete installation.				
18.1	Single/ Dual / Quad I/O faceplate as per requirement	881	Each	214	1,88,534
19	Supply, Installation, Testing & Commissioning of LSZH S/FTP CAT6A 10Gbps RJ-45 Patch Cords, either Solid Conductor or Stranded variants, of various lengths with different colours for differentiating Data, Voice & Wifi and other services. It shall be inclusive of all the necessary mounting accessories and hardware complete as required for a complete installation.				
19.1	1 meter / 3 feet	1,536	Each	349	5,36,064
19.2	2 meters / 7 feet	350	Each	1140	3,99,000
19.3	3 meters / 10 feet	350	Each	1232	4,31,200
20	FIBER OPTIC CABLE & COMPONENTS Supplying and drawing following core Fiber Optic Cable having corrugated steel armoring. The Fiber should be SM Fiber Central loose tube filled with Thixotropic jelly, duly following Standards: ISO 11801, IEC 60793-1/60794-1-2, ITU-T-REC G.652D and Telecordia GR-20-core, High quality Electro Chromium Coated Corrugated Steel tape (ECCS) and HDPE-Sheath, Operating ambient Temperature should be – 5 °C to +50 °C and Storage Temperature shall be – 5 °C to +50 °C, Max Attenuation ± 0.36 (db / km) at Operational Wavelength 1310 nm and ± 0.22 db / km at Operational Wavelength 1550 nm. type of fiber should				

	be 9/125 / G.652D & Refractive Index should be 1.4670/1.4675. The value for Mode-field, Cladding Diameter $9.2 \pm 0.4 \mu\text{m}$ and $125 \pm 0.7 \mu\text{m}$ correspondingly. The Dispersion value $< 3.5 < 18$ ps/nm-km and PMD value < 0.2 ps/km and Cable Cut-off wavelength < 1260 nm i/c splicing & marking etc complete as required.				
20.1	Single Mode Optical 12 Core fiber cable	7,200	Meter	89	6,40,800
21	Supply and fixing following port Rack Mount loaded LIU with pigtail, Front-mounted cable saddles for jumper management, suitable to manage both splices and terminations, Pre-assembled shelves in multiple configurations, Rubber fiber slotted bracket built-in, metal splice shelf to protect the fibers, 2 fiber spools built-in for 900 μm tight buffered fiber storing, Capable of storing up to 3 meters of 900 μm tight buffered fiber per adapter, Removable front and rear covers for better access to interior of LIU, Should be Single / Multi mode LC Type fully loaded. Accessory kit consists of cable ties, mounting ear screws, and spiral wrap tube etc complete as required.				
21.1	24 port LIU	36	Set	10049	3,61,764
22	Supply, Installation, Testing & Commissioning of 19" rack mounting type fully loaded fiber shelf of various capacities for assembly/termination of fiber optic cable for LC style components, for optical splicing and provision for storage of pigtails and splices, equipped with adaptors, adaptor plates and any other such all necessary hardware for proper dressing and management of fiber optic cable. Any blank adaptor positions must be suitably masked for restricting dust entry. It shall be inclusive of all couplers as per LIU capacity; adequate splice trays shall be provided for proper management of splices for all cores as per LIU capacity; adequate sliding shelves with slots shall be provided. It shall be inclusive of all the necessary mounting accessories, pigtails and hardware complete as required for a complete installation.				
22.1	For 192 cores, 4U, Single mode OS2 LC termination	6	Set	329726	19,78,356

23	Supply, Installation, Testing & Commissioning of LC-LC duplex fiber optic patch cords of various lengths, complete as required for a complete installation.				
23.1	2 meters / 10 feet, single mode	288	Each	705	2,03,040
24	Supplying and fixing of following size Wall Mount Rack having Fixed Structure with 0.8mm CRCA Sheet, completely knocked down condition (CKD) Shape, Vertical Mounting Rail 1.6 mm with 'U'Marking, Minimum 2 cable entry/exit provision at Top and bottom with rubber protection, Front 5mm Toughened Glass with lock, wall mounting kit, Powder coated Color- RAL- 7035, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1 number, etc. complete as required. 15U Rack	36	Set	13330	4,79,880
25	Supplying and fixing 42U Rack with 6 inch Castor wheels and front brake Floor Standing Rack with Main Frame Pillar of 1.6mm CRCA Sheet with removable side panels, L- Shape adjustable Vertical Mounting Rail of 2mm with 'U'Marking completely knocked down condition (CKD) Shape, fitted with 4 number cooling fans, minimum 8nos two line cable entry/exit provision at top and bottom with rubber protection, Front door 5mm Toughened Glass with MS frame or MS perforated with lock, Rear MS vented or perforated door, Powder coated Color- RAL- 7035 or black, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1 number, etc. complete as required.	3	Set	32954	98,862
26	Splicing / Termination of Fiber Optic Cable Cores using Fusion splicing with pre-terminated LC pigtails, dressing and proper fixing in splice trays. Including Splicing Kit.	2,016	Each	343	6,91,488

27	Supplying, Installation, Testing and commissioning of small form Pluggable (SFP) for Network Switches. Must be hot Pluggable, RoHS Complaint, etc. complete as required.				
27.1	10 G SFP + Single Mode	176	Each	14972	26,35,072
27.2	40 G QSFP	12	Each	42110	5,05,320
28	Access Switch - Supplying, installation, Testing and commissioning of following capacity 24 port Layer 3 Network Switch having features and specifications etc. as mentioned here under: At least 20 X RJ-45 Gigabit Ethernet Ports and additional 4 combo 10/100/1000 base t/SFP Ports with additional 4 SFP+ ports non-blocking architecture by having Switching capacity of min. 128Gbps and packet Forwarding rate of 95Mpps or higher, 16K MAC table. Console Port, USB port, Internal AC Power supply with operating temperature of 0 to +50 degree Celsius. Stacking port with stacking support of minimum 8 units per stack. 48K Mac address, 9K or more Jumbo frame, ERPS with enabling ring to converge in less than 50 ms from node or link failure, Static routing, Static, 6to4, ISATAP and GRE, IPv6 Neighbor Discovery (ND), BGP, ISIS, MPLS, VRRP v2, OSPFv2/v3, PBR, Route Redistribution, RIPv1/v2/ng, IP Helper all L3 Protocols should support from day 1 for both IPv6 and IPv4, 802.1x, Port security , Radius C TACACS+ authentication C accounting, DAD, DAI, DoS attack prevention, SSH, Guest VLAN, IP Access List, MAC Access List. Multicast: VLAN, PIM-SM, PIM-DM, PIM- SDM, PIM SMv6, DVMRP v3 and MSDP, IGMP C MLD Snooping, Flow mirroring, IGMP C MLD Snooping Querier, Per-VLAN IGMP C MLD Snooping. SNMP, Dual configurations, Multiple images, RMON, LLDP/LLDP MED, sFlow, DHCP/BOOTP Client, IPv4/IPv6, Syslog server, Debug command, 802.3ah Ethernet Link OAM, 802.1ag Connectivity Fault, Y.1731 OAM, 802.1Qbb Priority- based Flow Control (PFC), Dying Gasp, Cable Diagnostics , 6 kV surge protection on all Gigabit Ethernet ports and on all GE RJ-45 access ports. Certifications: UL, CE, FCC, RoHS, MTCTE, OEM/Product must be on Trusted	44	Each	193791	85,26,804

	Telecom Portal of Department of Telecommunication, Government of India.				
29	Core Switch: Supply, Installation, Testing and Commissioning of Networking Switch : Layer 3 Chassis/Fixed based switch, inclusive of the following line cards for (a) 48 x 10G SFP+ ports, (b) 4 x 40G QSFP+ ports, full advanced Layer 3 features, shall operate in dual redundancy/High Availability (HA) mode, Software Defined Networking (SDN) supported with all licenses from Day 1, installed dual redundant CPUs/Supervisor modules from Day 1, installed dual redundant hot-swappable power supplies from Day 1, and installed dual redundant hot-swappable fans from Day 1, complete as required and as per technical specifications. (Shall be deployed in High Availability Mode at BNR).	1	Each	6316730	63,16,730
30	Network Management System (NMS): Supply, Installation, Testing and Commissioning (SITC) of Network Management System (NMS) with all required software licenses, hardware server(s), operating system, and database components to monitor, manage, and configure all active network components (Core/Access Switches, Routers, Wireless WLC/APs, and IP EPBAX). The system shall support real-time auto-discovery, L2/L3 dynamic topology mapping, fault management, performance monitoring, automated configuration backup & compliance management (NCM), and SDN controller integration. Should support upto 5000 network devices and 15000 endpoints. The NMS shall operate in dual redundancy / High Availability (HA) mode, with dual redundant hot-swappable power supplies and fans on host servers installed from Day 1, complete as required and as per technical specifications.	1	Each	2412810	24,12,810
	Total of C6 - IBMS				6,32,99,406

	C7 - ICT				
1	S//FTP CAT6A CABLING COMPONENTS Supply, Laying & Termination of specified make LSZH S/FTP CAT6A cable in existing/prelaid surface/recessed steel/PVC conduits or pipes or floor raceways or cable trays, but without the cost of steel/PVC conduits or pipes or floor raceways or cable trays. The cable is to be drawn from individual workstation area/device/IO to the nearest distribution rack or networking rack. It shall be within the scope of contractor to carry out and submit scanner readings for all IOs for meeting the requirements of relevant EIA/TIA standards as per CAT6A cabling requirements. The contractor shall submit a detail IO maps, labelling and documentation related to terminations. It shall be inclusive of grounding and bonding and all the necessary mounting accessories and hardware complete as required for a complete installation.	8,69,917	Meter	107	9,30,81,119
2	Supply, Installation, Testing & Commissioning of Shielded CAT6A patch panel pre-fully-loaded with 48 ports in 2U form factor, with universal A/B labeling and terminations on rear of panel allowing for quick and easy installation of S/FTP CAT6A cable, inclusive of patching / termination of S/FTP CAT6A cables & grounding and bonding at all 24 ports. It shall be inclusive of all the necessary mounting accessories and hardware complete as required for a complete installation	264	Each	37740	99,63,360
3	Supply, Installation, Testing & Commissioning of single Shielded CAT6A I/O of 10Gbps speed of specified make with different colours for differentiating Data, Voice & Wifi and other services inclusive of termination of S/FTP CAT6A cable at each I/O as required as per drawing. The IO shall be mounted inside singlex or duplex or quad faceplate as applicable and using suitable backbox assembly. It shall be inclusive of grounding and bonding and all the necessary mounting accessories and hardware complete as required for a complete installation.	11,219	Each	349	39,15,431

4	Supply, Installation, Testing & Commissioning of faceplate of following configuration inclusive of shutters/hinged dust covers and corresponding GI backbox assembly. GI backbox assembly shall be provided for outlets installed at wall or at furniture, wooden or any partition at workstation area/device for flush mounting. For exposed mounting, PVC backbox assembly shall be provided. It shall be inclusive of all the necessary mounting accessories and hardware complete as required for a complete installation.				
4.1	Single/ Dual / Quad I/O faceplate as per requirement	11,219	Each	214	24,00,866
5	Supply, Installation, Testing & Commissioning of LSZH S/FTP CAT6A 10Gbps RJ-45 Patch Cords, either Solid Conductor or Stranded variants, of various lengths with different colours for differentiating Data, Voice & Wifi and other services. It shall be inclusive of all the necessary mounting accessories and hardware complete as required for a complete installation.				
5.1	1 meter / 3 feet	12,672	Each	349	44,22,528
5.2	2 meters / 7 feet	4,172	Each	1140	47,56,080
5.3	3 meters / 10 feet	1,000	Each	1232	12,32,000
6	FIBER OPTIC CABLE & COMPONENTS Supplying and drawing following core Fiber Optic Cable having corrugated steel armoring. The Fiber should be SM Fiber Central loose tube filled with Thixotropic jelly, duly following Standards: ISO 11801, IEC 60793-1/60794-1-2, ITU-T-REC G.652D and Telecordia GR-20-core, High quality Electro Chromium Coated Corrugated Steel tape (ECCS) and HDPE-Sheath, Operating ambient Temperature should be – 5 °C to +50 °C and Storage Temperature shall be – 5 °C to +50 °C, Max				

	Attenuation ± 0.36 (db / km) at Operational Wavelength 1310 nm and ± 0.22 db / km at Operational Wavelength 1550 nm. type of fiber should be 9/125 / G.652D & Refractive Index should be 1.4670/1.4675. The value for Mode-field, Cladding Diameter 9.2 ± 0.4 μm and 125 ± 0.7 μm correspondingly. The Dispersion value $< 3.5 < 18$ ps/nm-km and PMD value < 0.2 ps/km and Cable Cut-off wavelength < 1260 nm i/c splicing & marking etc complete as required.				
6.1	Single Mode Optical 12 Core fiber cable	14,400	Meter	89	12,81,600
7	Supply and fixing following port Rack Mount loaded LIU with pigtail, Front-mounted cable saddles for jumper management, suitable to manage both splices and terminations, Pre-assembled shelves in multiple configurations, Rubber fiber slotted bracket built-in, metal splice shelf to protect the fibers, 2 fiber spools built-in for 900 μm tight buffered fiber storing, Capable of storing up to 3 meters of 900 μm tight buffered fiber per adapter, Removable front and rear covers for better access to interior of LIU, Should be Single / Multi mode LC Type fully loaded. Accessory kit consists of cable ties, mounting ear screws, and spiral wrap tube etc complete as required.				
7.1	24 port LIU	72	Set	10049	7,23,528
8	Supply, Installation, Testing & Commissioning of 19" rack mounting type fully loaded fiber shelf of various capacities for assembly/termination of fiber optic cable for LC style components, for optical splicing and provision for storage of pigtails and splices, equipped with adaptors, adaptor plates and any other such all necessary hardware for proper dressing and management of fiber optic cable. Any blank adaptor positions must be suitably masked for restricting dust entry. It shall be inclusive of all couplers as per LIU capacity; adequate splice trays shall be provided for proper management of splices for all cores as per LIU capacity; adequate sliding shelves with slots shall be provided. It shall be inclusive of all the necessary mounting accessories, pigtails and hardware complete as required for a complete installation.				

8.1	For 192 cores, 4U, Single mode OS2 LC termination	10	Set	329726	32,97,260
9	Supply, Installation, Testing & Commissioning of LC-LC duplex fiber optic patch cords of various lengths, complete as required for a complete installation.				
9.1	3 meters / 10 feet, single mode	576	Each	1779	10,24,704
10	Supplying and fixing 42U Rack with 6 inch Castor wheels and front brake Floor Standing Rack with Main Frame Pillar of 1.6mm CRCA Sheet with removable side panels, L- Shape adjustable Vertical Mounting Rail of 2m m with 'U'Marking completely knocked down condition (CKD) Shape, fitted with 4 number cooling fans, minimum 8nos two line cable entry/exit provision at top and bottom with rubber protection, Front door 5mm Toughened Glass with MS frame or MS perforated with lock, Rear MS vented or perforated door, Powder coated Color-RAL- 7035 or black, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1 number, etc. complete as required.	77	Set	32954	25,37,458
11	Splicing / Termination of Fiber Optic Cable Cores using Fusion splicing with pre-terminated LC pigtails, dressing and proper fixing in splice trays. Including Splicing Kit.	3,648	Each	343	12,51,264
12	Access Switch - Type 1: Supply, Installation, Testing and Commissioning of Networking Switch (Access Switch) having 48 nos. 10/100/1000 Base-T ports, stacking, all ports capable of providing PoE+ as per 802.3at, with the switch having a PoE+ capability on all ports with each port capable of providing minimum 30 watts PoE power, additional minimum 4 SFP+ ports, Software Defined Networking (SDN) supported, with all licenses from Day 1 and inclusive of dual redundant hot-swappable power supplies installed from Day 1, complete as required and as per technical specifications	248	Each	683212	16,94,36,576

13	Access Switch - Type 2: Supply, Installation, Testing and Commissioning of Networking Switch (Access Switch) having 48 nos. 10/100/1000 Base-T ports (out of the 48 ports, 8 ports should be mGig ports supporting speeds of 1G/2.5G/5G), stacking all ports capable of providing PoE+ as per 802.3at, with the switch having a PoE+ capability on all ports with each port capable of providing minimum 30 watts PoE power, additional minimum 4 SFP+ ports, Software Defined Networking (SDN) supported, with all licenses from Day 1 and inclusive of dual redundant hot-swappable power supplies installed from Day 1, complete as required and as per technical specifications	75	Each	829215	6,21,91,125
14	Core Switch : Supply, Installation, Testing and Commissioning of Networking Switch (Building Level Core Switch): Layer 3 Chassis based modular switch, inclusive of the following line cards for (a) 144 x 10G SFP+ ports, (b) 24 x 40G QSFP+ ports, full advanced Layer 3 features, shall operate in dual redundancy/High Availability (HA) mode, Software Defined Networking (SDN) supported with all licenses from Day 1, installed dual redundant CPUs/Supervisor modules from Day 1, installed dual redundant hot-swappable power supplies from Day 1, and installed dual redundant hot-swappable fans from Day 1, complete as required and as per technical specifications.	2	Each	13659883	2,73,19,766
15	Server Farm Switch: Supply, Installation, Testing and Commissioning of Networking Switch : Layer 3 Chassis/Fixed based switch, inclusive of the following line cards for (a) 48 x 10G SFP+ ports, (b) 4 x 40G QSFP+ ports, full advanced Layer 3 features, shall operate in dual redundancy/High Availability (HA) mode, Software Defined Networking (SDN) supported with all licenses from Day 1, installed dual redundant CPUs/Supervisor modules from Day 1, installed dual redundant hot-swappable power supplies from Day 1, and installed dual redundant hot-swappable fans from Day 1, complete as required and as per technical specifications. (Shall be deployed in High Availability Mode at BNR).	2	Each	6316730	1,26,33,460

16	Supply, Installation, Testing and Commissioning of Internet Router: Layer 3 Router, 4 x 1G Copper, 4 x 10G SFP+ Fiber ports, 4 x 40G QSFP+ ports, full advanced Layer 3 features, High Availability, dual redundant hot-swappable power supplies and fans from Day 1, as per technical specifications.	2	Each	2451254	49,02,508
17	Indoor Access Points: Supplying, Installation, Testing and commissioning of indoor Wireless Access Point for High density use having features and specifications etc. as mentioned here under- WiFi6 802.11ax 574Mbps (2.4GHz) + 2402Mbps (5GHz), WIFI 6 Certified, 1 x RJ45 console port, MG 2.5G LAN POE Port, factory reset, WPA/WPA2/WPA3™ Personal/Enterprise, WEP 64/128-bit, SSID broadcast disable, MAC address access control, Internal RADIUS server, SNMP, Customizable Captive Portal, Auto Channel, Works as Access Point, WDS, WDS with AP, Wireless Client., Web (HTTP), Secure Socket Layer (SSL), Traffic control, Support ATF/Fast Roaming/Band Steering, Supports enhanced security – WPA PSK/WPA2-PSK/WPA3-PSK and RADIUS client, and Cipher negotiation, and MAC/ IP ACL for networks, Certifications: MTCTE, CE, FCC. Works as Standalone, Compatible with S/W & H/W Controller with additional features like - Real-Time Monitoring and Alerts, Rich Advanced Features, Centralized Device Management, Role-Based Administration, Real-Time Monitoring, VLAN and Access Control, Auto RF Management and Bandwidth Optimization, Multi-SSID and Captive Portal Authentication. OEM/Product must be on Trusted Telecom Portal of Department of Telecommunication, Government of India etc. complete as required.	250	Each	35559	88,89,750

18	Wireless Controller: Supplying, Installation, Testing and commissioning of indoor Wireless Controller having features and specifications etc. as mentioned here under- The network controller shall be a dedicated hardware appliance designed for centralized management of wireless access points, It must support the management of up to 500 networking devices, The system should be on-premise, ensuring data privacy and complete control over network configurations. It must include an intuitive user interface for real-time monitoring, device discovery, firmware upgrades, scheduling, and mass configuration deployment. Features such as role-based administration, multi-site management. AP to controller communication shall be use of industry standards-based (IEEE or IETF) CAPWAP or any tunneling protocols as per guidelines of DoT. The controller should support Layer 2 and Layer 3 device discovery, VLAN configuration, MAC ACL groups, IGMP snooping, and bandwidth optimization. Automatic radio frequency (RF) management and access policy enforcement are required for reliable wireless performance. The solution must offer a comprehensive dashboard with network topology, floor plan views, client and device lists, and alert notifications. For authentication, it should support a range of methods including local database, external RADIUS, LDAP, and passcode or MAC-based access. It should provide detailed traffic analytics, logs, and customizable reporting for network visibility and planning. Firmware and configuration backup and restoration functions must be available, with USB-based log storage supported. Physical specifications should include a compact form factor with a minimum of one 2.5G Ethernet port and USB 3.0 port, and it must be MTCTE, CE, FCC, and RoHS certified. The controller should operate reliably within a 0°C to 40°C temperature range and 10–90% non-condensing humidity. /Product must be on Trusted Telecom Portal of Department of Telecommunication, Government of India etc. complete as required.	1	Each	113228	1,13,228

19	(IP-Pbx)-Voice TCP/IP based EPABX Communications System - For Public Network (Internet, N1) segment (Main Call Control System): Supply, Installation, Testing & Commissioning of Server based Communication System with all the required Software licenses and Hardware IP-PBX/IP Telephony Communications Server: The IP Telephony Solution shall support the following Services Voice, Video, IM, Presence and Audio Conference. The Solution should be built on Active-Active Redundant Servers. The IP Telephony Solution should support H.323 and SIP. The Solution should support the following Trunks FXO, E1 PRI and SIP. The IP Telephony solution should incorporate all licenses for the Phones and Trunks. Solution should support 3500 Extensions from Day 1 with future scalability to support upto 6000 Extensions. Licenses for all Phones and Softphones supplied should be provisioned on Day 1. Solution should support Hard IP Phones, Softphones, Video Phones, Analog Phones, Video Conference Endpoints, Rack mount architecture, complete as required and as per technical specifications. (Shall be deployed in High Availability Mode for Internet segment).	2	Each	24053504	4,81,07,008
20	TDM Voice Gateway: Supply, Installation, Testing & Commissioning of Voice Gateway The Voice Gateway should provide 16 E1/PRI on Day 1, inclusive of support for 200 SIP Trunks and relevant licences and resources installed from Day 1, shall operate in dual redundancy, High Availability (HA) mode from Day 1. Capable of adding FXO, BRI and E&M trunks as per specifications. Support QOS and Security complete as required and as per technical specifications. (Shall be deployed in High Availability)	1	Each	2138720	21,38,720

21	AAA Solution for Campus LAN: SITC of AAA solution with all the required licenses, software, server(s) and hardware components to provide authentication, authorization and accounting (AAA), posture, profiling, BYOD for wired/wireless/VPN users and guest management services on a single platform from Day 1 should be licensed for minimum 6000 users/endpoints from Day 1 and scalable up to 12000 users/endpoints in future, shall operate in dual redundancy/High Availability (HA) mode, inclusive of dual redundant hot-swappable power supplies installed from Day 1 and inclusive of dual redundant hot-swappable fans installed from Day 1, as per technical specifications. It shall be inclusive of all servers or sets of servers and operating system(s) and related environment such as database server(s) as applicable and as per OEM, complete as required and as per technical specifications. (Shall be deployed in High Availability Mode).	1	Each	6133156	61,33,156
22	Network Management System (NMS): Supply, Installation, Testing and Commissioning (SITC) of Network Management System (NMS) with all required software licenses, hardware server(s), operating system, and database components to monitor, manage, and configure all active network components (Core/Access Switches, Routers, Wireless WLC/APs, and IP EPBAX). The system shall support real-time auto-discovery, L2/L3 dynamic topology mapping, fault management, performance monitoring, automated configuration backup & compliance management (NCM), and SDN controller integration. Should support upto 5000 network devices and 15000 endpoints. The NMS shall operate in dual redundancy / High Availability (HA) mode, with dual redundant hot-swappable power supplies and fans on host servers installed from Day 1, complete as required and as per technical specifications.	1	Each	2412810	24,12,810
23	Supplying, Installation, Testing and commissioning of small form Pluggable (SFP) for Network Switches. Must be hot Pluggable, RoHS Complaint, etc. complete as required.				

23.1	10 G SFP + Single Mode	1,312	Each	14972	1,96,43,264
23.2	40 G QSFP	24	Each	42110	10,10,640
24	Installation, Testing and Commissioning of IP Phones of Type A, Type B, Type C as directed by Engineer in Charge.	4,000	Each	80	3,20,000
	Total of C7 - ICT				49,51,39,209
	C8 - KITCHEN EQUIPMENTS				
1	SITC of RICE BOILER GAS 12 TRAY for the size of 750 mm X675 mm X1500 mm Material: High-grade Stainless Steel (SS 304).Tray Size: Standard 600 mm × 400 mm × 50 mm, Insulation: Foam (PUF) Water-Inlet: Equipped with a mechanical floating ball valve to prevent dry heating by keeping water levels constant, Bottom outlet pipe for easy draining, cleaning, and flushing out scale build-up.	2	Nos	195792	3,91,584
2	SITC of STOCK POT STOVE for the size of 600 mmX600 mm X600 mm Made of Top & Splash 1.5mm Thick SS304 Grade With Matt Finish, Sides : 1.0 mm Thick SS 304 Grade With Mirror Finish, Leg:1.5” &1” SS Square 304 Grade With Mirror Finish And Adjustable Bullet Leg. The gas Burner shall be of T-35 high pressure Burner with heavy duty Iron Casting square panspot.	2	Nos	16700	33,400
3	SITC of MASALA TROLLEY for the size of 750 mmX600 mm X850 mm. Top of trolley- 1.5mm Thick SS 304 Grade With Matt Finish, Leg: 1.5” SS 304 Grade With Mirror Finish And Movable Wheel, There shall be 1/6 GN Pan-6 Nos of required depth with proper individual lead in all 6 pans	1	Nos	20731	20,731

4	SITC of CHAPATI PLATCUM PUFFER for the size of 1200 mm X600 mmX850 mm+150 mm Top Grilled puffer covered with 16 SWG Polished SS 304, Front & sides Turned Down 50 mm & In 12 mm, Sound Deadned with coved corners, rear raised splash 150 mm returned 25 mm down . Angle frame : 30 mmX 30 mm X3 mm SS 304. Control Panel : 18 SWG SS 304. Spillage trays : 20 SWG SS 304 tray in 2 equal sections. Undershelves : 18 SWG SS 304 undershelf. Gas inlet at Both sides. 100mm rear body/legs setback for gas pipe routing Legs : 4 nos. legs 1-1/2"X 1-1/2"X16 SWG SS 304 square with adustable nylon Bullet Feet	1	Nos	69103	69,103
5	SITC of CHAPATI ROLLING TABLE for the size of 900 mmX600 mm X850 mm+150 mm Top of 16G S.S. sheet. The top will be mounted on M.S. angle 38x38x4mm duly rust proof painted & S.S.vertical tubular legs 38mm dia with adjustable feet's. The unit will have 18SWG S.S.sheet under shelf 6" ht. F.F.L. Top will have sound deadning provision	1	Nos	256977	2,56,977
6	SITC of PARATHA PLATE for the size of 1200 mmX600 mmX850 mm +150 mm Top of trolley- 1.5mm Thick SS 304 Grade With Matt Finish, Leg: 1.5" SS 304 Grade With Mirror Finish And Movable Wheel, There shall be 1/6 GN Pan-6 Nos of required depth with proper individual lead in all 6 pans	1	Nos	69103	69,103

7	SITC of WORK TABLE for the size of 900 mmX600 mmX850 mm+150 mm. Top to be Fabricated from 16SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. UNDERSHELVES: 1 in No. to be Fabricated from 18SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. Welded at 150 mm from Bottom of Unit, directly to Uprights. UPRIGHTS in 38 mm dia.X 16SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25 mm ht. adjustment. INTERNAL FRAMEWORK in 25X25X3mm thick Stainless Steel AISI 202 Grade Angle below the Top. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges. FINISH: All plain & pipe surfaces should be finished brush / satin finish.	1	Nos	24186	24,186
8	SITC of TWO BURNER RAINDIAN RAGNEfor the size of 1200 mmX600 mmX850 mm+150 mm Top & Splash : 1.5 mm Thick SS304 Grade With Matt Finish , Sides : 1.0 mm thick SS 304 Grade With Mirror Finish, Leg: 1.5" & 1" SS Square 304 Grade With Mirror Finish And Adjustable Bullet Leg. The gas Burner shall be of T-35 high pressure Burner with heavy duty Iron Casting square jolly.	1	Nos	31096	31,096
9	SITC of CHAPATI MACHINE 500 PC/HR for the size of 1200 mmX675 mm X1200 mm Capacity : 500 Chapati/Hr , Weight of chapati : 25 gm to 55 gm (Adjustable), chapati thickness : 1.5 mm to 3 mm (Adjustable), chapati size : 4.5" X 7" (adjustable), Colour : Light brown, Appearance :soft with puffed layer, LPG /Gas Consumption :1.5 kg, LPG Pressure : 5 p.s.i to 7 p.s.i, Electricity consumption : Approx. 3.5 kW, PUF Insulation Door : Optional, Harden polish of tawa : yes, Weight of machine : 150 kg approx, Dimension : 4' x 2.5' x 4.5' (500 chapati)	1	Nos	316722	3,16,722

10	SITC of WORK TABLE for the size of 1200 mmX600 mmX850 mm Top to be Fabricated from 16SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. UNDERSHELVES: 1 in No. to be Fabricated from 18 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. Welded at 150mm from Bottom of Unit, directly to Uprights. UPRIGHTS in 38 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25mm ht. adjustment. INTERNAL FRAMEWORK in 25X25X3 mm thick Stainless Steel AISI 202 Grade Angle below the Top. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges. FINISH: All plain & pipe surfaces should be finished brush / satin finish.	2	Nos	32248	64,496
12	SITC of FOUR DOOR REFRIGERATOR for the size of 1350 mm X750 mm X2100 mm. The Outer Body Fabricated from 21SWG AISI 304 grade Stainless Steel Sheet. The Inner Lining and Shelves (Two nos. in each compartment) Fabricated in 22 SWG AISI 304 grade Stainless Steel Sheet. Each Compartment provided with 2 adjustable shelves. UPRIGHTS in 50 mm dia.X 16SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25 mm ht. adjustment. Total height 100 mm from bottom of Unit. INTERNAL FRAMEWORK in 25 X25 X4 mm thick MS angles. INSULATION 75mm thick. Polyurethane Foam, COMPRESSOR of suitable Capacity of Standard make. Other Accessories Like Copper Tubing, Circulation Fan, etc. of Standard Quality. Coolant Gas of type. Doors Fabricated from 19SWG AISI 304 grade Stainless Steel Sheet. fitted on Pivotal Hinges with built in Handles & Lock, Door Sealing lining in High Quality Isoprene Rubber. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges,	1	Nos	143965	1,43,965

	surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges.				
13	SITC of EXHAUST HOOD for the size of 4150 mmX900 mmX450 mm. MADE OF 18 SWG. 304 GRADE S.S. SHEET, FILTER: FRAME OF 18 SWG STAINLESS Steel BAFFLE TYPE GREASE FILTER	1	Nos	193489	1,93,489
14	SITC of EXHAUST HOOD for the size of 4800 mmX900 mmX450 mm MADE OF 18 SWG. 304 GRADE S.S. SHEET, FILTER: FRAME OF 18 SWG STAINLESS Steel BAFFLE TYPE GREASE FILTER	1	Nos	221130	2,21,130
15	SITC of DRAIN THROUGH GRATING for the size of 600 mmX300 mmX75 mm. Frame Made of 1"x1" square pipe and supported by 3/4" SS square 304 pipe of 16 SWG. Outer frame made up off 25x25x3 mm SS 304 angle	10	Nos	11517	1,15,170
16	SITC of DRAIN THROUGH GRATING for the size of 1200 mmX600 mmX75 mm Frame Made of 1"x1" square pipe and supported by 3/4" SS square 304 pipe of 16 SWG. Outer frame made up off 25x25x3 mm SS 304 angle	4	Nos	23034	92,136

17	SITC of WORK TABLE for the size of 1350 mmX600 mmX850 mm+150 mm Top to be Fabricated from 16cSWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. UNDERSHELVES: 1 in No. to be Fabricated from 18 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. Welded at 150 mm from Bottom of Unit, directly to Uprights. UPRIGHTS in 38 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25 mm ht. adjustment. INTERNAL FRAMEWORK in 25X25X3 mm thick Stainless Steel AISI 202 Grade Angle below the Top. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges. FINISH: All plain & pipe surfaces should be finished brush / satin finish.	2	Nos	40310	80,620
18	SITC of CONVEYOR TOASTER for the size of 150 PC/HR Conveyor toasters are commercial-grade appliances designed for high-volume toasting of bread, bagels, buns, and other baked goods, crucial for cafes, buffets, and large kitchens. Capacity: Measured in slices per hour, typically ranging from 150 to over 200 slices/hour for high-volume models	1	Nos	109413	1,09,413
19	SITC of SANDWICH GRILLER for the size of DOUBLE JUMBO Material Stainless Steel;Size/Dimension - 11"x12"; Weight - 16 kg; Plate Size - 11"x12" Have Temperature Control	1	Nos	27641	27,641
20	SITC of MILK BOILER for the size of 10 Litre Made of SS 16 SWG 304 Grade with well insulated with cotton wool all around.Tank Bottom : 10 mm thickness Burner : 1	1	Nos	28793	28,793

	Nos. HP Burner 70,000 BTU/HR, with Individual pilots & control valve. NCV walls for regulating Gas Provided with on off switch				
21	SITC of INDUCTION PLATE for the size of 2 kW Standard feature of an induction heater. Capable of carrying load up to 25 kg (Table top model)	1	Nos	3455	3,455
22	SITC of PLATFORM TROLLEY for the size of 750 mmX600 mmX850 mm. Fabricated from 18 SWG Stainless Steel AISI 304 Grade Sheet, all sides turned up by 50 mm & then 12 mm for chipping bend. PUSH CART HANDLE in 25 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe. UPRIGHTS in 38 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe. CASTOR WHEELS: 2 Fixed & 2 Swiveling with Brake of 150 mm dia x 30 mm thick rubber tyres. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be FINISH: All plain & pipe surfaces should be finished brush / satin finish.	2	Nos	18427	36,854
23	SITC of INSECT KILLER Power-coated body with two black light tube lights provided with AC/DC converter. One power grid inside made of MS wire for execution of insects. Two safety grills on the outer sides of the body to prevent access to power grid independent power controls.	6	Nos	13821	82,926
24	SITC of SERVICE COUNTER for the size of 900 mmX675 mmX850 mm. Top- 20 SWG Polished SS 304, All sides Turned Down 50 mm & In 12 mm, Sound Deadened with coved corners. Angle frame : 30X30X3 mm SS 304 Undershelves : 2 Nos 18 SWG SS 304 undersheleves. All sides Turned Down 40 mm & In 12 mm with 16 SWG SS stiffner.	2	Nos	31096	62,192

	Legs : 4 nos. mads of square pipe of 1.5 mm 16 SWG SS 304 with nylon Bullet Feet; Surface Finish: Mat Polish Buffing,				
25	SITC of HOT BAIN MARIE for the size of 1800 mmX675 mmX850 mm Top- 1.5 mm Thick SS 304 Grade With Matt Finish , Tank : 1.2 mm Thick SS 304 Grade With Matt Finish, Three Side & Bottom Shelf : 1.0 mm Thick SS 304 Grade With Mirror Finish, Leg: 1.5" SS Square Pipe 304 Grade With Mirror Finish And Adjustable Bullet Leg Vessel : GN Pan 6 no. of 1/2 - 150 mm deep (10.5x13x 6 inches) Electric Heater of 3 kW Heater With Control Unit	2	Nos	97896	1,95,792
26	SITC of SS RACK for the size of 900 mmX450 mmX1800 mm Made of 304 Quality, Shelves will be made of 304 Quality 18/8 Grade, 18 SWG. Shelves: 5 Nos, 18 SWG. Stainless Steel. Upright of 30 mm stainless steel square pipe fitted with nylon bullet fit.	10	Nos	32248	3,22,480
27	SITC of DUNNAUGE RACK for the size of 1500 mmX600 mmX150 mm Frame Made of 1"x1" square pipe and supported by 3/4" SS square 304 pipe of 16 SWG. Outer frame made up off 25x25x3 mm SS 304 angle. Surface Finish: Mat Polish Buffing.	3	Nos	20731	62,193
28	SITC of Weighing Scale for the size of 300 kg Digital platform type weighing scale of capacity up to 300 kg with LED display and accurate load cell system, complete with all accessories	1	Nos	16124	16,124

29	SITC of PULVERIZER for the size of 3 HP Pulverizing Chamber, Blades, Hopper & body in AISI 304 Grade Stainless Steel, Unit Monted on Stainless Steel AISI 304 Grade 40x40x16 SWG Grade Pipe Uprights & Frame, Two Sets of Six nos. different mesh size sieves supplied with unit. Branded Single Phase Electrical Motor of 3 HP, Machine Capacity- 50-60 kg/hr, Speed- 2800-3500 RPM, Mesh Size-100-300 mm, Cyclone Collector: Made for excellent and efficient separation,	2	Nos	42441	84,882
30	SITC of POTATO PEELER 10 kg Peeling Chamber in Stainless Steel 16 SWG AISI 304 Grade Sheet. Top Lid in Stainless Steel 18SWG AISI 304 Grade Sheet. Bottom & Inside of Chamber Impregnated with Coarse Emery Powder Unit Mounted on 40x40x16 SWG AISI 304 Grade Square Pipe Frame. Water Inlet at the top of Chamber & Water Flow Out & removal Window at the bottom of the Chamber. Branded Single Phase Electrical Motor of one H.P.	1	Nos	97896	97,896
31	SITC of DOUGH KNEADER 25 kg Heavy duty cast iron body with gear box and motor, provided with a SS revolving drum and revolving arm made of stainless steel sheet. The unit is provided with brakes. Motor 2 HP single phase capacity 25 ltr	1	Nos	126689	1,26,689
32	SITC of VEGETABLE CUTTING MACHINE Cast iron body duly painted. The unit will have a top feeding tray and a housing of stainless steel with grinding plates and 3 type of meshes for variable type of cutting requirements. The unit will be fitted with 1.0 HP single Phase electric motor	1	Nos	166999	1,66,999

33	SITC of VEG WASHER for the size of 50 kg Toxic material. Double inclined well bottom to allow automatic cleaning. Perforated stainless steel base filter easily removable; overflow and filter in 304 AISI stainless steel. Height-adjustable feet. Washing system by water vortex; automatic water filling. Well capacity: 200 lt. Load per cycle: 8 kg (light vegetables); 30 kg (heavy vegetables). Cycle duration: 2-3 min.	1	Nos	558583	5,58,583
34	SITC of POT RACK for the size of 1800 mmX600 mmX1650 mm. Made of Outer Frame 1.5" SS square Pipe 304 Grade With Mirror Finish, Inner Support 25 mm Dia. Pipe 304 Grade With Mirror Finish, Leg : 1.5" SS 304 Grade Pipe With Adjustable Bullet Leg, No. of shelves 3.	1	Nos	51827	51,827
35	SITC of WORK TABLE WITH SINK for the size of 1500 mmX675 mmX850 mm+150 mm Top: 16 SWG SS sheet SS 304 Grade 12 mm raised marine edges turned out 12mm @ 45 deg., Down 45 mm & in 6 mm turn on front & both sides. Vertical & Horizontal corners are covered. All bends to be rounded & smooth Backsplash: Rear - 150 mm height, turned up 25 mm at 60° towards the back & 12 mm down at 90° with rounded junction for easy cleaning. Backsplash to be covered with 20 SWG thick SS sheet SS 304 Grade Sink: 16 SWG SS sheet SS 304 Grade sink duly welded with top. 38 mm dia. chrome-plated drain waste fitted on the centre of the sink. Sink size: 400mm (L)x	1	Nos	40310	40,310
36	SITC of GEYSOR for the size of 30 Litre Standard storage water heater of 30 ltr. capacity with copper tank, electric load 3 kW thermostatically controlled	2	Nos	20731	41,462
37	SITC of IDLI STEAMER 108 PC for the size of 600 mmX675 mmX1500 mm.	1	Nos	132447	1,32,447

	An insulated double walled chamber provided with tray carrier system for keeping idli and dhokla tray. The unit has a water tank duly heated by gas burner provided at the bottom of the unit. The gas burner have supportive kneedle valve & other gas hardware. The unit has provision for re-filling water and steam outlet. Provided with idli trays made of aluminium sheets.				
38	SITC of WORK TABLE for the size of 750 mmX675 mmX850 mm+150 mm Top to be Fabricated from 16 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm.UNDERSHELVES: 1 in No. to be Fabricated from 18 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. Welded at 150 mm from Bottom of Unit, directly to Uprights. UPRIGHTS in 38 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25 mm ht. adjustment. INTERNAL FRAMEWORK in 25X25X3 mm thick Stainless Steel AISI 202 Grade Angle below the Top. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges. FINISH: All plain & pipe surfaces should be finished brush / satin finish.	1	Nos	20155	20,155
39	SITC of DOSA TAWA for the size of 1200 mmX675 mmX850 mm+150 mm The dosa Tawa shall have 5 Nos. 'V' type burners of 40,000 BTU/hr capacity with 5 individually controlled gas valve at front panel. There shall be 5 pilot burners controlled by a 1 valve at the front panel. Dosa plate shall be made of 16 mm thick polished MS plate. Front of the top shall be in 16 SWG SS 304 with 150 mm high back splash. There shall be all round panelling upto 300 mm from top, front panelling in 18 SWG SS 304 and rear and both side panelling in 20 SWG SS 304. The bottom shelf shall be made of frame 16 SWG SS 304 square pipe with 12 mm dia. SS 304 tube. The	1	Nos	69103	69,103

	equipment is mounted on 4 legs of 38 mm dia. x 16 SWG SS 304 pipe with adjustable feet.				
40	SITC of WORK TABLE for the size of 600 mmX675 mmX850 mm+150 mm. Top to be Fabricated from 16 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. UNDERSHELVES: 1 in No. to be Fabricated from 18SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. Welded at 150 mm from Bottom of Unit, directly to Uprights. UPRIGHTS in 38 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25 mm ht. adjustment. INTERNAL FRAMEWORK in 25X25X3 mm thick Stainless Steel AISI 202 Grade Angle below the Top. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges. FINISH: All plain & pipe surfaces should be finished brush / satin finish.	1	Nos	20155	20,155
41	SITC of TWO BURNER RAINDIAN RAGNE for the size of 1200 mmX675 mmX600 mm. Made of Top & Splash 1.5 mm Thick SS 304 Grade With Matt Finish, Sides : 1.0 mm Thick SS 304 Grade With Mirror Finish, Leg: 1.5" & 1" SS Square 304 Grade With Mirror Finish And Adjustable Bullet Leg. The gas Burner shall be of T-35 high pressure Burner with heavy duty Iron Casting square panspot.	1	Nos	31096	31,096
42	SITC of SINGLE BURNER RANGE for the size of 600 mmX600 mmX600 mm. Made of Top & Splash 1.5 mm Thick SS 304 Grade With Matt Finish, Sides: 1.0 Mm Thick SS 304 Grade With Mirror Finish, Leg: 1.5" & 1" SS Square 304 Grade With Mirror Finish And Adjustable Bullet Leg. The gas Burner shall be of T-35 high pressure Burner with heavy duty Iron Casting square panspot.	2	Nos	16700	33,400

43	SITC of WORK TABLE for the size of 1500 mmX675 mmX850 mm+150 mm Top to be Fabricated from 16 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. UNDERSHELVES: 1 in No. to be Fabricated from 18 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. Welded at 150 mm from Bottom of Unit, directly to Uprights. UPRIGHTS in 38 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25 mm ht. adjustment. INTERNAL FRAMEWORK in 25X25X3 mm thick Stainless Steel AISI 202 Grade Angle below the Top. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges. FINISH: All plain & pipe surfaces should be finished brush / satin finish	1	Nos	40310	40,310
44	SITC of DEEP FREEZER for the size of 500 Litre Gross Capacity 500 ltr. ($\pm$ 5 ltr.), defrost type-automatic, swing door, two compartment with lock in built lighting, water drain, copper cooling coil, cooling range - 20°C(Convertable) +2°C to +8°C, power 220 Volt / 50 Hz/ single phase.	1	Nos	55282	55,282
45	SITC of MICROWAVE OVEN External Dimension: 559W x 483D x 349H mm Power Supply 240V, 50Hz 10 Amp. Single phase 1100 Watts of power for fast heating. 34 litre capacity, 5 power levels User-friendly controls, 100 Programmable settings, Durable stainless steel exterior and interior	1	Nos	12669	12,669
46	SITC of EXHAUST HOOD for the size of 1500 mmX900 mmX450 mm	1	Nos	69103	69,103

	MADE OF 18 SWG. 304 GRADE S.S. SHEET, FILTER: FRAME OF 18 SWG. STAINLESS Steel BAFFLE TYPE GREASE FILTER				
47	SITC of EXHAUST HOOD for the size of 1650 mmX900 mmX450 mm MADE OF 18 SWG. 304 GRADE S.S. SHEET, FILTER: FRAME OF 18 SWG. STAINLESS Steel BAFFLE TYPE GREASE FILTER	1	Nos	76013	76,013
48	SITC of MASALA TROLLEY for the size of 600 mmX600 mmX850 mm Top of trolley- 1.5 mm Thick SS 304 Grade With Matt Finish, Leg: 1.5" SS 304 Grade With Mirror Finish And Movable Wheel. There shall be 1/6 GN Pan-6 Nos. of required depth with proper individual lead in all 6 pans.	1	Nos	20731	20,731
49	SITC of DRAIN THROUGH GRATING for the size of 1200 mmX300 mmX75 mm Frame Made of 1"x1" square pipe and supported by 3/4" SS square 304 pipe of 16 SWG. Outer frame made up off 25x25x3 mm SS 304 angle.	3	Nos	23034	69,102
50	SITC of DISHLANDING TABLE for the size of 900 mmX675 mm X850 mm+150 mm. TOPS: Made of 16 SWG. 304 Quality, 18/8 Grade Stainless Steel duly 120 grit matt polished with all edges rounded with no burr or other excess material left. Top will be turned down 50 mm and 12 mm underneath in channel shape on all exposed sides, in case of sunk in top wherever mentioned the side shall be raised by 20 mm an all exposed sides, Where tables are placed against building wall they will be turned up at back approximately 100 mm returned 20 mm at 45 degree to wall with all exposed ends Closed, argon arc welded and smooth polish. UNDERSIDES: Undersides of all Stainless Steel Tops for table Counter, Sink, Dish and Pot Tables will be Mounted on 30mm x 30mm x 16 SWG. 304 Quality	1	Nos	20731	20,731

	S.S Square Pipes with cross supports at maximum of 750 mm span, duly secured by welding. The undersides will be suitably sound deadened by treating with a coat of aluminum carboxide rubberized paint, finished with silver paint. UNDERSHELVES: Undershelves wherever called for will be constructed of 304 Quality 18/8 Grade, 18 SWG. Stainless Steel Sheet uniformly matt polished with 120 grit and reinforced with 30mm x 30mm x 16 SWG. St. steel square pipe Frame. All shelves will be turned down 38 mm and 12 mm underneath on all sides with resulting corners cutout to fit contour of legs. Shelves for hot case will be perforated.				
51	SITC of TWO SINK UNIT (RHS SINK) for the size of 1500 mmX675 mm X850 mm+150 mm. TOP- 16 SWG Stainless Steel 304 Grade 25 mm Deep with 150 mm Back slash With (2) three Nos. Full Sink 300 mm deep With Stainless Steel 40 mm Dia. Sink Waste Coupling Body: Front apron 18 SWG Stainless Steel. LEGS: (4) Four Nos. 18 SWG Stainless Steel Square Pipes Bush: Adjustable Square Nylon Bush (4) Nos.	1	Nos	32248	32,248
52	SITC of HOOD TYPE DISHWASHER for the size of 750 mmX750 mmX1500 mm. Hood type dishwasher suitable for operation on Single phase 230 V, 50 Hz / Three Phase 415 V, 50 Hz supply (single phase supply preferred) with heated wash and rinse capability, 500 mm x 500 mm rack size and minimum 1000 plates per hour capacity. Cabling to be provided till nearest point (approx 25 meter)	1	Nos	431894	4,31,894
53	SITC of PRE RINSE UNIT for the size of T&S Made of 4'' Deck Mount Facuet	1	Nos	28793	28,793
54	SITC of UNLOADING TABLE for the size of 600 mmX675 mmX850 mm+150 mm.	1	Nos	16124	16,124

	The table has a top made of 16 SWG stainless steel sheet and an undershelf of 18 SWG SS sheet. The framework of the table is MS angle duly painted and vertical are of square SS pipe of 38 mm size with adjustable nylon bullet feets for height adjustments.				
55	SITC of SS RACK for the size of 1050 mmX600 mmX1800 mm. Made: Made of 304 Quality, Shelves will be made of 304 Quality 18/8 Grade, 18 SWG. Shelves: 5 Nos., 18 SWG. Stainless Steel. Upright of 30 mm stainless steel square pipe fitted with nylon bullet fit.	1	Nos	34552	34,552
56	SITC of SS RACK for the size of 1200 mmX600 mmX1800 mm. Made: Made of 304 Quality, Shelves will be made of 304 Quality 18/8 Grade, 18 SWG. Shelves: 5 Nos., 18 SWG. Stainless Steel. Upright of 30 mm stainless steel square.	1	Nos	36855	36,855
57	SITC of POT RACK for the size of 1200 mmX600 mm X1650 mm Made of Outer Frame 1.5" SS square Pipe 304 Grade With Mirror Finish, Inner Support 25 mm Dia Pipe 304 Grade With Mirror Finish, Leg : 1.5" SS 304 Grade Pipe With Adjustable Bullet Leg, No. of shelves 3.	1	Nos	32248	32,248
58	SITC of WORK TABLE for the size of 450 mmX600 mmX850 mm+150 mm. Top to be Fabricated from 16 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. UNDERSHELVES: 1 in No. to be Fabricated from 18 SWG Stainless Steel AISI 304 Grade Sheet, All sides to be turned down 38 mm and in 12 mm. Welded at 150 mm from Bottom of Unit, directly to Uprights. UPRIGHTS in 38 mm dia.X 16 SWG thick Stainless Steel AISI 304 grade pipe fitted with White Nylon Bullet Leg with 25 mm ht. adjustment. INTERNAL	1	Nos	13821	13,821

	FRAMEWORK in 25X25X3 mm thick Stainless Steel AISI 202 Grade Angle below the Top. WELDING: should be done by Argon Arc /TIG welding only. No Electrical Arc Welding should be used. All the welded edges, surfaces should be properly & smoothly ground & finished to remove any burr or sharp edges. FINISH: All plain & pipe surfaces should be finished brush / satin finish.				
59	SITC of WET GRINDER for the size of 10 Litre. Grinding bowl in 19 SWG AISI 304 Grade Stainless Steel with White Stone Base, Grinding Pestle in White Stone with properly embeded Wooden Stump Scraper inside Bowl in High Quality White Nylon Sheet 20 mm thick. fitted to Stainless Steel AISI 304 Grade Pipe with vertical & Lateral movement arrangement. Stand, Post & Supports of Pestle, Scraper, etc. in Stainless Steel AISI 304 Grade Pipe. Unit Mounted on Stainless Steel AISI 304 Grade 35x35x3 mm thick 304 Grade Angle Frame cladded with 18SWG AISI 304 Grade Sheet from all sides & top. Coconut Scraper with proper cover (when not in Use) to be provided as an additional feature. Branded Single Phase Electrical Motor of One H.P. Hand Tilting, Utility : Rice, Pulses, Masalas, Dal etc	1	Nos	109413	1,09,413
60	SITC of PULVERIZER 3HP Grinding bowl in 19SWG AISI 304 Grade Stainless Steel with White Stone Base, Grinding Pestle in White Stone with properly embeded Wooden Stump Scraper inside Bowl in High Quality White Nylon Sheet 20 mm thk. fitted to Stainless Steel AISI 304 Grade Pipe with vertical & Lateral movement arrangement. Stand, Post & Supports of Pestle, Scraper, etc. in Stainless Steel AISI 304 Grade Pipe. Unit Mounted on Stainless Steel AISI 304 Grade 35x35x3 mm thick 304 Grade Angle Frame cladded with 18 SWG AISI 304 Grade Sheet from all sides & top. Coconut Scraper with proper cover (when not in Use) to be provided as an additional feature.	1	Nos	90986	90,986

	Branded Single Phase Electrical Motor of One H.P. Hand Tilting, Utility : Rice, Pulses, Masalas, Dal etc				
61	SITC of DUNNAUGE RACK for the size of 900 mmX450 mmX300 mm. Frame Made of 1"x1" square pipe and supported by 3/4" SS square 304 pipe of 16 SWG. Outer frame made up off 25x25x3 mm SS 304 angle.	1	Nos	11517	11,517
62	SITC of COLD ROOM for the size of 2000 mmX2000 mmX2400 mm. Unit should be made from 60 mm thick prefab rigid PUF sandwich panels with 1 mm thick SS 304 grade sheet outside and inside, the cold room should be with ceiling and wall panels interlocked through a cam lock mechanism, fitted with a hermetic sealed compressor. The condensing unit should be split type, which is air cooled. Swing type and insulated door having magnetic gasket, safety latch, lock and heavy-duty hinges. The room should maintain a temperature of +2°C to +8°C. All accessories like light, light switch emergency switch, door heater, vacuum release, temperature indicator to be provided with the unit. The refrigerant used should be R134a.	1	Nos	823478	8,23,478
	Total of C8 - KITCHEN EQUIPMENTS				68,14,505
	Total of all subhead C1 to C8				1,92,62,92,896

Part- D
SCOPE &
SPECIFICATIONS OF
OPERATION & MAINTENANCE OF
COMPLETE E&M WORK

Name of work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.

OPERATION & COMPREHENSIVE MAINTENANCE FOR THREE YEARS AFTER COMPLETION OF WORK

Once the main/Original work is completed in all respects and declared complete by Engineer-in-charge, **separate supplementary agreement for Comprehensive Maintenance & operation of services shall be drawn for period of 03 years with contractor.** The work of Comprehensive Supplementary agreement shall be monitored by respective Engineer-in-charge of CPWD.

PROFORMA OF SCHEDULES for maintenance works of E&M works

PROFORMA OF SCHEDULES				
SCHEDULE 'A'				
Schedule of quantities, enclosed on separate sheets for: -				Attached
SCHEDULE 'B'				
Schedule of materials to be issued to the Contractor				
Sl. No.	Description of item	Qty.	Rates in figures & words at which the material will be charged to the Contractor	Place of issue
1	2	3	4	5
NIL				
SCHEDULE 'C'				
Tools and plants to be hired to the Contractor				
Sl. No.	Description	Hire charges per day	Place of Issue	
1	2	3	4	
NIL				
SCHEDULE 'D'				
Extra schedule for specific requirements/document for the work, if any				
As per NIT				
SCHEDULE 'E'				

Reference to General Conditions of contract		GCC 2023 Maintenance Works modified and corrected up to the last date of submission of bid
Name of work :		Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.
Total Estimated cost of Maintenance work:		Rs 8,76,85,824/-
Electrical Component		Rs 8,76,85,824/-
(i)	Earnest Money:	As per Part 'A'
(ii)	Performance Guarantee	As per Part 'A'
(iii)	Security Deposit	As per Part 'A'
Schedule 'F': General Rules & Directions: Maintenance works		
Officer Inviting Tender:		As per Part 'A'- Only for this Maintenance Portion separate Supplementary Agreement shall be drawn
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with clauses 12.2 & 12.3.		As per clause 12 mentioned below
2(vii i)	Accepting Authority	As per Part 'A'- Only for this Maintenance Portion separate Supplementary Agreement shall be drawn
2 (x)	Percentage on cost of material and labour to cover all overheads and profits	15 % (7.5% + 7.5%)
2 (xi)	Standard Schedule of Rates	DSR(E&M) 2025 & Market Rates
2 (xii)	Department	CPWD
Clause 1:		

(i)Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance, in days		As per Part 'A'	
(ii) Maximum allowable extension with late fee @0.1% of Performance Guarantee amount per day beyond the period provided in (i)above.		As per Part 'A'	
Clause 2:			
Authority for fixing compensation under clause 2 of bid.		As per Part 'A'	
Clause 2A:			
Whether Clause 2A shall be applicable		No	
Clause 5:			
Number of days from the date of issue of letter of acceptance for reckoning date of start		After completion of Construction work, supplementary agreement shall be drawn	
Mile stone(s) as per table given below:-			
Sl. No.	Description of mile stone (s) (Physical)	Time allowed in days (From date of start)	Amount to be withheld in case of Non-achievement of Mile stone(s)
	NOT APPLICABLE		
TIME ALLOWED FOR EXECUTION OF WORK—36 MONTHS			
Authority to decide:			
(i) Extension of time		As per Part 'A'	
(ii) Rescheduling of mile stones		NA	
(iii) Shifting of date of start in case of delay in handing over of site		As per Part 'A'	

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	Minimum Rs. 50 Lacs of work done		
Clause 7A: Whether Clause 7A shall be applicable.	Yes		
Clause 10 A: List of testing equipment to be provided by the Contractor at site lab.	Required as per Schedule of Items if any		
Clause : 10B(ii)			
Whether clause 10B (ii) shall be applicable	Not applicable		
Clause 10 C:-	Not applicable		
Clause 10 CA	Not applicable		
NIL			
Clause 10 CC to be applicable in contracts with stipulated period of completion exceeding the period shown in next column.	Applicable		12 months
For E&M Work			
Schedule of component of Labour and Material expressed as percentage of Value of Work	X _l		X _m
For (Comprehensive Maintenance and Annual Maintenance items) Component of labour expressed as percent of total value of Comprehensive Maintenance and Annual Maintenance items	25%		75%
For (Day to day operation items or Manpower items) Component of labour expressed as percent of total value of Day to day operation items	100%		0%

For (Supply items) Component of labour expressed as percent of total value of Supply items	0%	100%
For (all other items other than Comprehensive Maintenance and Annual Maintenance, Day to day operation items or Manpower items, Supply items) Component of labour expressed as percent of total value of Supply items	25%	75%
Clause 11: Specifications to be followed for execution of work	CPWD Specifications Part 1 Internal 2023, Part II External 2023, Part V Wet Riser & Sprinkler 2020, Part VI Fire Detection and Alarm System 2018, Part VIII Gas Based Fire Extinguishing System 2023, HVAC 2024 with modified & corrected up to the last date of receipt of bid.	
Type of work	Operation & Maintenance work	
Deviation limit beyond which clause 12.2 & 12.3 shall apply for building work	GCC 2023 Maintenance Works modified and corrected up to the last date of submission of bid	
Clause 16:		
Competent Authority for deciding reduced rates	Superintending Engineer (E), Central Vista Project Electrical Circle-2, New Delhi (For Civil Work) or successor thereof.	
Clause 18 List of Mandatory Machinery, tools and plants to be deployed by the Contractor at site.		
As per requirement of Schedule of work & other conditions.		
Clause 25	As per Part 'C'	

Clause 36(i) Requirement of Technical Representative(s)& recovery Rate:						
S.No.	Discipline	Designation (Principal Technical/ Technical Representative)	Requirement of Technical Staff		Minimum Experience	Rate at which recovery shall be made from the Contractor in the event of not fulfilling provision of Clause 36(i)
			Qualification	Number		
1	Electrical Work	Senior Engineer	Graduate Engineer	1	12	Rs.40,000/- (Rupees Four thousand only)
		Billing Engineer	Diploma in Engineering (Full time Deployment)	1	05	Rs.20,000/- (Rupees Fifteen Twenty Thousand) per month

1.0 Particular Conditions for Maintenance Work

- 1.1 Agency shall set up a Service Center which will operate in fulltime round the clock on all working days including Sundays and Gazetted Holidays. Only Space for Service center will be allocated by CPWD but it will be run by the Contractor including all required furniture and fittings to be provided by the contractor.
- 1.2 The Agency shall hire Engineers as mentioned in schedule F. The Supervisors deployed shall be on full-time basis who shall have a smart mobile phone with all necessary cellular data recharge etc. to enable the Engineer-in-charge for timely communication.
- 1.3 The Agency shall hire a computer operator cum Service Coordinator who shall maintain all complaints either on telephone or lodged manually or through any system as directed by Engineer-in-charge. A land line telephone shall also be installed by the Agency along with desktop computer with high-speed internet connection, if required for receiving complaints and other instructions, for which nothing extra shall be paid.
- 1.4 All labours /workers have to mark their attendance on biometric attendance system at location and system as directed by the Engineer-in-charge.
- 1.5 No claims of the labours shall be entertained by the Department

including that of providing employment, regularization of services etc.

- 1.6 Staff employed by the agency shall be well behaved, polite & courteous. Any complaint against staff on behavior should be taken very seriously and such staff should be removed by the contractor immediately from the site and arrange replacement for the same failing which the Engineer-in-Charge shall effect recovery as per condition 38.
- 1.7 All T&P including ladder's, wire drawing equipment, chase cutting equipment, drilling machine, megger insulation, earth resistance testing equipment etc. or any other T&P, as may be required for the work and scope mentioned in the agreement shall have to be arranged by the agency. No T&P shall be issued by the Department.
- 1.8 The agency shall provide all safety gear and shall make all safety arrangement required for the labour engaged by him at his own cost. All consequences due to negligence or due to lapse of security/safety or otherwise shall remain with the agency. The department shall not be responsible for any mishap, injury, accident or death of the agency's staff. The agency shall indemnify CPWD and all its officials against any such claim or damage arising out of direct or indirect actions of the staff of contractor. No claim in this regard shall be entertained /accepted by the department.
- 1.9 The agency shall take immediate action to attend to any complaint assigned to him through site order book/verbal instructions, email, Whatsapp or any other software/App as directed by Engineer-in-Charge.
- 1.10 Agency shall be fully responsible for any damage caused to Govt. property by him or his labour in carrying out the work directly or indirectly and the same shall be rectified by the agency at his own cost, failing which the department shall get the necessary rectifications done at the risk and cost of contractor. Chases, holes & drilling works etc. shall be done using only power operated tools. The defective items, materials, finishes, fitting shall be replaced with items of same specifications, make and model and compatible to the work.
- 1.11 (a) All the malba or rubbish obtained from dismantling or otherwise during the execution of the work shall be brought down in air tight containers/bags through the stair case and shall not be thrown to the ground directly from first floor or second floor etc. or malba rubbish generated due to any operation from the office spaces, toilets etc. and their open spaces whatsoever and shall be disposed off on daily basis by the contractor to the specified common disposal point as directed by Engineer-in-charge. After the collection of full truck load of the said malba (approx 4.5 cubic meters), the same shall be disposed off on same day by the contractor to the authorized municipal dhalao/

dumping ground and nothing extra shall be paid on this account. In case of non-removal/disposal in the specified period, a recovery of Rs.1000/- (rupees One thousand) per day shall be recovered from the contractor after issuing notice in writing by the Engineer incharge of work including getting such malba removed at risk and cost of contractor.

(b) All the malba or rubbish obtained from dismantling or otherwise during the execution of work shall be collected in the mobile container arranged by contractor free of cost of suitable size placed near the working place. The malba or building rubbish so collected shall be disposed off to the specified common disposal point in the campus, where from the contractor will finally disposed off the collected malba or rubbish to the authorized municipal dhalao/dumping ground. In no case the malba / bulding rubbish shall be allowed to dump at ground near the working place. A recovery of Rs.500/- shall be made by engineer-in- charge for every default per day till the final disposal of malba only after issuing a notice in writing by engineer-in-charge of work.

- 1.12 In case of receipt of feedback from user regarding his complaint through any means as "unsatisfactory/shown attended without attending, the complaint, compensation @ 500/- (Rs. Five hundred only) per such feedback will be levied. This levy will be made after duly verification of such feedback by Engineer-in-Charge which shall be final and binding over the contractor.
- 1.13 The material fetched on account of dismantling/replacement shall be the property of the Agency.
- 1.14 The facilities to be made available at the Service Center:
 - 1.14.1 One workstation for Computer Operator cum Service Coordinator to sit and receive complaints.
 - 1.14.2 All furniture required for agency's staff shall be arranged by the agency on his own cost.
- 1.15 The assistance shall be provided by the agency to Engineer-in-Charge in the following:
 - 1.15.1 Informing the Engineer-in-Charge regarding the failure of any service being provided by other agencies, in so far as they affect the assets being maintained under this contract so that they can be taken up with the concerned local body/departments for rectification.
- 1.16 The agency shall be provided with an inventory list of items in campus to be maintained. The agency shall be responsible for watch and ward of such items. The loss, if any, shall be made good by the agency at his cost, failing which the department shall get it done at the risk and cost of contractor. The decision of Engineer-in-Charge in this respect shall be final and binding on the agency.

- 1.17 Stores and bins shall be provided by the agency for storing the Materials.
- 1.18 The labour deployed for attending complaints should carry necessary tool kit, container (Tasla) etc. required for mixing any cement sand or other material and should carry with them water bottle and waste bag for collection of minor rubbish material if received during attending the complaints, so that the site of work shall remain neat and clean.
- 1.19 Each worker shall maintain a complaint diary and get the feedback recorded from the users regarding attending the complaint. In case, it is found that the complaint has been attended unsatisfactorily, it will be considered as unattended. List of such complaint shall be submitted to the Assistant Engineer-in-charge or his representative on daily basis.
- 1.20 When a register gets completed, it will be handed over to the concerned J.E. / A.E. It will not be returned to the contractor and the same will remain the property of the department.
- 1.21 All required register will be issued by Engineer-in-charge duly marked in chronological order but the contractor will have to arrange all such registers/stationery etc. Nothing extra shall be paid on this account.
- 1.22 The agency shall deploy adequate number of masons, fitters, plumbers, carpenters, sewer man and beldars to attend the complaints.
- 1.23 The material such as sanitary items / water supply items / Aluminum fittings/hardware item etc. as required shall be of same brand, make and manufacturer as provided in the original work.
- 1.24 The sample of all the items shall have to be got approved by the Contractor from the Engineer-in-charge before the supply commences and shall be without prejudice to the right of Engineer-in-Charge to get random samples tested out of the actual lot received.
- 1.25 The contractor shall if required furnish the manufacturer's certificate that the material supplied satisfy the requirements of the relevant specifications.
- 1.26 The manufacturing date and batch No. inscribed or printed on packs/containers by manufacturers are only acceptable for all the above said materials. Fresh material shall be brought at site as far as possible and materials more than 4 months old from the date of manufacturing will be rejected.

- 1.27 Rejected materials shall have to be removed by the contractor at his own cost immediately of the instructions of doing so.
- 1.28 The contractor shall be mandatorily required to provide certified copies of GST paid invoices to satisfy department that the material has been purchased from the authorized dealer and the GST has been paid.
- 1.29 The Contractor shall employ their regular staff in the works and credentials of employees shall have to be given by the Contractor. No claim of Contractors' employees/staff employed for subject work in any form shall be entertained by the department. Police verification of every staff deployed by the Contractor shall be got done by the Contractor compulsorily and a copy of police verification shall be provided to Engineer-in-Charge after which an identity card duly countersigned by Engineer-in-Charge or his representative shall be issued to each employee of the Contractor for proper identification.
- 1.30.1 No residential accommodation shall be provided to any of the staff engaged by the contractor. The contractor shall also not be allowed to erect any temporary set up for staff in the campus.
- 1.31 The Contractor shall provide minimum 03 sets of proper uniform (of colour, fabric and design as decided by the Engineer-in-charge) and appropriate Shoes every six months to each employee/worker along with Name Badge and CPWD Logo as approved by Engineer in charge **within 15 days** of start of work. In the event of non compliance, **a recovery of Rs. 50/- per day per Employee/worker** shall be made. The employee/worker engaged by the Contractor under this contract shall wear neat and clean uniforms alongwith name badges and CPWD Logo as approved by Engineer-in-Charge. **The Contractor shall also provide the all required PPEs (Personal Protection Equipments)/ Safety equipments like Helmet, Safety belt/harness, Safety Shoes, Gloves etc. to each worker and supervisor, whosoever is directly connected with the work.**

General Terms & Conditions

1. A separate supplementary Agreement for Comprehensive Maintenance & Operation for E& M services for GPOA Block 1 as stated in sub-Head C-9 & C-10 of E&M service shall be drawn with main contractor after completion of work in all respect under sub work C-1 to C-8.
2. Sufficient numbers of the trained staff as per detail mentioned at annexed documents for operation and routine maintenance of each service shall be deployed by firm for smooth operation of the system during warrantee/defect liability period as well as for operation as per BOQ. Payment towards the operation during the defect liability period shall be governed by suitable item mentioned under sub-Head C-9 of schedule of work.
3. Comprehensive, routine, preventive, Breakdown maintenance of complete Electrical and Mechanical services including material during the defect liability period is within the scope of defect liability and cost of same deemed to be included in original work and nothing account of this shall be paid to contractor.
4. Comprehensive, routine, preventive, Breakdown maintenance of complete Electrical and Mechanical services including material after defect liability period shall be governed as per sub-Head C-10. The payment towards the Comprehensive maintenance and operation of the installation shall be governed by suitable item under sub-Head C-10 of schedule of work. During this period except electricity and water all the material and man power shall be arranged by firm. No payments whatsoever it may be, shall be made against deployment of manpower and material for Comprehensive maintenance and operation other than payment admissible as per BOQ.
5. Comprehensive maintenance (wherever specified for a service) or Maintenance during Guarantee/warranty period and thereafter till currency of agreement means:
 - i. All the manpower, materials, T&P, loading/unloading, transporting, installation, testing and commissioning shall be arranged by contractor as his own cost.
 - ii. Replacement/repair of defective equipment/component to make it properly functional without compromising on its performance.

- iii. Preventive and Routine maintenance to keep the system healthy (including all manpower and material) as per recommendation of OEM's wherever applicable.
- iv. Cost of Loading, unloading, Transportation (both ways) for taking the parts to factory/workshops for repair.
- v. Cleaning Work includes all material like: Brush, brooms, cloth, chemicals, soap, duster etc. required for cleaning. For this purpose, contractor shall procure the anticipated qty of maintenance material required for satisfactory operation & maintenance of system and make use of that as required.

6. The Comprehensive maintenance (during Guarantee or after as specified) of following services shall be provided only through the specialized agencies:
 - i. Fire Protection system (C-3)
 - ii. HVAC (low side works) (C-4)
7. At no time the service to occupants shall be interrupted for more than a reasonable period, decision of engineer in charge shall be final to determine reasonable period
8. Energy and water conservation is the theme of the building hence all the equipment shall be operated and maintained in energy and water efficient manner. IBMs shall be made full use of to reduce man power and man interference. scheduling of IBMs shall be reviewed periodically in consultation with Engineer in Charge to get optimum performance.
9. Care shall be taken by the contractor during execution of the work to avoid damage to the building. Care shall also be taken by the contractor to avoid the damage to any of these existing service/service lines, any part of the building etc. If any damage is caused to any of the existing services/service lines, or any part of the building the same shall be repaired / rectified and made functional or restored so its original finish by the contractor immediately at his own expenses failing which the same shall be repaired/ rectified and made functional by department at the risk and cost of the contractor. The decision of the Engineer-in- charge in this regard shall be final & binding. He shall also remove all unwanted and waste materials arising out of the installation from the site of work from time to time. statutory deduction of works contract tax/GsT/Cess as applicable shall be made at source from each running /final bill payment.
10. Deployment of staff for Operation during/after defect liability period
The staff shall be deployed as per following details during the Defect Liability Period and thereafter:

S. No.	sub head	Graduate Engineer/ supervisor / Electrician (Highly skilled)	Operator (Highly skilled)	Operator (skilled)	Wiremen (skilled)	Khalasi (Unskilled)
1	Electrical installation (i/c sunday & Gazetted holiday)	1 No. (In General shift)	-	-	9 Nos.(3 Nos. in each shift)	9 Nos.(3 Nos. In each shift)
2	IBMs, fire alarm, PA system(i/c sunday & Gazetted holiday)		3 Nos.(1 No. in each shift)	-	1No. (In general shift)	
3	Fire Protection system & Gas based Fire suppression system (i/c sunday & Gazetted holiday)		-	3 Nos. (1 No. in each shift)		3 Nos.(1 No. in each shift)
4	HVAC (i/c sunday & Gazetted holiday)		-	2 Nos.(1 No. in each shift)	-	2 Nos.(1 No. in each shift)
5	AV system (i/c sunday & Gazetted holiday)	1 No. Graduate Engineer (In general shift)	4 Nos. (In general shift)			
6	ICT (i/c sunday & Gazetted holiday)		4 Nos. (In general shift)			
	Total	2	11	5	10	14

Note:- (1) These deployment of the manpower can be changed in shift as per actual requirement of work at site.

(2) Each shift shall be of 8 hours.

11. Qualifications And Experience of staff

- a) Graduate Engineer: should have B.Tech/ B.E. in any stream of Engineering.

Relevant experience of minimum 4 years along with knowledge on IP Network Devices and components (Router and switches, IP Routing Protocol (OSPF and BGP), LAN switching (STP, VTP), WAN (Modern Lease line, L1, L2, L3 Circuit and Ethernet Circuits) and Field Level Troubleshooting, Network Monitoring system, Email, L2 & L3 VPN, MPLs, Wi Fi, RF Communication and Network security. Basic knowledge OS (Windows and Linux) Call Management through service desk and vendor escalation. Monitoring and Report Generation through Network Management system and Other Monitoring Tools Performing the duties as assigned.

- b) Electrician/supervisor: should have ITI in Electrical stream and must possess Electrical supervisory Certificate of Competency. Must have minimum practical experience of 10 years in operation and maintenance of different type Electrical installation.
- c) Operator (Highly skilled) for IBMs, Fire Alarm, AV and PA system and ICT: should have passed ITI / Diploma or equivalent in the respective Trade and experience in same field of 7 years
- d) Operator (skilled) for Fire Protection system, Gas based Fire suppression system and HVAC system: should have passed ITI / Diploma or equivalent in the respective Trade and experience in same field of 5 years
- e) Wireman: Electrical workman permit / workman's competency certificate / Electrical workman's license (Certificate of competency class (II) OR any other equivalent certificate with at-least two years' experience
- f) Khallasi: should be physically & mentally fit.

11.1 The experience certificate of maintenance persons shall be submitted at the time of taking over of maintenance by the agency.

11.2 The staff deployed shall be interviewed by the representative of Engineer-in-charge to ascertain the suitability before their deployment.

12. It is the responsibility of the contractor to arrange alternate staff in the absence of any staff on account of weekly off/ leave/ found absent on duty etc. In case of non compliance of above, recovery at

the following rate shall be made from the Running Account/Final bill of the Contractor in addition to other contractual actions as deemed fit by Engineer-in-charge.

a. Graduate Engineer -	Rs. 3000/- per day per shift
b. Electrician/supervisor -	Rs. 2500/- per day per shift
c. Operator (Highly skilled) -	Rs. 2500/- per day per shift
d. Operator (skilled) -	Rs. 2000/- per day per shift
e. Wireman -	Rs. 2000/- per day per shift
f. Khallasi -	Rs.1600/- per day per shift

13. In case of additional requirement of manpower this shall be decided by Engineer-in-charge, the contractor shall arrange necessary number of manpower for operations and day-to-day maintenance of the E&M services. The contractor shall be paid additionally on account of providing additional manpower deployment. The decision of Engineer-in-Charge regarding requirement of additional person shall be final & binding upon the contractor.
14. The agency has to supply details of all the workers (Name, and address etc.) i/c EPF & EsI A/c No. engaged by him and get it approved from the Assistant Engineer (E) concerned in the staff register before deployment at site. The firm staff registers shall be maintained as per detail attached.
15. The firm/ contractor shall have to abide by the security Rules imposed by concerned agencies. Proper discipline shall have to be maintained at site of work. The character and antecedents of staff engaged on work shall be got verified through Police from time to time as required by the security authorities. The staff shall not be changed frequently once the verification of character & antecedents is done.
16. The contractor will issue necessary ID card to the labour. The list of labourers along with their full particulars and identity proof shall also be given by the contractor to Engineer - in -Charge
17. The labour engaged by the contractor shall wear uniform with name batch as approved by Engineer-in-Charge. All the staff and worker engage for the job shall wear proper badge indicating name of the contractor, name of the person, designation. While working or inspecting at site staff / worker shall wear safety helmet and safety shoes also if required.
18. The workers engaged by firm should maintain proper discipline and good behavior with occupants. The firm shall replace such staff

from the site whose behavior and performance is found improper. Executive Engineer's decision in this regard shall be final.

19. Agency has to observe all the labour rules and regulations in-force.
20. Labour engaged shall not be permitted to stay in the campus beyond duty hours.
21. The contractor agrees that it shall at all times indemnify CPWD against all claims for compensation under the provisions of any law for the time being in force or in respect of any person employed by it in carrying out the contract. such staff shall have no right to claim regarding employment in CPWD.
22. Any accident or damage during maintenance/operation will be the responsibility of the contractor and CPWD will not be liable for any claim, compensation, penalty etc. on this account or on account of non-observance of any other requirement of law relevant to this work.
23. In case of faults beyond the capacity of the staff provided as above, contractor shall immediately provide extra specialized work force so as to attend to the fault in minimum reasonable time or as instructed by the Engineer-in-charge during the validity of contract.
24. The required additional staff shall be deputed by contractor for breakdown and Comprehensive maintenance purpose. In case of any breakdown, contractor shall try to replace the faulty part/rectify the defect at the earliest even for standby units, In any case normal services /comfort level should not be disturbed. In case the contractor fails to provide satisfactory service, appropriate recovery as mentioned in the specific conditions for each service shall be made from monthly bill, after giving notice of 4 hours by E Mail/Fax.
25. Wherever contractor has to engage specialized firm/OEM/sub-contractor, they shall make sure that sub-contractor depute their Engineer, and the work carried out by their subcontractor is Comprehensively controlled and assured with respect to quality, coordination and delivery.
26. In some occasion due to VIP visit / inspection, restriction may be imposed for working in curtain areas, no claim what so ever on account of lose of time and labour shall be entered in this regard.
27. shut down for maintenance shall be taken with prior approval of the department.
28. Attending Complaints And Preventive Maintenance
 - a. Firm should have round the clock contact telephone number. In

case of Emergency, contractor and authorized engineer/supervisor shall be made available at site on short notice from engineer in charge and make all efforts to make the situation normal at the earliest.

- b. The agency will display on a board in sub-station room/ Fire Control room important telephone numbers and the duty chart of the workers engaged by him, as per requirement of engineer-in charge.
- c. A complaint register shall be maintained at control room as per the Performa finalized in consultation with Engineer-in-charge and shall be kept up to date at the enquiry by the firm and the same shall be available for checking & verification. The redressal of complaint shall be recorded in the form of complaint diary & special equipment job card etc. as per Performa attached in document or electronic form.
- d. Complaints shall mostly be received on telephone/intercom system, these complaints shall be recorded and monitored by Engineer/Manager of contractor.
- e. Contractor may note that various other agencies may also be working at site simultaneously. Hence proper arrangement be made by the contractor, safety and security of material kept at site as well as erected material.
- f. Contractor shall make a detailed maintenance activity schedule and the same shall be submitted to department. Department may insist on re-planning some or activities.
- g. Contractor shall develop maintenance schedule / log chart, and got those approve from department. As most of the Equipment are supposed to be controlled and monitored through IBMs, logs may be kept electronically and transferred to EE (E) on daily, weekly, monthly, quarterly, yearly basis suitable, as per direction of EE (E) in charge of maintenance.
- h. At the start of the contract the firm in consultation with the AE (E) concerned shall prepare a program for preventive maintenance to be carried out. The record of preventive maintenance carried out shall be submitted at the end of each month.
- i. Quarterly performance report shall be submitted to sub division office. Record of preventive maintenance and testing of equipment etc. carried out has to be readily available at site,

failing which firm shall be liable of non-execution of its liability under contract.

- j. The firm shall maintain staff movement register and T& P movement register. No staff /T&P shall move out of bldg. without entry in the staff and T&P movement register and movement shall be only for work pertaining to this contract during duty hours.
 - k. All the records pertaining to this contract is the property of the department and the agency has to submit the same to the Engineer-in -Charge on expiry/termination of contract.
29. The comprehensive maintenance (during Guarantee or after as specified) of all services (main equipments) shall be provided only through the OEM/ authorized service agents. At no time the service to occupants shall be interrupted for more than a reasonable period, decision of engineer in charge shall be final to determine reasonable period. The contractor shall provide all the works contract with the OEM to Engineer In charge.
30. Time frame for attending complaints.

S. No.	Complaint Type	Time
1	Emergency complaints	1 hours
2	Minor complaints	4 hours
3	Major complaints	3 days

31. Following recovery shall be made for delaying in attending complaints. The type of complaint shall be decided by Engineer in charge.

- 31.1 Recovery of Rs. **5000/- (Rupees five thousand only)** per complaint per day of delay in attending emergency complaints beyond above mentioned time shall be made.
- 31.2 A recovery of Rs. **3000/- (Rupees three thousand only)** per complaint per day for delay in attending major, minor & periodical complaints beyond above mentioned time shall be made.

SCOPE OF MAINTENANCE FOR EACH PACKAGE C1 TO C8

The scope etc. mentioned in this part is only indicative and not exhaustive; the details shall be worked out by Contractor and Engineer in Charge as per broader meanings of items in BOQ and as per OEM's recommendations/good engineering and maintenance practices.

C1 - EI & FANS, ELECTRICAL PANELS, UPS, LIGHTING FIXTURE

SCOPE OF MAINTENANCE:

1. The maintenance for this subhead shall be O&M by providing manpower as per BOQ and Comprehensive maintenance of all the items (excluding Light Fixtures and UPS with batteries).
2. Light Fixtures shall be having 5 years of warranty/guaranty and UPS with batteries shall have 3 years of warranty/guaranty.
3. Ensuring that installation is always kept in clean, healthy working condition.
4. Attending day to day routine complaints in a prompt and satisfactory manner.
5. Ensuring that no breakdown in power supply takes place.
6. Maintaining the installation i.e. fans, fittings and other components of the installation in clean condition
7. Carrying out various maintenance routines and tests.
8. Maintaining registers for complaints and test results.

TASKS TO BE PERFORMED WITHIN FIRST 15 DAYS

1. The agency should discuss and finalize the working schedule.
2. Check electrical system for proper contacts and cleanliness.

PREVENTIVE MAINTENANCE SCHEDULE TO BE FOLLOWED:

1. Testing of earthing system for earth Resistance: Within month of taking over and thereafter in month of November and May.
2. Inspection of MB & SDB: After six month of initial testing
3. Insulation test of MB & SDB: Within month of taking over and thereafter in month of February & August
4. Cleaning of fans, fittings etc: On regular basis so that Installation is always Clean and with soap solution twice in a year period (In the month of May and Nov)
5. The fittings to be cleaned by opening covers, removing dirt, dust

& insects from reflectors and ensuring transparency of cover. The adapter /terminal box should be free from cobwebs, dirt, and dust and should have rust free terminal contacts.

MATERIALS:

As the complete system shall be under Comprehensive maintenance, all the materials required including consumables for carrying out routine, preventive and breakdown maintenance shall be arranged by the Contractor.

UPS with batteries (Under 3 years of warranty/guaranty)

1. The scope of work is routine inspection once in a month. The work includes full supplying, replacement & rectifications of all the spare parts including batteries for which nothing extra shall be paid.
2. All the material brought by the contractor for use in the work shall be of good quality and should be got approved from Engineer-in-Charge before use in the work.
3. Monthly service report after carrying out the servicing ill be submitted by the firm in the subdivision office.
4. General upkeep & cleaning of UPs system & other equipment shall be the duty of the firm for which nothing extra shall be paid.
5. The complaint shall be attended within 48 hours or serviceable UPs shall be provided for smooth working.
6. The contractor will be responsible to keep the UPs in running condition and ensure that it is covered under the warranty/guaranty as specified in the NIT.
7. The contract shall be for all inclusive maintenance and all the defective parts shall be arranged and replaced by the firm with in quoted rates.
8. During the any specific event and before the event on any day on the month, service engineer and technicians shall deployed by the firm to ensure smooth functioning of the UPs.
9. scope of work/Maintenance service
 - a) Cleaning up of unit, visual inspection to check any deformation.
 - b) Checking and adjustment of power parameter etc.
 - c) Checking and adjustment of control parameter on different

PCBs etc.

- d) To perform operational test of the system i/c unit transfer and battery discharge.
 - e) Day to day routine maintenance and operation of the equipments.
10. Comprehensive and preventive maintenance as per manufacturer's standard so that uninterrupted power of requisite quality and quantity is made available all the time.
 11. Electrical log shall be kept regarding quality of power at all time.

Light Fixtures (5 years of warranty/guaranty)

12. Routine inspection of all the light fixtures and its components shall be carried out by agency once a month. Record of the inspection shall be shared with the Engineer-in-charge. All light fixtures and components thereof found defective during inspection or otherwise shall be replaced with the same model immediately to ensure uninterrupted illumination of the areas.
1. The contractors are required to maintain sufficient inventory of each light fixture and component thereof in the store room at the site to enable immediate replace of faulty fixtures and its components.

MATERIALS

As the complete system shall be under warranty/guaranty, All the materials required for carrying out routine, preventive and breakdown maintenance shall be arranged by the Contractor.

C2- FIRE ALARM SYSTEM AND PA SYSTEM

A. SCOPE OF MAINTENANCE

1. The scope of maintenance for this subhead is O&M by providing manpower as per the BOQ and warranty/guaranty for 3 years
2. Ensure that complete fire detection system is always clean and in healthy working condition.
3. Perform daily checks as per OEM standard & recommendation.

B. (TASKS TO BE PERFORMED WITHIN 15 DAYS)

1. Familiarize the maintenance personnel with the Fire detection and

alarm system and their responsibility in consultation with maintenance in charge.

2. Inspect the complete system for proper functioning. Any shortcoming noticed should be recorded and brought to the notice of engineer-in-charge.
3. Finalize detector cleaning and zone testing schedule
4. Educate maintenance personnel regarding steps to be taken in case of fire.

c. (MAINTENANCE SCHEDULE TO BE FOLLOWED)

1. Check working of PA system on daily basis.
2. Check working of F/D system from the control panel on daily basis.
3. Check battery for proper charge & clean contacts on daily basis.
4. Detectors to be cleaned during April and October months from the outside and once a year (October) with blower. During this activity system should remain in working condition.
5. The vendor shall replace the set of batteries as and when required during the currency of contract.
6. Replace Faulty devices as and when required.

NOTE:-

1. The methodology to be worked out in consultation with Engineer-in-charge as the same may vary according to number of detectors/zones.
2. The firm has to demonstrate (Fire Drill) to the Maintenance-in-charge proper working of the entire fire detection system including P.A. system once a month. Deficiencies if any noticed during demonstration shall be attended within a week's time. The result of fire drill shall be submitted along with the monthly bill.
3. In case of fire alarm it is expected that the maintenance person has to immediately rush to the trouble spot and also inform building in-charge/fire department. He should also take "First aid" steps depending upon situation. specific details for first aid steps to be worked out in consultation with Engineer in charge and kept on record.
4. In case of persistent problem OR if required by the Engineer-in-charge, contractor shall arrange and inspection by an expert in the fire detection system for identifying defects and solutions.

5. Any addition/alteration during the period of contract shall also be maintained by the firm and nothing extra shall be payable on this account.

D. MATERIALS

As the complete system shall be under warranty/guaranty for 3 years, all the materials required for carrying out routine, preventive and breakdown maintenance shall be arranged by the Contractor.

PA systems

1. Rectification of defects in cabling system including replacement of cables and components and accessories as required. Cleaning of all equipment of PA system etc. and setting right the defect if any.
2. Responsibility of the contractor shall be correctness of wiring from Complete PA system. Replacement of any defects / damages of components in cabling, wiring and Equipment.
3. The work includes repair / rectify / free replacement of defective components / software which shall be necessary for satisfactory operation of all systems during the period of agreement.
4. All the defective components or software shall be replaced with new one and using genuine OEM certified parts only.

MATERIALS

All the materials required for carrying out routine, preventive and breakdown maintenance under O&M service shall be arranged by the Contractor.

C-3 Fire Fighting system and Gas suppression system

A. SCOPE OF WORK

1. It is the contractor's responsibility to ensure that the Fire Protection system is running in Auto mode at all times.
2. All types of Valves, Piping including fittings, paint, sprinkler system, Clean Agent Gas based Fire suppression system for critical rooms i.e. UPs room/networking room etc. are covered.
3. Without taking prior approval from the Engineer in-charge, no fittings/materials

will be removed for the purpose of repairs. It will be the contractor's responsibility to provide alternative serviced temporary arrangements for such items removed during the period of repair. The item will be repaired and put into position so as ensure that the systems remain fully functional all the time.

4. The check list and test requirements mentioned in the tender documents are of general nature and indicative only. In case specific checks and additional tests under the overall guidelines of Fire Department/any other department are considered necessary for efficient working of the equipment /system towards ensuring its functioning all the time, whether included in the tender specification /bill of quantities or not, same will done/executed by contractor, nothing in this regard shall be paid by Owner.
5. In case of incident of fire, the contractor's manpower available on duty, will ensure adequate operation of system Fire Protection immediately and will also simultaneously inform Delhi Fire Office and Residents/working staff/patients for vacating the area under fire.
6. All tools, plants and materials to carry out the operation and maintenance of Fire Protection system work at site shall have to be provided by the contractor
7. Any work related to alignment of pipes & rectification of leakage from pipes etc. shall be in the scope of the contractor. Fault, if any shall be rectified immediately. pipes welding etc.
8. The check list and test requirements mentioned in the agreement documents are of general nature and indicative only. In case specific checks and additional tests under the overall guidelines of local fire authority are considered necessary for efficient working of the equipment /system towards ensuring its functioning all the time, whether included in the agreement /bill of quantities or not, same will be done /executed by contractor.
9. Contractor shall test & check the equipment under the sprinkler system from time to time to the entire satisfaction of the Engineer-in-charge as well as Fire Department.
10. Routine Preventive Maintenance schedule: The Contractor shall also prepare a Preventive Maintenance schedule of all the systems in compliance with the manufacturers"

recommendations and consultations with the engineer-in-charge. Brief schedule may be modified to improve further. The Contractor shall also maintain Fire Fighting system history card giving full details of equipment and frequency of check and overhaul. The Contractor should follow and carry out maintenance schedule briefed below in order to keep the system healthy for operation along with their connected equipment and accessories round the clock.

11. Regular Maintenance: The Contractor shall ensure Fire sprinkler system works within the specified limits (as per industry standard) at all the times.
12. The Contractor shall maintain adequate stock of frequently required spares/ consumables for rectifications works so as to ensure that the faults are rectified immediately without any down-time. It shall be the responsibility of the Contractor to provide special tools, always in readiness, so that break downs are attended immediately on their occurrence. All routine, preventive maintenance, overhauling, breakdown maintenance etc. are included in the "scope of Work". The Contractor shall also supply and maintain Electric Arc Welding Machine, sufficient stock of electrodes and safety equipment for the Welder at all the times during the tenure of the Contract.
13. Any water leakages in any pipe lines etc. are to be plugged immediately by welding or any other means. Replacement of pipeline if not repairable, is also covered under the contract.
14. The Contractor should report defects, if any, in Fire Protection system, connected equipment; accessories etc. immediately to department. and get it rectified immediately.
15. The Contractor will organize necessary training to the staff deputed at site as per norms and standards and as per direction of engineer in charge. The Contractor will also organize the evacuation drill, basis of Fire Protection system etc. in coordination with Fire department.

NOTE:-

All tools and tackles, grease, cloth, Gland packing, vacuum pumps, log book (one set for each set of machines) are to form part of annual Operation & Maintenance contract.

B. Materials

This being a Comprehensive maintenance contract, the repair/rewinding/ replacement of all the parts and the materials required for routine, preventive and breakdown maintenance and for efficient & satisfactory performance of the plant are included in the scope of agency's work without any extra payment over agreement rates. Release of the liquid/gas on account of malfunctioning of system including leakages shall be refilled/replaced by Contractor at his own cost for which nothing shall be paid. However liquid/gas released on account of actual fire inside the area being protected shall be replenished by Department.

C. PREVENTIVE MAINTENANCE SCHEDULE

1. The maintenance provided shall be fully Comprehensive and shall include but not limited to all equipments, labour, repair of equipments, spare parts, consumables and emergency calls providing and site response within 48 hours. The maintenance shall also include a minimum of one monthly preventive maintenance visit by qualified personnel who are thoroughly familiar with the type of equipment and system provided for this project.
2. The Following Works /Checks are required to be performed on Monthly/ Quarterly/ Half/ Yearly basis and record all the activities in the log book with date and time.

S. No	Equipment	Item	Description
1	sprinkler system and Accessories	Monthly Inspections and Test	1. Check washers, couplings, valve logo wheel check. 2. Visual check of Installation control valve, sprinkler, zone control valve for any damage rot/rust etc. 3. Check for leakages in the piping system within the building. Attend as required for example welding, bolts at joints may need tightening, gasket at joints may need replacement etc. 4. Check sprinkler bulbs are not painted up.
2	sprinkler system and Accessories	Quarterly /Half /Annual Inspections and Test	Perform all function for Monthly checks. 1. Clean the sprinkler heads externally and also the sprinkler bulbs carefully to make them free from dirt. see that the sprinkler heads are correctly repositioned after cleaning. 2. sprinkler system should be operated to check the operational readiness of the system.

			3. Flush out the entire piping network in sprinkler system and check that the pipes are clear. Charge the system again. 4. Check Pipe Paint if required re paint. 5. Check all piping supports to insure they are tight and properly secured
3	Clean Agent gas based Fire suppression system for UPs room including Gas Release Panel and all accessories (Under 3 years of warranty/guaranty)	Monthly and Annual inspections	1. Hydrostatic testing of cylinder /Refilling of clean agent gas periodically as per standard. 2. Check all valves, actuator, instruments and accessories. 3. Check pressure/ weight of all cylinders. 4. Check all connections to the remote releasing control panel. 5. Visually inspect all components and cylinder pressure 6. Refer any noted problems or deficiencies to authorized service personnel for correction. 7. Check the nozzles piping for corrosion and damage. 8. Check all piping supports to insure they are tight and properly secured 9. Check the discharge nozzle orifice to see if they are clear with no obstructions. 10. Check the quantity of liquid and pressure in each cylinder. If a loss in net

			weight of more than 5% or a loss in pressure of more than 10% it shall be refilled or replaced. 11. Check all detectors at the remote releasing control panel. 12. Check the pressure of the cylinder with pressure gauge 13. Check all local audible devices. 14. Check all releasing conditions. 15. Check if Clean Agent electric actuator operates after preset time delay. 16. simulate a low cylinder pressure by shorting low cylinder pressure switch terminals. 17. Verify the active installation supervision sitch on the electric actuator
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C-4 HVAC SYSTEM

A. scope of work:

The scope of work includes O&M of complete low side HVAC system for period of 3 years (including DLP) and Comprehensive maintenance of complete low side HVAC system for period of 2 years(after DLP).

B. schedule of Comprehensive Maintenance

1. Monthly inspection of the equipment by qualified personnel, who are thoroughly familiar with this type of the equipment's/ system provided, covering examination of the AHU's and ancillary equipment. The logbook reading and interpretation etc. shall also

be covered in the Monthly Inspection.

2. Preventive maintenance from time to time such as cleaning, greasing, lubrication and de scaling etc. as required and necessary as per the annexed intervals.
3. Replacement / rectification of any part/item as soon as defect is noticed.
4. Vacuum/ Pressure testing.
5. Adjustment of controls etc.
6. Greasing of motor bearings and shaft bearings.
7. All faults to be cleared within reasonable period of time or stand by equipment to be made operational for service. All faulty equipments to be collected from site and repaired equipments to be delivered or replaced with new one if required & fitted at site.
8. Replacement of any Ms structure / pipe is not covered under scope of work.
9. Replacement of AHU/CSU/AXIAL Fans as a whole unit is not covered under the scope of work however any defective, faulty component of system shall be replaced / rectified within the scope of work.

NOTE:-

1. All tools and tackles, chemicals (acid cleaning not acceptable), grease, cloth, CTC, Gland packing, insulation tapes, vacuum pumps, Charging line, log book (one set for each set of machines) are to be provided by contractor.
2. The repair/ rewinding/replacement of all the parts and the materials required for routine, preventive and breakdown maintenance and for efficient & satisfactory performance of the plant are included in the scope of work.

c. PREVENTIVE MAINTENANCE SCHEDULE

The Comprehensive maintenance provided during the defect liability period as well as thereafter shall be fully Comprehensive and shall include but not limited to all equipment, labour, repair of equipment, spare parts, consumables and emergency calls providing and site response within 48 hours. The maintenance shall also include a minimum of one monthly preventive maintenance visit by qualified personnel who are thoroughly familiar with the type of equipment and system provided for this

S. No	Equipment		Item
1.	Air handling units and fan coil unit	Monthly inspection	1. Inspect all air handling and fan coil units. 2. Check all air filters and clean or change filters as necessary. 2. Check all water coils, seals and pipelines for leaks and rectify as necessary. 3. Check all humidifiers and its pipe connections for good condition and repair/replace in case of faulty one 4. Check and re-calibrate modulating valves and controls. Adjust and rectify as necessary to ensure compliance to the original specifications. 5. Purge air from all water coils. 6. Check all fan bearings and lubricate with grease as necessary. 7. Check the tension of all belt drives and adjust as necessary. 8. Check and clean all the condensate pans, trays and drains. 9. Check measure and re-calibrate all sensors if necessary. 10. Check, clean and service smoke detectors. Carry out a system test to ensure that the smoke detector will trip the AHU's.

			11. Check spring vibration isolators for abnormal vibration. Rectify if necessary. 12. Coil to be cleaned by (a) spray of high pressure clean water (not exceeding 30 psi) (b) with chemical spray, if necessary. 13. UV lamp working
2.	Air handling units and fan coil unit	Annual Inspection on Prior to Expiry of defect liability period.	1. Perform all functions for monthly checks. 2. Tighten motor terminals 3. Check starter / VFD/ VsD contacts. 4. Test and calibrate overload and all other settings.
3.	Air cooled VRF units	Monthly inspection	1. Check condenser fan motor load ampere. 2. Check fan and motor mounting brackets. 3. Check shafts and bearings. Lubricate with grease as necessary. 4. Check the tension of all belt drives and adjust as necessary. 5. Check for refrigerant leaks with electronic leak detector. Check electrical terminals and contactors operation and connections for tightness. 6. Check compressor motor current. 7. Check refrigerant line driers and moisture indicators. 8. Check all indoor units including cleaning of filter/replacing choked filters, faulty components etc.

4.	Ventilation	Monthly Check	1. Check adjust as necessary the air flow of all fans are in compliance with the original specifications. 2. Check the tension of all belt drives and adjust as necessary. 3. Check and lubricate all fan bearings. 4. Tighten motor terminals. 5. Check starter contacts. 6. Test and calibrate overload settings. 7. A system check shall be carried out for all Mechanical ventilation (MV), supply and Exhaust system to verify the performance of the systems.
5.	switch board	Monthly Check	1. Clean and adjust all switch gear, contactors, relays and associated electrical equipment. 2. Check and prove operation of thermal over load and protection devices. 3. Check and ensure tightness of all equipment fastenings and cable terminations within switch boards. 4. Vacuum clean all switch board cubicles.

6.	Piping system and Valves	Monthly Check	1. Check all piping system and valves for leaks and repair these where they have occurred. 2. Check for damage & deterioration of insulation or sheathings. Rectify as necessary 3. Re-calibration/adjustment of all the valves.
7.	Air distribution system	Monthly Check	1. Check operation of all VAV's, modulating dampers, fixed dampers and actuators. 2. Lubricate all damper bearings and linkages as necessary. 3. Carry out space temperature checks on air- conditioned areas with thermo hydrograph. 4. Balance air flow as necessary to compliance with requirements of original specifications. These checks include the calibration of sensors, thermostat, etc. 5. Check noise level of discharged air from diffusers.
8.	Consumables		The Contractor shall supply all the consumable materials (and not limited to following) as and when required :- 1. All oils and greases required for lubrication of compressors, fan bearings, motors bearings, pivots and other moving parts.

			2. All Refrigerant required for topping up. Refrigerant loss if due to manufacturing defect or due to negligence shall be made good by the contractor. 3. All consumable filter elements/ rolls. 4. All chemicals for the correct chemical treatment of outdoor unit of VRF. 5. All carbon brushes required to replace worn brushes in electric motors. 6. All electric contact points required to replace worn electric contact points in switchgears, motor starter gears, electronic control gears and electric relays. 7. All Electrical EC Motors, PLC, MCCB, MCB, wires, fuses required to replace burnt out/ blown items/fuses. 8. Just before the expiry of the defect liability period and before completion of Comprehensive maintenance period, the contractor shall carry out a complete system operability test on all the systems or sub-systems. The purpose of the test is to verify that the performance of all the systems or sub-systems is in accordance to the specifications.
9.	UVGI in AHU		Lamp shall be replaced after min.16000 hours

C 5 - Audio-Video system

The scope of work / service to be done / provided by the contractor under this bid will be as under:-

1. The Contractor shall operate and maintain the entire AV system & associated works for a total operation and warranty/guaranty period of 3 years including one year defect liability period from the date of successful completion.
2. During the O&M period, contractor must provide adequately trained, skilled manpower as listed out in O&M sTAFF REQUIREMENT section or more to run and support operations for all the AV in the buildings along with fault rectifications and training of the client's staff. All necessary repairs, maintenance, overhaul, replacements etc., shall be made during the O & M to maintain the AV at the status of formal handing over after the successful commissioning. At the end of O & M period the AV systems shall be handed over to the Engineer-in-charge in fully functional and new condition except normal wear and tear.
3. The price for O & M bill shall include supply of all tools, tackles, spares, power supplies, adaptors, convertors, software, laptops, firmware, and any other accessories and equipment required for the successful operation of the AV systems.

Operation and Maintenance

1. The Work shall be carried out as per manufacturer's recommendation wherever applicable and as per instructions of Engineer- in - charge of work.
2. No T & P shall be issued to the contractor by the department.
3. The scope of work includes testing of the sound system in the morning period before start of the business hours and operation of the sound system during the session period of the day.
4. Daily Testing of AV systems to ensure that the guarantee parameters are as stipulated in the bid document.
5. Maintenance of proper records/ history sheets of operations and daily testing as per approved Performa at contractor's own cost as directed by Engineer-In-Charge
6. Testing the AV system in frequency desired by the Engineer-In-Charge and as per in general in accordance with the latest manuals by the OEMs of the systems and equipment.

7. The Contractor shall prepare consolidated daily reports, weekly and monthly reports on AV system operation and maintenance and submit to the Engineer-In-Charge. The daily reports are to be submitted within first working hour of the next day. The monthly reports shall be submitted on the first day of the next month and within two working hours with monthly record data. Overall reporting formats shall be approved by Engineer-In-Charge and may have to be modified from time to time as required and approved by Engineer-In-Charge. Contractor may have to prepare and submit additional reports on particular matters and incidents as and when required by the Engineer-In-Charge for each significant occurrence.
8. The Engineer-in-charge reserves right to collect testing reports at random at the will of the Engineer-in-charge through any agency nominated by him/her. Engineer-in-charge shall have right to seek testing reports collected by the Contractor without any prior intimation to cross check the results on random basis.
9. Maintenance of room-wise logbooks of all the equipment and systems shall be done separately. Fortnightly and monthly reports of all such machinery and parameters will be generated and hardcopy along with soft copy shall be got check and approved from the Engineer-In-Charge. These reports shall contain sufficient appropriate and adequate data to make the records meaningful and amenable to analysis for evaluating the performance of the AV systems as well as to help in O & M decisions.
10. The O & M shall include the appropriate preventive maintenance of equipment as per the manufacturer's recommendation.
11. The contractor must submit detailed but easy to understand and navigate O&M Manuals approved by the client or client's representatives like the engineer-in-charge or the consultants. separate O&M Manuals should be prepared for all the chambers, committee rooms, conference rooms, control rooms, etc. along with detailed system connectivity diagram and graphical guide to operate and maintain the system.
12. Maintenance including programming, firmware updating, calibration, configuration, and all allied works.
13. Repairs, Refurbishments & Replacement required during O & M

period for satisfactory running of all the AV system along with equipment

Down time:

The AV systems shall never be operated with compromises in the functionalities as intended in its design due to maintenance and repair reasons. The period of such exceptional operation shall not exceed 6 consecutive hours and shall not be more than two days a month. The maximum downtime of the whole AV systems in all the rooms and spaces of the building shall not exceed 24 hours. The periods for repairs and maintenance have to be communicated to the Engineer-In-Charge at least one working day in advance. For systems and equipment which requires repairing to be carried out by manufacturer/ manufacturer's authorized representative, the replacement system and equipment shall be installed and configured within 24 hours. The Client/Employer/CPWD reserves the right to impose penalty, should there be any default by Contractor on this account. The penalty amount will be deducted in the subsequent O & M bill if adequate reasons are not furnished by the Contractor for the delay.

Manpower

1. The Contractor shall provide experienced managerial, technical, supervisory, and labour as necessary to operate and maintain the Audio-Video systems properly, safely, and efficiently stipulated manpower annexed with the document (and on-demand in emergency) for the full term of the O & M period.
2. The qualification and capability of Contractor's personnel shall be appropriate for the tasks they are assigned to perform. The staff provided shall be fully trained in the operation of the works before being given responsibility. If, in opinion of the Engineer-In-Charge, a member of Contractor's staff is considered to be insufficiently skilled or otherwise inappropriate for the assigned task, and Engineer-In-Charge informs the Contractor in writing, the Contractor shall replace him with a person of appropriate skills and experience for the task, approved by the Engineer-In-Charge, within one month of being so informed.
3. The Contractor ensure that all labour welfare laws and regulations are followed, including weekly rests, rotation of duties, etc.

Frequency of Preventive maintenance

The preventive maintenance shall be carried out according to the preventive maintenance schedule of the AV systems which is generally every fortnight. The regular staff may be reinforced with short- term specialists by the Contractor for special maintenance tasks, after duly informing the Engineer-In-Charge of the need and the schedule.

Repairs

Repairs shall be made as and when needed very promptly on the spot or at the Contractor's/Manufacturer's/Authorized Dealer's workshop. The need of such repair has to be defined in co-ordination with the Engineer-In-Charge and according to the status of spare parts and replacement availability.

Replacement

The Contractor shall keep a reasonable stock of spare parts and equipment at site at his own cost so that the down time of AV systems can be kept within the limits specified above in the Downtime section. The contents of the stock and the reorder level of the inventory have to be approved by the Engineer-In-Charge.

Transportation

All necessary Transportation shall be arranged and made by the Contractor at his own expense.

Training

The Contractor shall be responsible for instruction and training of all his personnel in all aspects of AV system operation and maintenance till the end of the operation and maintenance period. The Contractor shall also be responsible for training personnel designated by the Employer/Client/CPWD who will operate the systems at the expiry of the contract. The Contractor will make available for this purpose competent staff and as well as propose schedule information that may be necessary for effective execution of the training programs.

The training shall be organized in two (2) stages as follows:

- i. Basic technical training education to be carried out during the final stages of the erection period of the contract through literature, manuals, handouts, presentations, demonstration at site, etc.
- ii. Intensive on-the- job training during commissioning and maintenance period. By the end of this training period these personnel should be able to carry out their respective duties

SPECIAL TERMS AND CONDITIONS FOR O&M

1. The operation and maintenance of all the works included in this tender as per details given should be carried out by contractor at his own cost. All the required spares of Audio Video systems and equipment like SMD LED Panels, microphones, multimedia discussion/conferencing unit, Power supply assemblies, Ethernet switches, fuse, cables, active-adapters/converters, wires, touch panels, etc. required for operation and maintenance shall be procured by contractor at his own cost should be kept in good condition.
2. Any equipment or part of the equipment not working properly after repairing and requires replacement, as per opinion of Engineer in Charge or his representative, then required equipment will be replaced by the Contractor. All the important equipment like LED Video Wall Panels, LCD Video Wall Panels, Microphones, Multimedia Discussion Units, etc. must be kept in spares to provide immediate replacements.
3. During the period of contract, a person other than responsible

representative of contractor or persons employed by him/her should not enter into the premises of the site. Every care should be taken by contractor to prevent such type of unauthorized entry or interruption in the premises or surrounding the property.

4. At any time during the visit of Engineer in charge or his representative if it is observed that the operation and maintenance is not carried out properly, Audio-video and PA systems along with all the related equipment are stopped and contractor is responsible for it then the recovery will be made at double rate of contract for that particular day.
5. All the works executed under this project & covered in the scope of this tender will be deemed to have handed over to contractor from the date of successful commissioning of the facility. Proper operation and maintenance of the same works/components shall be carried out by the contractor and at the time of completion of contract period or termination of contract, contractor should have to give possession of all the work and components back to CPWD in good condition. Before handing over the possession to CPWD, account of contract will not be finalized, and deposit will not be refunded to contractor. For all type of legal activities and expenditure for the same, contractor will be fully responsible.
6. Prescribed registers as maintained by agency during the period of operation and maintenance period shall be submitted to the CPWD.
7. Proper care is to be taken by contractor to keep neat and clean. Every component of head work sites and maintenance of all the components shall be done by contractor.
8. The contractor must carry out proper servicing and cleaning of all the AV equipment regularly as recommended by the respective OEMs and keep into the concerned registers. History sheet shall be maintained by contractor for servicing, repairing and replacement of any AV equipment.
9. All the AV equipment included in the scope shall be updated through tested firmware and software updates during contract period at the cost of contractor. E-Mail messages will be received and entered in the register and message should be conveyed to concern party for action. If any interruption in the

system of any important message should convey immediately to concerned Engineer in charge.

10. Contractor's duties with respect to store inventory & spares shall include the following:
 - a. The store's inventory, the issuing and recording of spare parts will be the responsibility of the Contractor.
 - b. The Contractor is also responsible for providing spare parts and materials required for the operation and maintenance during the operation period, including the cost of storing and safeguarding.
 - c. The Contractor will make all necessary arrangements to ensure the continuous supply of spare parts and material for the works, and the rate of supply of these materials shall be in such quantities and amounts as would ensure uninterrupted operation of AV systems.
 - d. spare parts shall be supplied by the Contractor and the same will be used during Operation and Maintenance Contract period.
 - e. The contractor shall have to procure the required spares from original equipment manufacture or authorized dealer at his cost.
 - f. The required spare parts which will be available with CPWD will be issued to the contractor from its stock and subsequently contractor shall have to replace the same without any extra cost.
 - g. Inspection register will have to be maintained, wherein inspection officers will note their instructions duly dated signature. successful bidder has to follow the instructions strictly.
 - h. On the date of Contract Completion or if the Contract is terminated, all the installations, works and equipment placed under the Contractor's responsibility shall be handed over to the Employer/client at no cost in good working order. The Employer may perform any inspections, tests, or expert appraisals he shall consider necessary with a view to checking that the property is in good working order and will certify to that effect to the Contractor while taking over.

- i. Handing over- After successful completion of O & M period (to be certified by the Engineer in Charge) the scheme as a whole and its components individually will be handed over to the CPWD or the agency nominated to take over the charge for further operation and maintenance. The CPWD will not take any responsibility of the employees engaged by the contractor to run the scheme during O&M period, whatsoever. The scheme and all its components individually shall be handed over to the CPWD in a very good maintained condition. Decision of Engineer-in-Charge will be final.
- j. Before handing over the components to CPWD or its nominated agency all the structures shall be maintained as per specifications given in the agreement and all the AV system along with equipment will be maintained by all standard maintenance procedure as per specifications and these must be in good running conditions. It will be the responsibility of the contractor to show that all stipulated service Level standards have been fulfilled and are up to the mark on the date of handing over the works to CPWD. The scheme and all its components individually shall be handed over to CPWD or its nominated agency in a very good maintained condition.

C 6- IBMs

The scope of work / service to be done / provided by the contractor under this bid will be as under:

The Contractor shall operate and maintain the entire IBMs system & associated works for a total operation and warranty/guaranty period of 3 years including one year defect liability period from the date of successful completion.

OPERATION AND MAINTENANCE

Contractor may be required to carry out the operation of the installation by providing manpower as specified.

MAINTENANCE

Routine Preventive Maintenance schedule as per OEM recommendation shall be submitted to Engineer-in-charge and routine and preventive maintenance shall be carried out accordingly.

The daily/Weekly/Monthly report as per approved schedule shall be submitted to Engineer-in-charge.

It shall be responsibility of the contractor to carry out the Maintenance of the complete system. The contractor shall receive calls for any and all problems experienced in the operation of the system, attend to these within 48 hours of receiving the complaints and shall take steps to immediately correct any deficiency that may exist.

All components, system software, parts and assemblies supplied by the IBMs Contractor shall be guaranteed against defects in materials and workmanship.

Labour, repair or replacement of system components shall be the responsibility of contractor. All equipment that requires repairing shall be immediately serviced and repaired. All replacement parts and labour shall be supplied promptly to the Owner.

The uptime during the maintenance period shall be 98% for the IBMs system. Any shortfall shall be treated as breach of contract and decision of Engineer-in-charge regarding penalty shall be final and binding.

Routine shut downs shall be permitted in consultation with Engineer-in-charge. Contractor shall be at liberty to carry out routine maintenance as and when required but with prior permission of the Owner.

MATERIALS

As the complete system shall be under warranty/guaranty, all the materials required for carrying out routine, preventive and breakdown maintenance shall be arranged by the Contractor.

The scope of work / service to be done / provided by the contractor are as under:

The Contractor shall operate and maintain the entire active and passive network of ICT system & associated works for a total operation and maintenance period of 3 years including one year defect liability period from the date of successful completion of the work.

1. During the O&M period, contractor must provide adequately trained, skilled manpower to run and support operations for all the ICT systems in the buildings along with fault rectifications and training of the client's staff. All necessary repairs, maintenance, overhaul, replacements etc., shall be made during the O & M to maintain the ICT at the status of formal handing over after the successful commissioning. At the end of O & M period the ICT systems shall be handed over to the Engineer-in-charge in fully functional and new condition except normal wear and tear.
2. All tools, tackles, spares, power supplies, adaptors, convertors, software, laptops, firmware, and any other accessories and equipment required for the successful operation of the active/passive component of ICT systems are to be arranged by the contractor.
3. Deployment of technical manpower as per Tender scope and as per O&M requirements at all the GPOA BLOCK 1 building locations.
4. Penta scanner and OTDR / OLTs shall be kept at site for quicker resolution of faults and issues.
5. Maintenance of all components like network cables, cable ducts, racks, uninterrupted power supply to racks, I/O ports, switches, voice and video equipment, servers etc. of the ICT Network
6. Analyzing the frequent incidents and conduct detailed analysis of the same.
7. Network Management- managing and monitoring the connectivity links to GPOA BLOCK 1 building and perform link management and resolving of link failures.
 8. Carry out preventive maintenance in an uninterrupted way.
9. Perform LAN network management, implementation, support, installation at GPOA BLOCK 1 building.
10. Perform maintenance, management and splicing of fibre cut within GPOA BLOCK 1 building across floor connectivity or in the Backbone.
11. Documentation related to IT infrastructure should be made

available when demanded.

12. Coordinate review meetings with various stakeholders at various levels.
13. Prepare detailed Network Topology for smooth fault management and trouble shooting.
14. Ensuring policies are being followed and practiced Implementation and Migration from IP4 to IPV6 as per guidance from NIC.
15. Rectification of defects in wiring system including replacement of wire as required.
16. Cleaning of distribution panels, patch panels etc. and setting right the defect if any.
17. Responsibility of the contractor shall be correctness of wiring from server to user end.
18. Replacement of any defect / damage component in wiring and distribution network.
19. The work includes repair / rectify / free replacement of defective components which shall be necessary running condition of all systems during the period of agreement. All the defective components shall be replaced with new one as per manufacturers standard and genuine OEM certified parts only.
20. software Upgradation/ updation, Installation of patches and any other software applications released by the OEM shall be done by the contractor promptly in all the active components.
21. The ICT systems shall never be operated with compromises in the functionalities as intended in its design due to maintenance and repair reasons. The maximum downtime of the whole ICT systems in all the rooms and spaces of the building shall not exceed 24 hours. The periods for repairs and maintenance have to be communicated to the Engineer-In-Charge at least one working day in advance. For systems and equipment which requires repairing to be carried out by manufacturer/ manufacturer's authorized representative, the replacement system and equipment shall be installed and configured within 24 hours. The Engineer-in-Charge reserves the right to impose penalty, should there be any default by Contractor on this account.
22. Network availability requirement for passive and active components is as below:

Type	Network Availability
Network Uptime - Equipment & Connectivity Links at GPOA Block 2 for all items under Tender scope	99.5%

23. **spares**

Following replacement spares inventory shall be maintained at all times at site itself for the following items:

- a. CAT6A I/Os - equal to 2% of BoQ quantity or next/nearest higher integer
- b. Fiber optic transceivers of each type - equal to 2% of BoQ quantity or next/nearest higher integer
- c. Access sitches - equal to 2% of BoQ quantity or next/nearest higher integer (full units)
- d. Power supplies and any other accessories of Access switches - equal to 2% of BoQ quantity or next/nearest higher integer

- e. CAT 6A Patch Cord, Pigtails, LC-LC Connectors - equal to 5% of BoQ quantity or next/nearest higher integer (full units)

24. Replacement sLA

During the maintenance period the spares and support activity for all the installed items shall be supported by OEMs'/Manufacturers' back-to-back 24 Hrs x 7 Days/week x 365 Days. Next Business-Day replacement and OEM support shall be ensured for all the items of ICT system.

25. Compensation Clause

In case the contractor fails to comply with the agreed service levels, Engineer-in-Charge will at liberty to engage another agency to ensure uninterrupted service at the risk and cost of contractor. In regard to penalty on account of this, decision of engineer-in-charge shall be final and binding.

26. MATERIALS:

As the complete system shall be under Comprehensive maintenance, all the materials required for carrying out routine, preventive and breakdown maintenance shall be arranged by the Contractor.

Schedule of Quantity (O&M Work)					
Name of work: Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi.					
S. No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT RATE	AMOUNT
a	b	c	d	e	f= d x e
C9 - OPERATION OF E&M SERVICES DURING DEFECT LIABILITY PERIOD					
1	Internal EI & Fans, Light Fixture, Electrical Panels, UPS with batteries				
	Operation of Internal Electrical Installation, Light Fixture, Electrical Panels, UPS with batteries as detailed in BOQ (C-1) on all days including sundays and holidays in respected sub head as per enclosed terms & conditions.	36	Month	6,79,049	2,44,45,764
2	IBMS , Fire Alarm System & PA System				
	Operation of IBMS , Fire Alarm system & PA System as per BOQ (C-6, C-2) (24 hours on each day including Sundays and Gazetted Holidays) as per enclosed terms and conditions.	36	Month	1,76,392	63,50,112
3	Fire Fighting & Gas Suppression System				

	Operation of the complete Fire Protection system of all the machinery/ equipment / components installed as per BOQ (C-3) (24 hours on each day including Sundays and Gazetted Holidays) as per enclosed terms and conditions.	36	Month	2,26,350	81,48,600
4	HVAC				
	Operation of the complete Heating, Ventilation and air conditioning system of all the machinery/equipment /components and electrical installation equipment installed as per BOQ (C-4) on all days including Sundays and Gazetted Holidays as per enclosed terms and conditions.	36	Month	1,50,900	54,32,400
5	AV System				
	Operation of AV System as detailed in as per BOQ (C-5) as per enclosed terms & conditions.	36	Month	1,79,928	64,77,408
6	ICT System				
	Operation of ICT system as detailed in as per BOQ (C-7) as per enclosed terms & conditions.	36	Month	1,79,928	64,77,408
	Sub-Total SH-(C-9)				5,73,31,692

C10 - COMPREHENSIVE MAINTENANCE AFTER COMPLETION OF DEFECT LIABILITY PERIOD

1	Internal EI & Fans, Electrical Panels				
	Comprehensive, Routine, preventive, breakdown maintenance of Electrical Installation (C-1) (excluding Light Fixtures and UPS with batteries) for a period mentioned below i/c repair & replacement of worn-out items with minimum down time etc as per enclosed terms & conditions	24	Month	2,32,940	55,90,560
2	Fire Protection System & Gas suppression System				
	Comprehensive, routine, preventive, Breakdown maintenance of complete FPS system & Gas suppression system including Utility-Automatic Sprinkler System and all associated instrumentation and electrical equipment and accessories as detailed in BOQ (C-3) with minimum down time etc. as per enclosed terms & conditions.	24	Month	38,238	9,17,712
3	HVAC				
	Comprehensive, routine, preventive, Breakdown maintenance of complete HVAC system as detailed in BOQ (C-4), including providing replacement /repair of worn-out / defective items with minimum down time etc.	24	Month	7,85,475	1,88,51,400

	as per enclosed terms & conditions.				
	Sub-Total SH-(C-10)				2,53,59,672
	Grand Total (C-9 and C-10)				8,26,91,364.00

PART-E

TENDER DRAWINGS



2nd to 4th (TYPICAL) FLOORING PLAN



NOTE:

- 1. SHOWN FOR REFERENCE ONLY.
- 2. SHOWN FOR REFERENCE ONLY.
- 3. SHOWN FOR REFERENCE ONLY.
- 4. SHOWN FOR REFERENCE ONLY.
- 5. SHOWN FOR REFERENCE ONLY.
- 6. SHOWN FOR REFERENCE ONLY.
- 7. SHOWN FOR REFERENCE ONLY.
- 8. SHOWN FOR REFERENCE ONLY.
- 9. SHOWN FOR REFERENCE ONLY.
- 10. SHOWN FOR REFERENCE ONLY.

PARTITION	DESCRIPTION
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100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION
100MM THICK FULL HEIGHT WALL	PARTITION WITH RELAXATION

NOTE:

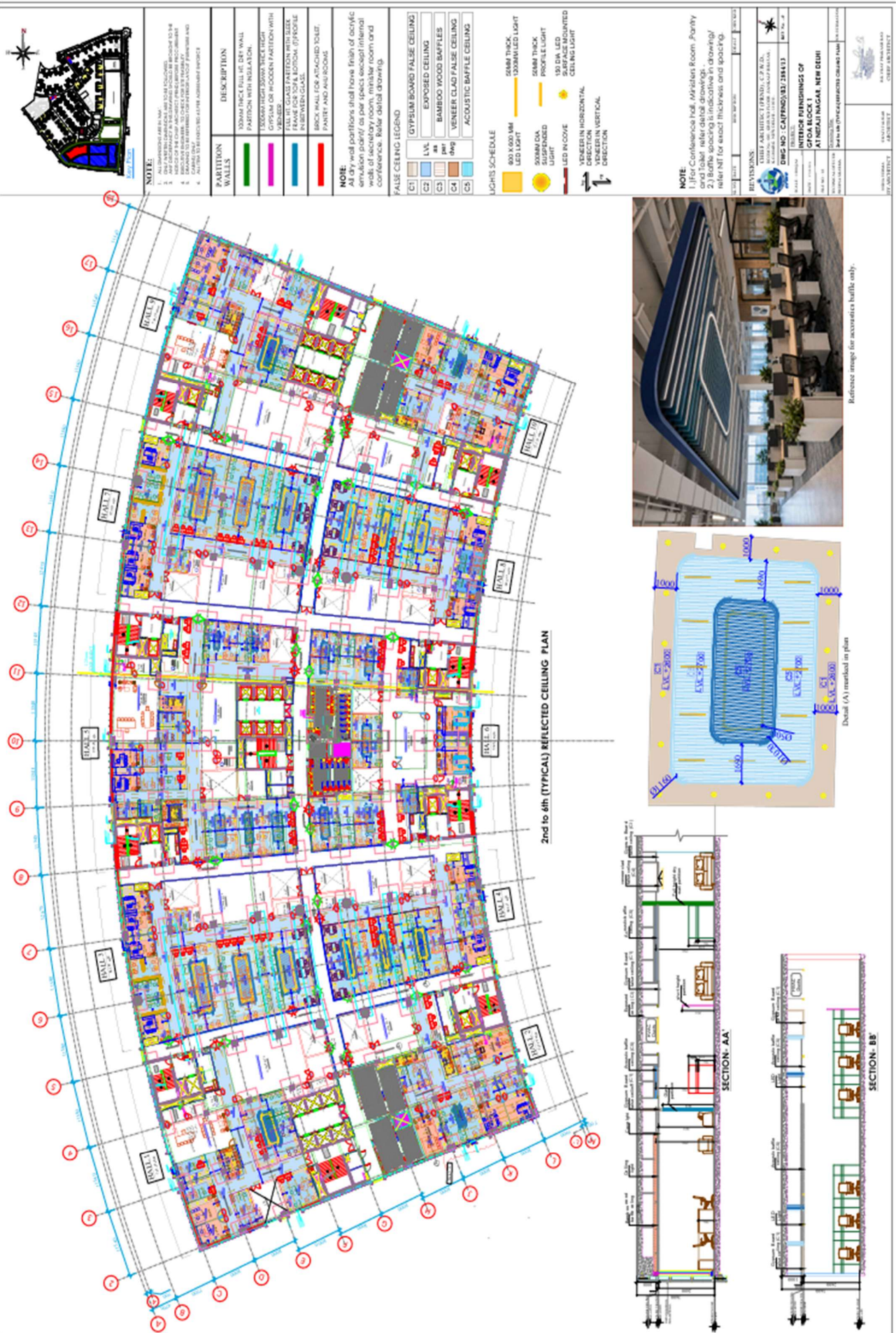
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- 2. SHOWN FOR REFERENCE ONLY.
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- 4. SHOWN FOR REFERENCE ONLY.
- 5. SHOWN FOR REFERENCE ONLY.
- 6. SHOWN FOR REFERENCE ONLY.
- 7. SHOWN FOR REFERENCE ONLY.
- 8. SHOWN FOR REFERENCE ONLY.
- 9. SHOWN FOR REFERENCE ONLY.
- 10. SHOWN FOR REFERENCE ONLY.

FLOORING LEGEND

F1	2400 x 800mm VITRIFIED TILES (SHADE 1)
F2	2400 x 800mm VITRIFIED TILES (SHADE 1)
F3	14.18mm PM BAMBOOWOOD FLOORING
F4	CARPET TILES
F5	800 x 800mm VITRIFIED TILES (SHADE 2)
F6	18mm PK GRANITE (ANTISKID)
F7	KOTA STONE FLOORING
	STARTING POINT

REVISIONS:

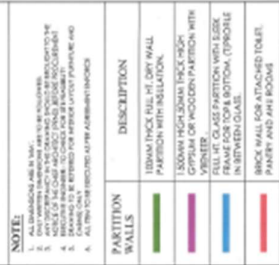
NO.	DESCRIPTION	DATE
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2	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
3	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
4	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
5	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
6	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
7	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
8	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
9	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	
10	FOR CONFERENCE HALL, MEETING ROOM, PARTY AND OTHER WITH CORRIDOR.	



2nd to 6th (TYPICAL) FURNITURE LAYOUT PLAN







NOTE:
All dry wall partitions shall have finish of acrylic emulsion paint/ or per spect except internal walls of secretary room, minister room and conference. Refer detail drawing.

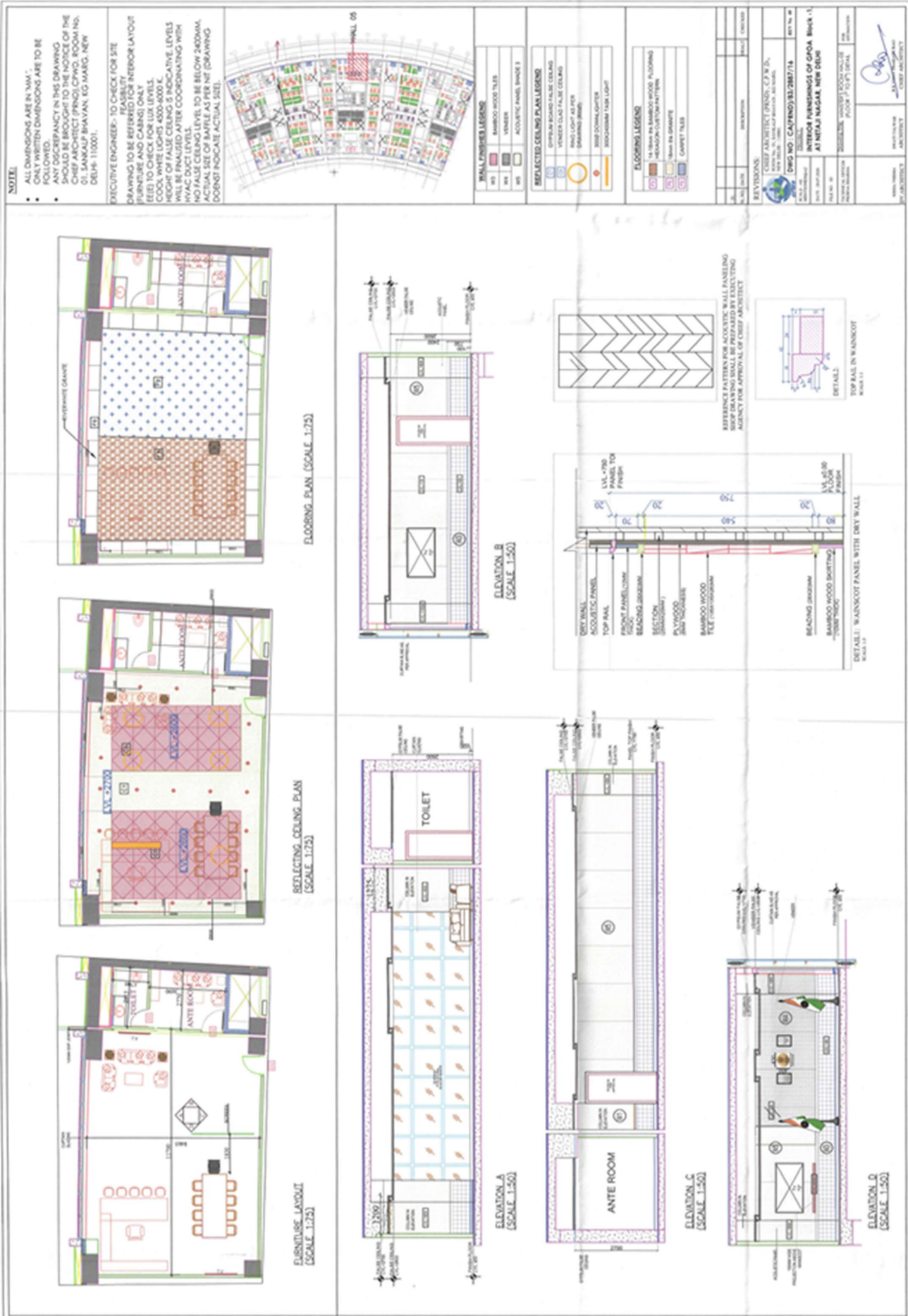
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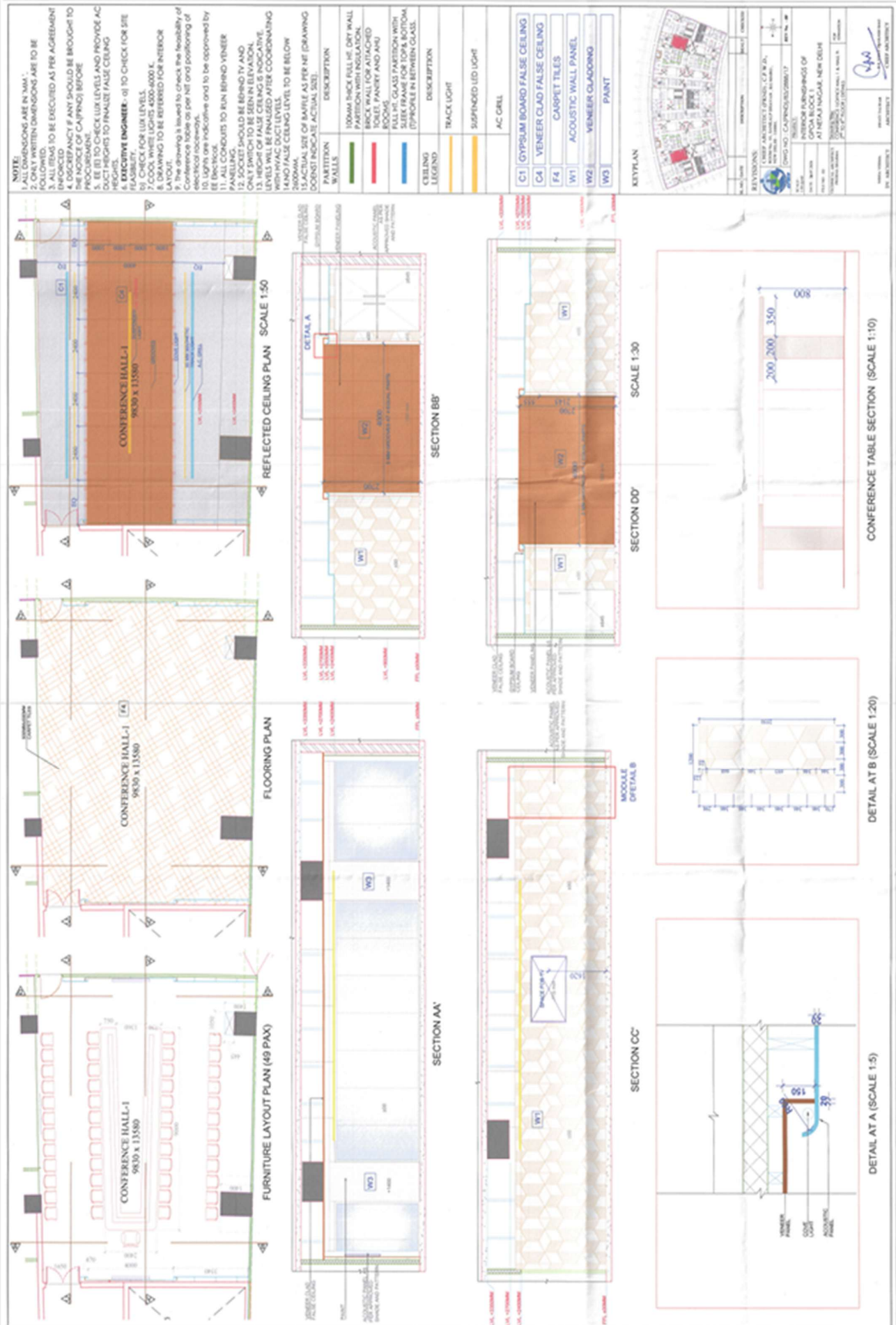
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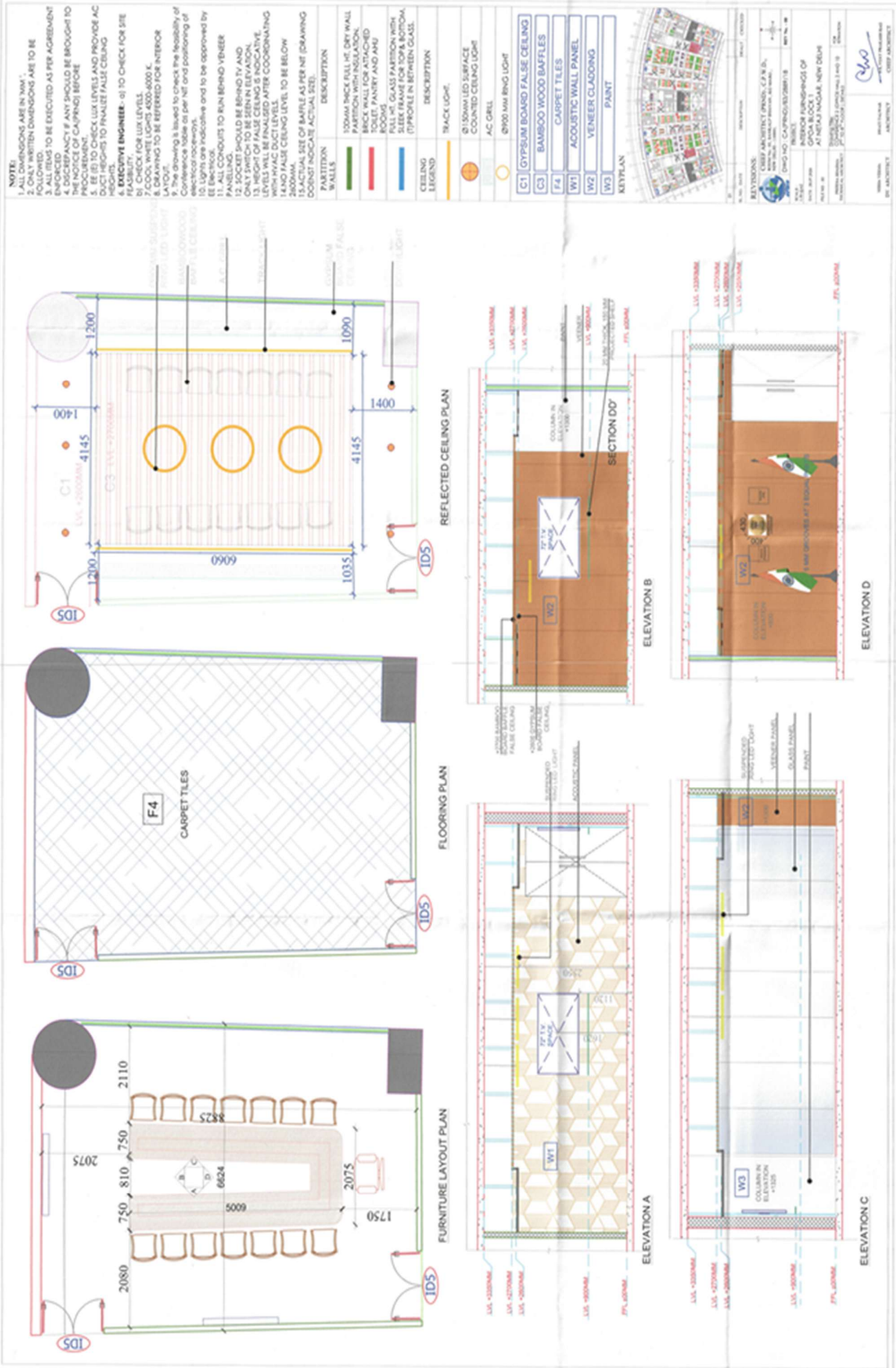
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 CHIEF, AGRICULTURE (FARM), P.W.D., KARNATAKA GOVT. ENGINEERING COLLEGE, CHANNarayana - 577 104 DWG NO. CA/ENR/03/297/04 PROJECT: CONSTRUCTION OF SHIVA ROCKS I AT NETAJI MAGAR, NIMN DELHI 75/23/2004		FOR APPROVAL:			
DRAWN BY: CHECKED BY: DATE: SCALE: PROJECT NO: PROJECT NAME:		PROJECT NO. PROJECT NAME PROJECT LOCATION			PROJECT NO. PROJECT NAME PROJECT LOCATION



7TH FLOOR FURNITURE LAYOUT PLAN









NOTE:

NOTE:

53.37761111111111 | 20.30611111111111 | 10.511611111111111

At dry wall partitions shall have finish of acrylic emulsion paint, as per specs except in area

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ST/SL/NS			
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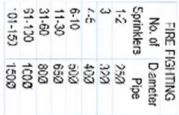
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SEVENTH FLOOR PLAN

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion



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PART-F

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion



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GOVERNMENT OF INDIA
CENTRAL PUBLIC WORKS DEPARTMENT



Annexure-IX

Price Bid Sheet

<u>Central Public Works Department</u>					
NIT No: 06/CE/CVPZ-2/CVP/NIT/2026-27					
Name of work:- Internal finishing, furniture, furnishing and related E&M works for office spaces in GPOA Block No. 1 at Netaji Nagar, New Delhi					
PROFORMA FOR QUOTING TENDER					
Name of the Contractor / Company Name					
Sl.No.	Name of component	Estimated cost	Percentage above or below the estimated cost	% in Figures	Total Cost (Rs.)
1	Civil+Furniture (Rs. 280,05,44,676/-)				
2	E & M Work (Rs.192,62,92,896/-)				
3	E&M Maintenance (Rs.8,26,91,364/-)				
	Grand Total	Rs. 408,95,28,936/-	Select	0.00	-

Correction = Nil, Insertion = Nil, Overwriting = Nil, Deletion