

APPROVAL OF NIT

Notice Inviting Tender No. : 05/2026-27/CE/CCU/CED-II/Dehradun

Name of work : Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).

Estimate cost put to tender : Rs. 15,64,86,955/-

Earnest Money : Rs. 25,64,870/-

**Performance Guarantee : a) 5% of tendered value or Estimated Cost Put to Tender (ECPT) (whichever is higher).
(b) Where the tendered amount is less than eighty percent (80%) of the Estimated Cost Put to Tender (ECPT), the Performance Guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount**

Security Deposit : @ 2.5% of Tendered Amount

Time Allowed : 15 (Fifteen) Months

This NIT amounting to Rs. 15,64,86,955/- (**Rupees Fifteen Crore Sixty-Four Lakhs Eighty-Six Thousand Nine Hundred Fifty-Five Only**) is hereby approved.

Certified that this NIT contains Pages 234.

Assistant Engineer (E) (P)-II
CCU, MoEF&CC, New Delhi

Assistant Engineer (C) (P)-II
CCU, MoEF&CC, New Delhi

Executive Engineer (E) (P)
CCU, MoEF&CC, New Delhi

Executive Engineer (C) (P)
CCU, MoEF&CC, New Delhi

Superintending Engineer
CCU, MoEF&CC, New Delhi

Chief Engineer
CCU, MoEF&CC, New Delhi

CIVIL CONSTRUCTION UNIT
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE
CHANGE

NOTICE INVITING TENDER

Name of Work: **Construction of Office Building of BSI, HAWHRC, Solan
(Himachal Pradesh).**

NIT NO. **: 05/2026-27/CE/CCU/CED-II/Dehradun**

Chief Engineer
CCU, MoEF&CC, New Delhi

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Name of work: Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).

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Executive Engineer, CED-II, CCU
(For and on behalf of the President of India)

PART-A

GENERAL INFORMATION

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

The Executive Engineer, Civil Engineering Division-II, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), FRI Campus, Dehradun-248006 ([email- eeecd2ccu-mef@nic.in](mailto:eeecd2ccu-mef@nic.in)) on behalf of President of India invites online rate bids from CPWD enlisted contractors of appropriate class in Buildings & Roads (erstwhile composite /Building/ Infrastructure) category in single bid system for the following work :

NIT No.	05/2026-27/CE/CCU/CED-II/Dehradun
Name of Work	Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).
Location	Solan, Himachal Pradesh.
Estimated cost put to bid (Rs.)	Rs. 15,64,86,955/-
Earnest Money (Rs.)	Rs. 25,64,870/-
Stipulated Period of Completion of work (in months)	15 Months
Last time & date of submission of online bid, copy of receipt of deposition of original EMD and other documents as specified in Notice Inviting e-Tender.	03:00 PM on 01.09.2026
Time date of opening of bid	03:30 PM on 01.09.2026

****To be filled by Executive Engineer, CED-II**

Enlistment of the contractors should be valid on the last date of submission of bids. In case, the last date of submission of bids is extended, the enlistment of contractor should be valid on the original date of submission of bids. ***Joint ventures/Consortium and Special Purpose Vehicles are not allowed to tender.***

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

- 5) But the bid can only be submitted after deposition of EMD through Payment Online payment mode and original bank guarantee including e-Bank guarantee (for balance amount as prescribed) **either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CPWD/CCU, MoEF&CC within the period of bid submission** and uploading the mandatory scanned documents as mentioned in the NIT, receipt for deposition of original EMD to any division office of CCU, MoEF&CC/ CPWD or office of **Executive Engineer, CED-II, CCU, FRI Campus, Dehradun** and other documents as specified.
- 6) Those contractors who are not registered or have not updated their profile on the website mentioned above, are required to get registered / update their profile beforehand. The necessary training materials including the videos with step-to-step process are available on download section of <https://etender.cpwd.gov.in>.
- 7) The intending bidder must have valid Class-III digital signature certificate with encryption key (combo type) to perform any operations / transactions on the e-tendering portal / website and the bidder should download and install the eMsigner on their system as per instructions available on download section of <https://etender.cpwd.gov.in>.
- 8) On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
- 9) Contractor can upload documents in the form of JPG format and PDF format.
- 10) Certificate of Financial Turn Over: At the time of submission of bid contractor may upload Affidavit/Certificate from CA mentioning Financial Turnover of last 7 years ending 31st March 2025 or for the period as specified in the bid document and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.
- 11) Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in yellow colour and the moment rate is entered, it turns sky blue. In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO). 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.
- 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) Online bid documents submitted by intending bidders shall be opened only of those bidders, whose deposited EMD and other documents scanned and uploaded are found in order.
- 14) If any information furnished by the applicant is found incorrect at a later stage, he shall be liable to be debarred from tendering/taking up of works in department. The department reserves the right to verify the particulars furnished by the applicant independently.

15. List of Documents to be scanned and uploaded within the period of tender submission

- 1) **Enlistment Order** of the Contractor of CPWD in appropriate Category and valid on the date of opening of tender.
- 2) Insurance Surety Bond/ Demand Draft / Pay order or Banker's Cheque / Deposit at Call Receipt /FDR/Bank Guarantee of from any of the Commercial Banks against **EMD in favour of "Executive Engineer, CED II, CCU, MoEF&CC, New Delhi"**.
- 3) Copy of receipt of deposition of original EMD issued by any divisions of CPWD/CCU, MoEF&CC (Format of deposition receipt should be as per **Annexure- A, available the Bid Document**)
- 4) GST Registration Certificate, if already obtained by the bidder. If the bidder has not obtained GST registration as applicable, then he shall scan and upload following under taking along with bid documents.

"If work is awarded to me, I/we shall obtain GST registration certificate, as applicable (of the state where site is located), within one month from the date of receipt of award letter or before release of any payment by CCU, 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 CCU or GST department in this regard".

- 5) Undertaking on structural stability and soundness as per prescribed format **Annexure-C**.
- 6) Declaration regarding scope of work and site inspection for this work as per **Annexure-D**.
- 7) Valid Electrical License issued by Competent Authority in the name of the contractor or an undertaking that they will either obtain valid electrical license at the time of execution of electrical work or associate contractors having valid electrical license of eligible class of execution of all electrical works. (Format of Undertaking as per **Annexure-G** of this section).
- 8) Any other Document as specified in the NIT.

Executive Engineer, CED-II, CCU
(For and on behalf of the President of India)

CPWD 6 FOR E- TENDERING

1. Percentage rate bids are invited on behalf of President of India from approved and eligible contractors of CPWD in appropriate class in Buildings & Roads (erstwhile composite /Building/ Infrastructure) category in single bid system for the following work **“Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).”**

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

- 1.1 The work is estimated to cost Rs. **15,64,86,955/-**. This estimate, however, is given merely as a rough guide.
2. Agreement shall be drawn with the successful bidders on prescribed Form No. **CPWD 7** which is available as a Govt. of India Publication and also available on website **www.cpwd.gov.in**. Bidders shall quote his rates as per various terms and conditions of the said form which will form part of the agreement.
3. The time allowed for carrying out the work will be **15 Months** from the date of start as defined in schedule ‘F’ or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
4. The site for the work is available on “as it is where it is” basis. **The bidders have to quote their rates in view of the site conditions and other parameters.**
5. The architectural and structural drawings for the work shall be prepared by domain experts and submitted by the agency as provision mention in tender document after award of work for approval from Engineer-in-charge.
6. The bid document consisting of plans, specifications, the schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.
7. After submission of the bid the contractor can re-submit revised bid any number of times **or withdraw it** before last date and time of submission of bid as notified. **No post-tender modification is allowed by the tenderers except through negotiations, if required. In case, any tenderer does so, the tender will be rejected and the tenderer will be debarred for future tendering in CCU/CPWD for two years by the concerned enlisting authority (in case of CPWD enlisted contractor).**
8. While submitting the revised bid, contractor can revise the rate of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.
9. Earnest Money in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee including e- Bank Guarantee (for balance amount as prescribed) from any of the Commercial Banks (drawn in favour of **Executive Engineer, CED-II, CCU, MoEF&CC, New Delhi**) shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The original

EMD should be deposited either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CCU/CPWD within the period of bid submission. The EMD receiving Executive Engineer (including NIT issuing EE/AE) shall issue a receipt of deposition of earnest money deposit to the bidder in a prescribed format (enclosed) uploaded by tender inviting EE in the NIT.

A part of earnest money is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee including e- Bank Guarantee of any Commercial bank having validity for a period of **180 days** or more from the last date of receipt of bids which is to be scanned and uploaded by the intending bidders.

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

10. The bid submitted shall become invalid and e-Tender processing fee (if applicable) shall not be refunded if:
 - (i) The bidder is found ineligible.
 - (ii) The bidder does not upload scanned copies of all the documents stipulated in the bid document.
 - (iii) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of bid opening authority.
 - (iv) If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer
11. The tenderer whose bid is accepted will be required to furnish performance guarantee:
 - a) Performance Guarantee (PG) shall be 5% of the estimated cost put to tender (ECPT) or tendered amount whichever is higher, to be submitted in the form as prescribed in tender document, within 7 days from the date of issue of letter of acceptance. Performance guarantee shall remain valid for a minimum period of six months beyond the date of completion of all contractual obligations.
 - b) If the quoted bid amount is lesser than 80% of the estimated cost put to tender, the bidder shall be required to submit Additional performance guarantee (APG) in addition to the standard performance guarantee as mention in (a) above. The amount of additional performance guarantee shall be equal to the difference between the 80% amount of ECPT and quoted amount.

(e.g. if EPCT is A and quoted amount is 0.7A then the amount of APG shall be 0.8A-0.7A). The additional performance guarantee shall be in the prescribed format of performance guarantee and has to be submitted within the time frame prescribed for submission of performance guarantee. The other terms and conditions for additional performance guarantee shall be same as that of PG as mention in GCC.

This period can be further extended by the Engineer- in-Charge at the written request of the tenderer, stating the reason for delays in procuring the Performance Guarantee to the satisfaction of Engineer-in- charge, for a maximum period of 3 days with late fee @ 0.1% per day of performance guarantee amount.

This guarantee shall be in the form of Deposit at Call receipt of any scheduled bank/ Banker's cheque of any scheduled bank/Demand Draft/Pay order of any scheduled bank or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank in accordance with the form annexed hereto.

In case the contractor fails to deposit the said performance guarantees as applicable (mentioned above) within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee. The contractor whose bid is accepted will be also be required to furnish either copy of applicable licenses/registrations or proof of applying for obtaining labour licenses, registration with EPFO, ESIC and BOCW Welfare Board including provident fund code no. if applicable and also ensure the compliance of aforesaid provisions by the sub-contractors, if any engaged by the contractor for the said work within the period specified in Schedule 'F'.

12. Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.
13. The competent authority on behalf of the President of India does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
14. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.

15. The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
16. The contractor shall not be permitted to bid for works in the CCU Circle responsible for award and execution of contracts, in which his near relative is posted as a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any Gazetted officer in the Civil Construction Unit or in the Ministry of Environment, Forests and Climate Change. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of the Department.
17. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.
18. The bid for the work shall remain open for acceptance for a period of **Forty Five (45)** days from the date of opening of tenders.
- 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 or makes any modification in the terms & conditions of the tender which is not acceptable to the department after expiry of 7 days after last date **and time (24 hours basis)** of submission of bids, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 100% of the earnest money absolutely irrespective of 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..
19. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of: -
- i) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

- ii) Standard C.P.W.D. Form 7 or other Standard C.P.W.D. Form as applicable.
- iii) General Conditions of Contract 2023 for Construction works, Central Public Works Department, as corrected up to last date of submission of bids.

20. **Specialized Agencies for E&M services:** The tenderer must associate himself with agencies of the appropriate eligibility for each of specialized nature of items / work as per part-‘C’ of NIT. The work of Lifts, STP, ETP & WTP shall be carried out by OEMs respectively.

Such works shall be got executed only through associated agencies specialized in these fields. Separate MOU has to be signed with each of the specialized works with either OEMs (Authorised channel partners) or with specialized agencies who have the credentials of executing either one work of 80% value or two work of 60% value or three works of 40% value of the corresponding component of the specialized work in last seven years.

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

The contractor has to submit MOU with associated contractor (in case electrical contractor is associated), engineers name, credential, email address & mobile no. before start of work. The main agency should possess a valid electrical contractor licence for executing EI works otherwise they have to associates contractor having valid electrical contractor licence. It shall be the responsibility of contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department.

The contractor shall be solely responsible for settling any dispute / litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies / sub-contractor(s).

No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim what so ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection/rejection of the Specialized Agency. The contractor has to associate agency(s) 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 within prescribed time. Name of the agency(s) to be associated shall be approved by Engineer-in-Charge.

- 21. The proposal for all specialized agencies (for Civil works and E& M works as specified in part ‘B’ and Part ‘C’ of notice inviting tender respectively) shall be submitted by the contractor within 03 months of the date of start/commencement. MOU should be submitted within three months of the date of start/commencement. In case of non-submission or incomplete or part submission of the proposals, deduction @ Rs. 5000/- per day per proposal of specialised agency shall be made from any amount payable to the contractor.
- 22. In case the 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. 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.

23. The contractor has to enter into MOU with agency(s) associated by him. Copy of such agreement shall be submitted to EE in charge. In case of change of associate contractor, the main agency(s) has to enter into MOU/agreement with the new contractor associated by him.
24. 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 ERP helpline no. 18001803286 or e-mail cpwd.support@techmahindra.com. The e- tendering bidders are also advised not to wait to raise any issues till the last date of submission of bid in their own interest.

Executive Engineer, CED-II
(For and on behalf of the President of India)

**GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FORESTS & CLIMATE CHANGE**

PERCENTAGE RATE BID AND CONTRACT FOR WORKS

Tender for the work of “**Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).**”

- i) To be uploaded by 15:00 hours on **01.09.2026** to/upload at
- ii) To be opened in presence of tenderers who may be present at 15:30 hours on **01.09.2026** in the office of in the office of the Executive Engineer, CED-II, CCU, FRI Campus, Dehradun.

** To be filled by EE, CED-II

TENDER

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

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

We agree to keep the tender open for acceptance for **Forty Five (45)** days from the due date of its opening of bid and not to make any modifications in its terms and conditions.

A copy of earnest money deposit receipt of prescribed amount deposited in the form of Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed) issued by a Commercial Bank, is scanned and uploaded. If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/ We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee absolutely. The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2(c) of the tender form. I/We hereby declare that I/we shall treat the tender documents drawings and other records connected with the work as secret/confidential documents and shall not communicate information derived there from to any person other than a person to whom I/we am/are authorized to communicate the same or use the information in any manner prejudicial to the safety and integrity of the State.

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

I/We undertake and confirm that eligible similar work(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of

Department, then I/We shall be debarred for tendering in CCU, MoEF&CC in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit/Performance Guarantee.

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

Signature of contractor

Postal Address -----**

Telephone No. -----**

Fax -----**

E-MAIL -----**

Witness:

Address:

Occupation:

** To be filled by Bidder

ACCEPTANCE

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

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

(a) -----*

(b) -----*

(c) -----*

For & on behalf of President of India

Signature.....*

Dated: -----*

.....*

Designation

* To be filled by Executive Engineer

Preparation and submission of Architectural & Structural drawings, MEP Services and Development Drawings:

- 1. Preparation of all Architectural & Structural drawings, MEP Services and Development Drawings etc. based on the layout available in the Bid document. The cost of preparation Architectural & Structural drawings, MEP Services and Development Drawings is deemed to be included in the tendered amount and nothing extra shall be paid on this account.**

All required drawings shall be got prepared by the agency at its own including vetting of structural drawings from IIT Delhi/DTU Delhi/IIT Roorkee/IIT Kanpur/NIT Delhi/NSUIT Delhi as approved by Engineer-in-charge. No payment on this account shall be made to the agency. All the drawings including additional/modified approved drawings shall be submitted in six sets along with soft copy for approval from Engineer-in-charge before execution at site.

- a. The agency has to proceed with the conceptual plan attached in this NIT.
- b. The agency has to:
 1. Carrying out digital ground survey and submission of topographical survey plan;
 2. Preparation and submission of design and drawings (architectural and structural) for approval;
 3. Preparation and submission of all good for construction architectural, structural, Civil and E&M services drawings as per schedule.
 4. All necessary as well as statutory approvals including fire NOC, as required, from commencement to completion of proposed work.
- c. The Soil investigation report for the work is available and shall be provided to the agency during handing over of the site. If the provided soil investigation report does not appear suitable to the agency, then the soil investigation may be carried out by the agency and the cost of soil investigation shall be deemed to be inclusive in the rates quoted by the contractor. However, value of SBC to be adopted for structural design out of two soil investigation reports, shall be as per direction of Engineer-in-charge.
- d. The architectural design shall be carried out in terms of specifications of latest versions of Bureau of Indian Standards (BIS) Codes, National Building Construction Standards 2026 and other approvals/guidelines applicable to this work.
- e. The agency shall have to get the structural analysis/design and drawings checked by the proof consultant. The proof checking/vetting shall be done by IIT Delhi/DTU Delhi/IIT Roorkee/IIT Kanpur/NIT Delhi/NSUIT Delhi. Nothing extra shall be paid on this account.
- f. The agency shall comply with all applicable laws, bye-laws, and statutory provisions etc. in the performance of the preparation of all type of drawings and in the execution of the project. The agency shall comply with the applicable norms of local as well as Central Govt. Bodies/Authorities.

- g. **GREEN BUILDING DESIGN:** The agency shall adhere to highest standards of environment and energy sustainability as stipulated in bid document and as approved by CCU. Holistic integration of the environmental sustainability in design, materials, construction, services, processes and maintenance concerns should be strictly addressed in campus/work planning and design to achieve a Green Campus equivalent to minimum **4-Star Rating** under GRIHA system. **The contractor shall also engage a GRIHA certified consultant for work.** All stage wise approvals from the concerned statutory authorities be coordinated and obtained by the consultant including the payment of requisite fee to the authorities, if required. **However, statutory fees paid to the statutory authorities for GRIHA Rating shall be reimbursed to the agency after submission of proof of payment.**

Note:

- 1) The agency shall submit the credentials and documents of the proposed domain experts for prior approval from Engineer-in-Charge for providing above mentioned services i.e. preparation of Architectural/Structural/MEP Services/Development Drawings or GRIHA Rating or Statutory Approval. **Nothing extra shall be paid to the agency to provide above services except statutory fees paid** to the statutory authority. The statutory fees paid to the statutory authorities shall be reimbursed to the agency after submitting documentary evidence of proof of payment to the Engineer-in-charge.
- 2) All the Civil, Electrical & Mechanical services etc. drawings as mentioned above shall be done by the agency. **No extra payment shall be made, if any modifications are required as per user department requirement in above.**

SCHEDULES (A to F)
(For Civil & Electrical Component)

SCHEDULE ‘A’

Schedule of Quantities -

As per contract document

SCHEDULE ‘D’

Extra schedule for specific requirements/document for the work, if any:	As per tender documents
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SCHEDULE ‘E’

Reference to General Conditions of contract	CPWD General Conditions of Contract 2023 Construction works, as amended / modified up to previous day of the last date of submission of bid.
Name of Work	Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).
Estimated cost of the work	Rs. 15,64,86,955/-
Earnest money	Rs. 25,64,870/-
Performance Guarantee	(a) 5% of tendered value or Estimated Cost Put to Tender (ECPT) (Whichever is higher). (b) Where the tendered amount is less than eighty percent (80%) of the Estimated Cost Put to Tender (ECPT), the Performance Guarantee, in addition to the requirement under (a) above, shall be increased by an amount equal to the difference between eighty percent (80%) of the ECPT and the tendered amount.
Security Deposit	2.50% of tendered amount.

SCHEDULE ‘F’

GENERAL RULES AND DIRECTION

Officer inviting tender	The Executive Engineer, CED-II, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), FRI Campus, Dehradun - 248006 or his legal successor or assignee thereof.
Maximum percentage of quantity of items of work to be executed beyond which rates are to be determined in accordance with Clause 12.2(c)	See at appropriate clause

Definitions:

2(vi)	Engineer-in-Charge	The Executive Engineer, CED-II, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), FRI Campus, Dehradun -248006 or his legal successor or assignee thereof shall be the Engineer-in-charge for both the civil and electrical components
2(viii)	Accepting Authority	Chief Engineer, CCU, MoEF&CC or his or his legal successor or Assignee thereof
2(x)a	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(x)b	Standard Schedule of Rates	DSR 2023 Corrected up to last date of submission of bid (for civil work volume I & II) DSR 2025 Corrected up to last date of submission of bid (for Elect. work) Schedule of Rates, Analysis of Rates and Specifications (Horticulture & Landscaping)-2025 Corrected up to last date of submission of bid.
2(xi)	Department:	Civil Construction Unit, Ministry of Environment, Forest & Climate Change, Government of India.
9(ii)	Standard CPWD Contract Form	CPWD Form 7, CPWD General Conditions of Contract 2023 Construction works, as amended / modified up to previous day of the last date of submission of bid.

Clause 1		
i)	Time allowed for submission of Performance Guarantee, Programme Chart (Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance.	07 Days
ii)	Maximum allowable extension with late fee @0.1% per day of Performance Guarantee amount beyond the period as provided in (i) above	03 Days
Clause 2		
i)	Authority for fixing Compensation under Clause 2:	The Superintending Engineer, CCU, MoEF&CC or his legal successor or Assignee thereof
Clause 5		
i)	Time allowed for execution of work	15 Months
ii)	Numbers of days from date of issue of letter of acceptance for reckoning date of start	10 Days

Mile stones as per table given below

Sl. No.	Description of mile stone (s)	Time allowed (From date of start)	Amount to be withheld in case of Non-achievement of each Mile stone(s)
1	Barricading of site, construction of site office, soil investigation, laboratory etc. and submission of architectural and foundation drawing for Ground Floor.	1 ½ Months	1% of accepted tendered amount.
2	i) Submission of all remaining Architectural, Structural drawings & MEP services drawings, development drawings etc. for completing the project. ii) Work done amount to 5% of accepted tendered amount	3 Months	1% of accepted tendered amount.
3	Work done amounting to 25% of accepted tender amount.	6 Months	1% of accepted tendered amount.
4	Work done amounting to 50% of accepted tender amount.	9 Months	1% of accepted tendered amount.
5	Work done amounting to 75% of accepted tender amount.	12 Months	0.5% of accepted tendered amount.
6	Work done amounting to 100% of accepted tender amount.	15 Months	0.5% of accepted tendered amount.

Time allowed for execution of work : 15 Months

Note:- Withheld amount shall be released if and when subsequent milestone is achieved within respective time specified. However, in case milestones are not achieved within the respective specified time by the Bidder for the work, the corresponding amount shown against unachieved milestones shall be withheld.

Monthly recovery for delay in submission of the monthly progress report within specified period - not exceeding Rs. 2000/- per month for each month default.

Schedule of handing over of site:

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

i) Authority to convey the decision of shifting of milestone and extension of time:	The Executive Engineer, CED-II, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), FRI Campus, Dehradun -248006 or his successor or Assignee thereof.
ii) Authority to decide rescheduling of mile stones and extension of time.	The Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi -110003 or his successor or Assignee thereof.
iii) Shifting of date of start in case of delay in handing over of site	The Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi -110003 or his successor or Assignee thereof.

CLAUSE 5.4: Schedule of rate of recovery for delay in submission of the modified programme in terms of delay days

S.N.	Contract Value	Recovery Rs / Per day
1.	More than Rs. 1 Crore	2000

Clause 6

i) Mode of measurement	CMB
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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. 75 lakh (civil) Rs. 27 lakh (electrical)
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Clause 7A Whether clause 7A shall be applicable	Yes
Clause -7B Whether clause 7B shall be applicable	Yes

Clause 8 A: Completion plans to be submitted by the contractor	
Authority to decide compensation on account if contractor fails to submit completion plans	The Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi -110003 or his successor or Assignee thereof

Clause 10 A

As per site requirement and details attached in the relevant pages of this bid document

Clause 10B (i) Whether Clause 10 B (i) shall be applicable?	:	Yes
Clause 10B (ii) Whether Clause 10 B (ii) shall be applicable?	:	No.

Clause 10 C

Whether Clause 10 C shall be applicable	Not Applicable
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Clause 10CC

Applicable

S. N.	Relevant component of Material /Labour for price escalation	Percentage of total value of work
1	Component of Cement	10%
2	Component of Labour	25%
3	Civil component of the other construction materials	28%
4	Electrical and Mechanical (E&M) Component of Construction Materials	21%
5	Reinforcement steel bars/ TMT bars/Structural steel (including strands and cables)	16%
	Total	100 %

Clause 11:

Specifications to be followed for execution of work (for civil work)	:	1. Civil work: CPWD Specifications 2019 Volume- I & II with up to the date corrections slips. 2. MORTH Specifications for Roads and Bridge work. 3. National Building Construction Standards 2026
Specifications to be followed for execution of work (for Electrical work)	:	Electrical & Other works (amended upto date): 1. CPWD General Specification for Electrical Works Part I (Internal) & Part II (External) – 2023. 2. General Specification for Electrical Works (Part III Lifts & Escalators)-2003.

		3. CPWD General Specification for Electrical Works Part IV Substation-2013. 4. CPWD General Specification for Electrical Works Part V Wet riser and sprinkler system-2020. 5. CPWD General Specification for Electrical Works Part VI fire detection and alarm system- 2018. 6. CPWD General Specification for Electrical Works Part VII DG Sets– 2013 7. CPWD General Specification for Electrical Works Part VIII Gas Based Fire Extinguishing System–2013. 8. General Specification for Heating Ventilation & Air-Conditioning-2024. 9. National Building Construction Standards 2026
Specifications to be followed for execution of work (for Horticulture & Landscaping work)	:	Schedule of Rates, Analysis of Rates and Specifications (Horticulture & Landscaping)-2025.

All the afore stated specifications shall be read with updated correction slips issued till last date of submission of bid.

Clause 12 : Construction work

12.2 (c)	Deviation limit beyond which clauses 12.2(c) shall apply for all building works and road works (including MEP services and horticulture works).	:	100%
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Clause 16:

Competent Authority for deciding reduced rates	:	The Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi -110003 or his legal successor or Assignee thereof
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Clause 18:

List of Mandatory Machinery, tools & plants to be deployed by the contractor at site: -

As per site requirement and details attached in the relevant pages of this bid document.

Clause 19

Clause 19 C	Penalty for each default	Rs. 500/-
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Clause 19 D	Penalty for each default	Rs. 500/-
Clause 19 G	Penalty for each default Enhanced penalty per day for continuous default	Rs. 500/- Rs. 500/-
Clause 19 K	Penalty for each default	Rs. 500/-

Clause 25: Settlement of disputes by Conciliation and Arbitration

Conciliator	:	Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi -110003 or his legal successor or Assignee thereof
Arbitrator Appointing Authority	:	Chief Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi - 110003 or his legal successor or Assignee thereof
Place of Arbitration	:	New Delhi

Clause 32 : Requirement of Technical Representative(s) and Recovery Rate :

S.N.	Minimum Qualification of Technical Representative	Discipline	Designation (Principal Technical / technical representative)	Minimum Experience (Years)	Number	Rate at which recovery shall be made from the contractor in the event of not fulfilling Provision of clause 32 (i)
						Figures
1	Graduate Engineer	Civil	Project manager with degree in civil engineering	10 (and having experience of one similar nature of work)	1	Rs.1,00,000/- per Month
2	Graduate Engineer	Civil	Deputy Project Manager	5 or 10 respectively	1	Rs.80,000/- per Month

3	Graduate Engineer Or Diploma Engineer	Civil	Project/Site Engineer	5 or 10 respectively	1	Rs. 50000/- Per month
4	Graduate Engineer Or Diploma Engineer	Electrical	Project/Site Engineer	5 or 10 respectively	1	Rs. 50000/- Per month
5	Graduate Engineer	Civil	Project Planning /Billing	2 or 5 respectively	1	Rs. 30000/- Per month
6	Graduate Engineer	Electrical	Project Planning /Billing	2 or 5 respectively	1	Rs. 30000/- Per month

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

Clause 38

(i)	(a)	Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of (for civil work)	:	Delhi Schedule of Rates 2023 printed by CPWD with upto date correction slip upto last date of bid submission.
		Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of (for Electrical work)	:	Delhi Schedule of Rates 2025 (E&M) printed by CPWD with upto date correction slip upto last date of bid submission.
(ii)		Variations permissible on theoretical quantities:		
	(a)	Cement	:	2% plus/minus.
	(b)	Bitumen All Works	:	2.5% plus only & nil on minus side.
	(c)	Steel Reinforcement and structural steel sections for each diameter, section and category	:	2% plus/minus variation
	(d)	All other materials.	:	Nil

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

S.No.	Description of Item	Rates in figures and words at which recovery shall be made from the Contractor	
		Excess beyond permissible variation	Less use beyond permissible variation
1.	Cement (PPC)	Nil	Not allowed. Substandard work will be rejected.
2.	Reinforcement Steel	Nil	
3.	Structural Steel	Nil	

Executive Engineer, CED-II,
Civil Construction Unit (CCU),
Ministry of Environment, Forest & Climate Change (MoEF&CC),
FRI Campus, Dehradun -**248006**

**PROFORMA FOR THE RECEIPT TO BE ISSUED BY THE EXECUTIVE ENGINEER
RECEIVING THE EMD**

Receipt of deposition of original EMD (drawn in favour of Executive Engineer, CED-II, CCU, MoEF&CC, New Delhi) (Receipt No. / date.....)		
Name of work	:	Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).
NIT No	:	05/2026-27/CE/CCU/CED-II/Dehradun
Estimated Cost	:	Rs. 15,64,86,955/-
Amount of Earnest Money Deposit	:	Rs. 25,64,870/-
Last date of submission of bid	:	01.09.2026
To be filled by EMD receiving Executive Engineer		
Name of contractor	:	
Form of EMD	:	
Amount of Earnest Money Deposit	:	
Date of Submission of EMD	:	
		(Signature) Name and Designation of EMD receiving officer (EE/AE(P)/AE/AAO) along with office stamp

(On non-judicial stamp paper of minimum Rs. 100)

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

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

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

OR**

Whereas the Executive Engineer (name of division), CCU 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 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 hereby undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.(Rupeesonly).
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..... | Authorized signatory |
| Name and address | Name |
| Designation | Staff code no. |
| 2. Signature | Bank seal |
| Name and address | |

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

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

FORM "F"

UNDERTAKING ON STRUCTURAL STABILITY AND SOUNDNESS OF ALREADY COMPLETED BUILDINGS AND INFRASTRUCTURE PROJECTS.

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

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

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

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

Signature of notary
with seal

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

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

DECLARATION

To,

The Executive Engineer,
CED-II, Civil Construction Unit (CCU),
FRI Campus, Dehradun -248006

Subject: Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).

Dear Sir,

It is hereby declared that, I/ We have carefully read the scope of work and I/we are fully aware that the cost of consultancy services is deemed to be included in the tendered amount by us and nothing extra shall be paid for the consultancy work.

It is also declared that, I/ We have inspected and examined the subject site and its surrounding and satisfy myself/ ourselves as to the nature of the ground and sub-soil (so far as is practicable), the forms and nature of the site / ourselves before submitting the bid, the accommodation which may require and all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid have been obtained. I/We the bidder shall have full knowledge of the site and no extra charge consequent upon any misunderstanding or otherwise shall be claimed in later date.

I /We bidder shall be responsible for arranging and maintaining at 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 me/us implies that I / We have read this notice and all other contract documents and has made myself /ourselves aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.

Yours faithfully

(Duly authorized signatory of the bidder)

GUARANTEE TO BE EXECUTED BY CONTRACTOR (S)
FOR ANY FADING, PEELING OFF AND DISCOLOURING AFTER
COMPLETION IN RESPECT OF ITEMS IN THE SCHEDULE OF QUANTITIES

The agreement made thisday ofTwo thousand
betweenson of (hereinafter called the
GUARANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the
Government of the other part).

WHEREAS THIS agreement is supplementary to a contract (hereinafter called the
contract) dated and made between GUARANTOR OF THE ONE PART
and the GOVERNMENT of the other part, whereby the contractor, inter alia, undertook to apply
paint on external surface of the building and structures in the said contract.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that
the said painting against fading, peeling off and discolouring for five years from the date after
the maintenance period prescribed in the contract.

Provided that the Guarantor will not be responsible for misuse of the painted surface.
The decision of the Engineer-in-Charge with regard to misuse of painted surface shall be final.

During this period of guarantee, the guarantor shall make good all defects and in case of
any defects being found in painting such as fading, peeling off and discolouring to the
satisfaction of the Engineer-in-Charge at his cost and shall commence the work for such
rectification within seven days from the date of issue of the notice from the Engineer-in-
Charge calling up on him to rectify the defects, failing which the work shall be got done by the
department by some other contractor at the GUARANTOR's cost and risk. The decision of the
Engineer-in-Charge as to the cost, payable by the guarantor shall be final and binding.

If the Guarantor fails to execute the painting or commits breach there under, then the
Guarantor will indemnify the principal and his successors against all loss, damage, cost,
expense or otherwise which may be incurred by him by reason of any default on the part of
the GUARANTOR in performance and observance of this supplementary agreement. As to the
amount of loss and/ or damage and/ or cost incurred by the Government the decision of the
Engineer-in-Charge will be final and binding on the parties.

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

Signed, sealed and delivered by the GUARANTOR in the presence of 1.
2.

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

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

This agreement made this _____ day of _____ two thousand _____ and between _____, (Name of the contractor, hereinafter call Guarantor of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part).

Whereas this agreement is supplementary to a contract (hereinafter called the Contract) dated _____ and made between the GUARANTOR of the one part and the GOVERNMENT of the other part where by the Contractor inter alia, undertook to render the buildings and structures in the said contract recited completely water and leak proof.

And whereas the Guarantor agreed to give a guarantee to the effect that the said structures will remain water / leak proof for ten years from the date of completion of 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 ten years to be reckoned from the date completion of work.

Provided that the Guarantor will not be responsible for leakage caused by earthquakes or structural defects or misuse of roof or alterations and for such purpose

Misuse of roof shall mean by operation, which will damage roofing treatment, like chopping of firewood and things of the same nature, which might cause damage to the roof.

Alteration shall mean construction of an additional storey or a part of roof or construction adjoining to existing roof, where by roofing treatment is removed in parts.

The decision of the Engineer-in-Charge with regard to cause of leakage shall be final.

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

That is the Guarantor fails to execute the necessary rectification or commits breach there under 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 reasons of any default on the part of GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and / or damage and / or cost incurred by the Government, the decision of the Engineer-in-Charge will be final and binding on the parties.

In witness where of these presents has been executed by the Obligor _____ and by _____ 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.

2.

Signed for and on behalf of THE PRESIDENT OF INDIA BY _____ in the presence of:

1.

2.

(Guarantee to be signed and delivered on a Non-Judicial stamp paper worth Rs.100/-)

UNDERTAKING REGARDING ELECTRICAL LICENSE

To,

The Executive Engineer,
CED-II, Civil Construction Unit (CCU),
FRI Campus, Dehradun -248006.

Name of work: Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).

Dear Sir,

Having examined the details given in the NIT and Bid document for the above said work,
I /We here by submit the following;

“I / We here by certify that I/ We either obtain valid electrical license at the time of
execution of electrical work or associate Contractor having valid electrical License of eligible
class”.

Seal of bidder:

Date of submission:

Signature(s) of Bidder(s)

LIST OF EQUIPMENTS FOR TESTING OF MATERIALS&CONCRETE AT SITE LABORATORY

All necessary equipment for conducting all necessary tests shall be provided at the site in the well-furnished site laboratory by the contractor at his own cost. The following minimum laboratory equipment's shall be set up at site office laboratory:

Sl. No.	Equipment	Numbers (Minimum)
1	Compressing testing machine	As per requirement
2	Cube mould	As per requirement
3	Slump cone, steel plate, tamping rod, steel scale, scoop	As per requirement
4	Graduated glass measuring cylinder	As per requirement
5	Sets of sieves of 450mm internal dia for coarse aggregate [100mm, 80mm, 40mm; 20mm;12.5mm, 10mm;4.75mm complete with lid and pan]	As per requirement
8	Sets of sieves of 200mm internal dia for fine aggregate [4.75mm;2.36mm;1.18mm; 600 microns;300 microns& 150micron,	As per requirement
9	Sieve Brushes and sieve shaker capable of 200mm and 300mm dia sieves, manually operated with timing switch assembly	As per requirement
10	Electronic balance 600gx0.1g., 10kg and 50kg	As per requirement
11	Physical balance weight upto 5 kg	As per requirement
12	Measuring jars100ml, 200ml,500ml	As per requirement
13	Gauging trowels 100mm & 200mm with wooden Handle	As per requirement
14	Spatula 100mm & 200mm with long blade wooden Handle	As per requirement
15	Vernier callipers12" &6" size	As per requirement
16	GI tray 600x450x50mm, 450x300x40mm,300x250x40mm	As per requirement
17	Screw gauge 0.1mm-10mm, least count 0.05	As per requirement
18	Set of box spanner	As per requirement
19	Hammer1lb & 2lb	As per requirement
20	Rubber Hammer	As per requirement
21	Hacksaw with 6 blades	As per requirement
22	Measuring tape 5mtr	As per requirement
23	Depth gauge 20cm	As per requirement
24	Shovels &Spade	As per requirement
25	Water testing kit	As per requirement

Note: The above list is only indicative and not exhaustive. The contractor may be required to provide more equipment's as per the requirement of work and as per the direction of the engineer-in- charge.

**LIST OF MANDATORY MACHINERY, TOOLS & PLANTS TO BE DEPLOYED BY
THE CONTRACTOR AT SITE**

S. No.	Equipment	Numbers (Minimum)
1.	Needle Vibrators.	As per Requirement of work
2.	Plate Vibrator	As per Requirement of work
3.	JCB, Excavator, Dumper, Tipper	As per Requirement of work
4.	Reinforcement cutting & Bending machines	As per Requirement of work
5.	Total station.	As per Requirement of work
6.	Auto level & staff.	As per Requirement of work
7.	Water tanker (Minimum capacity of 5000 litres)	As per Requirement of work
8.	Welding machine 400 Ampere	As per Requirement of work
9.	Screener for coarse sand and fine sand	As per Requirement of work
10.	Centrifugal mono block water pump minimum capacity 2 HP	As per Requirement of work
11.	Steel Shuttering with necessary steel props	As per Requirement of work
12.	Steel scaffolding and staging materials	As per Requirement of work
13.	Plain Concrete/Mortar Mixer	As per Requirement of work
14.	Semi-Automatic Pavement Concrete Paver	As per Requirement of work
15.	Screed Vibrator	As per Requirement of work
16.	Any other machinery required for completion of the work as per decision of Engineer-in-charge.	As per Requirement of work

PART B

SPECIAL CONDITIONS, PARTICULAR SPECIFICATION FOR CIVIL

SPECIAL CONDITIONS

1.0 GENERAL

- 1.1** The contractors are advised to inspect and examine the site and its surroundings before submission of the bids and satisfy themselves with the nature of site, the means of access to the site, the constraints of space for stacking material / machinery, accommodation of labour etc., constraints put by local regulations (if any), weather conditions at site (rainfall, snowfall, winter and summer temperatures etc.), general ground/subsoil conditions etc. or any other circumstances which may affect or influence their tenders. No claims, whatsoever, shall be entertained at a later date for any errors found, on plea that the information supplied by the department in the tender is insufficient or is at variance with the actual site conditions.
- 1.2** The contractor shall, if required by him, before submission of the tender, study the drawings and tender document carefully. The department shall not bear any responsibility for the lack of knowledge and also the consequences, thereof to the contractor. The information and data shown in the drawings and mentioned in the tender documents have been furnished, in good faith, for general information and guidance only. The Engineer-in-Charge, in no case, shall be held responsible for the accuracy thereof and/or interpretations or conclusions drawn there from by the contractor and all consequences shall be borne by the contractor. It is presumed that the contractor shall satisfy himself for all possible contingencies, incidental charges, wastages, bottlenecks etc. likely during execution of work and acts of coordination which may be required between different agencies. Nothing extra shall be payable on this account.
- 1.3** The work shall be carried out, all in accordance with true intent and meaning of the scope of work, 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 and/or scope of work, provided that the same can be reasonably inferred.
- 1.4** The work shall generally be carried out in accordance with the “CPWD Specifications 2019 Vol. I & II” with correction slips up to last date of submission of bid (including any extension in last date of bid submission), additional/particular specifications, architectural and structural drawings and as per instructions of Engineer-in-Charge. Any additional item of work, if taken up subsequently, shall also conform to the relevant specifications mentioned hereinabove.
- 1.5** The several documents forming the tender are to be taken as mutually complementary to each other. Detailed drawings shall be followed in preference to small scale drawings and figured dimensions in preference to scale dimensions. Between two or more clauses of this contract, the provisions of a specific clause relevant to the issue under consideration shall prevail over those in other clauses.
- 1.6** The work shall be carried out in accordance with the architectural drawings and structural drawings, which shall be issued by the Engineer-in-Charge after award of work as per schedule mentioned in the CPWD6. Before commencement of any item of work, the contractor shall correlate all the relevant architectural, structural and services drawings issued for the work and satisfy himself that the information available there from is complete and unambiguous. The discrepancy, if any, shall be brought to the notice of the Engineer-in-Charge before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement of work on the basis of any erroneous and or incomplete information.

- 1.7 Should there be any difference or discrepancy between the description of items or condition of contract or conditions of contract as given in the particular specifications, special conditions, general condition of contract and I.S. Codes, drawings etc., the following order of preference shall be observed-
- a) Description of Schedule of Quantity
 - b) Particular specification
 - c) Special conditions
 - d) Additional Conditions
 - e) Architectural drawings /Structural drawings
 - f) CPWD Specifications including upto date correction slips.
 - g) CPWD General Conditions of Contract 2023 construction works including correction slips issued up to last date of submission of bid including extensions if any.
 - h) Indian Standards Specifications of B.I.S.
 - i) ASTM, BS, or other foreign origin code mentioned in tender document.
 - j) Manufacturer's specifications and as decided by the Engineer-in-Charge.
 - k) Sound Engineering practices or well-established local construction practices.
- 1.8 In the event of any variation/ discrepancy in the drawings, specifications and tender documents etc. the decision of the Engineer-in-Charge shall be final binding and conclusive and if, the contractor have any doubt, the same should be got clarified immediately from the Engineer-in-charge and no claim of the contractor shall be entertained thereafter. Moreover, the contractor is not allowed to take benefit out of any clerical/ grammatical mistake in the standard clauses/specifications etc. being used in the agreement.
- 1.9 The contractor shall give to the local body, police and other authorities all necessary notices etc. that may be required by law and obtain all requisite licenses and/or for temporary obstructions, enclosures etc. and pay all fee, taxes and charges which may be levied on account of these operations in executing the contract. The charges to be paid by contractor are not related to permanent constructed asset as per contract.
- 1.10 The contractor shall ensure that there is no damage to adjoining property. If any such untoward incident happens, he shall be entirely responsible for any consequences besides making good any damages to the adjoining property whether public or private. He shall supply and maintain lights either for illumination or for cautioning the public at night.
- 1.11 Proper temporary barricading by fencing with G.I. sheets around the construction site, shall be carried out by the contractor at the start of work. **It shall be done by providing, erecting, maintaining temporary protective barricading of minimum height 6.00 meter or and in accordance with the prevalent guidelines issued by statutory authorities** in this context, made in panels, with each panel having MS frames / MS scaffolding pipes of suitable size and stiffness, with 24-gauge thick GI corrugated sheet or suitably stiffened plain GI sheet fixed on frames. Such panels shall be suitably connected to each other for stability with nuts and bolts, hooks, clamps etc. and fixed firmly to the ground at about 2 meters (or as per design) spacing, for the entire duration till completion of the work. The contractor shall also provide and erect temporary protective barricades within the site as per stipulations/guidelines of statutory authorities. Temporary protective roofing near the Entrance to the building, under construction, shall be made to protect the visiting officials from getting hurt by falling debris etc. Also, one or more coat of enamel paint of shade as approved and directed by the Engineer-in-Charge shall be applied on the panels and "CCU, MoEF&CC" shall be painted over that in suitable sizes, shapes and numbers as directed by the Engineer-in-Charge. It shall be dismantled and

taken away by the contractor after the completion of work at his own cost with the approval of the Engineer-in- Charge. Nothing extra shall be payable on this account. **The contractor shall maintain the site barricading during the complete period of execution and realign it if required, for execution of works. A Recovery of Rs.500/- per day shall be levied for not maintaining the barricading in good condition or breach of any of the above conditions as per the direction of Engineer-in-charge.**

- 1.12** The contractor shall bear all incidental charges for cartage, storage and safe custody, insurance, erection, testing and commissioning of materials issued by department (if any) as well as to those materials arranged by the contractor. The contractor shall also be responsible for the watch and ward / guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.
- 1.13** Wherever any reference to any Indian Standards occurs in the documents relating to this contract, the same shall be inclusive of all amendments issued thereto or revisions thereof, if any, up to the last date of receipt of tenders (including extended date, if any).
- 1.14** No claim whatsoever on account of any discrepancy between the sub-surface strata conditions shall be entertained.
- 1.15** Any legal or financial implications resulting out of disposal of earth shall be sole responsibility of the contractor. Nothing extra shall be paid on this account.
- 1.16** Wherever required for the execution of work, scaffolding shall be provided and suitably fixed, by the contractor. The contractor shall provide steel double scaffolding system, suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection. It shall be designed to take all incidental loads. It should cater to the safety features for workmen. Nothing extra shall be payable on this account. It shall be ensured that damage is not caused to any structure due to the scaffolding.
- 1.17** The contractor shall make his own arrangements to provide for accommodation for labour as per the rules of the local bodies. The Engineer-in-Charge shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained. Nothing extra shall be payable on this account.
- 1.18** No tools and plants including any special T&P etc. shall be supplied by the department and the contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.
- 1.19** The contractor shall take all precautions to abide by the environmental related restrictions imposed by any statutory body having jurisdiction in the state as well as prevent any pollution of streams, ravines, river bed and waterways. All waste or superfluous materials shall be transported by the contractor and disposed off at designated places only. Nothing extra shall be payable on this account.
- 1.20** No claim on account of site constraints mentioned in this document or any other site constraints such as lack of public transport, inadequate availability of skilled, semi-skilled or unskilled workers in the near vicinity, non-availability of construction machinery spare parts etc. or any other constraints not specifically stated here shall be entertained from the contractor. Therefore, the tenderers are advised to visit site and get first-hand information of site constraints. Accordingly, they should quote their tenders. Nothing extra shall be payable on this account.

Any hindrances claimed by the contractor on this account shall not be considered while action under clause '2' and '5' of General condition of contract amended upto date till last date or extended last date of submission of tender.

- 1.21** Other agencies may also simultaneously execute and install the works of other civil and E&M services for the work. The contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings, trenches etc. as may be required for such related works and the contractor shall fix the same at time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.
- 1.22** The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night. The contractor shall ensure entire necessary precaution during the entire period of work and site related activities to ensure full safety to workers and avoid any kind of accident. In case of any accident of labour's/ contractual staffs or any other human being the entire responsibility will rest on the part of the contractor both legally and financially and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor.
- 1.23** Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been included in the contract amount and nothing extra shall be payable for extra cement considered in consumption on this account.

1.24 FACILITIES FOR THE DEPARTMENT

- (a) **Site Office-** The contractor shall provide 1 No. site office accommodations of approximately **100 sqm** area including toilet (as per layout plan to be approved by engineer-in-charge) as specified by Engineer in charge, including but not limited to following-
- i) The site office accommodation shall be provided with all necessary furniture, fitted with all electrical items like lights, fans, air conditioners, Generator set, all office utilities etc. and complete wiring, water supply, sewerage and drainage system etc. The toilet fixtures shall be as per specifications mentioned in this document. The agency shall provide necessary air conditioners, lights and fixtures including fan, RO etc.
 - ii) The contractor shall provide the office accommodation within Forty Five (45) days from the date of commencement of work failing which the compensation @ **Rs.1,00,000/- per month shall be recovered from the contractor.**
 - iii) The cost of construction, cost of all furniture, fittings/fixtures /electrical fittings etc. and cost of maintenance and the related service charges of the site office is deemed to be included in the quoted rates of work and nothing extra shall be payable. This site office accommodation shall be maintained properly till completion of work and no claim whatsoever shall be entertained on the ground whether the delay in completion of work has been attributable to the Department or to the contractor.
- (b) **Communication and Commuting**
- i) The contractor shall provide one no. all-in-one desktop (window 10) with 4G/5G enabled internet connection. The contractor shall also provide one number color laser printer (A3 Size). These accessories shall be the property of Engineer-in-Charge. The complete cost of these accessories are deemed to be inclusive in the

quoted rates of the agency. No additional payment shall be made to the Contractor on this account. The laptop/computer shall be provided with software with MS-project, Primavera, MS office, Auto Cad, STADD etc.

- (c) The contractor shall make arrangement for Helmets and leather shoes (meant of construction work at sites) for all field staff of the department during the entire period of construction for safety reasons. One helmet and two pairs of shoes per staff member (maximum ten members) of the departments per year shall be arranged by the contractor.
- (d) **IP Based CCTV:** The contractor shall provide IP Based CCTV (in sufficient number to capture/monitor whole site) with all requisite software, hardware and accessories. A monitoring room with digital screens shall be made in site office.

1.25 NUISANCE PREVENTION AND POLLUTION CONTROL

The contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupants of the adjacent properties and to the public in general. The contractor shall take all care, as not to damage any other adjacent property or other services running adjacent to the plot. If any damage is done, the same shall be made good by the contractor at his own cost and to the entire satisfaction of the Engineer-in-Charge. The contractor shall use such methodology and equipment's for execution of the work, so as to cause minimum environmental pollution of any kind during construction, to have minimum construction time and minimum inconvenience to road users and to the occupants of the buildings on the site/adjacent plot and public in general, etc. He shall make good at his own cost and to the entire satisfaction of the Engineer in Charge any damage to roads, paths, cross drainage works or public or private property whatsoever caused, due to the execution of the work or by traffic brought thereon, by the contractor. Further, the contractor shall take all precautions to prevent any pollution of streams and waterways. All waste or superfluous materials shall be carted away by the contractor, entirely to the satisfaction of the Engineer-in-Charge.

- 1.26 The site of work has limited availability of space left out for stores, field office, batching plant etc. The contractor may be allowed to erect site office, stores, field office, batching plant within site/plot subject to availability of space and without disturbing the construction area. However, the contractor shall make his own arrangements to provide for additional requirement (in addition to available area at site), as per the rules of the local bodies. Before tendering, he shall visit the site and assess the manner in which he is able to arrange the above facilities. The Engineer-in-Charge shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained.
- 1.27 No payment shall be made for any damage caused by rain, snowfall, flood or any other natural calamity, whatsoever during the execution of the work. The contractor shall be fully responsible for any damage to the govt. property and the work for which payment has been advanced to him under the contract and he shall make good the same at his risk and cost. The contractor shall be fully responsible for safety and security of his material, T&P/Machinery brought to the site by him. Nothing extra shall be payable on this account. Also, no claims for hindrance shall be entertained on this account.
- 1.28 Royalty at the prevalent rates shall be paid by the contractor or by RMC supplier as per the terms of supply between them on all materials such as boulders, metals, sand and bajri etc. collected by him for the execution of the work, directly to the revenue authority of the state government concerned. Nothing extra shall be payable on this account.

1.29 The contractor shall keep himself fully informed of all acts/laws of the Central/State/Local Governments, orders of central/state/local government, 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 / Municipal Corporation of area (where site is located) 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 national/state/local authorities. The contractor shall abide and ensure compliances to terms and conditions of various approvals obtained for the project. 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. The contractor shall indemnify the department 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.

1.30 The fee payable to statutory authorities for obtaining the various permanent service connections and occupancy certificate for the building shall be borne by the department.

1.31 The earth work under this work will be treated as earth work for major works under CPWD Specifications Volume 1, 2019 (as applicable). No extra payment will be made for maintaining water level low enough so as to execute the work and not to cause any harm to work done inclusive of pumping out or bailing out water, if required.

1.32 SETTING OUT

- (i) The contractor shall carry out survey of the work area, setting out the layout and fixing of alignment of the building as per architectural and Structural drawings in consultation with the Engineer-in-Charge and proceed further ensuring full structural continuity and integrated/monolithic construction. Any discrepancy between the architectural drawings and actual layout at site shall be brought to the notice of the Engineer-in-charge. It shall be responsibility of the contractor to ensure correct setting out of alignment/layout using total station instrument. Nothing extra shall be payable on this account.
- (ii) The initial levels shown in the layout plan are indicative and the actual ground levels may vary. Though the site levels are indicated in the drawings the Contractor shall ascertain and confirm the site levels with respect to benchmark from the concerned authorities. No claim due to difference in ground levels as per layout plan and as per actual on ground shall be entertained.
- (iii) The contractor shall establish, maintain and assume responsibility for grades, lines, levels and benchmarks. He shall report any errors or inconsistencies regarding grades, lines, levels, dimensions etc. to the Engineer -in-Charge before commencing work. Commencement of work shall be regarded as the contractor's acceptance of such grades, lines, levels, and dimensions and no claim shall be entertained at a later date for any errors found.
- (iv) If at any time, any error appears due to grades, lines, levels and benchmarks during the progress of the work, the contractor shall, at his own expense rectify such error, if so required, to the satisfaction of the Engineer -in-Charge.
- (v) The contractor shall protect and maintain temporary/ permanent benchmarks at the site of work throughout the execution of work. These benchmarks shall be got checked by the

Engineer-in-Charge or his authorized representatives. The work at different stages shall be checked with reference to bench marks maintained for the said purpose.

- (vi) The approval by the Engineer-in-Charge, of the setting out by the contractor, shall not relieve the contractor of any of his responsibilities and obligation to rectify the errors/defects, if any, which may be found at any stage during the progress of the work or after the completion of the work.
- (vii) The contractor shall be entirely and exclusively responsible for the horizontal, vertical and other alignments, the level and correctness of every part of the work and shall rectify effectively any errors or imperfections therein. Such rectifications shall be carried out by the contractor at his own cost to the entire satisfaction of the Engineer-in-Charge.

1.33 The contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the site so as to achieve early completion. The contractor shall 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 by contractor commensurate with requirement 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 maintained in proper working conditions at all times 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.

1.34 The Engineer-in-Charge shall not be responsible for any claims for injuries to person/workmen or for structural damage to property happening from any neglect, default, want of proper care or misconduct on the part of the contractor or of his representatives, 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.

1.35 PRESERVATION AND CONSERVATION MEASURES

- i) Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services, if any, encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. Even in case of accidental damage, the responsibility of repair / replacement including removal of leaked/spilled water sewage etc. will be on the contractor at his own cost.
- ii) Existing services shall not be diverted permanently until they are interfering directly with the layout. Notwithstanding anything to the contrary contained herein, the contractor shall ensure that the respective entities owning the existing roads, right of way, level crossings, structures, or utilities on, under or above the site are enabled by it to keep them in continuous satisfactory use, if necessary, by providing suitable temporary diversions with the controlling authority of that road, right of way or utility. All temporary supports and other measures required to protect and maintain the services during construction period as per direction of Employer, shall be deemed to be included in the quoted rate / amount of the contractor and nothing extra shall be paid on this account. In case the same are to be removed and diverted, expenditure incurred in doing so shall be payable to the contractor. The contractor shall work out the cost, get the same approved by Engineer-in-Charge before taking up actual execution. 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.

- iii) All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on project location during excavation/construction shall be the property of the Government, and shall be dealt with as per provisions of the relevant legislation. The contractor will take reasonable precaution to prevent his work men or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaint the Engineer-in-charge of such discovery and carry out the official instructions of Engineer-in-charge for dealing with the same, till then all work shall be carried out in a way so as not to disturb/damage such article or thing.

1.36 A site laboratory with the minimum equipment's as specified in CPWD specifications/in this tender document shall be established, made functional and maintained within **Forty Five (45) days** from the commencement date or date of start without any extra cost to the department. In case of noncompliance / delay in compliance of this condition, a recovery @ Rs. 5000/- per day will be imposed which will be recovered from the R/A Bill of the Contractor.

1.37 CO-OPERATION WITH SPECIALIZED AGENCIES/ SUB-CONTRACTORS

- i) The contractor shall cooperate with and provide the facilities to the sub-contractors and other agencies working at site for smooth execution of the work. The contractor shall indemnify the department against any claim(s) arising out of such disputes. The contractor shall:
 - a) Allow use of toilets, sheds etc.
 - b) Properly co-ordinate their work with the work of other contractors.
 - c) Provide control lines and benchmarks to his sub-contractors and the other contractors.
 - d) Provide electricity and water at mutually agreed rates.
 - e) Provide hoist and crane facilities for lifting material at mutually agreed rates.
 - f) Co-ordinate with other contractors for leaving inserts, making chases, alignment of services etc. at site.
 - g) Adjust work schedule and site activities in consultation with the Engineer-in- Charge and other contractors to suit the overall schedule completion.
 - h) Resolve the disputes with other contractors/ sub-contractors amicably and the Engineer-in-Charge shall not be made intermediary or arbitrator
- ii) The work should be planned in a systematic manner so as to ensure proper co-ordination of various disciplines e.g. sanitary & water supply, drainage, rainwater harvesting, electrical, firefighting, information technology, communication & electronics and any other services.
- iii) 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 possibly arrange his work and shall place and dispose of the materials being used or removed so as not to interfere with the operations of another contractor. The contractor shall arrange his work with that of the others, in an acceptable, and in a proper coordinated manner and shall perform it in proper sequence to the complete satisfaction of others

1.38 RATES

- i) The rates quoted by the contractor are deemed to be inclusive of site clearance, setting out work, creating profile, establishment of reference bench mark(s), installing various signage, taking spot levels, survey with total station, construction of all safety and protection devices, compulsory use of helmet and safety shoes, and other appropriate safety

gadgets by workers, imparting continuous training for all the workers, barriers, preparatory works, working during monsoon or odd season, working beyond normal hours, working at all depths, height, lead, lift, levels and location, implementation of green building norms to achieve desired GRIHA rating etc. and execution of compliance of any other condition mentioned anywhere in the bid document.

- ii) The rates quoted by the tenderer, shall be firm and inclusive of all taxes and levies.
- iii) No foreign exchange shall be made available by the department for importing (purchase) of equipment, 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.
- iv) Ancillary and incidental facilities required for execution of work like labour accommodations, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level (if any), temporary structure for plants and machineries, water storage tanks, installation and consumption charges of temporary electricity, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various No Objection Certificates, completion certificates from local bodies etc., protection works, testing facilities / laboratory at site of work, facilities for all field tests and for taking samples etc. during execution, shall be deemed to be included in rates quoted by the contractor. Nothing extra shall be payable on these accounts. Before start of the work, the contractor shall submit to the Engineer-in-Charge, a site / construction yard layout, specifying areas for construction, site office, positioning of machinery, material yard, cement and other storage, steel fabrication yard, site laboratory, water tank, etc.
- v) 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.
- vi) All material shall only be brought at site as per program 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.

1.39 SAFETY PRACTICES

- i) **WARNING/ CAUTION BOARDS:** All temporary warning / caution boards / glow signage display such as "Construction Work in Progress", "Keep Away", "No Parking", Diversions & protective Barricades, barricading as required from environmental protection view as per NGT etc. shall be provided and displayed by the Contractor, wherever required. These glow signage and red lights shall be suitably illuminated during night also. The contractor shall be solely responsible for damage and accident caused, if any, due to negligence on his part. Also, he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. Nothing extra shall be payable on this account. If the contractor fails to provide the warning /caution boards within 7 days of written direction of Engineer In charge or his authorized representative, **recovery of Rs. 1000/- on per day basis shall be made.**
- ii)
- iii) **SIGN BOARDS:** The Contractor shall provide and erect a display board of size and shape as required 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 15 days from issuance of letter of acceptance. Nothing extra shall be payable on this account. In case of noncompliance/delay in compliance, a **recovery @ Rs. 500/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.**

- iv) Necessary protective and safety equipment's shall be provided to the site engineer, supervisory staff, labour and technical staff by the contractor at his own cost.
- v) All signage shall be dismantled and taken away by the contractor after completion of the work with the approval of engineer in charge. No payment shall be made on this account.
- vi) No inflammable materials including P.O.L shall be allowed to be stored in huge quantity at site. Only limited quantity of P.O.L may be allowed to be stored at site subject to the compliance of all rules / instructions issued by the relevant authorities and as per the direction of Engineer -in- Charge in this regard. Also, all precautions and safety measures shall be taken by the contractor for safe handling of the P.O.L products stored at site. All consequences on account of unsafe handling of P.O.L shall be borne by the contractor.

1.40 QUALITY ASSURANCE

- i) The proposed work is a prestigious project and quality of work is of paramount importance. Contractor shall have to engage well-experienced skilled labour and deploy modern T&P and other equipment to execute the work. Many items like exposed finish form work, specialized flooring work, Oxysulphide sealant and backer rod fixing in structural glazing works, factory made door- window shutters, proper slope maintaining in toilet units, sanitary- water supply installation, water proofing treatment will specially require engagement of skilled workers having experience particularly in execution of such items.
- ii) The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/work beyond 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 shall be replaced / removed by the contractor at his own risk & cost.
- iii) The contractor/ associated agency shall extend full cooperation to **Third Party Quality Assurance Agencies** engaged by the department for the project during their field visits.
- iv) In addition to the supervision of work by engineer- in-charge or his representatives, the consultants deployed by the department 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 Engineer- in-charge or his representatives to the contractor. Upon receipt of instructions from engineer in charge, the work so pointed out shall be made good by necessary improvement, rectification, replacement upto 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 from 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 an facility

of international standards.

- v) The contractor shall submit immediately after the issuance of letter of acceptance within 20 days, Minimum Quality Assurance Plan (a detailed and complete method statement for the execution, testing and quality assurance plan/procedures for basic materials and such items, to be followed during the execution of the work), for approval of the Engineer-in-Charge. All the materials to be used in the work, to give the finished work complete in all respects, shall comply with the requirements of the specifications and shall pass all the tests required as per specifications as applicable or such specifications / standards as directed by the Engineer-in-Charge. Further, **a recovery of Rs. 1000/- shall be made on per day basis in case of delay in submission of the Minimum Quality Assurance Plan.**
- vi) 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. If a particular brand of material is specified in the particular specification, the same shall be used after getting the same approved from Engineer-In-Charge. Wherever brand / quality of materials are not specified in the particular specifications; the contractor shall submit the sample as per list of preferred make given in tender documents. For all other items, materials and fittings of ISI Marked shall be used with the approval of Engineer-in-Charge. Wherever ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant specifications or IS codes and use the same only after getting the approval of Engineer-In-Charge.
- vii) The contractor shall procure and provide all the materials from the manufacturers / suppliers as per the item description/particular specifications for the work. The equivalent brand other than brand / make mentioned in particular specification for any item, shall be permitted to be used in the work, only when the specified make is not available 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 to the equivalent make of the material shall be final and binding on the contractor. the material shall be procured only after written approval of the Engineer-in-Charge. No claim, whatsoever, of any kind shall be entertained from the contractor on this account. Nothing extra shall be payable on this account.
- viii) All materials whether obtained from government stores or otherwise shall be got checked by the Engineer-in-Charge or his authorized supervisory staff on receipt of the same at site before use.
- ix) The tests, as necessary, shall be conducted in the laboratory approved by the Engineer-in-Charge. The samples shall be taken for carrying out all or any of the tests stipulated in the particular specifications, minimum quality assurance plan, and as directed by the Engineer-in-Charge or his authorized representative.
- x) All the registers of tests (carried out at construction site or in outside laboratories) and all material at site (MAS) registers including cement register shall be maintained by the contractor which shall be issued to the contractor by Engineer-in-charge. All the entries in the registers will be made by the designated engineering staff of the contractor and same should be regularly reviewed by JE/AE/AEE/EE. Contractor shall be responsible for safe custody of all the registers.
- xi) The contractor shall at his own risk and cost make all arrangements and shall provide all such facilities including material and labour, 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.

- xii) 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.
- xiii) **Samples of materials required for testing shall be provided free of cost by the contractor. All expenditure to be incurred for testing of samples of all materials e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor.** Unless specified otherwise, all the testing charges shall be borne by contractor
- xiv) All the hidden items such as water supply lines, drainage pipes, electrical conduits, sewers etc. are to be properly tested as per the design conditions before covering.
- xv) Water tanks, taps, sanitary, water supply and drainage pipes, fittings and accessories should conform to byelaws 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.
- xvi) The contractor shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted.
- xvii) The contractor shall give ten years guarantee in the prescribed proforma for water proofing items specified in the schedule of quantities. The ten years to be reckoned from the date after the defect liability period prescribed in the contract. In addition to this 10% of the executed cost of items shall be retained either in fixed deposit or in the form of bank guarantee, which shall be released as per existing Rules and as per the provision of CPWD Works Manual 2026 with amendment /modifications upto last date of submission of tender, if no defects are found in water proofing or the defects are made good. This amount shall be adjusted against the expenses incurred on making good the defects if the contractor commits breach of guarantee.
- xviii) 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 / firefighting equipment's, 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.
- xix) The contractor shall make available, on request from the department, the copies of challan, cash memos, receipts and other certificates, if any, vouchers towards the quantity and quality of various materials procured for the work. The contractor shall also provide information and necessary documentation 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 etc., for the department to ensure that the

material have been procured from the approved source and is of the approved quality, as directed by the Engineer-in-Charge. Wherever specified, day-to-day account of receipt of such material shall be maintained at site of work.

- xx) If the Contractor does not provide adequate supporting staff or labour or both for carrying out field tests or collecting and forwarding samples to outside laboratory or for maintaining test records, Engineer in charge may carry out field tests or collect and forward sample to outside laboratory or appoint any person to maintain the registers at risk and cost of contractor. The charges so incurred shall be entirely borne by contractor and shall be deducted from running or final bill of contractor. Further, **recovery of Rs. 2000/- for each default shall be levied to contractor.**
- xxi) In case there is any discrepancy in frequency of testing as given in list of mandatory tests and that in individual sub-heads of work as per CPWD Specifications, higher of the two frequencies of testing shall be followed and nothing extra shall be payable on this account.

1.41 SUBMISSION AND DOCUMENTATION

The contractor shall render all help and assistance in documenting the total sequences of this project by way of photography, slides, audio / video recording etc. The original films shall be the property of the department. No copy shall be prepared without the prior approval of the Engineer- in – Charge.

- i) 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.
- ii) The contractor shall make available five (05) sets of “AS BUILT” architectural, structural, all services (internal & external) drawings (including soft copy of the same), along with literatures, maintenance manuals, warranty certificates etc. of various installed fittings, fixtures and equipment for the completed projects. This shall be the prerequisite for payment of final bill.
- iii) The contractor shall make available four (04) sets of computerized Standard Measurement Books (SMBs) having measurement of all the permanent standing.
- iv) The performance guarantee shall not be released to the contractor until the aforesaid drawings are submitted to the Engineer-in-Charge.
- v) The contractor shall comply the conditions of various NOC, clearance obtained for the project and submit the necessary document mentioned in these statutory NOC / Clearance.

1.42 PROGRAM /SCHEDULE

The contractor shall prepare an integrated program chart including civil, electrical & mechanical, horticulture, landscaping 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 completion of the work within the stipulated period and submit the same for approval of the Engineer-In-Charge within fifteen days of the issuance of letter of acceptance. The integrated program chart so submitted should not have any discrepancy with the physical/financial milestones specified in this tender documents. The program chart should include the following:

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- i) Descriptive note explaining sequence of various activities.
- ii) Construction program prepared on PRIMAVERA/ M.S. Project etc. Software, which will indicate resources in terms of materials, manpower and specialized equipment for every important stage.
- iii) Program for procurement of materials by the contractor.
- iv) Program for arranging and deployment of manpower both skilled and unskilled so as to achieve targeted progress.
- v) Program of procurement of machinery/equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.
- vi) In case of noncompliance/delay in compliance, a recovery @ Rs. 5000/- per week or part thereof will be imposed which will be recovered from the R/A Bill of the contractor.
- vii) 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 additional inputs to ensure completion of the work within the stipulated time.
- viii) 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 contract.

1.43 SUBMISSION OF PROGRESS REPORT:

Apart from the above integrated program chart, the contractor shall be required to submit fortnightly progress report of the work in a computerized form on 5th and 20th of every month. The progress report shall contain the following -

- 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. At least 10 digital photographs showing all the parts of construction site along with at least 5 minutes video of executions of different items in soft copy has to be submitted in every fortnightly progress report.
- b) Comparative progress chart of the various components of the work that were planned and achieved, for the fortnight, with reason for deviations, if any in a tabular format.
- c) Plant and machinery statement, indicating those deployed in the work.
- d) Man-power statement indicating:
 - Individually the names of all the staff deployed on the work, along with their designations.
 - No. of skilled workers (trade wise) and total no. of unskilled workers deployed on the work and their location of deployment within site

- e) Financial statement, indicating the broad details of all the running account payment received up to date, such as gross value of work done, advances taken, recoveries effected, amount withheld, net payments details of cheque payment received, extra/substituted/deviation items if any, etc.
- f) In case of noncompliance / delay in compliance in submission of fortnightly progress report, a recovery @ Rs. 2000/- per report will be imposed which will be recovered from the R/A Bill of the Contractor..

1.44 TEMPORARY WATER/ ELECTRICITY/ TELEPHONE CONNECTION

- i) Arrangement of temporary connection for telephone, water and electricity etc. by him, shall be made by the contractor at his own cost and also necessary permissions shall be obtained by him directly from concerned authorities, under intimation to the department. Also, all initial cost, running charges, and security deposit, if any, in this regard shall be borne by him. The contractor shall abide by all the rules/ bye laws applicable in this regard and he shall be solely responsible for any penalty on account of violation of any of the rules / byelaws in this regard. The contractor may bring water from outside through tankers from authorized sources.
- ii) The contractor shall be responsible for maintenance and watch and ward of the complete installation and water / electricity meter. The contractor shall also be responsible for any pilferage, theft, damage, penalty etc. in this regard. The contractor shall indemnify the department against any claim arising out of pilferage, theft, damage, penalty etc. whatsoever on this account. Security deposit for the work shall be released only after No Dues Certificates are obtained from the local Authorities from whom temporary electric/ water / telephone connection have been obtained by the contractor.
- iii) The department shall in no way be responsible for either any delay in getting electric and/or water and/or telephone connections for carrying out the work or not getting connections at all. Also, contingency arrangement of stand-by water & electric supply shall be made by the contractor for commencement and smooth progress of the work so that work does not suffer on account of power failure or disconnection or not getting connection at all. No claim of delay of any kind whatsoever shall be entertained on this account from the contractor.

1.45 CLEANLINESS OF SITE

- i. The contractor shall not stack building material / malba / muck on the land or road of the local development authority or on the land owned by the others, as the case may be. So, the muck, rubbish etc. shall be removed periodically, from the site of work to the approved dumping grounds as per the local byelaws and regulations of the concerned authorities and all necessary permissions in this regard from the local bodies shall be obtained by the contractor. In case, the contractor is found stacking the building material / malba as stated above, the contractor shall be liable to pay the stacking charges / penalty as may be levied by the local body or any other authority and also to face penal action as per the rules, regulations and bye-laws of such body or authority. The engineer-in-charge shall be at liberty to recover, such 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 and performance guarantee in respect of this contract.
- ii. The contractor shall take instructions from the engineer-in-charge regarding collection and stacking of materials at any place within the site. No excavated earth or building rubbish

shall be stacked on areas where other buildings, roads, services or any development works are to be constructed/carried out.

- iii. The site of work shall always be kept clean due to constraints of space and to avoid any nuisance to the users of buildings in the adjacent plots. The contractor shall take all care to prevent any water- logging at site. The wastewater, slush etc. shall not be allowed to be collected at site. For discharge into public drainage system, necessary permission shall be obtained by the contractor from relevant authorities after paying the necessary charges, if any, directly to the authorities. The work shall be carried out in such a way that the area is kept clean and tidy. All the fees/charges in this regard shall be borne by the contractor.
- iv. It is the responsibility of contractor to keep building neat and clean. The contractor shall spray the chemicals fumigate site area to check the mosquitoes at frequent interval or as directed by the engineer in charge. The contractor shall also make lighting and temporary ventilation arrangement in basement. The contractor shall provide submersible pumps with automatic on/off system in each sump in basement to bail out the water accumulated. The contractor shall quote rates after considering the above stated conditions and nothing extra shall be paid on this account.
- v. The contractor shall not wash the drum of TM (transit mixture) at site and shall avoid the spread of leachate / cement slurry at the site of work and all care shall be taken to keep the site neat and clean at his own cost.

1.46 INSPECTION OF WORK

- A. In addition to the provisions of relevant clauses of the contract, the work shall also be open to inspection by senior officers of department & the representative of the consultants. The contractor shall at times during the usual working hours and at all times at which reasonable notices of the intention of the Engineer-in-charge or other officers as stated above to visit the works shall have been given to the contractor, either himself be present to receive the orders and instructions or have a responsible representative duly accredited in writing, to be present for that purpose.
 - i) The consultant and third-party quality assurance agency appointed by department shall be inspecting the works including workshops and fabrication factory to ensure that the works are in general being executed according to the design, drawings and specifications laid down in the contract. Their observations shall be communicated by department to contractor and compliance shall be reported to department by the contractor.
 - ii) Senior officers of department, dignitaries from central ministry / 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) Keep entrance and surrounding area clean.
 - c) Display layout plan, key plan, building drawings including plans, elevations and sections.
 - d) Upto date displays of progress of work in form of Bar chart, CPM and PERT etc.

- e) Keep details of quantities executed, balance quantities to be executed, deviations, possible Extra item, etc.
- f) Keep plastic / cloth mounted one sets of building drawings.
- g) Set of helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.

1.47 PRODUCT DELIVERY, STORAGE AND HANDLING OF CHEMICALS

- (i) The contractor shall construct storage space for chemicals to ensure that the storage conditions are as recommended by the manufactures.
- (ii) All the chemical shall be procured and delivered in sealed containers with labels legible and intact.
- (iii) All the chemicals (polymers, epoxy, water proofing compound, plasticizer, Polysulphide, SBR based elastomeric, all exterior and interior paints, polish etc.) shall be procured in convenient packings (say 20 litres/Kgs.) with packing capacity as approved by the Engineer-in-Charge, and not in bigger capacity containers, say 200 litre (Kgs.) drums unless otherwise specifically permitted by the Engineer-in-Charge. One sample from each lot of the chemicals procured by the contractor shall be tested in a laboratory approved by the Engineer-in-charge.
- (iv) All chemicals required for the execution of the work shall be got approved, procured and deposited with the departmental supervisory staff. The chemicals shall be kept in joint custody of the contractor and the department. The watch and ward of such material shall, however, remain to be the responsibility of the contractor and no claim, whatsoever, on this account shall be entertained. Different containers of each chemical shall be serially numbered on packing and also consumed in that order. Day-to-Day account of receipt, issue and balance shall be regulated by the department and proper account shall be maintained at site of work in the prescribed form as per the standard practice.
- (v) All the chemicals shall be procured by the contractor directly from the manufacturer. In exceptional circumstances, the contractor may be allowed to procure the materials from the authorized dealers of the manufacturers, if specifically permitted by the Engineer-in-Charge.
- (vi) The original copies of challan/cash memos towards the quantity of various chemicals procured shall be made available by the contractor to Engineer-in- Charge and a copy of the same shall be kept in record.
- (vii) The name of manufacturers, manufacturer's product identification, manufacturer's mixing instructions, warning for handling and toxicity and date of manufacturing and shelf life shall be clearly and legibly mentioned on the labels of each container.
- (viii) The contractor shall submit for the chemicals procured, manufacturer's and / or authorized dealer's certificate regarding supplying and verifying conformance to the material specifications, as specified.
- (ix) All filled containers shall be handled in safe manner and in a way to avoid breaking container seals.

- (x) Empty containers of the chemicals should not be removed from site till the completion of work and shall be removed only with the written approval of the Engineer-in-Charge.
- (xi) All arrangements for measuring, dosing and mixing of material / chemicals at site have to be made by the contractor.
- (xii) Contractor shall suitably advise his site engineer and all the workers as regards safe handling of chemicals. Necessary protective and safety equipment's in form of hand gloves, goggles etc. shall be provided by the contractor and be also used at site.
- (xiii) The chemicals shall be tested at the frequency as specified in an independent laboratory as approved by the Engineer-in-charge. If required, more samples may have to be tested as per the directions of the Engineer-in-Charge. Nothing extra shall be payable on this account.

1.48 DE-WATERING

- i. De-watering required, if any, shall be done conforming to BIS Code IS: 9759 (guide lines for de-watering during construction) and / or as per the specifications approved by the Engineer-in-Charge. Design of an appropriate and suitable dewatering system shall be the contractor's responsibility. Such scheme shall be modified / augmented as the work proceeds based on fresh information discovered during the progress of work. At all times during the construction work, efficient drainage of the site shall be carried out by the contractor and especially during the laying of plain cement concrete, taking levels etc. The contractor shall also ensure that there is no danger to the nearby properties and installations on account of such lowering of water table. If needed, suitable precautionary measures shall be taken by the contractor. Also, the scheme of dewatering adopted shall have adequate built-in arrangement to serve as stand-by to attend to repair of pumps etc. and disruption of power / fuel supply. Nothing extra shall be payable on this account.
- ii. In trenches where surface water is likely to get into cut / trench during monsoons, a ring bund of puddle clay or by any other means shall be formed outside, to the required height, and maintained by the contractor. Also, suitable steps shall be taken by the contractor to prevent back flow of pumped water into the trench. Nothing extra shall be payable on this account.
- iii. The contractor shall be responsible for taking necessary approval from the concerned authority for the discharge of the water. Nothing extra shall be payable on this account.

1.49 INSURANCE POLICIES

Before commencing the execution of work, the contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property, at site of work. The contractor shall obtain and submit to the Engineer-in-Charge proper Contractor All Risk Insurance Policy for an amount 1.25 times the contract amount for this work, with Engineer-in-Charge as the first beneficiary. The insurance shall be obtained in joint names of Engineer-in-Charge and the contractor (who shall be second beneficiary). Also, he shall indemnify the department from any liability during the execution of the work. Further, he shall obtain and submit to the Engineer-in-Charge, a third-party insurance policy for maximum Rs.10 lakh for each accident, with the Engineer-in-Charge as the first beneficiary. The insurance shall be obtained in joint names of Engineer-in-Charge and the contractor (who shall be second beneficiary). The contractor shall,

from time to time, provide documentary evidence as regards payment of premium for all the insurance policies for keeping them valid till the completion of the work. The contractor shall ensure that insurance policies are also taken for the workers of his sub-contractors / specialized agencies also. Without prejudice to any of its obligations and responsibilities specified above, the contractor shall within 10 days from the date of letter of acceptance of the tender and thereafter at the end of each quarter submit a report to the department giving details of the insurance policies along with certificate of these insurance policies being valid, along with documentary evidences as required by the Engineer-in-Charge. No work shall be commenced by the contractor unless he obtains the insurance policies as mentioned above. Also, no payment shall be made to the contractor on expiry of insurance policies unless renewed by the contractor. Nothing extra shall be payable on this account. No claim of hindrance (or any other claim) shall be entertained from the contractor on these accounts.

1.50 PRESERVE AND PROTECT LANDSCAPE DURING CONSTRUCTION

- i) The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.
- ii) The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.
- iii) Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by Engineer in Charge.
- iv) The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.
- v) The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.

1.51 PREPARATION OF SAMPLE (MOCK UP)

The contractor shall prepare one sample/Mock-Up for typical units of office cabin and toilet unit. Samples of representative units shall be prepared by the contractor well in advance before taking up the mass execution at the appropriate time as per mile stones. The contractor shall invariably prepare the samples units with finishing items i.e. flooring of different types, external & internal finishing i/c colour scheme of paint, water supply & sanitary fittings and any other item as per direction of Engineer-in-charge. The contractor shall proceed with further finishing works only after getting the samples of these items approved in writing from Engineer-in-charge.

1.52 SPECIALIZED AGENCIES

The contractor shall engage specialized agency for carrying out specialized item such as:

- i) Structural Glazing,

- ii) Expansion Joint Works,
- iii) Waterproofing work,
- iv) Water supply & Plumbing work,
- v) Fire check Doors,
- vi) Anti-termite treatment, etc,

Before engaging such agency, the contractor shall submit the name of the agency along with their working experience to Engineer-in-charge for approval. Contractor shall submit the proposal (along with work experience certificate issued by competent authority) of only those specialized agencies who have work experience of satisfactorily completion of similar works as per following criteria during last seven years –

Three works each costing not less than 40% of estimated cost for concerned similar work

Or

Two works each costing not less than 60% of estimated cost for concerned similar work

Or

One work costing not less than 80% of estimated cost for concerned similar work item.

- vii) Estimated cost of the specialized item/work for various items/schemes shall be as per schedule of quantity or as determined by engineer-in-charge. Unless specified otherwise, the contractor shall be fully responsible for and shall guarantee proper design and performance of specialized works for a period of 10 years from the date of completion of work. All the guarantees shall be submitted before final payment and shall not in any way limit any other rights to correct which the employer may have under the contract. **In addition, an amount of 10 % of work done of specialized work, shall be retained in interim/final payment till it reaches the 10 % of estimated cost of such specialized items/works. This amount shall be withheld towards guarantee and shall be in addition to the other amounts to be withheld as mentioned elsewhere in the contract.** However, this amount (withheld) would be released after guarantee period if the performance, as required, is found satisfactory. If any defects are noticed during the guarantee period, it shall be rectified by the contractor within seven days of issuance of notice to the contractor, temporarily, to the satisfaction of the department or any other authorized representative of department and permanent rectification of the defects/replacement of defective should be carried out by the contractor within a period of one month after issuance of notice to the contractor. If not attended to, the same shall be got done through other agency at the risk and cost of the contractor and the cost, which shall be final and binding on the contractor, shall be recovered from the amount withheld towards the guarantee as mentioned above or from any other amount due to the contractor. However, the amount withheld as guarantee can be released in full on submission of irrevocable bank guarantee, from a Schedule/Nationalized Banks, of the same amount, for the guarantee period by the contractor. The defects, if any, shall be rectified in a workmanlike manner, retaining the same aesthetics and other functional parameters of the original work.
- viii) The contractor shall submit the credential of specialized agency well in advance as per the direction of Engineer-in-charge. After verification of the same, written approval will be conveyed to main contractor in this regard. The contractor shall not change the specialized agency. However, if the change is warranted, he may do so, with permission of Engineer-in-charge. However, before making any such change, he has to enter into similar agreement as with previous agency & submit the same to Engineer-in-Charge for approval. This shall however be without any change in the accepted rates of the contract and without any cost implications to the Department. If the contractor proposes name of specialized agencies

from list of preferred makes, there is no need to comply eligibility criteria mentioned in para (i) above. Also, if the specialized work is carried out by the authorized fabricator/applicator of the manufacturers then there is no need to comply eligibility criteria mentioned in para (i) above.

- ix) The main contractor cannot work as a specialized agency unless his name is approved as specialized agency by Engineer-in-charge in accordance with criteria mentioned at sr. No. (i) above.
- x) Proposal of the specialized agencies for each specialized work shall be obtained from the Engineer-in-Charge within three months of issuance of letter of acceptance even if, such specialized items of work shall be executed by the specialized agencies at later date. The work shall be deemed to be executed by the tenderer for all purposes and the responsibility of the quality of items of works executed etc. shall continue to be that of the tenderer only. It is expressly agreed that the contractor shall, at all times, be responsible and liable for all its obligations under this contract notwithstanding anything contained in the contracts with its sub-contractors or any other contract that may be entered into by the contractor, and no default under any such contract shall excuse the contractor from its obligations or liability hereunder.
- xi) It shall be the responsibility of contractor to sort out any dispute / litigation with the specialized agencies without any time & cost overrun to the department. The contractor shall be solely responsible for settling any dispute / litigation arising out of his agreement with the specialized agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies / sub- contractor(s). No claim of hindrance in the work shall be entertained from the contractor on this account. No extension of time shall be granted and no claim whatsoever, of any kind, shall be entertained from the contractor on account of delay attributable to the selection/rejection of the specialized agencies or any dispute amongst them.

1.53 STRUCTURAL SAFETY

Following guidelines shall be followed where height of casting of concrete is higher than 3.5 m or where higher loading are coming during casting of concrete or span is more than 5 meter long or special structure like domes, vaults, steel structure etc. are to be constructed:

- i) Centering/scaffolding/staging for casting of these structures should be properly designed by a qualified and experienced person/agency having past experience in design of false work (centering) for concrete structures and should be proof checked by similar experienced person/agency and it should be approved by Engineer-in-Charge. The provisions of relevant Indian standard (IS: 14687) may be referred for design of false work (centering).
- ii) A method statement for erection and dismantling of the centering/scaffolding/staging and process of concreting & process of anchor of steel structure shall be prepared by contractor and submitted to Engineer-in-Charge for approval and the work shall be commenced only after approval of method statement by Engineer-in-Charge. The provisions of relevant Indian standard (IS: 14687) may be referred for erection of false work (centering), safety precautions and other site operations, pertaining to false work (centering).
- iii) Engineering form watcher shall be engaged during erection, concreting and dismantling for early detection of any movement or instability in the system.
- iv) A detailed programme of field safety inspection of centering, scaffolding, form work of such structures during different stages should be chalked out and strictly followed.

- v) The prime responsibility of safety of false work shall be with contractor.
- vi) Provision of safety net, fall arresting system including other safety gears, for workers, working over these structures shall be used strictly.

1.54 OTHER CONDITIONS W.R.T EXECUTION OF WORK

- i) The work shall be carried out in accordance with the contract specification/terms, tendered drawings and detailed drawings including revised drawings, if any, issued during execution of work by the Engineer-in-Charge.
- ii) Before commencement of any item of work, the contractor shall correlate all the relevant architectural, structural and MEP drawings, and specifications etc. issued for the work and satisfy himself that the information available therefrom is complete and unambiguous. The figure and written dimension of the drawings shall be superseding the measurement by scale. The discrepancy, if any, shall be brought to the notice of the Engineer-in-charge before execution of the work. The contractor alone shall be responsible for any loss or damage occurring by the commencement and execution of work based on any erroneous and or incomplete information and no claim whatsoever shall be entertained on this account.
- iii) The contractor is required to deploy resources as per availability of site and as per approved programme chart of the work. However, no claims shall be entertained for idle labour, idle machinery, idle technical/no-technical staff, idle T&P etc.
- iv) The work of services may be executed simultaneously. The contractor shall minimize the scope of making recesses, holes, opening etc. as the same shall be planned in advance and necessary grooves/niches shall be provided in shuttering of RCC.
- v) Ready mix plaster shall be executed using pneumatic spray machine of reputed make.
- vi) Laminates on flush doors shall be machine pressed, preferably in factory. The design and pattern of laminates shall be as approved by engineer in charge.
- vii) The aluminium door-windows-framework, lamination and lipping on flush doors shall be factory made.
- viii) Unless otherwise specified, wherever mild steel / galvanized iron sections and pipes are provided in the work, priming coat of approved steel primer shall be done after removing rust from section if any and finally finished with low VOC synthetic enamel paint or as mentioned in specification.
- ix) Unless otherwise specified, monkey ladder shall be provided for overhead water tanks, mummy and lift machine room doors with frame and steps of 40x40x6 mm angle iron, etc.
- x) Wall mounted door stoppers shall be provided to protect the wall where the door handle would run into it.
- xi) For avoiding of scratch marks or damage to the vitrified / ceramic floor tile, the necessary arrangement of hessian cloth with a coat of plaster of paris over it shall be provided.

- xii) Fall nets and scaffolding nets for protection from debris / dusts and noise etc. are to be provided during the construction period.
- xiii) Wherever M.S. grill provided in window, weight of grill in each window should not be less than 12 kg/sqm.
- xiv) Wherever utility ducts, drains etc. are required, the same shall be provided with precast concrete units made of M-30 grade concrete and reinforcement steel of grade of Fe-500D.
- xv) Wherever the doors are required to be fixed to AAC block masonry, the frame shall be fixed in RCC band or concrete block masonry.
- xvi) No sunken floor slab except floor depression for maintaining slopes. However, camouflaging of water supply and sanitary line of upper floor to be done by false ceiling.

1.55 It is intended to make our built environment barrier free and accessible to all. Bidders are instructed to strictly adhere to the provision contained in Hand Book on Barrier free and accessibility containing and corresponding provisions of NATIONAL BUILDING CONSTRUCTION STANDARD 2026 while incorporating such -features in the building.

1.56 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.

1.57 Jurisdiction of the court shall **be Delhi**.

2.0 SPECIAL CONDITIONS FOR GREEN BUILDING

The building shall confirm to minimum 4-Star rating as per GRIHA. norms. The contractor shall follow the all guidelines to achieve minimum 4-star GRIHA rating. The contractor shall be fully responsible for maintaining the desired records / documentation which shall be required for achieving minimum 4-star GRIHA rating. The copies of these records /documentation shall be provided to the appointed GRIHA consultant, GRIHA council and Engineer in charge. The contractor shall provide full cooperation to appointed GRIHA consultant, GRIHA council and Engineer in charge. The contractor shall attend all the site visits / meetings conducted by the appointed GRIHA consultant, GRIHA council and Engineer in charge time to time and shall provide the necessary compliances accordingly at site for this purpose.

2.1 Construction Stage-

- i) All vehicles, equipment and machinery to be procured for construction shall conform to the relevant Bureau of India Standard (BIS) norms.
- ii) Emission from the vehicles must conform to environmental norms.
- iii) Dust produced from the vehicular movement and other site activities shall be mitigated by sprinkling of water.

a) Construction Wastes Disposal

- i) The pre-identified dump locations will be a part of solid waste management plan to be prepared by the Contractor in consultation with Engineer -in-charge.
- ii) Contractor shall get approved the location of disposal site prior to

commencement of the excavation on any section of the project location.

- iii) Contractor shall ensure that any spoils of material will not be disposed off in any municipality solid waste collection bins.

2.2 Procurement of Construction Materials

- i) All vehicles delivering construction materials to the site shall be covered to avoid spillage of materials and maintain cleanliness of the roads.
- ii) Wheel Tyres of all vehicles used by the contractor, or any of his sub-contractor shall be cleaned and washed clear of all dust/mud before leaving the project premises. This shall be done by routing the vehicles through tyre washing tracks.
- iii) Contractor shall arrange for regular water sprinkling at least twice a day (i.e., morning and evening) for dust suppression of the construction site and unpaved roads used by his construction vehicles.

2.3 Water Pollution

- i) The contractor shall take all precautionary measures to prevent accumulation of the wastewater during construction.
- ii) The wastewater arising from the project shall be disposed off in the manner that is acceptable to the Engineer -in-charge.

2.4 Air and Noise Pollution

- i) Contractor shall use dust screens and sprinkle water around the construction site to arrest spreading of dust in the air and surrounding areas.
- ii) Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and shall confirm that emission levels comply with environmental emission standards/norms.
- iii) All vehicles and equipment used in construction may be fitted with exhaust silencers.
- iv) Servicing of all construction vehicles and machinery shall be done regularly and during routine servicing operations, the effectiveness of exhaust silencers may be checked and be replaced if, found defective.
- v) Noise emission from compactors (rollers) front loaders, concrete mixers, cranes (movable), vibrators and saws should be less than 75 dB(A).

2.5 Personal Safety, Hygiene Measures for Labour

- i) Contractor may provide the following items for safety of workers employed by contractor and associate agencies:
 - a) Protective footwear and gloves to all workers employed for the work on mixing, cement, lime mortars, concrete etc. and works of water pipeline/sewer line.
 - b) Welder's protective eye-shields to workers who are engaged in welding works.

- c) Safety helmet and Safety harness/ belt.
- d) Provide adequate sanitation/safety facilities for construction workers to ensure the health and safety of the workers during construction, with effective provisions for the basic facilities such as sanitation, drinking water and safety equipment's or machinery.
- ii) All the workers should be wearing helmet and shoes all the time on site.
- iii) Masks and gloves should be worn whenever and wherever required.
- iv) Adequate drinking water facility should be provided at site, adequate number of decentralized latrines and urinals to be provided for construction workers.
- v) If allowed and full-time workers are residing on site, then they should be provided with clean and adequate temporary hutment.
- vi) First aid facility should also be provided.
- vii) Overhead lifting of heavy materials should be avoided. Barrow wheel and hand-lift boxes should be used to transport materials onsite.
- viii) Tobacco and cigarette smoking should be prohibited onsite.
- ix) All dangerous parts of machinery are well guarded and all precautions for working on machinery are taken.
- x) Maintain hoists and lifts, lifting machines, chains, ropes and other lifting tackles in good condition. Provide safety net of adequate strength to arrest falling material down below.
- xi) Use of durable and reusable formwork systems to replace timber formwork and ensure that formwork is properly maintained.
- xii) Ensure that walking surfaces or boards at height are of sound construction and are provided with safety rails and belts.
- xiii) Provide measure to prevent fire. Fire extinguisher and buckets of sand may be provided in fire-prone area.
- xiv) Provide sufficient and suitable light for working during night.
- xv) Ensure that the construction firm/division/company should have sound safety policies.
- xvi) Comply with the safety procedure, norms and guidelines (as applicable) as outlined in NATIONAL BUILDING CONSTRUCTION STANDARD 2026.
- xvii) Adopt additional best practices and prescribed norms as in NATIONAL BUILDING CONSTRUCTION STANDARD 2026

2.6 Contractor is required to get existing top soil tested for fertility. If test finds it fertile, then top soil preservation is required. For preservation, top layer of soil (150mm- 300mm from the top) must be stripped off the site areas where construction activity will be carried out and kept separately for preservation. The preserved top soil must NOT be mixed with subsoil (soil

excavated below 150mm – 300mm depth). The top soil should be preserved from erosion by wind/rain water by planting plants or grass on it. The preserved top soil stack height should not be more than 400mm – 600mm. The area used for preserved top soil should be barricaded from all the sides & nothing should be dumped on it during the construction process. There should be regular water sprinkling on the preserved top soil for its compaction & to maintain its fertility by adding organic manure as per the direction of horticulturist. Top-soil fertility test must be carried out before preservation and post construction to ensure and maintain its fertility. The soil fertility should be enhanced by organic means only if required. Preserved top soil must be spread back to landscaped areas after the construction activity is completed as per the direction of engineer in charge. Top soil fertility test must be done from an ICAR or NABL accredited laboratory for the following parameters- P.H., Mineral Content, Organic Matter (%), Nitrogen (kg/Hec), Phosphorus (kg/Hec), Potassium (kg/Hec), Free Lime content (%), Iron (ppm), Maganese (ppm), Bauxite (ppm), Copper (ppm), Texture (%), Bulk Density (Mg m3), Particle Density (Mg m3), Maximum Water Holding Capacity (%), Exchangeable Sodium (Mg/100g).

- 2.7** Identify roads on-site that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral type that make up the surface base. Add surface gravel to reduce source of dust emission. Amount of fine particles (smaller than 0.075mm) may be to 10 -20%. Vehicular speed on site may be limited 10km/h. Nothing extra will be payable for this.
- 2.8** All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust/particulate emissions.
- 2.9** Spills of dirt or dusty materials shall be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean - up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained/cleaned up immediately before they can infiltrate into the soil/ground or runoff in nearby areas.
- 2.10** The contractor shall ensure that water spraying is carried out by wetting the surface by spraying water on:
- i) Any dusty material.
 - ii) Areas where demolition work is carried out.
 - iii) Any unpaved main-haul road and.
 - iv) Areas where excavation or earth moving activities are to be carried out.
- 2.11** The contractor shall ensure the following:
- i) Cover and enclose the site by providing dust screen, sheeting or netting to scaffold along the perimeter of a building.
 - ii) Covering stockpiles of dusty material with impervious sheeting.
 - iii) Covering dusty load on vehicles by impervious sheeting before they leave the site.
 - iv) Transferring, handling/storing dry loose materials like bulk cement and dry pulverized

fly ash inside a totally enclosed system.

- v) Clear vegetation only from areas where work will start right away.
- vi) Vegetate/mulch areas where vehicles do not ply.
- vii) Apply gravel / landscaping rock to the areas where mulching/paving is impractical.

2.12 The contractor shall adopt measures to prevent air pollution in the vicinity of the site due to construction activities.

2.13 Prior to the commencement of any work, the method of working, plant equipment and air pollution control system to be used on -site should be made available for the inspection and approval of the Engineer -in-Charge to ensure that these are suitable for the project.

2.14 The contractor shall employ measures to segregate the waste on-site into inert, chemical or hazardous wastes. The inert waste may be disposed off to Municipal Corporation/local bodies dump yard and landfill sites.

2.15 The contractor shall preserve the existing landscape and protect it from degradation during the process of construction. Proper timing for construction activity shall be selected to minimize the disturbance such as soil pollution due to spilling of the construction material and its mixing with rainwater. The construction management plan including soil erosion control management plan shall be prepared accordingly for each month. The application of erosion control measures includes construction of gravel pits and tyre washing bays of approved size and specification for all vehicular site entry/exits, protection of slopes greater than 10%. Existing vegetation shall be preserved and protected by not-disturbing or damaging to specified site areas during construction.

2.16 The contractor should follow the construction plans proposed by the Engineer-in-charge / landscape consultant to minimize the site disturbance such as soil pollution due to spilling.

2.17 The contractor shall ensure that no construction leachates (e.g., cement slurry) is allowed to percolate into the ground. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant -laden water directly to the treatment device or facility (municipal sewer line).

2.18 All lighting installed by the contractor around the site and at the labour hutments during construction shall be CFL/ LED bulbs of the appropriate illumination levels.

2.19 All the building materials and systems used on site must be as per the specifications and approved makes by the Engineer-in-Charge.

2.20 All required certificates explaining the properties of the building material/system needs to be obtained from the manufacturer/vendor as required by the green building rating authority. The purchase orders of all the materials made with the manufacturers / authorized vendors should be maintained and shall be provided for the process with due diligence upon request.

2.21 All paints, adhesives and sealants should comply with the VOC limits prescribed by GRIHA norms.

- 2.22 Water saving measures need to be followed on site. If bore well water is used for construction, it must be metered. For waste water use in construction, record must be maintained of all tankers used at site. All sources of water use during construction must be regularly monitored.
- 2.23 The contractor / subcontractor shall prepare and submit a Site Management Plan (SMP) within 15 days of commencement date, for approval by the Engineer -in-charge. This SMP shall indicate the locations of go down, stockpiles, barricading, waste storage, offices, vehicular movement routes etc. In short, this SMP would comprehensively represent how the site activities shall be managed conforming to GRIHA guidelines. **Deduction/recovery @ Rs. 500 per day** of delay on non-submission of SMP beyond due date which shall be recovered from next RA bill.
- 2.24 Any other site management measures suggested by the Engineer-in-charge shall be followed on site.
- 2.25 The contractor & his team shall put adequate efforts to minimize construction waste generation at site. This shall include collection and segregation of all construction waste at site like broken bricks, tiles, glass, pavers, Steel scrap, Concrete debris, Plastic bags, drums, packaging cardboard, Timber scrap, Cement bags etc.
- 2.26 The contractor must keep record of all the construction waste being recycled or reused at site and also maintain receipts/records of waste sold from site. The contractor must ensure that no waste from the site is sent to landfill from sites, either all waste is reused within the site or sent for recycling. Waste sent off the site to its final destination may be tracked. Contractor must keep record as gate passes / challans for all the waste material sent out for selling.
- 2.27 The contractor shall submit to the Engineer -in-Charge after completion of the buildings, a detailed as built quantification of the following within 10 days of recording of completion. **Deduction/recovery @ Rs. 500 per day** of delay on non-submission beyond due date shall be recovered from the Final bill:
- i) Total materials used
 - ii) Total waste generated,
 - iii) Total waste reused,
 - iv) Total water used,
 - v) Total electricity consumed, and
 - vi) Total diesel consumed.
- 2.28 Evidence for the implementation of the all the above required measures shall be provided in the form of photographs and templates as required for the submission to the green building rating authority (GRIHA). Contractor shall provide potable water for all workers. The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water, latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. The total no. of toilets to be provided shall not be less than 1 per 30 employees in any one shift. Toilet facilities shall be provided from the start of building operations, and connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.

2.29 In compliance to the Hon'ble National Green Tribunal (NGT) and Office Memorandum no. DG/SE/CM/CON/Misc./02 dated 16.03.2016 following preventive/corrective measures to be taken at site in order to control Air pollution from construction and demolition activity: –

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

- (xiii) The contractor shall ensure that the construction material is covered by tarpaulin. The contractor shall take all other precaution to ensure that no dust particles are permitted to pollute air quality as a result of such storage.
- (xiv) The paving of the path for plying of vehicles carrying construction material is more permanent solution to dust control and suitable for longer duration projects.

2.30 In case of non-availability of the C& D waste Material / Product, the contractor shall make arrangement of substitute materials/Products without any cost adjustment.

2.31 Any Penalty imposed by Civic bodies/ NGT for Non-Compliance of their guidelines issued by them from time to time shall be borne by the contractor.

2.32 The contractor shall comply with the safety procedures, norms and guidelines (as applicable) as outlined in the Part 7 of National Building code 2016 of India, Bureau of Indian Standards. A copy of all pertinent regulations and notices concerning accidents, injury and first-aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first-aid shall be available at work site to render and direct first-aid to wounded/causalities. A telephone may be provided to first-aid assistant with telephone numbers of the hospitals. Complete reports of all accidents and action taken thereon shall be forwarded to the competent authorities.

2.33 The contractor shall preferably select materials / vendors, harvested and manufactured regionally, within a 800-km radius of the project site. Contractor shall collect & submit the relevant material certificates for materials with high recycled (both post-industrial and post-consumer) content, including materials like RMC mix with fly-ash, glass with recycled content, calcium silicate boards etc.

2.34 The contractor shall ensure that a flush out of all internal spaces is conducted prior to handover. This shall comprise an opening of all doors and windows for 14 days to vent out any toxic fumes due to paints, varnishes, polishes, etc.

2.35 Wherever required, Contractor shall meet and carry out all activities on site, supplement information, and submittals.

2.36 CONSTRUCTION WASTE

2.36.1 Subject to the suitability, all construction debris shall be used for road preparation, back filling, etc., as per the instructions of the Engineer in Charge, with necessary activities of sorting, crushing, etc. No construction debris shall be taken away from the site, without the prior approval of the Engineer in Charge. If and when construction debris is taken out of the site, after prior permissions from the Engineer in Charge, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

2.36.2 Contractor shall collect all construction waste generated on site. Segregate these wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. All construction debris generated during construction shall be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc.

- 2.36.3 Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged.
- 2.36.4 Contractor should provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate the size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas.
- 2.36.5 Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.
- 2.36.6 The storage of material shall be as per standard good practices as specified in Part 7, Section 2 in Storage, Stacking and Handling practices, NATIONAL BUILDING CONSTRUCTION STANDARD 2026 and shall be to the satisfaction of the Engineer in Charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. There should be a proper planning of the layout for stacking and storage of different materials, components and equipment's with proper access and proper manoeuvrability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipment's at different stages of construction shall be considered.
- 2.36.7 The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labelled in both Hindi and English with suitable symbols.
- 2.36.8 The Contractor shall remove from site all rubbish and debris generated by the Works and keep Works clean and tidy throughout the Contract Period. All the serviceable and non-serviceable (malba) material shall be segregated and stored separately. The malba obtained during construction shall be collected in well-formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitable covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during day. In case of poor visibility artificial light may be provided

2.37 DOCUMENTATION:

- (a) The contractor shall submit to the Engineer in Charge, before the start of construction, a site plan along with a narrative to demarcate areas on site from which top soil has to be gathered, designate area where it will be stored, measures adopted for top soil preservation and indicate areas where it will be reapplied after construction is complete.
- (b) The contractor shall, during the entire tenure of the construction phase, maintain the following records and submit to the Engineer in Charge on demand:
- i) Water consumption in litres

- ii) Electricity consumption in 'kwh' units
 - iii) Diesel consumption in litres
 - iv) Quantum of waste (volumetric/weight basis) generated at site and the segregated waste types divided into inert, chemical and hazardous wastes.
 - v) Digital photo documentation to demonstrate compliance of safety guidelines as specified herein.
 - vi) Quantities of material brought into the site, including the material issued to the contractor by the Engineer in charge.
 - vii) Quantities of construction debris (if at all) taken out of the site
 - viii) Digital photographs of the works at site, the workers facilities, the waste and other material storage yards, pre-fabrication works, etc.
- (c) The contractor shall submit to the Engineer in Charge, following information, for all material brought to site for construction purposes, including manufacturer's certifications, and test data, but not limited to:
- i) Source of products: Supplier details and location of the supplier.
 - ii) Recycled Content: Submit information regarding product post-industrial recycled and post-consumer recycled content.
 - iii) Product Recyclability: Submit information regarding product and product's component's recyclability including potential sources accepting recyclable materials wherever applicable.
- (d) The contractor shall provide total support to Engineer in Charge and Green Building Consultants appointed by the Engineer in charge in completing all Green Building Rating related formalities, including signing of forms, providing signed letters in the contractor's letterhead whenever required.
- (e) The contractor is expected to go through all other conditions of the GRIHA rating stipulations. Failure to adhere to any of the above-mentioned conditions, without approval of the Engineer in Charge, shall be deemed as a violation of contract and the contractor shall be held liable for penalty as per terms of the agreement.

3.0 Special condition for Cement:

3.1 Unless otherwise specified in this document, PPC cement shall be used. For design-mix concrete, OPC cement with flyash or PPC cement may be used without any cost adjustment. The contractor shall procure PPC conforming to IS: 1489 (Part 1) as required in the work from cement manufacturers mentioned in the list of Preferred makes for civil works or from any other reputed cement manufacturer having a production capacity not less than 1 million tons per annum as approved by competent authority of CCU. Uses of GGBS /Fly ash with OPC is permitted as per norms.

3.2 The supply of cement shall be taken in 50 kg. bags bearing manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer-in-charge and got tested in accordance with provisions of relevant BIS codes. In case the test results indicate that

the cement arranged by the contractor does not conform to the relevant BIS codes, the same shall stand rejected, and it shall be removed from the site by the contractor at his own cost within a weeks' time of written order from the Engineer- in-charge to do so. Supply of cement shall be taken in 50-kg bags bearing manufacturer's name, or his registered trademarks if any and grade and type of cement as well as ISI marking.

- 3.3 The cement shall be brought at site in bulk supply of approximately 25 tons or as decided by the Engineer-in-charge on the basis of requirement of work in progress. The cement godown of Minimum 500 bags capacity to store the cement shall be constructed by the Contractor at site of work for which no extra payment shall be made.
- 3.4 Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the engineer-in-charge or his authorised representative and the keys of other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of cement godown. The contractor shall facilitate the inspection of cement godown by the Engineer-in-charge at any time.
- 3.5 The cement shall be got tested by the Engineer-in-charge and shall be used on the work only after satisfactory test results have been received.
- 3.6 The actual issue and consumption of cement on work shall be regulated and proper accounts shall be maintained. The theoretical consumption of cement shall be worked out. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate so prescribed shall be made. In case of excess consumption, no cost adjustment shall be made.
- 3.7 The cement brought to the site and the cement remaining unused after completion of the work shall not be removed from site without the written permission of the Engineer-in-charge.
- 3.8 The damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-charge. If he does not do so within 3 days of receipt of such notice, the Engineer-in-charge shall get it removed at the cost of the Contractor.

4.0 Special Conditions for Steel Reinforcement

- 4.1 The Contractor shall/procure ISI marked TMT bars of various grades from the Steel Manufacturers mentioned in preferred make list for civil works or their authorized dealers/ authorized distributors/channel partners.
- 4.2 Samples shall also be taken and got tested by the Engineer-in-Charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the reinforcement steel arranged by the contractor does not conform to the specifications, the same shall stand rejected, and it shall be removed from the site of work by the contractor at his cost within a week time or written orders from the Engineer-in-Charge to do so.
- 4.3 The steel reinforcement bars shall be brought to the site in bulk supply of 25 tonnes or more, or as decided by the Engineer-in-charge.
- 4.4 The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent their distortion and corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.
- 4.5 For checking nominal mass, tensile strength, bend test, re-bend test etc. specimens of sufficient

length shall be cut from each size of the bar at random, and at frequency not less than that specified below:

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

- 4.6** The contractor shall supply free of charge the steel required for testing including its transportation to testing laboratories.
- 4.7** The actual issue and consumption of steel on work shall be regulated and proper accounts maintained. The theoretical consumption of steel shall be worked out. In case the consumption is less than theoretical consumption including permissible variations, recovery at the rate so prescribed shall be made. In case of excess consumption, no adjustment needs to be made.
- 4.8** The Steel brought to site and remaining unused shall not be removed from site without the written permission of Engineer-in-Charge.
- 4.9** The standard sectional weights referred to shall be as given in Table 5.4 in para 5.3.4 in CPWD Specification 2019 Vol.-I and will be considered for conversion of length of various sizes of TMT Bars in to standard weight. Record of actual sectional weights shall also be kept diameter and lot wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as Derived Actual Weight. If the derived weight is less than the standard weight, then the Derived Actual Weight shall be accepted if it is within the following tolerances specified in IS:1786-2008, otherwise whole lot will be rejected. However, deductions shall be made for the difference in derived actual weight and standard weight at the rate determined by engineer-in-charge. If the derived actual weight is found more than the standard weight, then nothing shall be paid extra for the difference in derived actual weight and standard weight.
- 4.10** The contractor shall submit original vouchers from the manufacturer for the total quantity of steel supplied under each consignment to be used in the work. All consignment received at the work site shall be inspected by the Site staff along with the relevant documents before acceptance. The contractor shall obtain original vouchers and copy of test certificates and furnish the same to the Engineer-in-Charge in respect of all the lots of steel brought by him from approved supplier to the site of work. The original vouchers and copy of test certificates shall be defaced by the site staff and kept on record in the site office.
- 4.11** The reinforcement steel brought to site of work shall be stored on brick / timber platform of 30/40-cm height, nothing extra shall be paid on this account.

PARTICULAR SPECIFICATIONS FOR CIVIL WORKS

1.0 General:

- (i) CPWD Specifications Vol. I & vol II as amended from time to time shall be applicable for all the items to be executed as per contract.
- (ii) Provision contained in the harmonized guidelines & standard for universal Accessibility in India 2021 (Available on CPWD website) of Ministry of Housing and urban affairs, Government of India shall be complied with while executing the works.
- (iii) C& D waste products and recycled aggregates to the extent provided in IS codes shall be used as per extant provisions of the green building measures. Only potable water shall be used in the work

2.0 Earthwork, Foundation and Plinth:

- (i) Excavation (surface excavation, over area, foundation, trenches etc.) in all kind of soil shall be carried out upto desired level as per good for construction structural drawings.
- (ii) Earth required for filling in all works like trenches, foundations, plinth, around building, road work and other development works shall be of good quality useful for filling as per CPWD specifications.
- (iii) The available excavated earth suitable for filling shall be used by the contractor.
- (iv) Surplus excavated earth after filling as per site conditions shall be disposed outside the campus after remittance of due royalty to concerned authority, as applicable, by taking required permission from concerned Government authority. Surplus excavated earth after filling as per site conditions shall be disposed outside the campus after payment of remittance due royalty to concerned statutory authority, as applicable, by taking required permission from concerned Government authority and Engineer Incharge. Nothing extra shall be payable on account of disposal of extra surplus excavated earth.
- (v) Appropriate ground improvement or soil stabilization measures recommended as per the soil investigation report and structural design, if any, shall be carried out.
- (vi) Appropriate foundation system including isolated footing/combined footing/ raft/ pile and possible combination of these as per the recommendations of the soil investigation report containing borehole data, seasonal variation of subsoil water table, and as per structural design conforming to relevant Indian standard codes shall be provided.
- (vii) Anti-termite treatment as per the necessity of soil at site shall be carried out as per relevant Indian standard codes/CPWD specifications.
- (viii) Structural grade slab shall be designed & provided accordingly.
- (ix) Damp proof course shall be provided wherever required as per CPWD specification.
- (x) Drainage and plinth protection along the perimeter of the buildings may be provided, wherever required, as per CPWD specifications or as per specific functional requirement.
- (xi) All the excavated earth/soil shall be levelled & neatly dressed. Sand filling of minimum 150mm thickness, with river sand, wherever required, shall be done under floor.

3.0 Superstructure:

- (i) Expansion joints/seismic separation joints shall be provided as per the good for construction structural drawing and shall be treated/covered as per CPWD specifications / manufacturer specifications.
- (ii) The exposed structural steel shall be made fire resistant (as per NATIONAL BUILDING CONSTRUCTION STANDARD 2026) by using vermiculite coating as per manufacturer's specifications and by applicators authorized by them.

4.0 Concrete Works:

All concrete works shall be carried out in general as per CPWD Specifications 2019, Volume-I & II with upto date revisions, amendments, correction slips issued till last date (including any extension, if any) of submission of bid.

5.0 RCC WORKS:

Foundation (isolated/combined, strip, raft, pile etc.) shall be with RCC using specified grade of concrete. RCC retaining/breast wall shall be provided as per good for construction drawings and site condition.

6.0 Design Mix Concrete (from Batch Mix Plant or from RMC Plant)

- 6.1 Design mix shall be carried out as per IS 10262, IS 456, IS 4926, and other relevant IS codes / CPWD Specifications amended upto last date (including extended date, if any) of submission of bid. The contractor shall carry out design mixes for each class of concrete indicating that the concrete ingredients and proportions will result in concrete mix meeting requirements specified. The cement shall be actually weighed as presumption of each bag having 50 kg shall not be allowed. In case of use of admixture, the mix shall be designed with these ingredients as well. All the ingredient shall confirm to relevant Indian standard as well as the CPWD specification.
- 6.2 The contractor may install fully automatic Batch Mix Plant at site or in nearby area wherever permissible. In case, contractor opt for installing of Batch Mix Plant as mentioned in description of items in BOQ then agency **has to install new fully automatic Batch Mix Plant** at site. *The old Batch Mix Plant shall not be permitted, in any case.* If desired by the engineer-in-charge the contractor has to submit the vouchers of new purchased fully automatic Batch Mix Plant. All permissions/NOCs (including payment/fee if any stipulated) from the concerned authorities shall be obtained by the contractor and no claim of hindrance on account of delay in installation of batching plant shall be admissible. Contractor may arrange concrete from RMC (Ready Mix Concrete) producing plants with prior approval from Engineer-in-charge. Nothing extra shall be payable for sourcing concrete from RMC plant. For all purposes, the contractor shall carry out fully, the responsibilities of the “placement Contractor” and the “manufacturer of concrete”.
- 6.3 The Engineer-in-Charge will reserve the right to inspect at any stage and reject the concrete if he is not satisfied about quality of product at the user’s end.
- 6.4 The Engineer-in-charge reserves the right to exercise control over the: -
 - i) Ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting tests for checking quality of materials, recording of test results and declaring the materials fit or unfit for use in production of mix.

- ii) Calibration checks of the Fully Automatic Batching plant /RMC.
- iii) Weight and quantity check on the ingredients, e.g. cement, aggregates, water and admixtures added for batch mixing.
- iv) Time of mixing of concrete.
- v) Testing of fresh concrete, recordings of results and declaring the mix fit or unfit for use. This will include continuous control on the workability during production and taking corrective action, if required.

6.5 All stone aggregate and stone ballast shall be of hard stone variety to be obtained from approved quarries. Coarse sand should be obtained from approved sources. The same shall be clean and sharp angular grit type. The coarse sand shall be screened before using, if required. If the sand brought to site is dirty, it must be washed in clean water to bring the sand to the required specifications. Nothing extra shall be payable on this account.

6.6 For exercising such control, the Engineer-in-charge shall periodically depute his authorized representative at the fully automatic batching plant/ RMC plant. It shall be responsibility of the contractor to ensure that all necessary equipment, manpower & facilities are made available for inspections/checking to Engineer-in-Charge and/or his authorized representative at fully automatic batching plant/ RMC plant.

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

6.8 The terms machine batched, machine mixed and machine vibrated concrete used elsewhere in contract shall mean the concrete produced in concrete batching and mixing plant and if necessary, transported by transit concrete mixers, placed in position by the concrete pumps, tower crane and vibrated by surface vibrator /needle vibrator / plate vibrator, as the case may be to achieve required strength and durability.

6.9 The concrete mix design with and without admixture will be carried out by the contractor, at his own cost, through one of the laboratories/Test houses to be approved by Engineer-in-charge.

6.10 Ultrasonic Pulse Velocity Method of Test for RCC

- a) The underlying principle of assessing the quality of concrete is that comparatively higher velocities are obtained when the quality of concrete in terms of density, homogeneity and uniformity is good. In case of poorer quality lower velocities are obtained. If there are cracks, voids or flaws inside the concrete which come in the way of transmission of pulse, lower velocities are obtained.
- b) The quality of concrete in terms of uniformity, incidence or absence of internal flaws, cracks and segregation etc. are indicative of the level of workmanship employed, can thus be assessed using the guidance given in table below, which have been evolved for characterizing the quality of concrete in structure in term of the ultrasonic pulse velocity.

Velocity criterion for Concrete Quality Grading

S.N.	Pulse Velocity by Cross Probing (Km/Sec)	Concrete Quality grading
1	Above 4.5	Excellent
2	4.5 to 3.5	Good
3	3.5 to 3.0	Medium
4	Below 3.0	Doubtful

- c) Ultrasonic Pulse velocity method of testing of concrete is to be conducted for works as a routine test. The acceptance criteria as per the above table will be applicable which is as per IS 13311 (Part-1):1992. From the above “Good” and “Excellent” grading are acceptable and the grading “Medium” and “Doubtful” will not be acceptable.
- d) At least **5%** of the total number of RCC members in each category i.e. beam, column, slab and footing may be tested by Ultrasonic Pulse velocity test method for establishing quality of concrete. It is suggested that test may be conducted on RCC beam near joint with column, on RCC column near joint with beam, on RCC footings and rafts. On RCC rafts a suitable grid can be worked out for determining number of tests. In addition, doubtful areas such as honeycombed locations, locations, where continuous seepage is observed, construction joints and visible loose pockets may also be tested.
- e) The test results shall be examined in view of the above acceptance criteria “Good” and “Excellent” and wherever concrete is found with less than required quality as per acceptance criteria, repairs to concrete will be made. Honeycombed areas and loose pockets will be repaired by grouting using Portland Cement Mortar/Polymer Modified Cement Mortar /Epoxy Mortar, after chipping loose concrete in appropriate manner. In areas where concrete is found below acceptance criteria and defects are not apparently visible on surface, injecting approved grout in appropriate proportion using epoxy grout /acrylic polymer modified cements slurry made with shrinkage compensating cement / plain cement slurry etc. shall be resorted to for repairs (refer relevant chapters from CPWD Hand Book on Repairs and Rehabilitation of RCC Buildings). Repair to concrete shall be done till satisfactory results are obtained as per the acceptance criteria by retesting of the repaired area. If satisfactory results are not obtained dismantling and relaying of concrete will be done at the cost of contractor.

6.11 Standard of acceptance shall be same as specified in clause 16 of IS 456-2000. In case of rejection of concrete on account of unacceptable compressive strength, the work for which samples have failed shall be redone at the cost of contractor. However, the Engineer in charge may order for additional tests (like cutting cores, ultrasonic pulse velocity test, load test on structure or part of structure etc.) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The contractor shall take remedial measures necessary to retain the structure as approved by the Engineer in charge without any extra cost.

6.12 COVER/SPACER BLOCK- The contractor shall provide approved type of support for maintaining the bars in position and ensuring required spacing and correct cover of concrete to reinforcement as called for in the drawings, by providing spacer blocks of required shape and size. Chairs and spacer bars shall be used in order to ensure accurate positioning of reinforcement. Only factory-made cover blocks shall be used. Pre-cast cement mortar/concrete blocks/blocks of polymer shall not be used as spacer blocks unless specially approved by the Engineer-in-charge.

7.0 SHUTTERING/FORMWORK:

- 7.1 The work shall be done in general as per CPWD Specifications 2019, Volume-I & II with date revisions, amendments, correction slips issued upto last date of submission of bid.
- 7.2 Double steel scaffolding having two sets of vertical supports shall be provided for external wall finish, cladding etc. The supports shall be sound and strong, tied together with horizontal pieces over which scaffolding platform shall be fixed. Scaffolding shall have steel staircase for inspection of works at upper levels.
- 7.3 In order to keep the floor finish as per architectural drawings and to provide required thickness of the flooring as per specifications, the level of top surface of R.C.C. shall be accordingly adjusted at the time of its centering, shuttering and casting for which nothing extra shall be paid to the contractor.
- 7.4 As per general engineering practice, level of floors in toilet / bath, balconies, shall be kept lower than general floors as required from waterproofing point of view. Shuttering should be adjusted accordingly. Nothing extra is payable on this account.
- 7.5 Dented, broken, cracked, twisted or rusted shuttering shall not be allowed to be used on the work.
- 7.6 The shuttering shall be cleaned properly with electrically driven sanders to remove any cement slurry or cement mortar or rust. Proper shuttering oil or de-bonding compound shall be applied on the surface of the shuttering in the requisite quantity before laying of steel reinforcement.
- 7.7 For the execution of centering and shuttering, the contractor shall use propriety shuttering oil as approved by Engineer-in-Charge and nothing extra shall be paid on this account.
- 7.8 All existing formwork that fails to meet the specifications mentioned above or do not qualify to meet the minimum standards in the view of Engineer-in-Charge shall have to be removed and stacked.

8.0 REINFORCEMENT:

- 8.1 The reinforcement work shall be done as per CPWD Specifications 2019, Volume-I & II with revisions, amendments, correction slips upto last date of bid submission (including extensions if any).
- 8.2 Reinforcement work includes all operations including straightening, cutting, bending, welding, binding with annealed steel or welding and placing in position at all the floors with all leads and lift complete as per CPWD Specifications.
- 8.3 The contractor shall provide approved type of support for maintaining the bars in position and ensuring required spacing and correct cover of concrete to reinforcement as mentioned in the drawings. Spacer blocks of required shape and size, chairs and spacer bars shall be used in order to ensure accurate positioning of reinforcement. To ensure proper cover, factory made round / rectangular type cover blocks will be used to avoid displacement of bars in any. Couplers may be used for splicing of reinforcement bars.
- 8.4 Reinforcement TMT bars, to be used for the work, shall be of grade Fe 500D or more as specified in the Schedule of Quantities.
- 8.5 Bar Bending Schedule: The agency shall prepare bar bending schedule as per structural drawings. The bar bending schedule shall conform to Indian Standard IS 2502-Code of Practice for Bending and Fixing of bars for Concrete Reinforcement.

9.0 MASONRY WORK:

The masonry work shall be done as per CPWD Specifications 2019, Volume-I & II with revisions, amendments, correction slips upto last date of bid submission (including extensions if any). In case of conflict or contradiction between detailing shown in drawings and specification mentioned herein under this subhead, the specification mentioned herein under this subhead shall be followed.

- 9.1** Chicken mesh 85gsm or fibre mesh of good quality to be provided in plaster at the junction of Masonry and RCC or CC Member/band.
- 9.2** For masonry work above plinth level, RCC band at sill level and lintel level shall be provided. This thickness of the band shall preferably be 100 mm or as approved by the Engineer-in-Charge.
- 9.3** All opening on masonry wall shall be provided with RCC lintels, RCC bands / lintel over top of parapet wall at corridors, balconies etc. with cement concrete of 1:1½:3 (1 Cement: 1½ C & D recycled stone dust: 3 graded stone aggregate 20 mm nominal size) shall be provided. If the C&D waste product are unavailable in market, the conventional products may be used by the contractor at no extra cost to department.
- 9.4** AAC blocks masonry shall be of Grade I and of oven dry density 551-650 kg/cum with polymer modified adhesive mortar above plinth level except wet areas. The polymer modified adhesive mortar shall be provided @ 30 kg per cum. AAC Block confirming the IS Code – 2185 (Part-3) 1984 (Reaffirmed 2005) shall be used. All type of internal masonry work which is affected by water shall be carried out by using Clay bricks of class designation 7.5 in the building as per CPWD specifications. In rest of the internal masonry work shall be of AAC blocks.

- a) Dimensions & Tolerances: Autoclave Aerated Concrete Block shall be made in sizes and shapes to fit different needs.
- b) The maximum variation in the length of the Autoclave Aerated Concrete Block shall not be more than plus/minus 5mm and maximum variation in the height and width of Autoclave Aerated Concrete Block, not more than plus/minus 3mm.
- c) The faces of Autoclave Aerated Concrete Block shall be flat & rectangular, opposite faces shall be parallel and all arises shall be square. The bedding surfaces shall be at right angle to the face of the Blocks. The Autoclave Aerated Concrete Block with special faces shall be manufactured and supplied if so required.
- d) The autoclaved aerated concrete block shall be classified in two grades according to their compressive strength as indicated in table below:

S.N.	Density in Oven dry Condition (Kg/m3)	Compressive Strength (N/mm2)		Thermal Conductivity in air dry condition (W/m.k)
		Grade I	Grade II	
1	451 to 550	2.00	1.50	0.21
2	551 to 650	4.00	3.00	0.24
3	651 to 750	5.00	4.00	0.30
4	751 to 850	6.00	5.00	0.37
5	851 to 1000	7.00	6.00	0.42

- e) All Autoclave Aerated Concrete Block shall be sound, free of cracks or other defects

which interfere with the proper placing of block units and impair the strength or performance of the construction. The face or faces that are to be exposed shall be free of chips, cracks or other imperfections except that if not more than 5% of a consignment contains slight cracks or small chippings not larger than 25mm, this shall not be deemed grounds for rejection.

- f) **Block Density** – The Block density shall conform to the requirements specified in above table, when tested accordance with IS 6441 (Part-1) -1972.
- g) **Compressive Strength** – The minimum compressive strength being the average of twelve block units shall be as prescribed in above table, when tested accordance with accordance with IS 6441 (Part-5) -1972.
- h) **Thermal Conductivity** – The thermal conductivity shall not exceed the values specified in above table when tested in accordance with IS 3346 -1980.
- i) **Drying Shrinkage** – The drying shrinkage shall be not more than 0.05% for grade –1 block and 0.10% for grade-2 block when tested in accordance with IS 6441 (Part-2) -1972.
- j) **Number of tests:** A sample of 24 blocks shall be selected at random. All the 24 Blocks shall be checked for dimensions and inspected for visual defects. Out of the 24 blocks, 12 blocks shall be subjected to the test for compressive strength, 3 blocks to the test for density, 3 blocks to the test for thermal conductivity and 3 blocks to the test for drying shrinkage. The remaining 3 blocks shall be reserved for re-test for drying shrinkage if a need arises.
- k) The samples of AAC blocks (each sample consisting of 6 specimen) shall be chosen randomly from the lot procured and tested for various parameters specified as above. One samples shall be tested for every **200 cum** or part thereof. However, minimum one sample shall be tested from each lot received at site if the quantity procured in the lot is less than 200 cum. If required, Engineer-in-Charge or his authorized representative shall inspect the factory during production of the material for this work and also collect samples (of materials used for making AAC blocks and precast AAC blocks) from the factory itself. The contractor shall consider this contingency also while placing the order with one of the approved firms. Nothing extra shall be payable on this account.
- l) **Criteria for conformity:** The number of blocks with dimensions outside the tolerance limit and or with visual defects, among those inspected, shall not be more than two. For density, the mean value shall be within the range as specified in above Table. For compressive strength, the mean value, say X shall be determined. The test results shall be grouped into groups of 4, individual values of ranges shall be determined, the average range a calculated from these values and shall satisfy the following condition: $X - 0.6 R > \text{minimum value specified in above Table}$. For thermal conductivity, the mean value shall be equal to or less than the value specified in above Table. For drying shrinkage, all the test specimens shall satisfy the requirements of the test. If one or more specimens fail to satisfy the requirements, the remaining 3 blocks shall be subjected to these tests. All these blocks shall satisfy the requirements.
- m) **Manufacturer's Certificate:** The manufacturer shall satisfy himself that the masonry units conform to the requirements of these specifications and, if requested, shall supply a certificate to this effect to the purchaser or his representative.

- n) **Marking:** Each lot of concrete masonry units manufactured in accordance with this specification shall preferably be marked with information-
- o The identification of the manufacture
 - o The grade and block density of the unit
 - o The month and year of manufacturing.

10.0 DOOR/WINDOW WORK:

The door/window work in general shall be carried out as per CPWD Specifications 2019, Volume-I & II with revisions, amendments, correction slips upto last date of bid submission (including extensions if any). In case of conflict or contradiction between detailing shown in drawings and specification mentioned herein under this subhead, the specification mentioned herein under this subhead shall be followed. Before taking up any procurement/construction activity, shop drawings (for fixing of all kind of doors, showing all hardwares) shall be prepared (on the basis of specification laid herein) and submitted by contractor for obtaining approval from Engineer-in-Charge.

- 10.1** Windows along with glazing shall be designed for wind loads applicable to the area/location as per relevant IS codes.
- 10.2** The samples of species of timber to be used, shall be deposited by the contractor with the Engineer-in-Charge before commencement of the work. The contractor shall produce cash vouchers and certificates from standard kiln seasoning plant operator about the timber to be used on the work having been kiln seasoned by them, failing which it would not be accepted as kiln seasoned. Specified timber shall be of good quality and well-seasoned. It shall have uniform colour, reasonably straight grains and shall be free from dead knots, cracks and sapwood.
- 10.3** Wood work shall not be painted, oiled or otherwise treated before it has been approved by the Engineer-in-Charge. All portion of timber including architrave abutting against masonry concrete stone or embedded in ground shall be painted with approved wood preservative or with boiling coal tar.
- 10.4 Toilet Cubical-** Toilet Cubical shall be provided for all the internal doors of wet areas having more than one unit of W/C, bathroom, change rooms etc. in all buildings.
- 10.5** Glazed Doors: All the glazed doors (non-fire rated) shall be made in Aluminum door frames, shutters of suitable section, (with powder coating in required shade and colour of not less than 50 microns), toughened glass with necessary fittings and fixtures of stainless steel (SS 304) required to make the door operational and function smoothly, complete as per directions of Engineer-in-charge. Necessary shop drawings should be prepared by the contractor and work shall be executed after obtaining approval from Engineer-in-charge. The thickness of glazing should not be less than 8 mm.
- 10.6** All fittings and fixtures shall be procured well in advance and the approved samples shall be kept at site till completion of the work.

11.0 FIRE CHECK/RATED DOOR:

CPWD Specification 2019 Vol. I & II with revisions, amendments, correction slips upto last date of bid submission (including extensions, if any), National Building Code (NBC) 2016 and manufacturer's specification shall be followed. Fire Check doors shall be provided in buildings wherever necessary and required as per National Building Code 2016. Unless otherwise

specified elsewhere in tender document, all fire check doors should be fire rated for 120 minute and doors of fire exit corridor should meet the requirement of fire exit corridor specified in NBC 2016. Before taking up any procurement/construction activity, shop drawings (for fixing of all kind of doors, showing all hardware) shall be prepared and submitted for obtaining approval from Engineer-in-Charge.

- 11.1** The fire check/rated door should not collapse during the rated period of the fire under specified fire conditions. The fire door should not allow the passage of hot gases or the flames through the rebate or the gap between the door frame and shutter. The integrity or smoke sealing function is achieved by fire door by incorporating an “Intumescent Seal”. This intumescent seal in the form of a strip under fire conditions expands many times its original size and forms a hard char which has high insulation properties and does not permit the smoke or flames to escape through the gap between the shutter and frame.
- 11.2** Observation, if any, made by the fire officer on the fire check/rated doors, shall be incorporated suitably.
- 11.3** Execution of Fire Check Doors shall be carried out through the specialized agencies having sufficient work experience in the same field and shall be got approved from the Engineer-in-Charge well in advance. Specialized firm shall furnish all materials, labour, accessories, equipment, tool and plant and incidentals required for providing and installing the fire check/rated doors. Contractor has to select one specialized agency from list of preferred makes and specialized agencies.
- 11.4** Fire resistance and smoke check doors shall be made of proper sizes and section as per the available opening at the site. Before proceeding with manufacturing, the contractor shall prepare and submit complete manufacture and installation drawing for approval of the Engineer-in-Charge and no work shall be performed until the approval of these drawings is obtained.
- 11.5** The term “Fire Rating” referred in tender documents means fire rating of complete assembly of fire check door e.g. frames, shutter, vision panel, glass, hinges and other hardware’s. Doors will be approved only after door passes the required tests from fire testing lab approved by the Engineer-in-Charge. Cost of sample door and testing shall be borne by contractor.
- 11.6** Doors shall be fabricated to size in factory. Fabricated material shall be protected against any damage during transportation. Loading and unloading shall be carried out with utmost care. On receipt of material at site it shall be carefully examined to detect any damaged units/members. Arrangements shall be made for expeditious replacement of damaged units or members. Materials found acceptable on inspection shall be repacked in crates and stored safely.
- 11.7** Just prior to installation, the doors shall be uncartered and stacked on edge on level bars and supported evenly. The frame shall be fixed into position true to line and level using adequate number of fasteners of approved size and manufacture and in an approved manner. The holes in concrete /masonry member for housing anchor bolts shall be drilled with an electric drilling machine only.
- 11.8** Stainless steel ball bearing hinges, panic bars, door trims, fire rated hydraulic door closers, handles, tower bolts, lock and other fittings shall be provided as per requirement and shall be got approved from Engineer-in-Charge. All hardware’s should have a minimum 02 Years of manufacturer warrantee from the date of supply. Hardware should be “CE” / “UL” certified with required fire ratings and relevant documents to this effect shall be produced at the time of approval of samples.
- 11.9** The design of fire check/rated doors and material to be used in their construction have to be such

that the doors shall be capable of providing an effective barrier of desired rating.

12.0 ALUMINIUM WORK:

- (a) Before taking up any procurement/construction activity, shop drawings (for fixing of all kind of Aluminum Works, showing all hardware) shall be prepared and submitted for obtaining approval from Engineer-in-Charge.
- (b) Minimum weight of aluminum section for door, windows and ventilators shall be as per relevant standards.
- (c) Kiln seasoned hard wood shall be filled inside door frames on hinged side and top of frames wherever hydraulic door closers are to be provided.
- (d) Frames shall be fixed with dash fastener of minimum size 10 x 100 mm as per approved shop drawings.
- (e) Gap between aluminum frame / uPVC window and adjacent RCC / masonry work shall be filled by providing weather silicon sealant over backer rod of approved quality as per direction of Engineer-in-Charge.
- (f) The material for the work shall be procured from the approved manufacturer as per list of preferred make for materials in this contract. The Contractor shall procure and submit samples of various materials to be used in the work for the approval of Engineer-in-Charge and no work shall commence before such samples are approved. Samples of un-anodized as well as polyester powder coated aluminum sections, microwave cured EPDM gaskets, glass, stainless steel screws, anchor fasteners, hardware and any other material or components requiring approval of samples, in opinion of Engineer-in-Charge, shall be submitted for the approval as mentioned above. The above samples shall be retained as standards of materials and workmanship.
- (g) Fabrication: The factory for fabrication and coating of windows/doors/frameworks shall be got approved from Engineer-charge.
- (h) All joints shall be accurately fabricated and be hairline in appearance. The finished surface shall be free from visible defects. All the windows, ventilators, doors shall be factory made and shall be brought to site for assembly and fixing.
- (i) All hardware used shall conform to the relevant specifications. Design, quality, type, number and fixing of hardware shall be generally in accordance with shop drawings and as approved by the Engineer-in-Charge before use.
- (j) All doors, windows, ventilators and glazing etc. shall be made water tight with microwave cured EPDM gaskets and weather silicone sealants to the satisfaction of the Engineer-in-Charge.
- (k) The corners of the frame being fabricated to the true right angles. Both the fixed frames and openable shutter frames shall be fabricated out of sections cut to required length, mitered and mechanically jointed for satisfactory performance. All members shall be accurately machine milled and fitted to form hairline joints. The jointing accessories such as aluminum cleats, stainless steel screws etc. shall not to cause any bi-metallic reaction by providing separators, wherever required. Vertical members of the aluminum frame work shall be embedded in the floors, wherever required, by cutting and making good of

the floor.

(l) FIXING OF ALUMINIUM FRAME WORK

- i. The screws used for fixing fixed aluminum frames of the aluminum windows to masonry walls / RCC members and aluminum members to other aluminum members shall be of stainless steel of approved make and quality and of stainless-steel grade 304. Threads of machine screws used shall conform to requirement of I.S. 4218.
- ii. For the aluminum windows, the gap between the aluminum frames and the R.C.C / Masonry and also any gaps in the various sections shall be filled with weather silicone sealant, to ensure water tightness including providing and fixing backer rod, wherever required. The weather silicone sealant shall be of such approved colour and composition that it would not stain or streak the masonry / R.C.C. work. It should not sag or flow and shall not set hard or dry out under any conditions of weather and shall be tooled properly. The weather silicone sealant shall be used as per the manufacturer's specifications and shall be of approved colour and shade. Any excess sealant shall be removed / cleared.
- iii. Fixing of glass panes shall be designed in such a way that replacing damaged / broken glass pans is easily possible without having to remove or damage any members or interior finishing materials.

(m) PROTECTIONS AND CLEANING

- i) All glass pans shall be retained within aluminum framing by use of exterior grade microwave cured EPDM gaskets. Use of glazing or caulking compounds around the perimeter of glass will not be permitted. There shall be no whistling or rattling. Before installation of glass, Contractor shall ensure the following:
 - All glazing rebates shall be square, to plumb, true to plane, dry and free from dust.
 - Glass edge shall be clean and cut to exact size and grounded.
- ii) Glass of specified thickness in doors, windows, ventilators and fixed glazing etc. shall be of approved make and standard quality conforming to C.P.W.D. Specifications.

13.0 FLOORING, MARBLE, CLADDING WORK:

All flooring work and cladding work in Granite, Tile, Marble, Stones, Wooden, PVC, Vinyl etc. in general shall be carried out as per CPWD Specifications 2019, Volume-I & II with revisions, amendments, correction slips upto last date of bid submission (including extensions if any). The tiles, stones shall be of approved colours and shades and will be laid in pattern as per approved architectural drawings or shop drawings. Nothing extra shall be paid for laying tiles, different stones in specific design/pattern. The tiles shall be of first quality of approved make and nothing extra shall be paid for use of cut/sawn tiles in the work. Before taking up any procurement/construction activity, shop drawings shall be prepared and submitted for obtaining approval from Engineer-in-Charge.

- 13.1** Proper gradient shall be given to flooring for toilets, verandah, kitchen, courtyard, corridors etc. so that the wash water flows towards the direction of floor trap. Any reverse slope if found, these shall be made good by the contractor by ripping open the floor/grading concrete and nothing shall be paid for such rectifications.

- 13.2** Samples of flooring material are to be deposited well in advance to the Engineer-in-Charge for approval. Approved samples should be kept at site with the Engineer-in-Charge and the same shall not be removed except with the written permission of Engineer-in-Charge.
- 13.3** The samples shall be submitted along with the following details:
- Three representative samples for each type of flooring/cladding specified.
 - Details of physical characteristics such as dimensional tolerances (within the specified limits), water absorption, compressive strength, Mohs Hardness, Specific gravity with reference to IS or International standards.
 - Source of supply and confirmation of availability in full quantity and uniformity of colour, tone and textures.
 - Company profile of Suppliers.
- 13.4** The Engineer-in-Charge or his representative may, if required, visit the source of supply of the various materials (Granite/Stones/Marble/Tiles/Cladding etc.) to assess the quality as well as availability of the material in the required quantities.
- 13.5** The entire supply for each type of granite/stone slabs shall be procured preferably from one location (in one quarry), and supplied preferably, in one lot to keep variations to the minimum. The Contractor shall also segregate and sort the slabs according to colour, shade, texture and size of grains etc. to keep variation(s) in stones used at any one floor to the minimum. Any slab with variation in the colour, shade, texture and size of grains etc., not acceptable to the Engineer-in-Charge, shall not be used in the work and shall be removed and replaced by the Contractor. Nothing extra shall be payable on these accounts.
- 13.6** 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 site of work 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. 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.
- 13.7** The material (Granite, Stones, Marble, Tiles, Cladding etc.) shall be transported to site well packed in boxes or otherwise. These shall be handled carefully to prevent any damage. Granite stone slabs shall be individually packed in cardboard paper. The various types of stones and tiles, procured shall be free of any surface defect or any edge damage. The damaged (Stones, Marble, Tiles, cladding etc.) shall not be allowed to be used in the work. So, the contractor shall procure additional quantity of the stone and tiles to cover such contingencies. The stone slabs shall not be waxed or touched up with dyes / colours.
- 13.8** The following tolerances shall be allowed in the dimension of granite stone slab:
- Length $\pm 1\text{mm}$
 - Width $\pm 1\text{mm}$
 - Thickness - 1mm
 - Angularity at corners $\pm 0.25\%$

The stone (slab and tiles) not meeting the above tolerance limits shall be rejected and not permitted to be used in the work. Nothing extra shall be payable on this account.

- 13.9** Stone slabs shall have uniform thicknesses within the tolerance limits and linear items like

treads, sills and jambs, coping, risers, urinal partitions, kitchen and wash basin platforms, vanity counters, facias and other similar locations etc. shall have edge polished calibrated thickness i.e. exposed edges shall have edge polished uniform thickness throughout the length of the work.

- 13.10** The flooring work shall be carried out as per the architectural drawings in design and pattern (geometric, abstract etc.) and in linear and / or curvilinear portions and in combination with stones of different colour and shade and ceramic tiles etc. For the flooring portions curved in plan, the stone slabs (at the edge) shall be cut to the required profile and shape as per the architectural drawings. Nothing extra shall be payable on this account and any consequent wastages and incidental charges on such accounts shall be deemed to be included in the cost.
- 13.11** The granite slabs used for providing and fixing in the sills, soffits and jambs of doors, windows, ventilators and similar locations shall be in single piece unless otherwise directed by the Engineer-in-Charge. Wherever stone slab other than in single piece is allowed to be fixed, the joints shall be provided as per the architectural drawings and as per the directions of the Engineer-in-Charge. In the cabin areas, the joints in sills shall preferably be provided in line with the partition wall. Depending on the number of joints, as far as possible, the stone slabs shall be procured and fixed in slabs of equal lengths as per the architectural drawings and as directed by Engineer-in-Charge.
- 13.12** The specifications for dressing, laying, curing, finishing etc. for the granite stone flooring shall be same as that of works for the Marble flooring, skirting and risers of steps under Flooring Sub Head of the CPWD Specifications. The wall lining / veneer work with granite stone shall be as per the CPWD Specifications for Marble work Sub Head.
- 13.13** For flooring work, the joints between the different types of flooring shall be located as per the architectural drawings. Also, the contractor shall maintain the uniform level of the finished flooring of the different types unless specifically mentioned on the architectural drawings.
- 13.14** All the flooring works specified under this sub-head shall be adequately protected by a layer of plaster of paris which shall be laid over a 400-micron PVC film. POP protection layer shall be laid on all finished floors for protection from damage during execution of other items of work in that area which shall be removed and cleaned just before handing over of the premises.
- 13.15** One piece Granite stone for treads / risers in staircase shall be used including rounding of nose.
- 13.16** For the skirting in the enclosures with curvilinear profiles, the (Stones, Marble, Tiles, cladding etc.) shall be cut to the required size and the shape to match the profile and/ or the joints as per the architectural drawings. Similarly, the skirting shall be fixed in a manner as to flush or project from the finished face of the wall as per the architectural drawings and as directed by the Engineer – in– Charge. Any chasing of the masonry works required for such fixing is deemed to be included in the cost of masonry.
- 13.17** Granite stone tiles and slabs shall be pre polished (mirror polished), eggshell polished, flame finished or given any other surface treatment as specified in architectural drawings and as directed by the Engineer-in-Charge.
- 13.18** Machine polishing and cutting to required size shall be done with water (as lubricant) only. Sawing shall also be done preferably with water as lubricant but as a special case, the Engineer-in-Charge may permit, at his discretion, oil or kerosene as lubricant subject to all kerosene or oil in the body and surface of tiles / slabs being thoroughly dried in ovens. Tiles / slabs with stains or patches due to the use of oil or otherwise, either before or after installation, shall be rejected and shall be replaced by the contractor at his own cost.

- 13.19** The exposed cut edges of the kota stone slab in risers and treads along its width (sides of the risers and treads of the steps i.e. along the shorter dimensions of the kota stone slab for the risers and treads) shall be polished in a workmanlike manner. The top exposed edge of the kota stone skirting shall also be polished in a workmanlike manner.
- 13.20** Nosing / edge moulding shall be provided to the front edge of the kota stone slab treads along its length i.e. along the longer dimensions of the Kota stone slab, as per the architectural drawings.
- 13.21** At the time of handing over, flooring & dado / cladding shall be free of any scratches, stains etc. The flooring & dado / cladding shall be properly cleaned before handing over. However, abrasive cleaners shall not be used to clean the marks and other scratches.

14.0 ROOFING WORK:

All roofing work in general shall be carried out as per CPWD Specifications 2019, Volume-I & II with revisions, amendments, correction slips upto last date of bid submission (including extensions if any). Before taking up any procurement/construction activity, shop drawings shall be prepared and submitted for obtaining approval from Engineer-in-Charge.

- 14.1** At inlet mouth of rain water pipe, cast iron grating 15 cm diameter and weighing not less than 440 grams shall be provided.

15.0 FINISHING WORK:

- 15.1** Necessary drip course shall be provided in Chajja, Balcony, Projecting Roof, Beams etc.
- 15.2** All the internal surfaces including exposed ceiling (non-false ceiling areas) shall be finished with 2 mm thick POP, one coat of cement primer and two or more coats of paints.
- 15.3** Application of paints shall be done with mechanical equipment. Mechanical sanding machine (for scrubbing & preparation of surface) shall be used by the contractor.
- 15.4** All the steel work shall be applied two or more coats of synthetic enamel paint over a coat of suitable primer of approved brand and manufacture with ready mixed red oxide zinc chromatic on steel / iron works having VOC content less than 250 grams/litre.

16.0 STAINLESS STEEL WORK:

Stainless steel of grade SS 316 grade Aluminum Mild steel/GI railings and grills shall be provided as per architectural design in Balconies, staircases, steps, Ramp's corridors and in other common circulation area as indicated in drawings and in accordance with provisions of **National Building Construction Standards 2026**.

Unless otherwise specified, stainless steel generally shall be of SS 316. Lower grades shall not be used. Before taking up any procurement/construction activity, shop drawings shall be prepared and submitted for obtaining approval from Engineer-in-Charge.

Factory-made stainless-steel railing shall be provided with SS 316 grade stainless steel with adequate rods parallel to handrail, balusters, flanges, end caps, newel posts with caps etc. complete as per approved drawings and direction of Engineer-in-charge.

Surface finish of all the stainless-steel materials will be in 240 grit satin finish / matt finish. All

stainless-steel material will have to be coated by a solution of Inox to avoid finger in prints and avoidance of settlement of environment / atmospheric dust. Stainless steel railing, both sides in staircase and external ramp with double handrail shall be used for barrier free accessibility requirements with adequate SS balusters, runners etc. as per approved architectural drawing. Fixing shall be done by stainless steel expansion bolts of approved size and make as per direction of Engineer-in-Charge. Welding shall be done by using organ welding rods and the surface being duly finished and cleaned by K2 passivation, which is nitric acid plus florid acid solution treatment by which the chances of corrosion will be eliminated and any burn out makes on the metal will also be eliminated.

17.0 WATER PROOFING & INSULATION WORK:

For waterproofing of works below plinth/ground/road level complete envelope/box shall be ensured. All the RCC works shall be given waterproofing treatment by adding the cementitious integral crystalline admixture in reinforced cement concrete at site of work.

1. The work shall be got executed as per CPWD Specifications and as per the manufacturer's specification through specialized agency as approved by the Engineer-in-charge.

The contractor shall furnish the following particulars immediately after the issue of letter of acceptance by the department.

- a) The name of the specialized firm.
- b) The trade names of the product, which would be used.
- c) List of works where the treatment has been used.
- d) Quantity of chlorides and sulphides used in the product.

GUARANTEE FOR WATER PROOFING TREATMENT

2. The contractor shall be fully responsible for and shall guarantee proper performance of the entire waterproofing system for a period of 10 (Ten) years from the final completion of works. In addition, specific 10 years written guarantee (to be furnished in a non-judicial stamp paper of value not less than Rs.100/-) in approved proforma shall be submitted for the performance of the system, before final payment and shall not in any way limit any other rights the Employer may have under the contract. Guarantee for water proofing shall comprises of all the items described above in particular specification.
3. All water-proofing work shall be carried out through approved specialist agency as per method of working approved by the Engineer-in-charge. However, the contractor shall be solely responsible for waterproofing treatment until the expiry of the above guarantee period.
4. TEN years guarantee in prescribed proforma attached shall be given by the contractor for the water proofing treatment. Towards that 10% (ten percent) of the cost of these items of water proofing under this sub head worked out on prevailing market rate shall be retained as guarantee to watch the performance of the work executed. However, half of this amount (withheld) would be released after five years from the date of completion of the work, if the performance of the waterproofing works is satisfactory. The remaining withheld amount shall be released after completion of ten years from the date of completion of work, if the performance of the waterproofing work is satisfactory. If any defect is noticed during the guarantee period, it should be rectified by the contractor within seven days of issuing of notice by the Engineer-in-Charge and, if not attended to, the same shall be got done through other agency at the risk and cost of the contractor and recovery shall be affected from the amount retained towards guarantee. In any case, the contractor and the specialist agency, during the guarantee period, shall inspect and examine the treatment once in every year and make good any defect observed and confirm the same in writing. The security deposit can be released in full, if bank guarantee of equivalent amount, valid for the

duration of guarantee period, is produced and deposited with the department.

18.0 ROAD WORK:

- 18.1** All roads will be cement concrete roads, as per MORTH specifications (Latest edition), laid over sub grade (duly prepared with power roller) of required thickness as per design. The drainage, signages (Informative, Mandatory, Regulatory etc.) other works associated with road works shall be provided as per relevant standards and specification MORTH Specifications for Road and bridge work (Latest edition).

19.0 SIGNAGES:

Signages inside/outside buildings shall be as per **National Building Construction Standards** 2026 guidelines and of approved design and make with LED backlit. Each room shall be provided with Name Boards, Numbering of rooms, Signages etc. The contractor shall prepare the detailed shop drawing in compliance to the **National Building Construction Standards** 2026 guidelines and Harmonized Guidelines & Standards for Universal Accessibility in India 2021 (available on CPWD Website) of Ministry of Housing and Urban Affairs, Government of India.

Signage works include providing and fixing Building Entrance signage, Tactile Layout, Emergency Evacuation Layout on the wall or with any other required structure. Each signboard shall be fixed strictly as per the Harmonised Guidelines & Space Standards for Barrier Free Built Environment for persons with Disability, issued by MOUD, Govt. of India, and as per approved drawings and complete as per the directions of Engineer - In - Charge.

20.0 Sanitary Installations and Water Supply:

All the work in general shall be carried out as per CPWD Specifications 2019, Volume-I & II with revisions, amendments, correction slips upto last date of submission of bid. The work shall be in conformity with the bye-laws, regulations and standards of the local authorities concerned. The contractor shall be responsible for the protection of the sanitary and water supply fittings, other fittings and fixtures against pilferage and breakage during the period of installation and thereafter until the building/work is handed over.

- a) All Storm pipes/ NP2 RCC pipes shall be complete with fittings.
- b) All concealed work shall include cutting chases and making good the walls etc.
- c) In toilets and other waste water disposal areas sanitary pipe lines shall be suspended from the floor slabs i.e. the floor slabs should not be depressed on account of accommodating sanitary lines. These overhanging sanitary lines shall be camouflaged by moisture resistant false ceiling.
- d) Plumbing system shall be designed and provided as per the functional requirements of the buildings.
- e) Double stack system shall be followed. All sewerage to be connected to one stack and all drainage to be connected to other stack.
- f) Water supply and sanitary fittings shall be provided as per the functional and architectural requirements.

- g) Pipes shall be duly fixed to the wall by bracket. All pipes shall be fixed with clamps at maximum 1.00 m spacing.
- h) All drainage in balconies shall have their inlets in plan. All drainage through balconies shall be connected to Rain Water Harvesting.
- i) Utility balcony drainage shall be suitably treated and shall not be connected to Rain Water Harvesting System.
- j) For buildings, the stacks shall be provided in shafts which shall be covered with weather proof doors and accessible for maintenance.
- k) **Soil, Waste, Vent & Rainwater Pipes & Fittings:** Two pipe system as recommended in code of practice for soil and waste pipes as per (IS: 5329). Separate vertical stacks for **Soil pipes** (to carry the wastes from WC's & urinals) and **Waste pipes** (to carry the wastes from waste appliances e.g. showers, lavatory basins, kitchen sinks etc.) shall be provided.
- l) The soil, waste, vent pipes system shall include horizontal soil, waste and vent pipes, and all fittings, joints, clamps, connections to fixtures, floor and urinal traps, cleanout plugs, inlet fittings, UPVC rain water pipes, testing of all pipe lines.
- m) All sanitary ware & C.P brass fittings shall be low flow rate fixtures to meet the green rating requirement. Single lever basin mixer shall be provided with all wash basins. Urinal shall be provided with automatic sensor based flushing system.
- n) Contractor shall furnish without cost all such accessories and fixing devices that are necessary and required but not supplied along with the plumbing fixtures & CP fittings by the manufacturers as a part of the original and standard supply. All fittings and fixtures shall be fixed in a neat workmanlike manner true to level and heights shown on the drawings and in accordance with the manufacturer's recommendations. Care shall be taken to fix all inlet and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, tiling or terrace shall be made good at contractor's cost. Fixing screws shall be half round head chromium plated brass screws with C.P. washers where necessary. Contractor shall seal all fixtures fixed near wall, marble and edges. With an approved type of poly-sulphide sealant appropriate for its application.

21.0 Drainage (External Water-Supply/Sewerage/Storm Water Drainage/Rain Water Harvesting System): Inspection chambers/manholes/ gullies chambers/ valves and other accessories of approved specifications and make shall be provided considering all the site conditions and reduced level as per design parameters. As far as possible green and recyclable materials shall be preferred.

- a) All drainage work shall be done in accordance with the local municipal bye-laws. Location of all manholes, etc. shall be got approved from the engineer in charge. No drains or sewers shall be laid in the middle of road unless otherwise specifically shown on the drawings or directed by the Engineer in charge.
- b) The contractor shall design the rain water harvesting system and construct the same for entire campus in holistic manner. Rainwater harvesting system shall be designed and

provided as appropriate to the site and as per municipal byelaws and Central Ground Water Board norms.

- c) Unless otherwise specified, minimum & maximum velocity of sewer pipe shall be 0.75 m/sec & 2.0 m/sec respectively. Unless otherwise specified, minimum & maximum velocity of Storm water pipe shall be 0.6 m/sec & 2.0 m/sec respectively.
- d) Manhole shall be built in brick masonry with common burnt clay F.P.S. (Non-modular) bricks class designation 7.5 with cover and frame (SFRC) or as specified/shown in drawings. Size and depth of manholes shall be as per **National Building Construction Standards 2026 / CPWD specifications**.
- e) Gully traps: Gully traps shall be fixed in cement concrete mix and a brick masonry chamber 30x30 Centimeter inside in cement mortar 1:5 with 15x15 CMS grating inside and 30x30 Centimeter C.I sealed cover and frame weighing not less than 7.0 kg (approx.) to be constructed as per detailed drawing.

22.0 HORTICULTURE & LANDSCAPE WORK: Contractor shall furnish all materials, labour etc. terms necessary to complete the work indicated on drawing and specified here in.

22.1 MATERIALS:

a) Plant materials:

- (i) All plant materials shall be healthy, sound, and vigorous, free from plant disease, insect pests or their eggs, and shall have healthy, well-developed root systems.
 - (ii) All plants shall be hardy under climatic conditions similar to those in the locality of the project. No plant material will be accepted if branches are damaged or broken. All material must be protected from the sun and weather until planted.
 - (iii) Any nursery stock shall have been inspected and approved by the Engineer-in-Charge.
 - (iv) Plants shall be delivered with legible identification labels.
- b) **Topsoil:** Topsoil or good earth shall be a friable loam, typical of cultivated topsoil of the locality containing at least 2% of decayed organic matter (humus). It shall be taken from a well-drained arable site. It shall be free of subsoil, stones, earth clods, sticks, roots or other objectionable extraneous matter or debris. It shall contain no toxic material. No topsoil shall be delivered in a muddy condition. Good earth shall have PH range 6.5 to 7.5
- c) **Manure (as locally available):** Dry farm yard manure shall be used. It shall be free from extraneous matter, harmful bacteria insects or chemicals.
- d) **Root System:** The root system shall be conducive to successful transplantation. Where necessary, the root-ball shall be preserved by support with hessian or other suitable material. On soils where retention of a good ball is not possible, the roots should be suitably protected in some other way which should not cause any damage to roots.
- e) **Condition:** Trees and shrubs shall be substantially free from pests and diseases, and shall be materially undamaged. Torn or lacerated roots shall be pruned before dispatch. No roots shall be subjected to adverse conditions, such as prolonged exposure to drying winds or

subjection to water-logging, between lifting and delivery.

- f) **Supply and substitution:** Upon submission of evidence that certain materials including plant materials are not available, the contractor shall be permitted to substitute other material and plants, with an equitable adjustment of price. All substitutions shall be of the nearest equivalent species and variety to the original specified and shall be subject to the approval of the engineer-in-charge.
- g) **Packaging:** Packaging shall be adequate for the protection of the plants and such as to avoid heating or drying out.
- h) **Marking:** Each specimen of tree and shrub, or each bundle, shall be legibly labelled with the name of the supplier and the date of dispatch from the nursery, unless otherwise agreed.

22.2 TREES, ORNAMENTAL PLANTS & PALMS PLANTING:

- a. Trees should be supplied with adequate protection as approved. After delivery, if planting is not to be carried out immediately, balled plants should be placed cheek to cheek and the ball covered with sand to prevent drying out. Bare-rooted plants can be heeled in by placing the roots in a prepared trench and covering them with earth which should be watered into avoid air pockets round the roots.
- b. **Digging of Pits:** Tree pits shall be dug a minimum of three weeks prior to backfilling. The pit sizes shall be as specified further herein. It shall be replaced with soil mixture as specified further herein. While digging the pits, the top soil up to a depth of 30 cm may be kept aside, if found good (depending upon site conditions) and mixed with the rest of the soil. If the soil is bad below, it shall be replaced with the soil mixture as specified further herein. The bottom of the pit shall be forked to break up the sub-soil.
- c. **Backfilling:** If the excavated soil is normal, it shall be mixed with manure. River sand shall be added to the soil if it is heavy. However, if the soil is bad, the pit shall be refilled with imported good garden soil mixed with manure 2:1 by volume (2 parts of stacked volume of earth after 20% reduction: 1 part of stacked volume of manure after 8% reduction). The soil backfilled has to be watered through and gently pressed down a day previous to planting to make sure that it may not further settle down after planting. The rest 100mm shall be filled with manure. The soil shall be pressed down firmly by treading it down, leaving a shallow depression all around for watering.
- d. **Planting:** No tree pits shall be dug until final tree positions have been pegged out for approval. Care shall be taken that the plant sapling when planted is not buried deeper than in the nursery, or in the pot. Planting should not be carried out in water logged soil. Plant trees at the original soil depth; the soil marks on the stem are an indication of this and it should be maintained on the finished level, allowing for setting of the soil after planting. All plastic and other imperishable containers should be removed before planting. Any broken or damaged roots should be cut back to sound growth. The bottom of the planting pit should be covered with 50mm to 75mm of soil. Bare roots should be spread evenly in the planting pit; and small mound in the center of the pits on which the roots are placed will aid an even spread. Soil should be placed around the roots, gently shaking the tree to allow the soil particles to sift into the root system to ensure close contact with all roots and to prevent air pockets. Backfill soil should be firmed as filling proceeds, layer by layer, care being taken to avoid to avoid damaging the roots, as follows:
 - o Chlorpyrifos emulsifiable concentrate 0.2% shall be applied on walls of pit, and

initially pit shall be filled to 200 depths with earth mixed Chlorpyrifos emulsifiable concentrate 0.2%. The balance earth shall be filled in with manure in proportion as specified further herein. Chlorpyrifos emulsifiable concentrate 0.2% shall be applied every 15 days.

- e. **Staking:** Newly planted trees must be held firmly although not rigidly by staking to prevent a pocket forming around the stem and newly formed fibrous roots being broken by mechanical pulling as the tree rocks.
- f. **Methods:** The main methods of staking shall be:
 - i) A single vertical stake, 900mm longer than the clear stem of the tree, driven 600mm to 900mm into the soil.
 - ii) Two stakes as above driven firmly on either side of the tree with a cross-bar to which the stem is attached. Suitable for bare-rooted or balled material.
 - iii) A single stake driven in at an angle at 45° and leaning towards the prevailing wind, the stem just below the lowest branch being attached to the stake. Suitable for small bare-rooted or balled material.
 - iv) For plant material 3m to 4.50 m high with a single stem a three-wire adjustable guy system may be used in exposed situations.
 - v) The end of stake should be pointed and the lower 1.0m to 1.20m should be coated with a non-injurious wood preservative allowing at least 150mm above ground level.
- g. **Tying:** Each tree should be firmly secured to the stake so as to prevent excessive movement. Abrasion must be avoided by using a buffer, rubber or hessian, between the tree and stake. The tree should be secured at a point just below its lowest branch, and also just above ground Level; normally two ties should be used for tree. These be adjusted or replaced to allow for growth.
- h. **Watering:** The contractor should allow for the adequate watering in of all newly planted trees and shrubs immediately after planting and he shall during the following growing seasons, keep the plant material well-watered.
- i. **Fertilizing:** Fertilizing shall be carried out by application in rotation of the following fertilizers, every 15 days from the beginning of the monsoon till the end of winter: - sludge of organic well-rotted dry farmyard manure or vermicomposting or approved organic manure as per directions of engineer-in-charge.

22.3 SHRUBS, GROUND COVERS, CREEPERS PLANTING IN PLANTERS AND BEDS

- a) All areas to be planted with shrubs shall be excavated, trenched to a depth of 600 mm, refilling it with finely mixed good black garden soil and excavated earth (after breaking the clods and mixing with sludge in the ratio as specified further herein. Backfill soil should be firmed as filling proceeds, layer by layer, care being taken to avoid to avoid damaging the roots, as follows:
 - o Chlorpyrifos emulsifiable concentrate 0.2% shall be applied on walls of pit. The balance earth shall be filled in a mixture with manure in proportion as specified further herein. Chlorpyrifos emulsifiable concentrate 0.2% concentration shall be applied every 15 days.

- b) Tall shrubs may need staking, which shall be provided if approved by the engineer-in-charge depending upon the conditions of individual plant specimen.
- c) For planting shrubs and ground cover shrubs in planters, good earth shall be mixed with sludge in the proportion as above and filled in planters.
- d) Positions of shrubs to be planted should be marked out in accordance with the planting plan. When shrubs are set out, precautions should be taken to prevent roots drying. Planting holes (of sizes as specified further herein) should be excavated for longer shrubs. Polythene and other non-perishable containers should be removed and any badly damaged roots carefully pruned. The shrubs should then be set in holes so that the soil level, after settlement, will be at the original soil mark on the stem of the shrub. The hole should be backfilled to half pots depth and firmed by treading. The remainder of the soil can then be returned and again firmed by treading.

22.4 GRASS AREAS:

- a. Mixing earth and manure in proportion 8:1 and spreading to a thickness of 200mm.
- b. Fine dressing the ground (to levels specified).
- c. Grassing with selection No. 1 grass including watering and maintenance of the lawn for 60 days or more till the grass forms a thick lawn, free from weeds and fit for mowing including supplying good earth, if needed.
- d. In rows 5 cm apart in both directions
- e. Flooding the ground with water including making kiaries and dismantling the same.

22.5 GROUND COVER AND HERBAL PLANTS

- a) Pit Preparation: Preparing planting beds for ground covers planting by excavating and refilling the same with sweet earth mixed with manure 8:1 by volume (8 parts of stacked volume of earth after 20 % reduction: 1 part of stacked volume of manure after 8 % reduction), flooding with water, dressing including removal of rubbish and surplus earth if any with all leads and lifts; excluding cost of earth and manure. Unless otherwise specified, pit size shall be 0.15m x 0.15m x 0.30 m.
- b) Supply and plantation: Planting best quality ground covers of species and height as specified. All ground covers to be planted should be best quality pot-grown healthy ground covers inclusive of preparation and cultivation of ground cover beds as specified. All plants to be approved before planting.

22.6 CREEPERS

- a) Pit Preparation: Preparing planting beds for creepers planting by excavating and refilling the same with sweet earth mixed with manure 8:1 by volume (8 parts of stacked volume of earth after 20 % reduction: 1 part of stacked volume of manure after 8 % reduction), flooding with water, dressing including removal of rubbish and surplus earth if any with all leads and lifts; excluding cost of earth and manure. Unless otherwise specified, the pit size shall be 0.6m x 0.6m x 0.6m.
- b) Supply and plantation: Planting best quality creepers of species and height as specified. All ground covers to be planted should be best quality pot-grown healthy ground covers inclusive of preparation and cultivation of creeper beds as specified. All plants to be approved before planting

LIST OF PREFERRED MAKE / MANUFACTURERS FOR DIFFERENT MATERIALS TO BE USED IN THIS PROJECT FOR CIVIL & HORTICULTURE WORKS

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
1	ANTI TERMITE PESTICIDES	BAYER, FMC INDIA, HINDUSTAN INSECTICIDES
2	ALUMINIUM COMPOSITE PANEL	ALUCOBOND, REYNOBOND, ALSTONE, ALUDECOR
3	ADHESIVE TAPE	3M, NORTON, TESA
4	AAC BLOCK	TATA TISCO BUILD, ULTRATECH (XTRLITE), BIRLA AEROCON, FINECRETE
5	ALUMINIUM SECTIONS FOR DOORS & WINDOWS ETC.	JINDAL, HINDALCO
6	AAC BLOCK ADHESIVE	ULTRATECH, ARDEX ENDURA, WEBER
7	ACOUSTIC SEAL / DOOR SEAL	LORIENT, RAVEN, DORMA, 3M, HAFELE
8	AIR TRANSFER GRILL	RUSKIN, SYSTEM AIR, TROX, TREMCO
9	ACOUSTICAL PANELS, ACOUSTICAL FALSE CELING, ACOUSTICAL CLADDING, ACOUSTICAL CLOUD CEILING, ACOUSTICAL CARPET FLOORING, ACOUSTICAL GLASS FIBER REINFORCED GYPSUM PANEL/ BOARD, ACOUSTICAL SPRAY	ARMSTRONG, GYPTECH, ECOPHON- SAINT GOBAIN
10	BITUMEN MEMBRANE FOR WATERPROOFING, HDPE MEMBRANE FOR WATERPROOFING, POLYUREA MEMBRANE FOR WATERPROOFING	SIKA, SAINT GOBAIN, FOSROC, PIDILITE
11	BAMBOO DECKING, ROOFING & CLADDING	ECO GREEN FLOORING, LAMIWOOD, EPITOME BAMBOOWOOD
12	BACKER ROD	SUPREME/SYSTRANS
13	CEMENT	ACC, AMBUJA, ULTRATECH, JK CEMENT, WONDER
14	CERAMIC GLAZED TILES	SOMANY, KAJARIA, RAK
15	CRYSTALLIANE CEMENTITIOUS WATERPROOFING COMPOUND	XYPEX, KRYTON
16	CALCIUM SILICATE BOARD FOR FIRE DOOR	PROMOTECH, PROMINA, RAMCO
17	CPVC PIPES	ASTRAL, PRINCE, SFMC
18	CALCIUM SILICATE TILES FALSE CEILING	AEROLITE, RAMCO, HILUX
19	C.P. BRASS FITTING AND ACESSORIES	ROCA, KOHLER, TOTO, GROHE
20	DASH, ANCHORING FASTENERS	HILTI, FISCHER
21	EPDM GASKET	HANU, ANAND, VICTOR
22	EPOXY MORTAR	FOSROC, SIKA, MYK LATICRETE
23	EXPANSION JOINT	MIGUA, CS, CAMEO
24	ENGINEERED WOODEN FLOORING AND SKIRTING	MIKASA (GREENLAM), TARKETT, HAVWOODS, PARADOR (HIL), PERGO, KAHRS
25	ENGINEERED MARBLE	HR JOHNSON, KALINGA STONE

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
26	FIRE SEALANT	HILTI, 3M, MCCOY
27	FLOAT GLASS, REFLECTIVE GLASS, TINTED GLASS, HIGH PERFORMANCE GLASS, LOOKING GLASS / MIRROR LACQUERED GLASS, HIGH PERFORMANCE GLASS, FIRE RESISTANT GLASS	MODI GLASS, SAINT GOBAIN GLASS
28	FIRE CHECK DOORS (METAL/ROLLING/GLAZED)	PACIFIC FIRE CONTROLS, JC FIRE DOOR
29	FLOOR HARDENER, POLYSULPHIDE SEALANT, WATERPROOFING COMPOUND, ADMIXTURES/ CURING COMPOUND	FORSROC, PIDILITE, SOPREMA, ASIAN PAINTS
30	FIRE STOP IN CURTAIN WALL SYSTEM	HILTI, 3M, FISCHER, LORIENT
31	FLY ASH BRICKS	SIPOREX, SUNVIK, HIL
32	GYPSUM BOARD	SAINT GOBAIN, ARMSTRONG, LAFARGE, GYPTECH
33	GI PIPES	JINDAL HISAR, TATA
34	GI FITTINGS	UNIK, TATA, JINDAL
35	GLASS MOSAIC TILE	ITALIA, CORAL, KAJARIA
36	HIGH PERFORMANCE EPOXY BASED RESIN ANCHOR SYSTEM	HILTI, FOSROC, CICO
37	HDPE PIPES	SUPREME, FINOLEX, ASTRAL, RELIANCE
38	HYDRAULIC DOOR CLOSER, FLOOR SPRING, DOOR AUTOMATION, HARDWARES FOR FIRE RATED DOORS, STAINLESS STEEL FITTINGS/HARDWARE FOR WOODEN/METAL/GLAZED/STEEL DOOR & WINDOWS, FRICTION STAY HINGES, HARDWARE FITTINGS FOR ALUMINIUM WINDOWS & DOORS	DORMA, GEZE, EBCO, HAFELE, HORMANN
39	INTUMESCENT FIRE / SMOKESEAL	ASTRO FLAME, RAVEN, SEALZ, LORIENT
40	MECHANICAL COUPERS	USHA MARTIN, DEXTRA, HALFEN, SANFIELD
41	MS SECTIONS (PIPES, BOXES CHANNELS)	JINDAL HISAR, TATA
42	METAL/ALUMINUM FALSE CEILING	SAINT GOBAIN, HUNTER DOUGLUS, ARMSTRONG, GYPTECH
43	OUTDOOR SIGNAGES	3M, AVERY DENNISON, VEDAAANSHI SIGNS
44	PLY BOARD, PLYWOOD (PINE BOARD), LAMINATE, FLUSH DOOR (ALL FLUSH DOORS SHALL BE PROCURED FROM FULLY OWNED FACTORY OF THE MANUFACTURER AND NOT FROM JV / OUTSOURCED), PRELAMINATED PARTICLE BOARD	GREENLAM, MERINO, CENTURY, DURO, KIT PLY
45	POLYCARBONATE SHEET	DANPALON, SOLALITE, DPI SYSTEM, EVERLITE, CPI
46	POP OUT VENT FOR FAÇADE AND SYSTEM WINDOW HARDWARE	COTSWOLD, SCHUCO, ALUK, REYNAERS
47	PRECAST PAVER BLOCK	ACC, NOVACO, ULTRATECH, MODI COVER BLOCKS
48	READY MIXED CEMENT CONCRETE	ACC, ULTRA TECH, AFCON, LAFARGE (NUVACO)
49	READY MIX GYPSUM PLASTER	SAINT GOBAIN, ULTRATECH
50	READY MIX CEMENT PLASTER	WEBER, ULTRATECH, BIRLA
51	ROLLER BLIND	VISTA, MAC, HUNTER DOUGLUS

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
52	CORROSION RESISTANT STEEL (TMT FE-500D OR MORE)	TATA., RINL, JINDAL STEEL & POWER LTD, JSW STEEL LTD., SAIL
53	STRUCTURAL STEEL SECTIONS	TATA, JINDAL, SAIL, RINL
54	SILICON SEALANT	GE, DOW CORNING, PIDILITE
55	S.S. MATERIAL/HADRAILS/RAILINGS	JINDAL STAINLESS STEEL LTD., TATA STEEL, SAIL
56	SOIL, WASTE, VENT PIPES & FITTINGS	ASTRAL, PRINCE, SFMC, SUPREME
57	SS SINK	NILKANTH, NIRALI, JAYNA
58	SANITARY WARE (URINAL, WASH BASIN, WC ETC.)	GROHE, KOHLER, TOTO
59	SS TACTILE	EMINENT, FERROTECH, SUNDARAM, JINDAL
60	SLUICE VALVES, GATE / BALL VALVES	ZOLOTO, KIRLOSKAR, LEADER
61	TILE ADHESIVE, STONE ADHESIVE, EPOXY GROUTING COMPOUND	PIDILITE, ARDEX ENDURA, WEBER
62	UPVC WINDOWS	FENESTA, ALUPLAST, KOENMERLING
63	VITRIFIED TILES (DOUBLE CHARGED / FULL BODY/ULTRA SLIM /ANTISKID / ACID-ALKALI RESISTANT)- (ALL TILES SHALL BE PROCURED FROM FULLY OWNED FACTORY OF THE MANUFACTURER AND NOT FROM JV / OUTSOURCED)	SOMANY, KAJARIA, RAK, NITCO
64	VINYL / CONDUCTIVE FLOORING, DADO SKIRTING	FORBO, TARAKETT, ARMSTRONG, GERFLOOR
65	WHITE CEMENT	BIRLA, J.K. WHITE, ULTRATECH
66	WATER-PROOF CEMENT PAINT, SYNTHETIC ENAMEL PAINT, PLASTIC EMULSION PAINT, DISTEMPER/ACRYLIC EMULSION PAINT, TEXTURED PAINT, STEEL PRIMER, WOOD PRIMER, EXTERIOR WATERPROOFING PAINT, WOOD FINISH (MELAMINE & PU POLISH)	ASIAN PAINT, NEROLAC, ICI
67	WOOD ADHESIVE	FEVICOL, 3M, ARALDITE
68	WALL PUTTY	JK, BIRLA, ASAIN PAINT
69	WPC (WOOD POLYMER COMPOSITE) DOOR SHUTTER, FRAME	GREENPLY, CENTURY, RAJSHREE, ALSTONE INDUSTRIES PVT LTD
70	WEATHER/STRUCTURE SILICON SEALANT	WACKER, MCCOY, DOW CORNING
71	AUTOMATIC SLIDING GLASS DOOR WITH COMPLETE MECHANISM	DORMA, AUTO INGRESS, GEZE, GODREJ, HAFELE
72	GEOCOMPOSITE GEOMAT	TERRASHIELD, MACCAFERRI, TECHFAB, HMBS TEXTILES

Note: - The articles / materials which are not mentioned in the above said list shall be approved by the NIT approving authority before execution of work.

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION OF SPECILAISED WORKS

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

WHEREAS THIS agreement is supplementary to a contract (Hereinafter called the Contract) dated and made between the GUARANTOR OF THE ONE PART AND the Government of the other part whereby the contractor inter alia undertook to remove all the defects in(name of specialized work) in said contract completely.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain intact without any defect for (No. of years) from the date of completion of the work.

NOW THE GUARANTOR hereby guarantee that the works executed by him will remain intact and full functional without any defects of any kind for(No. of years) to be reckoned from the date of completion of work under the contract.

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

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

That if the guarantor fails to make good all defects or commits breach there under, then the Guarantor will indemnify Engineer-in-Charge and his successor against all loss, damage, cost expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and / or cost incurred by the Government, the decision of the Engineer-in-charge will be final and binding on both the parties.

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

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

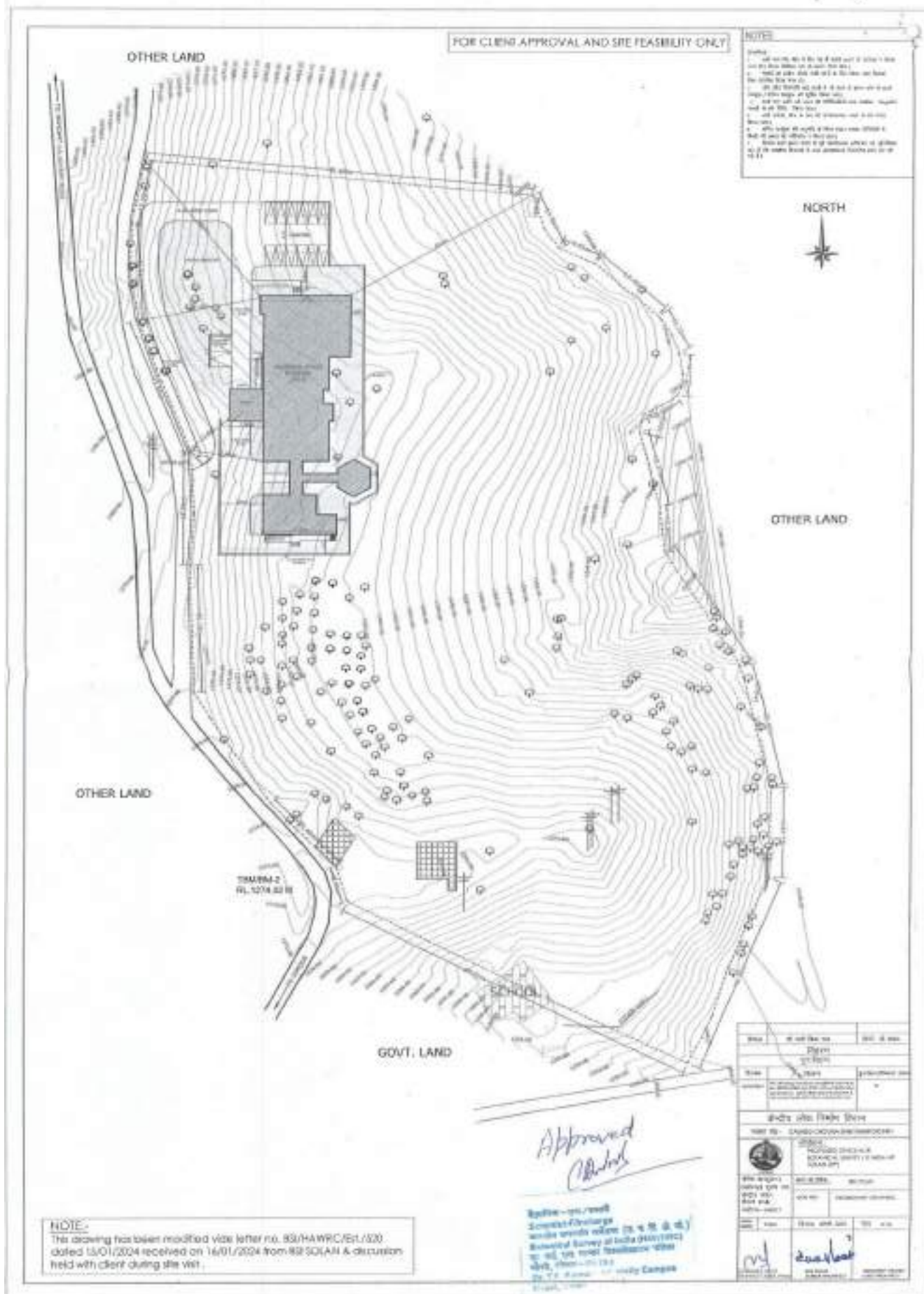
1. 2.

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

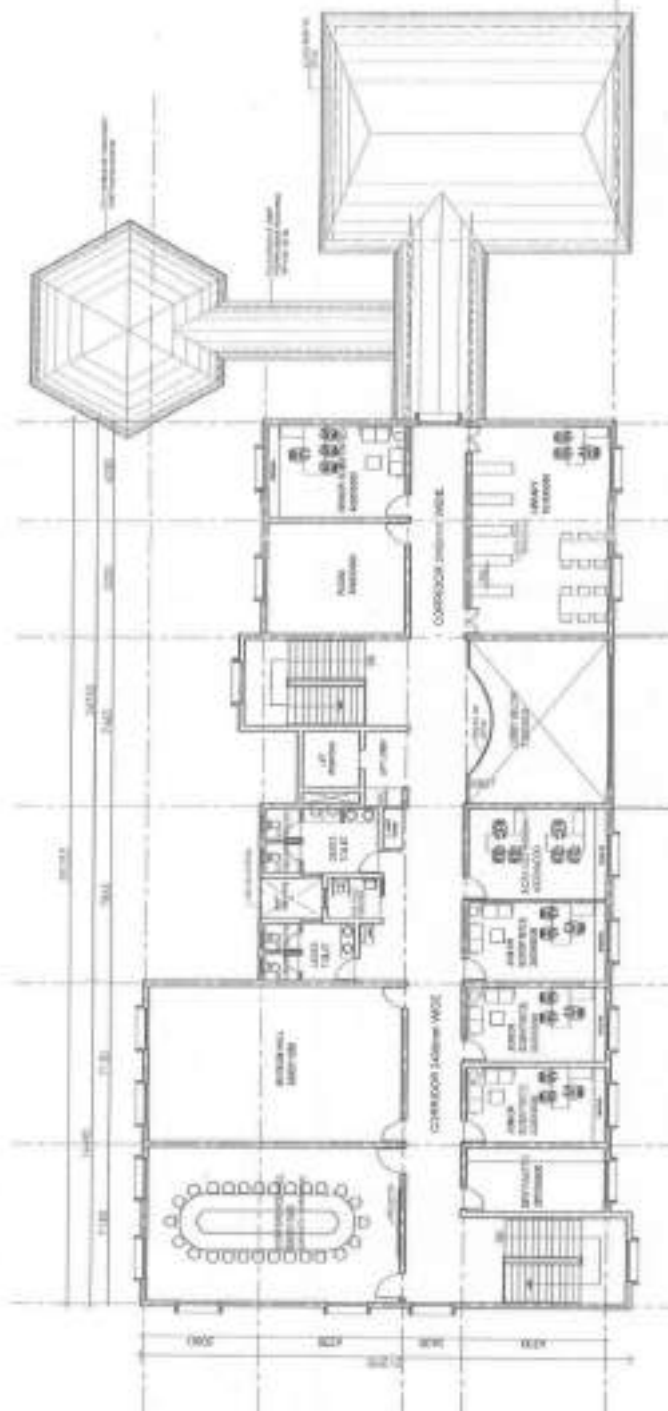
1. 2.

TENDER DRAWINGS

S. NO.	DRAWINGS TITLE	DRAWING NO.
	SITE PLAN & CONCEPTUAL DRAWINGS	
1	SITE PLAN	CA(ADG-CHD) SA-2/48/1049/PD/01/R1
2	PART LAYOUT PLAN	CA(ADG-CHD) SA-2/48/1058/PD/10/R1
3	GROUND FLOOR PLAN	CA(ADG-CHD) SA-2/48/1050/PD/02/R1
4	FIRST FLOOR PLAN	CA(ADG-CHD) SA-2/48/1051/PD/03/R1
5	FRONT VIEW	CA(ADG-CHD) SA-2/48/1052/PD/04/R1
6	3D VIEW	CA(ADG-CHD) SA-2/48/1057/PD/09/R1



FOR CLIENT APPROVAL AND SITE FEASIBILITY ONLY



FIRST FLOOR PLAN
(FLOOR TO FLOOR HEIGHT - 3600mm)

Approved

CAH

Author: - Mr. CAH
Reviewer: - Mr. CAH
Checker: - Mr. CAH
Approved: - Mr. CAH
Date: - 10/10/2023

Notes:
 1. All dimensions are in millimeters (mm) unless otherwise stated.
 2. All dimensions are to the center of the wall unless otherwise stated.
 3. All dimensions are to the finished surface unless otherwise stated.
 4. All dimensions are to the center of the column unless otherwise stated.
 5. All dimensions are to the center of the beam unless otherwise stated.
 6. All dimensions are to the center of the slab unless otherwise stated.
 7. All dimensions are to the center of the wall unless otherwise stated.
 8. All dimensions are to the center of the column unless otherwise stated.
 9. All dimensions are to the center of the beam unless otherwise stated.
 10. All dimensions are to the center of the slab unless otherwise stated.

AREA STATEMENT	
Ground floor area	- 100.78 sqm.
First floor area	- 530.53 sqm.
Porch area	- 55.35 sqm.
Total Plot Area (FAR 2000)	(Ground floor + First floor + Porch) = 1006.03 sqm.
(including stair)	

Item	Unit	Qty	Rate	Amount
1. Plot area	Sqm	1006.03	100.00	100603.00
2. Building area	Sqm	636.66	100.00	63666.00
3. Porch area	Sqm	55.35	100.00	5535.00
4. Stair area	Sqm	10.00	100.00	1000.00
5. Total area	Sqm	1707.99	100.00	170799.00
Grand Total				
170799.00				

CAH

10/10/2023

A black and white photograph of a large, multi-story building with a flat roof and numerous windows. The building is situated on a hillside, with a road and a car visible in the foreground. The background shows a vast, open landscape under a cloudy sky.

Approved

प्राचार्य
Scientist-in-Charge
भारतीय वनस्पति सर्वेक्षण (ड. ए. हि. जे. के.)
(MAWHIRC)
Botanical Survey of India
डा. आर. एच. प्रसाद विभागाध्यक्ष पत्तिस
श्रीमती. सोहन - 173 230
Dr. Y.S. Parmar University Campus
Nauni, Solan - 173 230

[illegible][illegible]

FOR CLIENT APPROVAL AND SITE FEASIBILITY ONLY



3D VIEW

Approved
 Project Manager
 10000 10th Avenue, Suite 100
 San Diego, CA 92121
 Tel: 619.594.1234
 Fax: 619.594.1235
 Email: info@jordanhill.com

NOTES:
 1. All work shall be in accordance with the City of San Diego Building Code, 2015 Edition, and all applicable codes and standards.
 2. The project shall be designed to meet the minimum requirements of the City of San Diego Building Code, 2015 Edition, and all applicable codes and standards.
 3. The project shall be designed to meet the minimum requirements of the City of San Diego Building Code, 2015 Edition, and all applicable codes and standards.
 4. The project shall be designed to meet the minimum requirements of the City of San Diego Building Code, 2015 Edition, and all applicable codes and standards.
 5. The project shall be designed to meet the minimum requirements of the City of San Diego Building Code, 2015 Edition, and all applicable codes and standards.

Project Name	10000 10th Avenue
Client	Jordan Hill
Architect	Jordan Hill Architects
Engineer	Jordan Hill Engineers
Contract No.	10000 10th Avenue
Project No.	10000 10th Avenue
Revision	10000 10th Avenue
Drawn By	Jordan Hill
Checked By	Jordan Hill
Approved By	Jordan Hill
Date	10/10/2015

Schedule of Quantity for Civil Work

SCHEDULE OF QUANTITY

Name of Work : Construction of Office building of BSI, HAWHRC, Solan (HP).

Item No.	Description of item	Qty.	Unit	Rate (in Rs.)	Amount (in Rs.)
1	Earth Work				
1.1	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and for all lift, as directed by Engineer-in-charge.				
1.1.1	All kinds of soil	4,190.00	Cum	219.34	9,19,035
1.2	Earth work in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.				
1.2.1	Ordinary rock	221	Cum	616.50	1,36,247
1.3	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, for all lift, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
1.3.1	All kinds of soil	10	Cum	321.66	3,217
1.4	Excavating trenches by mechanical / manual means of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, for all depth, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering,				

	etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
1.4.1	All Kind of Soil				
1.4.1.1	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	280	Metre	435.16	1,21,845
1.5	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 and for all lift.	4,190.00	Cum	242.2	10,14,818
1.6	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	114	Cum	2,624.34	2,99,175
1.7	Excavating, supplying, stacking and filling of local earth (including royalty) by mechanical transport upto a lead of 5km also including ramming and watering of the earth in layers not exceeding 20 cm in foundation trenches, plinth, sides of foundation etc. complete for all lift.	2,873.00	Cum	865.61	24,86,898
2	Concrete Work				
2.1	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :				
2.1.1	1:4:8 (1 Cement : 4 coarse sand (zone-III) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources)	436	Cum	8,417.66	36,70,100
2.2	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor etc., up to floor five level, excluding the cost of centering, shuttering and finishing:				
2.2.1	1:2:4 (1 Cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources)	8	Cum	12,227.60	97,821

2.3	Centering and shuttering including strutting, propping etc. and removal of form work for:				
2.3.1	Foundations, footings, bases of columns, etc. for mass concrete	229	Sqm	484.58	1,10,969
2.4	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	101	Sqm	925.92	93,518
3	R.C.C. Work				
3.1	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana / Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering, finishing and reinforcement as per direction of the engineer-in-charge; for the following grades of concrete.				
3.1.1	All works upto plinth level				
3.1.1.1	Concrete of M30 grade with minimum cement content of 350 kg /cum	1,186.00	Cum	11,931.65	1,41,50,937
3.1.2	All works above plinth level upto floor V level				
3.1.2.1	Concrete of M30 grade with minimum cement content of 350 kg /cum	788	Cum	12,371.13	97,48,450
3.2	Add for using extra cement in the items of design mix over and above the specified cement content therein.	754	Quintal	906.39	6,83,418

3.3	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.				
3.3.1	Thermo-Mechanically Treated bars of grade Fe-500D or more.	1,13,435.00	Kg	133.27	1,51,17,482
3.4	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.				
3.4.1	Thermo-Mechanically Treated bars of grade Fe-500D or more.	86,515.00	Kg	133.27	1,15,29,854
3.5	Centering and shuttering including strutting, propping etc. and removal of form for:				
3.5.1	Foundations, footings, bases of columns, etc. for mass concrete	800	Sqm	484.58	3,87,664
3.5.2	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	2,391.00	Sqm	1,041.09	24,89,246
3.5.3	Suspended floors, roofs, landings, balconies and access platform	1,421.00	Sqm	1,145.81	16,28,196
3.5.4	Shelves (Cast in situ)	16	Sqm	1,145.81	18,333
3.5.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers	1,734.00	Sqm	909.98	15,77,905
3.5.6	Columns, Pillars, Piers, Abutments, Posts and Struts	1,314.00	Sqm	1,187.89	15,60,887
3.5.7	Stairs, (excluding landings) except spiral-staircases	67	Sqm	945.26	63,332
3.5.8	Edges of slabs and breaks in floors and walls				
3.5.8.1	Under 20 cm wide	173	metre	257.71	44,584
3.5.9	Weather shade, Chajjas, Corbels etc., including edges	73	Sqm	1,175.28	85,795
4	Brick Work				
4.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class				

	designation 7.5 in foundation and plinth in:				
4.1.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	59	Cum	8,813.39	5,19,990
4.2	Providing and laying Autoclaved Aerated concrete (AAC) blocks masonry with 150mm to 300 mm thick with Grade-1 AAC blocks of density 551 to 650 kg/cum conforming to IS:2185 (Part 3) in super structure above plinth level up to floor V level with RCC band at sill level and lintel level with approved block laying polymer modified adhesive mortar all complete as per direction of Engineer-in-Charge. (The payment of RCC band and reinforcement shall be made for separately).	402	Cum	10,297.97	41,39,784
4.3	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level.				
4.3.1	Cement mortar 1 : 4 (1 cement : 4 coarse sand)	86	Sqm	1,388.69	1,19,427
5	Cladding Work				
5.1	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing of edges to give high gloss finish etc. complete at all levels.				
5.1.1	Granite stone slab of colour black, Cherry/Ruby red				
5.1.1.1	Area of slab over 0.50 sqm	46	Sqm	6,346.98	2,91,961
5.2	Extra for providing opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter and similar location in marble/ Granite/ stone work, including necessary holes for pillar taps etc.	14	Each	1,209.39	16,931

	including moulding, rubbing and polishing of cut edges etc. complete.				
5.3	Providing and fixing Ist quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	397	Sqm	1,566.82	6,22,028
6	Wood Work				
6.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length (hold fast lugs or dash fastener shall be paid for separately).				
6.1.1	Second class teak wood	2	Cum	1,76,644.37	3,53,289
6.2	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.				
6.2.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	77	Sqm	4,292.67	3,30,536
6.3	Providing 40x5 mm flat iron hold fast 400 mm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 300x100x150mm 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size).	162	each	282.79	45,812

6.4	Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 36 kg to 80 kg and door width from 701 mm to 1000 mm), with double speed adjustment with necessary accessories and screws etc. complete.	34	each	1,214.89	41,306
6.5	Providing and fixing factory made single extruded WPC (Wood Polymer Composite) solid door/window/Clerestory windows & other Frames/Chowkhat comprising of virgin PVC polymer of K value 58-60 (Suspension Grade), calcium carbonate and natural fibers (wood powder/ rice husk/wheat husk) and non toxic additives (maximum toxicity index of 12 for 100 gms) fabricated with miter joints after applying PVC solvent cement and screwed with full body threaded star headed SS screws having minimum frame density of 750 kg/cum, screw withdrawal strength of 2200 N (Face) & 1100 N (Edge), minimum compressive strength of 58 N/mm ² , modulus of elasticity 900 N/mm ² and resistance to spread of flame of Class A category with property of being termite/borer proof, water/moisture proof and fire retardant and fixed in position with M.S hold fast/lugs/SS dash fasteners of required dia and length complete as per direction of Engineer-In- Charge. (M.S hold fast/lugs or SS dash fasteners shall be paid for separately).				
	Note: For WPC solid door/window frames, minus 5mm tolerance in dimensions i.e depth and width of profile shall be acceptable. Variation in profile dimensions on plus side shall be acceptable but no extra payment on this account shall be made.				
6.5.1	Frame size 65 x 100 mm	99	Metre	1,373.24	1,35,951
6.6	Providing and fixing factory made single extruded WPC (Wood Polymer Composite) solid plain flush door shutter of required size comprising of virgin polymer of K value 58-60 (Suspension Grade), calcium carbonate and natural fibers (wood powder/ rice husk/wheat husk) and non toxic				

	additives (maximum toxicity index of 12 for 100 gms) having minimum density of 650 kg/cum and screw withdrawal strength of 1800 N (Face) & 900 N (Edge), minimum compressive strength 50 N/mm ² , modulus of elasticity 850 N/mm ² and resistance to spread of flame of Class A category with property of being termite/borer proof, water/moisture proof and fire retardant and fixing with stainless steel butt hinges of required size with necessary full body threaded star headed counter sunk S.S screws, all as per direction of Engineer-In-Charge. (Note: stainless steel butt hinges and necessary S.S screws shall be paid separately)				
6.6.1	30 mm thick	40	Sqm	5,371.26	2,14,850
6.7	Providing and fixing SS sliding door bolts (304grade) of required finish from approved make with necessary SS screws etc. complete as per direction of Engineer-in-Charge.(Combi. Of satin & Glossy)				
6.7.1	300x16 mm	46	Each	891.1	40,991
6.8	Providing and fixing SS tower bolts (304 grade) of required finish from approved make with necessary SS screws etc. complete as per direction of Engineer-in-Charge.				
6.8.1	250x10 mm	59	Each	401.55	23,691
6.9	Providing and fixing bright /matt finished Stainless Steel handles of approved quality & make with necessary screws etc all complete.				
6.9.1	125 mm long	118	each	147.3	17,381
6.1	Providing and fixing SS hanging floor door stopper of required finish from approved make with necessary screws etc. complete as per the direction of Engineer in chrage				
6.10.1	Twin rubber stopper	59	Each	246.1	14,520
6.11	Providing and fixing factory made uPVC glazed/wire mesh windows/doors comprising of lead free uPVC multi-chambered frame, sash and mullion/coupler (where ever required) extruded profiles having minimum wall thickness of 1.70 mm				

	for Series R1 and R2 profiles and 2.10 mm for Series R3 and R4 profiles conforming to EN: 12608 in any shape, colour and design duly reinforced with galvanized mild steel section made of required shape & size as per CPWD Specification, uPVC extruded glazing beads, interlocks and Inline sash adaptor (where ever required) of appropriate dimension, EPDM gasket, hardware, SS 304 grade fasteners of minimum 8 mm dia with countersunk head, comprising of matching polyamide PA6 grade sleeve for fixing frame to finished wall as per IS 1367 : Part 1 to 14, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame, sash & mullion (if required) shall be mitred cut and fusion welded/mechanically jointed duly sealed at all corners, including drilling of holes for fixing hardware and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of approved size and quality, all complete as per approved drawing conforming to CPWD specification & direction of Engineer-in-Charge. Section of steel reinforcement and cross sections of uPVC profiles to be as per design approved by Engineer-in-Charge.				
	Wire mesh / Glazing of plain/ toughened/ laminated/ double glass unit with / without high performance coatings as per design requirements and conforming to IS: 3548 & IS: 16231 shall be paid separately.				
	Note:- Structural design proof checked from a Government Engineering Institute, to be provided by the manufacturer for :				
	(i) Sites with basic wind speed > 45 m/sec as per IS 875 – Part 3				
	(ii) Sites with structure height more than 20m for all wind speeds				
6.11.1	Three track three panels sliding window with two glazed & one wire mesh panels with Aluminium channel for roller track, wool pile, nylon rollers with SS 304 body.				
6.11.1.2	Using R3 series with frame (98mm & above) x (40mm & above) & both glazed and fly screen sash (30mm & above) x (55mm & above) with zinc alloy (zamak) powder coated handle on	145	Sqm	13,437.36	19,48,417

	every glazed panel along with multi-point locking system. (Height upto 1.8m).				
6.11.2	Fixed window / ventilator with mullion / transom.				
6.11.2.1	Using R1 series with frame (33mm & above) x (35mm & above) & mullion (33mm & above) x (50mm & above). (Height upto 0.90 meter)	9	Sqm	11,313.17	1,01,819
6.12	Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thick clear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete.	155	Sqm	6,175.71	9,57,235
6.13	Providing and fixing fly proof SS grade 304 wire gauge to uPVC windows and clerestory windows using wire gauge with average width of aperture 1.4 mm in both directions with wire of dia 0.50 mm all complete as per direction of Engineer in charge.	73	Sqm	1,232.15	89,947
7	Steel Work				
7.1	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	825	Kg	165.21	1,36,298
7.2	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, including welding and bolted with special shaped washers etc. complete.				
7.2.1	Hot finished welded type tubes	16,490.00	Kg	240.22	39,61,228
7.3	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved				

	steel primer using structural steel etc. as required.				
7.3.1	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	11,575.00	Kg	213.28	24,68,716
7.4	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.				
7.4.1	10 x 160 mm	133	Each	277.42	36,897
7.5	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	1,142.00	Kg	954.46	10,89,993
8	Flooring Work				
8.1	Providing and laying flamed finish Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge :				

8.1.1	Flamed finish granite stone slab Jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent.	203	Sqm	3,937.84	7,99,382
8.2	Providing and laying Polished Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing , curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge.				
8.2.1	Polished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent	273	Sqm	5,537.59	15,11,762
8.3	Providing and laying 12 mm thick AC-5, grade laminate wooden flooring of having 0.2 mm thick direct laminate on top of specially developed substrate core (high density fibre board) of plank size as per manufacturer's specification having smart lock, tongue and groove joint construction should be sealed with 4mm thick teak wood lipping. The under layer has to be a 0.2 mm thick alkali resistant polyethylene sheet of density 30-32 kg. per cum on top to secure the floor. The work shall be carried out as per manufacturer's installation procedure and as per direction of Engineer-in-charge.	94	Sqm	3,038.50	2,85,619
8.4	Providing and laying Vitrified tiles in floor in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm including grouting the joints with white cement and matching pigments etc. The tiles must be cut with the zero chipping diamond cutter only . Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily.				

8.4.1	Glazed vitrified floor tiles polished finish of size				
8.4.1.1	Size of Tile 600 x 600 mm	708	Sqm	1,856.96	13,14,728
8.5	Providing and laying Vitrified tiles in floor in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm including grouting the joints with white cement and matching pigments etc. The tiles must be cut with the zero chipping diamond cutter only . Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily.				
8.5.1	Glazed Vitrified tiles Matt/Antiskid finish of size				
8.5.1.1	Size of Tile 600 x 600 mm	106	Sqm	1,810.13	1,91,874
8.6	Providing and laying Vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joint with white cement & matching pigments etc. complete.				
8.6.1	Size of Tile 600x600 mm	71	Sqm	2,005.62	1,42,399
8.7	Granite work in skirting, risers of steps over 12 mm thick bed of cement mortar 1:3 (1 cement :3 coarse sand) and jointed with grey cement slurry @ 3.3 kg/sqm, including pointing in white cement mixed with pigment of matching shade complete.				
8.7.1	Polished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent	28	Sqm	5,862.90	1,64,161
9	Roofing Work				

9.1	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes.				
9.1.1	110 mm diameter	92	Metre	466.36	42,905
9.2	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.				
9.2.1	Single pushfit Coupler				
9.2.1.1	110 mm	20	Each	157.68	3,154
9.2.2	Bend 87.5°				
9.2.2.1	110 mm bend	10	Each	185.79	1,858
9.2.3	Shoe (Plain)				
9.2.3.1	110 mm bend	10	Each	162.93	1,629
9.3	Providing and fixing unplasticised - PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.				
9.3.1	110 mm	54	Each	458.82	24,776
9.4	Providing and fixing to the inlet mouth of rain water pipe PTMT (an Engineering Thermoplastic) grating square (Slit) 150 mm square with a height of 8 mm and weighing not less than 100 gms.	10	Each	104.48	1,045
9.5	Providing and fixing pre-coated galvanised iron profile sheets (size, shape and pitch of corrugation as approved by Engineer-in-Charge) of total coated thickness 0.50mm (base metal of minimum 0.45mm thickness with total coating thickness of 0.05mm) with zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on	865	sqm	912.76	7,89,537

	both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 metre or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55 mm) with EPDM seal, complete upto any pitch in horizontal/vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.				
9.6	Providing and fixing precoated galvanised steel sheet roofing accessories of total coated thickness 0.50mm (base metal of minimum 0.45mm thickness with total coating thickness of 0.05mm) with Zinc coating 120 grams per sqm as per IS: 277, in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns using self drilling/ self tapping screws complete:				
9.6.1	Ridges plain (500 - 600mm)	152	metre	657.83	99,990
9.6.2	Flashings/ Aprons.(Upto 600 mm)	228	metre	600.06	1,36,814
9.6.3	Gutter (600 mm over all girth)	228	metre	1,623.35	3,70,124
9.7	Providing and fixing tiled false ceiling of specified materials of size 595x595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanized steel sections (galvanized @ 120 grams/ sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to center and cross "T" of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making,				

	opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 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.				
9.7.1	GI Metal Ceiling Lay in plain Tegular edge Global white color tiles of size 595x595 mm, and 0.5 mm thick with 8 mm drop; made of G I sheet having galvanizing of 100 gms/sqm (both sides inclusive) and electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending.	631	sqm	2,351.49	14,83,790
9.8	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.				
9.8.1	With 15 mm thick integral densified micro edge light weight calcium silicate false ceiling tiles	543	sqm	3,250.41	17,64,973
10	Finishing Work				
10.1	12 mm cement plaster of mix : 1:6 (1 cement: 6 coarse sand)	2,385.00	Sqm	424.65	10,12,790
10.2	6 mm cement plaster of mix : 1:3 (1 cement : 3 fine sand)	407	Sqm	371.27	1,51,107
10.3	Cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.				
10.3.1	12 mm cement plaster	431	Sqm	555.51	2,39,425
10.4	15 mm cement plaster on rough side of single or half brick wall of mix:				
10.4.1	1:6 (1 cement: 6 coarse sand)	1,275.00	Sqm	488.54	6,22,889
10.5	Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	3,030.00	Sqm	324.62	9,83,599
10.6	Finishing walls with textured exterior paint of required shade :	1,275.00	Sqm	276.3	3,52,283
10.6.1	New work (Two or more coats applied @ 3.28 ltr/10 sqm) over and including priming coat of exterior primer applied @ 2.20kg/10 sqm				
10.7	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade:				
10.7.1	Two or more coats on new work	753	Sqm	192.65	1,45,065
10.8	Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound) content less than 50 grams/ litre, of approved brand and manufacture, including applying	3,030.00	Sqm	169.85	5,14,646

	additional coats wherever required, to achieve even shade and colour.				
10.8.1	Two coats				
10.9	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.				
10.9.1	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre	3,030.00	Sqm	91.38	2,76,881
10.1	Polishing in high gloss/matt finish melamine clear polish on wood work in required color/wooden shade texture with following process in the sequence as detailed below: 1. The surface to be polished is rubbed with sand paper 80/120 no. and then with sand paper of 160/180 nos. 2. Applying two coats of sealer with spray gun and allowing sufficient drying time for 1st coat and 2nd coat is allowed to dry for 8 to 12 hrs. 3. On drying of sealer coat, wet rubbing with emery cloth of finer grading with ample water to remove excess sealer layer and make the surface further smooth after this wet rubbing, then surface is applied with special grade melamine fillers to fill all the small and big holes/grooves etc. Filler coat to be allowed to dry for 4 to 6 hrs on which again a light wet rubbing is done this surface is further allowed to dry for 12 hrs. 4. On this, 1st coat of melamine polish is applied with spray gun using melamine clear polish and melamine thinner in required proportion. This 1st coat is allowed to dry for 24 hrs then this dry surface is again fine wet rubbed smooth, which is further allowed to dry for 12 hrs. The final melamine polish is applied with compressor pressure spray gun using melamine clear polish and melamine thinner mixed in required proportion complete as per direction of Engineer-in-Charge. (Final coat to be done in 1 or 2 layers without gap of time.)	40	Sqm	1,681.12	67,245
11	Aluminium Work				

11.1	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) :				
11.1.1	For fixed portion				
11.1.1.1	Powder coated aluminium (minimum thickness of powder coating 50 micron).	1,207.00	kg	656.04	7,91,840
11.1.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately)				
11.1.2.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	189	kg	784	1,48,176
11.2	Designing, providing and fixing multiwall three or more-layered polycarbonate sheet panel co-extruded Ultra Violet (UV) protective coating on external surface with standing seam on both the running ends, sheet shall be connected using polycarbonate connectors having grip lock double tooth locking mechanism and provided with endcap at the ends to ensure water and air tightness. The light transmission from transparent or translucent or opaque or in combination polycarbonate sheet, varies from 15 to 85%, shall be decided by engineer in charge as per requirement. The polycarbonate sheet shall have Dart drop impact value more				

	than 60 Joules as per IS14434 2023 and confirm either flame retardancy of class UL-9418/94V-0 category as per IS14434.2023 or category VO & HB as per ASTM D635-18 or BS100 classification as per EN13501 for fire safety The yellowness index tested as per ASTM E313 (D1925) or ASTM E313 (D1925) shall be equal to or more than 10 unit or 6 units respectively on a sample after 5000 Hours of exposure of UV/sun light. The cross section ends of poly carbonate sheet shall be provided with self-adhesive aluminium impermeable tape at top and aluminium ventilated tape at bottom of the sheet and covered with polycarbonate/ aluminium u-shaped protective profile. The poly carbonate sheet shall be held in position by using stainless steel (SS304 grade) trapezoidal cleat of 1 mm thick having minimum bottom width 35mm and top width 50mm or any other shape and size as per design requirement and manufacturer specification, cleat fixed with 2 or more stainless steel screws of 5 mm diameter with 25mm long with structural steel framework. The cleat shall be tested to withstand pull out force equal to wind speed of 50m/s as per IS. 875 and design test report shall be submitted to Engineer-in-charge for approval before use. The cost of ridge and gutters of pre-coated galvanized iron sheet of approved specifications and structural steel framework of shall be paid in respective item for separately.				
11.2.1	18 mm thick, 1000 (+10%) wide panel with U value not more than 2.00 W/m ² K and weight not less than 3.10 kg/sqm	123	Sqm	5,074.44	6,24,156
12	Water Proofing Work				
12.1	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for under ground structures as directed by Engineer-in-Charge and consisting of :				

	(i) 1st layer of 22 mm to 25 mm thick approved and specified rough stone slab over a 25 mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) including applying of twice (at base and top of mortar) cement slurry @ 2.2kg/m ² (each time) mixed with water proofing compound conforming to IS:2645 in the recommended proportion over the leveling course (leveling course to be paid separately). Joints sealed and grouted with cement slurry mixed with water proofing compound.				
	(ii) 2nd layer of 25 mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportions.				
	(iii) Finishing top with stone aggregate of 10 mm to 12 mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer.	36	Sqm	1,872.84	67,422
12.1.1	Using rough kota stone.				
12.2	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25 mm thick with cement slurry mixed with water proofing compound conforming to IS:2645 in recommended proportions with a gap of 20 mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:3 (1 cement : 3 coarse sand) 20 mm thick with neat cement punning mixed with water proofing compound in recommended proportion complete at all levels and as directed by Engineer-in-charge :				
12.2.1	Using rough Kota stone	84	Sqm	2,501.94	2,10,163
12.3	Providing and laying water proofing treatment in sunken portion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying :				
	(a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/ sqm. This layer will be allowed to air cure for 4 hours.				

	(b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours.				
	The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.	42	Sqm	762.49	32,025
12.4	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations:				
	(a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300 mm height including cleaning the surface before treatment.				
	(b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs.				
	(c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/ sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge.				
	(d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and				

	making pattern of 300x300 mm square 3 mm deep.				
	(e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. "All above operations to be done in order and as directed and specified by the Engineer-in-Charge :				
12.4.1	With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	848	Sqm	2,081.68	17,65,265
13	SANITARY INSTALLATIONS				
13.1	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require:				
	White Vitreous China Wash basin size 630x450 mm with a pair of 15 mm C.P. brass pillar taps	2	Each	3,273.21	6,546
13.2	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 :				
13.2.1	Kitchen sink without drain board				
13.2.1.1	610x510 mm bowl depth 200 mm	2	Each	6,105.40	12,211
13.3	Providing and fixing 8 mm dia C.P. / S.S. Jet with flexible tube upto 1 metre long with S.S. triangular plate to European type W.C. of quality and make as approved by Engineer-in-charge.	14	Each	431.45	6,040
13.4	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.				
13.4.1	Flexible pipe				
13.4.1.2	40 mm dia	2	Each	147.73	295
13.5	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	14	Each	1,986.96	27,817

13.6	Providing and fixing CP Brass 32mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge.	19	Each	1,278.71	24,295
13.7	Providing and fixing toilet paper holder :				
13.7.1	C.P. brass	14	Each	993.14	13,904
13.8	Providing and fixing uplasticised PVC connection pipe with brass unions :				
13.8.1	45 cm length				
13.8.1.1	15 mm nominal bore	74	Each	120.79	8,938
13.9	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931				
13.9.1	15 mm nominal bore	74	Each	709.67	52,516
13.1	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms.				
	15 mm nominal bore	18	Each	987.27	17,771
13.11	Providing and fixing C.P. Brass extension nipple (size 15mmx50mm) of approved make and quality as per direction of Engineer-in-charge.	92	Each	92.43	8,504
13.12	Providing and fixing white vitreous china extended wall mounting water closet of size 780x370x690 mm of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 4 litre/ 8 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete.	14	Each	18,534.60	2,59,484
13.13	Providing and fixing white vitreous china battery based infrared sensor operated urinal of approx. size 610 x 390 x 370 mm having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge.	5	Each	9,859.98	49,300
13.14	Providing and fixing under counter Wash Basin (size 550x450x175mm) with C.P brass waste coupling and fluid single lever basin mixer tall of approved make with smooth flowing	12	Each	8,336.25	1,00,035

	lines , fixing as per manufacturers specification and as per direction of Engineer-in-charge.				
14	SOIL, WASTE & VENT PIPES				
14.1	Providing and fixing soil, waste and vent pipes :				
14.1.1	100 mm dia				
14.1.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	147	Meter	1,444.92	2,12,403
14.2	Providing and fixing M.S Holder bat clamps of approved design to Sand Cast iron/cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10 cm of 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including cost of cutting holes and making good the walls etc. :				
14.2.1	For 100 mm dia pipe	42	Each	448.38	18,832
14.3	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
14.3.1	100 mm dia				
14.3.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	50	Each	700.89	35,045
14.4	Providing and fixing plain bend of required degree.				
14.4.1	100 mm dia				
14.4.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	50	Each	454.74	22,737
14.5	Providing and fixing double equal plain junction of required degree.				
14.5.1	100x100x100x100 mm				
14.5.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	50	Each	940	47,000
14.6	Providing and fixing single equal plain junction of required degree :				
14.6.1	100x100x100 mm				
14.6.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	50	Each	718.5	35,925
14.7	Providing and fixing terminal guard :				

14.7.1	100 mm				
14.7.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	6	Each	528.64	3,172
14.8	Providing and fixing shielded coupling for Hubless centrifugally cast iron pipe				
14.8.1	100 mm dia				
14.8.1.1	SS 304 grade coupling with EPDM rubber gasket	550	Each	533.89	2,93,640
14.9	Providing and fixing M.S. stays and clamps for sand cast iron/ centrifugally cast (spun) iron pipes of diameter :				
14.9.1	100 mm	6	Each	172.63	1,036
14.1	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 :				
14.10.1	100 mm inlet and 100 mm outlet				
14.10.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	33	Each	1,055.98	34,847
14.11	Providing and fixing SS grating of approved quality and colour.				
14.11.1	Circular type				
14.11.1.1	125 mm nominal dia	33	Each	714.75	23,587
15	WATER SUPPLY INTERNAL				
15.1	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, including cutting and making good the walls etc.				
	Internal work - Exposed on wall				
15.1.3	25 mm dia nominal bore	50	Metre	681.74	34,087
15.1.4	32 mm dia nominal bore	25	Metre	824.22	20,606
15.1.5	40 mm dia nominal bore	50	Metre	1,003.27	50,164
15.1.6	50 mm dia nominal bore	50	Metre	1,295.46	64,773
15.2	Providing and fixing G.I. Pipes complete with G.I. fittings and clamps, including making good the walls etc. concealed pipe, including painting with anti-corrosive bitumastic paint, cutting chases and making good the wall :				
15.2.1	15 mm dia nominal bore	150	Metre	717.27	1,07,591
15.2.2	20 mm dia nominal bore	30	Metre	784.92	23,548

15.3	Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc.				
	External work				
15.3.1	40 mm dia nominal bore	10	Metre	762.49	7,625
15.3.2	50 mm dia nominal bore	80	Metre	941.8	75,344
15.4	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
15.4.1	25 mm nominal bore	6	Each	769.11	4,615
15.4.2	32 mm nominal bore.	3	Each	852.15	2,556
15.5	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :				
15.5.1	15 mm nominal bore	3	Each	502.75	1,508
15.6	Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality :				
15.6.1	40 mm diameter pipe	10	metre	31.2	312
15.6.2	50 mm diameter pipe	80	metre	37.69	3,015
15.7	Providing and filling sand of grading zone V or coarser grade, allround the G.I. pipes in external work :				
15.7.1	40 mm diameter pipe	10	metre	206.36	2,064
15.7.2	50 mm diameter pipe	80	metre	214.09	17,127
15.8	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, IS : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	6,000.00	Per Litre	13.59	81,540
16	Sewerage and Drainage work				
16.1	Providing, laying and jointing glazed stoneware pipes class SP-1 with stiff mixture of cement mortar in the proportion of 1:1 (1 cement : 1 fine sand) including testing of joints etc. complete :				
16.1.1	150 mm diameter	20	Metre	859.81	17,196
16.2	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal				

	size) all-round S.W./RCC pipes including bed concrete as per standard design :				
16.2.1	150 mm diameter S.W. pipe	20	Metre	1,457.95	29,159
16.2.2	250 mm dia. RCC pipe	100	Metre	1,965.46	1,96,546
16.3	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design:				
16.3.1	100x100 mm size P type				
16.3.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	10	Each	3,345.87	33,459
16.4	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
16.4.1	250 mm dia. R.C.C. pipe	100	Metre	1,111.89	1,11,189
16.5	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 coarse sand (zone- III) : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand (zone- III) : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design :				
16.5.1	Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) :				
16.5.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	15	Each	15,780.70	2,36,711

16.6	Extra for depth for manholes :				
16.6.1	Size 90x80 cm				
16.6.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	5	Metre	10,905.64	54,528
16.7	Constructing brick masonry road gully chamber 50x45x60 cm with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) including 500x450 mm pre-cast R.C.C. horizontal grating with frame complete as per standard design :				
16.7.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	10	Each	7,362.24	73,622
16.8	Extra for depth beyond 45 cm of brick masonry chamber :				
16.8.1	For 455x610 mm size				
16.8.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	2	Metre	7,558.84	15,118
17	Road Work				
17.1	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earth with lead upto 50 metres.	900	Sqm	270.5	2,43,450
17.2	Providing and laying design mix cement concrete of M-30 grade, in roads/ taxi tracks/ runways, using cement content as per design mix, using coarse sand and graded stone aggregate of 40 mm nominal size in appropriate proportions as per approved & specified design criteria, providing dowel bars with sleeve/ tie bars wherever required, laying at site, spreading and compacting mechanically by using needle and surface vibrators, levelling to required slope/ camber, finishing with required texture, including steel form work with sturdy M.S. channel sections, curing, making provision for contraction/ expansion, construction & longitudinal				

	joints (10 mm wide x 50 mm deep) by groove cutting machine, providing and filling joints with approved joint filler and sealants, complete all as per direction of Engineer-in-charge (Item of joint fillers, sealants, dowel bars with sleeve/ tie bars to be paid separately).				
	Note:- Cement content considered in M-30 is @ 340 kg/cum. Excess/ less cement used as per design mix is payable/ recoverable separately.				
	Cement concrete prepared with batch mixing machine	180	Cum	13,011.22	23,42,020
17.3	Providing and fixing pre-moulded joint filler in expansion joints of RCC roads / CC pavements after making the joints dust free with high pressure air jet cleaners, all complete as per direction of the Engineer-in-Charge. (Pre-moulded joint fillers shall be made of bitumen hot sealing compound impregnated fibre board having impregnation more than 35%, conforming to IS:1838 for fibre board and IS: 1834 for hot sealing bitumen compound grade A.)	150	per cm depth per cm width per metre length	6.55	983
17.4	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of coarse sand, filling the joints with line sand etc. all complete as per the direction of Engineer-in-charge.	28	Sqm	1,201.11	33,631
17.5	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	2	Cum	12,502.42	25,005

17.6	Construction of granular sub-base by providing close graded Material conforming to specifications, mixing in a mechanical mix plant at OMC, carriage of mixed material by tippers to work site, for all leads & lifts, spreading in uniform layers of specified thickness with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per specifications and directions of Engineer-in-Charge.				
	With material conforming to Grade-I (size range 75 mm to 0.075 mm) having CBR Value-30	135	cum	3,440.22	4,64,430
17.7	Providing and laying in position plum cement concrete in Foundation/ retaining walls /breast walls upto plinth level having 40% stone boulders of size 150 to 250 mm and 60% cement concrete of grade 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size derived from natural sources) including the cost of centering and shuttering and its removal, making provision for weep holes, providing key stone of appropriate size for guard block all complete as per direction of Engineer in charge.	274	cum	7,189.15	19,69,827
17.8	Providing and laying in position plum cement concrete in retaining walls /breast walls above plinth level and upto floor five level having 40% stone boulders of size 150 to 250 mm and 60% cement concrete of grade 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size derived from natural sources) including the cost of centering and shuttering and its removal, making provision for weep holes, providing key stone of appropriate size for guard block all complete as per direction of Engineer in charge.	274	cum	8,190.45	22,44,183

17.9	Supplying & laying of drainage composite for use behind walls, between two different fills, alongside drains of road, below concrete lining of canals etc. Geocomposite for planar drainage, realized by thermobonding a draining core in extruded monofilaments with two filtering nonwoven geotextiles that may also be working as separation or protecting layers. The draining three dimensional core will have a “W” configuration as longitudinal parallel channels. Minimum thickness to be 7.2mm, with two filtering UV stabilized polypropylene nonwoven geotextile of minimum thickness of 0.75mm characteristic opening size (O90) of 110 micron and tensile strength of 8.0 kN/m that will be working as separation or protecting layer, geo-composite having in plane flow capacity of 2.1 L / (m.s) at hydraulic gradient of 1.0 & 20 kPa pressure and tensile strength of 18 kN/m , with mass per unit area of 740 gsm, supplied in the form of roll for easy transportation to site of work as per detailed specification all complete as per directions of Engineer in charge.	1,707.00	Sqm	1,219.58	20,81,823
				-	
17.1	Providing and placing the PVC pipe in the retaining walls for weephole etc.as per direction of Engineer In Charge.				
	110 mm dia (4 kg/sqm)	442	metre	326.6	1,44,357
18	Rain Water Harvesting &Tubewells				
18.1	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer-in-charge, upto 90 metre depth below ground level.				
18.1.1	Rocky strata including Boulders				
18.1.1.1	350 mm dia	90	metre	2,215.44	1,99,390

18.2	Boring/drilling bore well of required dia for casing/ strainer pipe, by suitable method prescribed in IS: 2800 (part I), including collecting samples from different strata, preparing and submitting strata chart/ bore log, including hire & running charges of all equipments, tools, plants & machineries required for the job, all complete as per direction of Engineer - in-charge, beyond 90 metre & upto 150 metre depth below ground level.				
18.2.1	Rocky strata including Boulders				
18.2.1.1	350 mm dia	60	metre	2,416.55	1,44,993
18.3	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer -in-charge.				
18.3.1	150 mm nominal size dia	100	metre	980.23	98,023
18.4	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
18.4.1	150 mm nominal size dia	50	metre	997.77	49,889
18.5	Gravel packing in tubewell construction in accordance with IS: 4097, including providing gravel fine/ medium/ coarse, in required grading & sizes as per actual requirement, all complete as per direction of Engineer-in-charge.	47	Cum	2,501.69	1,17,579
18.6	Development of tube well in accordance with IS : 2800 (part I) and IS: 11189, to establish maximum rate of usable water yield without sand content (beyond permissible limit), with required capacity air compressor, running the compressor for required time till well is fully developed, measuring yield of well by "V" notch method or any other approved method, measuring static level & draw down etc. by step draw down method,	10	hour	1,340.81	13,408

	collecting water samples & getting tested in approved laboratory, i/c disinfection of tubewell, all complete, including hire & labour charges of air compressor, tools & accessories etc., all as per requirement and direction of Engineer-in-charge.				
18.7	Providing and fixing suitable size threaded mild steel cap or spot welded plate to the top of bore well housing/ casing pipe, removable as per requirement, all complete for borewell of:				
18.7.1	150 mm dia	1	each	304.54	305
18.8	Providing and fixing M.S. clamp of required dia to the top of casing/ housing pipe of tubewell as per IS: 2800 (part I), including necessary bolts & nuts of required size complete.				
18.8.1	150 mm clamp	1	each	2,494.96	2,495
18.9	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I).				
18.9.1	150 mm dia	1	each	397.9	398
	Total				11,56,50,293

PART-C

ADDITIONAL CONDITIONS, SPECIFICATIONS AND SCHEDULE OF QUANTITIES APPLICABLE TO ELECTRICAL AND MECHANICAL COMPONENT OF THE WORK

ADDITIONAL CONDITIONS

1. The work shall be carried out strictly in accordance with CPWD specification for electrical works CPWD general specification Part-I (Internal) 2023, Part- II (External) 2023, Part-III (Lift & Escalator) 2003, Part -IV (Substation) 2013, Part-V (Wet riser & Sprinkler System) 2020, Part-VI Fire detection and alarm System-2018, General Specification for Electrical works Part-VII (DG set) 2013, Part VIII Gas Based Fire Extinguisher System, General Specification for Heating Ventilation & Air Conditioning (HVAC) 2024 as amended up to date, and in accordance with Indian Electricity Rules, 1956, India Electricity Act, 2003, ECSBC 2024, available on CPWD website and National Building Construction Standard 2026, as amended up to date and as per instructions of the Engineer-in-Charge and nothing extra will be paid.
2. The scope of works & specification is given in general but they are not exhaustive i.e. does not mention all the incidental works required to be carried out for complete execution of the item of work. The work shall be carried out, all in accordance with true intent and meaning of the specifications and the drawings taken together, regardless of whether the same may or may not be particularly shown on the drawings and/ or described in the specifications, provided that the same can be reasonably inferred there from. There may be several incidental works, which are not mentioned in the contract document/specifications but will be necessary to complete the item in all respect.
3. 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.
4. Adjustment of rates shall not 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.
5. Three final copies of the documents prepared shall be submitted to Engineer-in-charge for record. All the documents created out of the assignment will become the sole property of the Department.
6. Stage Payment for E&M packages: The following percentage of contract rates shall be payable against the stages of work shown herein:

S. No.	Stage of Work	Payment terms in %
1	On initial inspection of materials and delivery at site in good condition on basis	50%
2	On completion of installation	25%

3	On completion of testing and commissioning	20%
4	On Handing Over	5%
	Total	100%

7. **ELIGIBILITY CRITERIA FOR ASSOCIATE AGENCY:** CPWD Enlisted Contractor in Composite category is also eligible to carry out electrical and mechanical services works himself/herself without associating any specialized agency provided he fulfils the prescribed eligibility criteria respectively for these work(s) as mentioned below:

a) **Eligibility Criteria for Internal & External Electrical Work (Wiring, DB, MCB, MCCB, LED Lights, Fans, Geyser, Boom Barrier, UPS, External Lighting etc):**

CPWD Enlisted Contractor in composite category having valid electric license or the agency have to associate an agency having valid electrical contractor license and should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

Similar work shall mean “**Internal & External Electrical Work**”

b) **Eligibility Criteria for Fire Fighting system:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

Similar work shall mean “**Supplying, Installation, Testing & Commissioning of Fire Fighting system**”.

c) **Eligibility Criteria for Automatic Fire Alarm System:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

Similar work shall mean **“Supplying, Installation, Testing & Commissioning of Automatic Fire Alarm System”**.

d) **Eligibility Criteria for Electrical Sub-Station Work :-**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean **“Supplying, Installation, Testing & Commissioning of Electrical Sub Station, the capacity of individual transformer being 80% of individual capacity (rounded off to next available higher capacity) of the equipment i.e. transformer proposed in NIT”**.

e) **Eligibility Criteria for DG set:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean “**Supplying, Installation, Testing & Commissioning of DG set, the capacity of individual DG Set being 80% of individual capacity (rounded off to next available higher capacity) of the equipment i.e. DG Set proposed in NIT**”.

f) **Eligibility Criteria for UPS:-**

~~Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.~~

~~Three similar completed works each costing not less than 40% of the estimated cost put to tender.~~

~~OR~~

~~Two similar works each costing not less than 60% of the estimated cost put to tender.~~

~~OR~~

~~One similar works each costing not less than 80% of the estimated cost put to tender.~~

- Similar work shall mean “**UPS System**”

g) **Eligibility Criteria for VRV/ VRF Type Air-Conditioning Systems:-**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean “**Supplying, Installation, Testing & Commissioning of VRV/ VRF Type Air-Conditioning systems, the**

capacity of total system being 80% of total capacity (rounded off to next available higher capacity) of the equipment i.e. Chiller/ proposed in NIT”.

h) **Eligibility Criteria for Solar PV Power Generation System:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean “**Supplying, Installation, Testing & Commissioning of Solar PV Power generation plant**”.

i) **Eligibility Criteria for CCTV and LAN System: -**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean “**Supplying, Installation, Testing & Commissioning of CCTV and LAN System**”

j) **Eligibility Criteria for IPBAX (IP Based) System:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

Similar work shall mean “**Supplying, Installation, Testing & Commissioning of IPBAX (IP Based) System**”

k) **Eligibility Criteria for STP: -**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean “**Supplying, Installation, Testing & Commissioning of Sewage Treatment Plant**”

~~l) **Eligibility Criteria for Boom Barrier System :-**~~

~~Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.~~

~~Three similar completed works each costing not less than 40% of the estimated cost put to tender.~~

~~OR~~

~~Two similar works each costing not less than 60% of the estimated cost put to tender.~~

OR

~~One similar works each costing not less than 80% of the estimated cost put to tender.~~

- ~~• Similar work shall mean “Boom Barrier & Driver Face and Number Plate Recording System”.~~

m) **Eligibility Criteria for Lift:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean “Supplying, Installation, Testing & Commissioning of Lifts”.

n) **Eligibility Criteria for Audio Video System:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending last date of month previous to the one in which tender is invited.

Three similar completed works each costing not less than 40% of the estimated cost put to tender.

OR

Two similar works each costing not less than 60% of the estimated cost put to tender.

OR

One similar works each costing not less than 80% of the estimated cost put to tender.

- Similar work shall mean “Supplying, Installation, Testing & Commissioning of Audio Video System”.

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

Estimated cost put to tender for above mentioned specialized work are as under: -

Sl. No.	Similar work	ECPT (Amount)
1	Internal & External Electrical	12863697/-
2	Fire Fighting & Fire safety system	1149606/-
3	Automatic Fire Alarm System	758069/-
4	Electrical Sub-Station Work	5439439/-
5	DG set	914168/-
6	VRV/ VRF Type Air-Conditioning Systems	5987998/-
7	Solar PV Power Generation System	3346362/-
8	CCTV and LAN System	2180432/-
9	IPBAX (IP Based) System	1681724/-
10	STP/ ETP	1045346/-
11	Lift	2076650/-
12	Audio Video System	3393168/-

8. The contractor has to submit MOU with associated contractor (in case electrical contractor is associated), engineers name, credential, email address & mobile no. before start of work. The main agency should possess a valid electrical contractor licence for executing EI works otherwise he has to associates contractor having valid electrical contractor licence.
9. All the material to be used on this work by the contractor shall be got approved from the Engineer-in-Charge in advance before installation at the site.
10. All damages done to the building during the execution of electrical work shall be the responsibility of the contractor and the same will be made good immediately at his own cost to the satisfaction of the Engineer-in-Charge. In case, the repair is not satisfactory, the department will get it rectified & any expenditure incurred by the department in this connection shall be recovered from the contractor and decision of the Engineer-in-charge
11. All the debris of the electrical works should be removed and the site should be cleared by the contractor immediately after the accruing of debris daily. Similarly rejected material if any should be immediately cleared off from the site by the contractor.

12. The contractor or his engineer is bound to sign the site order book as and when required by the Engineer-in-Charge and to comply with the remarks therein.
13. The size of conduit and wiring shall be got approved from the Engineer-in-Charge before the execution of work.
14. The contractor shall make his own arrangement at his own cost for Electrical/ General tools and plants required for the work. In case, proper tools are not available, the department will purchase the tools for bonafide use of work at the risk & cost of the contractor.
15. Main board and main distribution board: The work shall be carried out according to the drawing/details as approved by the Engineer-in-Charge. The contractor shall have to get the sample approved before the whole lot is brought to site. The main board, distribution board shall be properly labelled.
16. The entire installation shall be at the risk and responsibility of the contractor until these are tested and handed over to the department. The watch & ward is the responsibility of the contractor till handing over.
17. The connection inter connection, earthing and inter earthing shall be done by the contractor wherever required and nothing extra shall be paid on this account.
18. Nothing extra shall be paid for inter connections with thimbles/Wires/Tapes strips etc. used on the work.
19. The contractor has to make his own arrangements for stores and watch and ward and no extra claim for this will be entertained.
20. The contractor shall make his own arrangements for electrical power supply for the construction activities. No extra payments for the same will be made.
21. The wiring and conduit route shall be marked by the contractor on the drawing first, and shall be got approved from the Engineer-in-charge.
22. The rupturing capacity of the MCB's shall be 10KA. The MCB's shall have ISI mark.
23. The insulated copper wire to be used on this work shall be FRLS type of multi stranded.
24. Make of MCB/MCCB shall be the same as the make of MCB DB.
25. The contractor shall on demand by the Engineer-in-charge, furnish the proof to the satisfaction of Engineer-in-charge regarding purchase of Wires, Modular switches & accessories, MCBs MCBDB fan & fixture and accessories and other items, from the manufactures authorized outlets.
26. All PVC/MS conduits accessories shall be of the same make as conduits and shall be ISI marked. The conduits shall be terminated as switch boxes/metallic junction boxes with suitable glands/check nuts.

27. Cutting of brick walls shall be done with due care. All repairs and patch works shall be neatly carried out to match the original finish and to the entire satisfaction of the Engineer in Charge.
28. All the sub main and circuits wiring includes loose wire for connections inside switch boxes and MCB DBs. No payment for these loose wires shall be made. However, wires within the cubicle panel will be measured and paid under relevant item of work.
29. To facilitate drawing of wires, 18 SWG GI fish wire shall be provided along with laying of recessed conduit for which no extra payment shall be made. Conduits laid for other services, like TV, Telephone etc., where wiring is not done along with IEI work, fish wire shall be invariably drawn.
30. The connection between incoming switch/isolator and bus bar shall be made with suitable size of thimble and cable at no extra cost.
31. Copper conductor of insulated cables of size 1.5 Sq.mm and above shall be stranded and terminals provided with crimped lugs.
32. All hardware items such as screws, thimbles, GI wire etc. which are essentially required for completing an item as per specification will be deemed to be included in the item even when the same have not been specifically mentioned.
33. All hardware items such as nuts/bolts/screws/washers etc. to be used in work shall be of zinc/cadmium plated iron.
34. While laying conduit, suitable size junction boxes shall be provided for pulling the wire as per the decision of the Engineer-in-charge.
35. Materials to be used in work are to be ISI marked. The make of the materials has been indicated in the list of preferred makes. No other makes will be acceptable. The materials to be used in the work shall be got approved by the Engineer in Charge/his representative before its use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not acceptable.
36. Where switches / sockets / regulator / telephone / TV / internet outlets/ GI Box are to be provided, the same shall be of only one make.
37. The firm should submit the warranty against manufacturer defect for a period of 5 years from the date of completion of work for LED fittings including all accessories from the manufacturer separately.
38. The contractor shall have to work as per the convenience of the concerned Department.
39. Any conduit which is not to be wired by the contractor shall be provided with GI fish wire for wiring for some other agency subsequently. Nothing extra shall be paid for the same.

40. The tenderer should either himself meet the eligibility conditions for the respective E&M components or otherwise he will have to associate with agencies, fulfilling the eligibility requirements and hence consent letter from eligible Associate Agency of the respective components of E&M work shall also be submitted as per attached **Proforma in Form “A”**.
41. In case the main contractor is himself eligible (as per eligibility criteria) for executing any specific minor component and intends doing the job himself, he may not be required to associate with another agency for that minor component of work. In such cases the main contractor also has to submit the documents as per eligibility criteria mentioned for associated agency of individual E&M component.
42. In support of the eligibility conditions of the proposed Associated Contractor, copy of their registration documents, Electrical License, GST Documents duly attested by the applicants (Main Contractor) shall be submitted to the **Executive Engineer-in-charge** for deciding the eligibility. Each such Associated Contractor will certify that they are not debarred as on the day of application for tender participation. Proposal for associating agency for minor components of work shall be submitted in **Form ‘B’** of this tender document from each associate independently for all electrical and mechanical components.
43. The main contractor should submit an affidavit of MoU signed with eligible associated contractor. The MoU in the enclosed **Form ‘C’** 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.
44. In the event of the concerned E&M agency not performing satisfactorily or failure of associate contractor to complete the E&M work, the main contractor on written directions of the department, shall remove the Associate contractor deployed on the work and shall submit name of new associate agency who fulfil the conditions mentioned in the NIT to execute the leftover work without any loss of time or variation in cost to the department. **Such associates shall also give an undertaking along with the main tenderer but both of them together will stand guarantee for the equipment’s 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 Department, 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.
45. In respect of all works i.e., Electrical installation., the materials shall be procured only from the original equipment manufacturers / authorized dealers of OEM. The contractor shall submit all documentary details in fulfilment of these conditions regarding procurement of materials including relevant test certificates.
46. Before completion of defect liability period as per condition laid down in GCC 2023, the main contractor has to submit security deposit of 5% of 80% of the Quoted price of SITC

of LED fittings (total work done for LED fittings) for the warranty period for LED fittings in acceptable form i.e. FDR/ Bank guarantee to Engineer in charge. The Security Deposit deducted from the bills of contractor shall be refunded to the main contractor only after submission of above security deposit for LED fittings by main contractor, failing which this LED security deposit shall be deducted from Security Deposit deducted for total work and balance amount only will be refunded after completion of defect liability period. The LED Security Deposit will be released after completion of warranty period of 5 years to the main contractor.

47. The contractor shall execute the whole work in the most substantial and workman like manner in strict accordance with the specifications, approved design, drawings, particular specifications, special conditions, additional conditions and instructions of the Engineer-in-Charge.
48. The contractor shall at his own expense and risk arrange land for accommodation of labour, setting up of office, storage of materials, erection of temporary workshops, construction of approach roads to the site of work, including land required for carrying out of all jobs connected with the completion of the work. The contractor shall have to abide by the regulations of the authorities concerned and the directions of the Engineer-in-Charge for use of land available at the site of work. If it becomes necessary during construction to remove or shift the stored materials, shed, workshop, access roads, etc, to facilitate execution of the work included in this agreement or any other work by any other agency, the contractor shall remove or shift these facilities as directed by the Engineer-in-Charge and no claim whatsoever shall be entertained on this account.
49. The necessary tests shall be conducted in the laboratory approved by the Engineer-in-Charge. The samples for carrying out all or any of the tests shall be collected by the Engineer-in-charge or on his behalf by any other officer of CCU. The contractor or his authorized representative shall associate himself in collection, preparation, packing and forwarding of such samples for the prescribed tests and analysis. In case the contractor or his authorized representative is not present or does not associate himself in the aforesaid operation the results of such tests and consequences thereon shall be binding on the contractor.
50. Materials used on work without prior inspection and testing (where testing is necessary) and without approval of the Engineer-in-Charge are liable to be considered unauthorized, defective and not acceptable. The Engineer-in-Charge shall have full powers to require the removal of any or all of the materials brought to site by contractor which are not in accordance with the contract specifications or do not conform, in character or quality to the samples approved by the Engineer-in-Charge. In case of default on the part of the contractor in removing rejected materials, the Engineer-in-Charge shall be at liberty to have them removed at the risk and cost of the contractor.
51. The work shall be carried out in such a manner so as not to interfere or adversely affect or disturb other works being executed by other agencies, if any.

52. Any damage done by the contractor to any existing works or work being executed by other agencies shall be made good by him at his own cost.
53. The work shall be carried out in the manner complying in all respects with the requirement of relevant rules and regulations of the local bodies under the jurisdiction of which the work is to be executed and nothing extra shall be paid on this account.
54. For completing the work in time, the contractor may have to work in two or more shifts and no claims whatsoever shall be entertained on this account, notwithstanding the fact that the contractor will have to pay to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and/or extra amount for any other reasons.
55. The contractor shall take all precautions to avoid all accidents by exhibiting necessary caution boards and by providing red flags, red lights and barriers. The contractor shall be responsible for any accident at the site of work and consequences thereof.
- 56. Quality Assurance Manual (Quality Assurance Plan & Checklist for E &M Service).**
- (a) Main contractor/Associate agency shall submit the required quantity of materials as sample for Testing from Govt. / NABL approved private Laboratory.
 - (b) The decision on testing shall be as per E&M quality checklist of CPWD vide OM No. 51(4)/CE(E)/CSQ/2016/293 (H) dated 31.03.2016 as applicable and/or as per direction of Engineer in charge and shall be binding on contractor. Contractor shall submit the required size and quantity of samples for the testing.
 - (c) Department shall send the samples to the testing laboratory & the test results shall be reported directly to department.
 - (d) 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.
57. All the equipment shall be delivered with (i) Manufacturer's test certificate, (ii) Manufacturer's technical catalogues and Installation / Instruction (O&M) manuals. For LED luminaries, the contractor shall also submit the LM-79 test report of LED luminaries from NABL accredited laboratory.
58. Scaffoldings & any other T & P required for execution, testing and commissioning of work shall be arranged by the contractor and is included in the cost of work tendered by the contractor.
- 59. Inspection before Dispatch:** All routine tests shall be conducted before dispatch of equipment. No equipment shall be dispatched out from the manufactures premises before such tests are conducted and test result recorded. These test certificates shall be given along the supply of equipment. The Engineer- In-charge shall, if he so desires inspect and witness the pre-delivery tests. For this purpose, the agency shall give 15 days advance notice. Agency shall arrange for inspection of the department. Department shall bear expenses of

its officials for inspection as far as travelling, boarding and / lodging is concerned. However, the inspection shall be done at the discretion of the department without any cost implication but **ROUTINE TEST & TYPE TEST Certificates** shall have to be submitted for all the equipment.

60. Prior to dispatch, all equipment 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, humid climate and accidents etc.
61. Approval of materials, shop floor drawings and commencement of work: The contractor shall submit list of makes & Model numbers of all items of equipment and accessories for each Sub Head of work. Catalogues of the equipment to be supplied. Shop floor drawings of each packages/ Sub work shall be submitted separately for approval. It is the responsibility of the tenderer to get the makes, models and shop floor drawings approved by the department before placing of order.
62. **Insurance:** The agency shall include storage cum erection insurance including third party insurance right from the storage to commissioning and handing over of various equipment. In insurance, the beneficiary shall be Engineer-In-charge at the cost of the agency. All insurance which the agency is required to enter into under the contract shall be affected any authorized general insurance company and the agency shall produce the policies of insurance. In case of any delay in handing over, the insurance cover will be suitably extended by the contractor at his own cost.
63. **Remedy of failure to insure:** If the agency fails to effect and keep in force the insurance referred to in the preceding sub-clause and in case of unforeseen eventuality of theft/damage etc. to any material, the contractor only shall be held responsible and necessary rectification/replacement has to be done by contractor himself.
64. **Quality of material and workmanship:** All parts of the equipment shall be of such design, size and material so as to function satisfactorily under all rated conditions of operation. All components of the equipment shall have adequate factor of safety. The work of fabrication and assembly shall conform to sound engineering practice and on the basis of “Fail Safe Design”. The mechanical parts subject to wear and tear shall be easily replaceable type. The construction of the equipment shall be such as to facilitate easy operation, inspection, maintenance and repairs. All connections and contacts shall be designed to minimize risk of accidental short circuits caused by animals, birds and vermin etc. All identical items and their component parts should be completely interchangeable including spare parts.
65. All electrical & mechanical fittings / fixture / appliances, to be provided for the work, where BEE certification is available should have **5-star rating (of BEE)**.
66. **QUALITY ASSURANCE:** 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.

- 67.** Storage and safe custody of all materials shall be the sole responsibility of the Contractor. Nothing extra shall be payable on this account. This shall include cost of painting of the entire installation. The major equipment's shall be factory final finish painted. The agency shall be required to do only touch up to the damages caused to the painting during transportation, handling & installation at site, if there is no major damage to the painting. However, hangers, supports etc. of bus trunking & cable tray etc. shall be painted with required shade including painting with two coats of anticorrosive primer paint or pressurized paint for touch up of powder coated equipment atsite.
- 68.** The scope of works includes the on job technical training of two persons of department at site. Nothing extra shall be payable on this account.

**CONSENT LETTER FROM ELIGIBLE ASSOCIATE AGENCY OF MINOR
COMPONENT OF WORK**

Name of work: .

I / We hereby give my consent to associate with M/s.....,
for Executing the minor component of work of
.....
(Mention category).

I / We will execute the work as per specifications and conditions of the agreement and as per directions of the Engineer –in-Charge for the corresponding minor work till the completion of the work.

I / We will be responsible for necessary action to handover the installations and for rectification of defects and repair during the maintenance / warranty period.

Also, I / We will employ full time technically qualified Engineer / supervisor for the minor component of the work as required for the work. I / We will attend inspection of officers of the department as and when required.

Date:

Signature with date of Major component
Contractor
Address

Signature with date of Associate/Minor Component
Contractor
Address

Witness with address
(From major component contractor side)

Witness with address
(From minor component contractor side)

FORM – B**PROPOSAL FOR ELIGIBLE ASSOCIATING AGENCIES FOR MINOR COMPONENTS OF WORK**

I/we hereby propose the following agencies as mentioned against each for executing corresponding minor components of work. Their consent letters are also attached.

Sl. No	Name of Associated Contractor	Category and class of registration	Enlistment copy / Completion Certificates attached	Monetary Limit of work	Validity of registration	Consent Letter Attached (Yes/No)
1)						

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

Signature of contractor

AFFIDAVIT OF MEMORANDUM OF UNDERSTANDING (MOU)

(to be submitted for each and every E&M component)

M/s. (Name of the firm with full address)Enlistment Status (Valid Upto)
.....(Henceforth called the main Contractor)

M/s. (Name of the firm with full address)..... Enlistment Status (Valid
Upto).....(Henceforth called Associated Contractor)

For the execution of E &M component Works

Name **of** **work:**

.....
.....

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 (CCU) 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 this MOU allows. Both the parties shall be paid consequent to the execution as per agreement to the extent this MOU permits. In case of any dispute, either of us will go for mediation by the Engineer In charge. Any of us may appeal against the mediation to the Chief Engineer, His decision shall be final and binding on both of us.

We have agreed as under:

The Associated Contractor will execute all E & M works in the wholesome manner as per terms and conditions of the agreement.

The Associated Contractor shall be liable for disciplinary action if he fails to discharge the action(s) and other legal action as per agreement.

All the machinery and equipments, tools and tackles required for execution of the E & M works, as per agreement, shall be the responsibility of the Associated Contractor.

The site staff required for the E & M work shall be arranged by the Associated Contractor as per terms and conditions of the agreement.

SIGNATURE OF MAIN CONTRACTOR

Date:

Place:

SIGNATURE OF ASSOCIATED CONTRACTOR

Date :

Place:

Witness with address
(From major component contractor side)

Witness with address
(From minor component contractor side)

**UNDERTAKING LETTER FROM MANUFACTIRERES OF LED FITTINGS
(ON THEIR LETTER HEAD)**

We hereby agree that:

1. All the LED fittings supplied by us are guaranteed for five years including drivers from the date of handing over.
2. In case of discontinuation of model and non-availability of spares, we will replace the fittings with equivalent/ high end model in case of manufacturing defect during the warranty period of 5 years.

For M/S,

.....

(Authorized signatory of manufacturer of LED luminaries)

Counter Signature,

Major contractor

LIST OF PREFERRED MAKES OF MATERIALS FOR ELECTRICAL WORKS

SL. NO.	ITEMS	MAKES
	ELECTRICAL INSTALLATIONS & GENERAL	
1	WIRES AND CABLES a) PVC INSULATED FRLS COPPER CONDUCTOR SINGLE CORE CABLE b) 1.1 KV GRADE XLPE POWER CABLE AND CONTROL CABLE c) FIRE SURVIVAL CABLE d) 11 KV GRADE XLPE POWER CABLE e) COMMUNICATION CABLE	POLYCAB/ KEI/ HAVELLS/ FINOLEX
2	a) MS CONDUIT/ PVC CONDUIT AND ITS ACCESSORIES b) GI PERFORATED CABLE TRAY c) GI RACEWAY	AKG / BEC / NIC
3	MODULAR SWITCH & SOCKET	MK -ORNA / HAVELLS (CRABTREE MURANO) / SCHNEIDER LIVIA OR MILUZ LARA
4	ANCHOR FASTENER	HILTI/ 3M/ FISCHER
5	CABLE LUGS AND BRASS GLAND	GRIPWEL / DOWELL/ COMET
6	CAT-6 UTP CAT-6A, UTP UTP PATCH CORD FIBRE OPTICS CABLE	PANDUIT/ BELDEN / 3C3 / DERWISER
8	UPVC / HDPE PIPE/DWC	DURALINE/ REX/ TIRUPATI
9	RACK FOR ALL (EPABX / AUDIO VIDEO / CCTV etc.)	PANDUIT/ APC INDIA / 3C3 / IMPULSE / NEXXUX / BELDEN
10	PAINT, PRIMER	ASIAN PAINT/ NEROLAC / BERGER/ ICICI
11	MS PIPE, GI PIPE	SAIL/ TATA/ JINDAL (HISSAR)/JINDAL STAR
12	SERVER / DESKTOP	DELL / HP/ IBM / LENOVO / PANASONIC
13	WI- FI SYSTEM & NETWORK SWITCHES	CISCO/ JUNIPER/ NEXXUUS / IMPLUSE / BELDEN
14	STRUCTURAL STEEL	TATA/ SAIL/ JINDAL HISSAR / APL-APOLLO
15	WATER SUPPLY, STP, DRAINAGE, SUBMERSIBLE PUMPS	KIRLOSKAR /KSB/ GRUNDFOSS/ WILO/ XYLEM/ ARMSTRONG
	<u>DG SET</u>	
1	DIESEL ENGINE	CUMMINS / CATERPILLER/ PERKINS/ KIRLOSKAR OIL ENGINE LTD.
2	ALTERNATOR	STAMFORD/ KIRLOSKAR ELECTRIC/ CROMPTON
3	PROTECTION RELAYS & CT'S	L&T/ SIEMENS/ SCHNEIDER ELECTRIC
4	BATTERY	EXIDE / AMARON/ AMARAJA/LUMINOUS
5	DG SET - ACOUSTIC ENCLOSURE & ASSEMBLER	KIRLOSKAR (JACKSON) / SUDHIR / CUMMINS INDIA
6	AMF CONTROLLER	AS PER OEM
7	POWER/ AUXILLARY CONTACTOR/ CAPACITOR DUTY CONTACTOR / METERS INCLUDING DIGITAL METERS / INDICATING LAMP (LED TYPE) / PUSH BUTTON / STARTERS /OVERLOAD RELAY / TIMER	L&T/ SIEMENS/ SCHNIEDER ELECTRIC/ ABB
	<u>SUB-STATION</u>	
1	11 KV VCB PANEL	ABB / SCHNEIDER ELECTRIC/ SIEMENS/ TRICOLITE
2	a) DRY TYPE (11KV/433 VOLT)	

	b) OIL TYPE TRANSFORMER (11KV/433 VOLT)	KIRLOSKAR/ VOLTAMP/ ABB/ CROMPTON GREEVES
3	COMPACT SUB STATION	SCHNEIDER ELECTRIC/ ABB/ SIEMENS/ THEIR AUTHORIZED LICENSE PARTNER
4	ACB	SCHNEIDER ELECTRIC – MASTERPACT NW (6.0A)/ L&T - U POWER OMEGA (MTX3.5)/ SIEMENS 3WL (ETU 45B)/ ABB EMAX (PR122)
5	MCCB	SCHNEIDER – COMPACT NSX/ L&T DU/ ABB TMAX
6	MCB/ RCCB/ ISOLATOR	SCHNEIDER - ACTI9/ HAGER-H3/ SIEMENS BETA GUARD 10KA/ ABB SB200M
7	MCB DB	HAGER (H3) / SIEMENS (BETAGARD) /SCHNEIDER (ACTI-9)/ABB (ITUS)
8	MAIN LT PANEL/ SUB LT PANELS/ CAPACITOR PANEL/ SYNCHRONIZING PANEL WITH ACCESSORIES/ STARTER PANEL	NEPTUNE/ ADVANCE PANELS & SWITCHGEAR (P) LTD / ADLEC /ASPL/ APPLICATION CONTROL PVT. LTD
9	BUS DUCT, AIR INSULATED COMPACT RISING MAINS, END FEED UNIT, TAP-OFF BOX (PLUG-IN TYPE)	SCHNEIDER ELECTRIC/ LEGRAND / L&T/RR
10	OUTDOOR BUS TRUNKING	SCHNEIDER ELECTRIC/ RR/ NAXSO BBT
11	HT, LT JOINTING KIT & TERMINATION KIT	REYCHEM / 3M / ABB
12	SOFT STARTERS	SIEMENS/ SCHNEIDER/ ABB / L&T
13	CT, PT	ADVANCE / KAPPA / AE
	UPS	
1	UPS	SCHNEIDER (APC)/ EATON/ EMERSON (VERTIV)/ PEGASUS/ ABB / NUMERIC
	LIGHTING, FIXTURES & FANS	
1	CEILING FAN / EXHAUST FAN / KITCHEN FRESH AIR/ WALL FAN	HAVELLS/ CROMPTON/ USHA /BAJAJ/ ORIENT
2	LED EXIT SIGNAGE	MR. LITE/ PROLITE/ WIPRO/ AGNI
3	A) LED INDOOR LUMINAIRES B) LED DECORATIVE LIGHT LUMINAIRES C) LED STREET LIGHT D) BOLLARDS & OUTDOOR FITTINGS	PHILIPS/ REGENT/ LIGHTING TECHNOLOGY
4	MS DECORATIVE POLE	PHILIPS/ BAJAJ/ HI-LITE/ HAVELLS/ LUSTER/ UTKARSH/ ILEN
5	POLYCARBONATE JUNCTION BOX WITH CONNECTOR	HENSEL / RITTAL/ SCHNIEDER
6	SENSORS & TIMER FOR LIGHT CONTROL	PHILIPS / HONEYWELL / SCHNEIDER ELECTRIC / HAVELLS
	EPABX	
1	IP-PBX SYSTEM / IP PHONE	CISCO / CORAL / TADIRAN
	FIRE ALARM SYSTEM	
1	a) ADDRESSABLE FIRE ALARM CONTROL PANEL b) ADDRESSABLE DETECTORS c) GRAPHIC USER INTERFACE SOFTWARE d) MONITOR & CONTROL MODULE e) RESPONSE INDICATORS f) MANUAL CALL BOXES & HOOTERS g) INPUT /OUTPUT DEVICES	NOTIFIER (HONEYWELL)/ BOSCH/ SCHNEIDER/ EATON/ NOHMI
	PUBLIC ADDRESS SYSTEM	
1	a) PUBLIC ADDRESS SYSTEM CONSOLE AND ALL ACCESSORIES b) P.A. SPEAKERS c) AMPLIFIERS	BOSCH/ BIAMP/ HONEYWELL
	FIRE FIGHTING SYSTEM	

1	a) 2-WAY/4-WAY FIRE BRIGADE CONNECTION b) AIR RELEASE VALVE c) LANDING VALVE d) BRANCH PIPE e) FIRST AID HOSE REEL AND DRUM f) RRL HOSE PIPE g) FIRE MAN AXE	SAFEX/ NEWAGE/ LIFE GUARD/ EXFLAME
2	DIESEL ENGINE (FIRE-FIGHTING)	CUMMINS/ KIRLOSKAR / CATER PILLER
3	FIRE EXTINGUISHERS	CEASEFIRE/ MINIMAX/ NEWAGE / SAFEX / KANEX / EXFLAME
4	FLEXIBLE DROP & FLEXIBLE COUPLINGS	LIFE GUARDS / VICTAULIC/ TYCO
5	a) INSTALLATION CONTROL VALVE b) DELUGE VALVE c) SPRINKLER HEADS	TYCO / VICTAULIC / HD / HONEYWELL
6	SPRINKLER PANEL, CURTAIN SYSTEM PANEL PRESSURE RELEASE VALVE ZONE CONTROL VALVE (ZCV)	TYCO / HONEYWELL / HD
7	ALL FIRE FIGHTING PUMPS	GRUNDFOSS / WILO / MATHER PLATT / KIRLOSKAR
8	ELECTRICAL MOTOR	ABB/ KIRLOSKAR ELECTRIC CO./ SIEMENS INDIA LTD
9	THERMAL INSULATION FOR EXHAUST PIPE	UPTWIGA/ LLOYD INSULATION/ OWENS CORNING/ KIMMCO
10	M.S. FITTINGS	VS / DRP / VICTAULIC / UNIK
11	WELDING RODS	ADORE / ESAB/ MARGLAM
12	BUTTERFLY (MANUAL, GEAR OPERATED) VALVES, NON-RETURN VALVES, SLUICE VALVES Y-TYPE STRAINER FOOT VALVE WITH STRAINER AIR RELEASE VALVE BALL VALVES	AUDCO / ZOLOTO / SANT / HONEYWELL
13	TAMPER SWITCH FOR BUTTERFLY VALVE	HONEYWELL/ POTTER/ RAPID CONTROL/ SYSTEM SENSOR/ PACIFIC FIRE
14	PRESSURE SWITCH FLOW TEST METER	DANFOSS/ INDFOS/VIKING/ DELTA CONTROL
15	PRESSURE GAUGE LIQUID FILLED	FEIBIG/ H. GURU/ EMERALD/ WAAREE
	HVAC	
1	VRV/VRF SYSTEM INCLUDING INDOOR & OUTDOOR UNITS	DAIKIN/ HITACHI/ MITSUBISHI/ O-GENERAL/ CARRIER-TOSHIBA
2	SPLIT TYPE AC	HITACHI/ MITSUBISHI / O-GENERAL
3	REFRIGERANT PIPING	MANDEV / MEXFLOW / RR SHRMIK
4	CLOSED CELL NITRILE RUBBER INSULATION/ EPDM INSULATION	ARMAFLEX /AEROCCELL / ALP
5	INLINE FANS	SYSTEMAIR/ KRUGER/ GREENHECK/ HUMIDIN/ NICOTRAAIR
6	CHILLER	TRAIN/ TROX/ YORK/DAIKEN
7	CHILLER PUMP	ARMSTRONG/ GROUND FOSS/XYLEM
8	AIR HANDLING UNITS/ TREATED FRESH AIR UNITS	SYSTEMAIR/ EDGETECH/ TRANE/ BALANCE/ ZECO / WAVES
9	AIR WASHER	SYSTEMAIR/ EDGETECH / TRANE/ BALANCE/ ZECOW/ WAVES
10	AIR SEPARATOR	XYLEM/ EMERALD/ ANERGY/ KD AGENCIES
11	COOLING TOWERS (CTI/ CERTIFIED)	ADVANCE/ MARLEY/ PAHARPUR/ BELL
12	GI SHEETS DUCTING ETC	SAIL/ TATA/ JINDAL
13	CO2 SENSOR	SCHNEIDER/ HONEYWELL/ SIEMENS
14	PPR PIPE	JINDAL HISSAR / ASTRAL / FUSION

15	CENTRIFUGAL & AXIAL FANS VANE AXIAL IN-LINE FANS AND THEIR MOTORS	KRUGER/ GREENHECK/ NICOTRA/ BALANCE/ TRISTAR WITH MOTOR FROM THEIR APPROVED OEM
16	VIBRATION ISOLATOR RUBBED PAD DUCT SUPPORT ARRANGEMENT	DUNLOP/ RESISTOFLEX/ GERB
17	GRILL DIFFUSER FIRE DAMPERS LOUVERS VOLUME CONTROL DAMPER	SYSTEM AIR/ CARRYAIRE/ COSMOS/ TRISTER / GREENHECK/ BALANCE
18	FLEXIBLE GROOVED FITTINGS COUPLINGS	VICTAULIC/ TYCOGRINNEL/ VIKING
19	PRE-FABRICATED DUCT DUCT FLANGE (WITH GI SHEETS OF MAKES)	ZECCO/ ROLLASTAR/ DUCTOFAB/ WAVES
20	VARIABLE FREQUENCY DRIVE	DANFOSS/ ABB / HONEYWELL/ SIEMENS / SCHNEIDER
21	ALUMINUM TAPE	JOHNSON/ BIRLA-3M/ NIPPON INDUSTRIES
	LIFT	
1	LIFT	KONE ELEVATORS INDIA PVT. LTD./ MITSUBISHI / SCHINDLER/ OTIS ELEVATOR/ JHONSON
	SOLAR POWER	
1	POWER CONDITIONING UNIT (PCU)/ SOLAR INVERTERS	ABB FIMER/ SOLAREEDGE/ FRONIUS
2	SOLAR PV PANEL	TATA SOLAR/ WAAREE ENERGY/ADANI SOLAR
	STP/ETP/WTP	
1	PLANT MANUFACTURER	GRANNUS WATER AND ENVIRONMENTAL SOLUTIONS PVT. LTD./ CIMERA ENGINEERS/ SPECTRUM ENGINEERING TECH PVT. LTD. / ION EXCHANGE / ZETA4/ ROHANTA INFRA SOLUTION
2	AIR BLOWER	EVEREST / BETA / ROBUSCHI
3	AIR DIFFUSERS	REHAU / SSI AERATION / MM AQUA
4	RAW SEWERAGE TRANSFER PUMP / SLUDGE RECYCLE PUMP / FILTER FEED PUMP / NON CLOG HORIZONTAL CENTRIFUGAL PUMP/ DE WATERING PUMP / DOSING PUMP/ SBR FEED PUMP/ FILTER FEED PUMP/ SLUDGE PUMP/ CHLORINE DOSING PUMP	ARMSTRONG / XYLEM / GRUNDFOS/ / WILO
5	FILTER PRESS	SACHINFILTECH / PHARMATECH / HITECH
6	TUBE SETTLER MEDIA /MBBR MEDIA	WELBRICK / PHARMATECH / MM AQUA
7	M.S. FILTER	WELBRICK / ION EXCHANGE / ASTHA / THERMAX / ZETA4
8	OZONATOR	CREATIVE/ OZONICS/ ORAPL / CHEMTRONICS / FARADAY
9	NON CLOGG HORIZONTAL SCREW TYPE FILTER PRESS PUMP	ROTO/ POSITIVE/ ROTAMAC/ TUSHACO
10	CENTRIFUGE	APOLLO/ WELBRICK/ GWSPL/ PHARMATECH / GEA
11	PRESSURE GAUGE	H GURU / FEIBIG / GLUCK / BAUMER
12	BUTTERFLY / DUAL PLATE CHECK VALVES	AUDCO / ZOOTO / ADVANCE / CASTLE / SANT
13	PLC	DELTA/ SIEMENS/ SCHNEIDER
	AUDIO-VIDEO	
1	LED VIDEO WALL / LED DISPLAY	SAMSUNG/LG/ PANASONIC / SONY
2	PROJECTOR	CHRISTIE / BARCO / NEC / PANASONIC
3	WIRELESS AND WIRED MICROPHONE BOUNDARY MICROPHONE GOOSNECK MICEOPHONE WIRELESS CHARGER FOR	SHURE / SENNHEISER / AUDIO TECHNICA

	WIRELESS GOOSNECK MICEOPHONE ANTENNA & SPLITTER/ COMBINER	
4	DIGITAL PODIUM	AHA/ UNI/ MAXHUB/ TECCOM
5	NETWORK VIDEO ENDPOINT	QSC/KRAMER/EXTRON/ LIGHTWARE/ CRESTRON/ LUMENS
6	FULL RANGE CEILING SPEAKERS 2 WAY SPEAKER – TYPE 1 & 2 SUBWOOFER SURROUND SPEAKER PASSIVE COLUMN ARRAY LOUDSPEAKER – TYPE 1 & 2	QSC/ BOSE / TW AUDIO
7	AMPLIFIER	QSC/ LAB GRUPPEN / POWER SOFT
8	DIGITAL SIGNAL PROCESSOR	QSC/ BOSE / SYMETRIX
9	DIGITAL IP BASED CHAIRMAN UNIT DIGITAL IP BASED DELEGATE UNIT WIRELESS DELEGATE UNIT WIRELESS CHAIRMAN UNIT WIRELESS CONFERENCE CONTROLLER	SENNHEISER/ SHURE / TELVIC
10	MATRIX SWITCHER DISTRIBUTION AMPLIFIER, TRANSMITTER & RECEIVER	LIGHTWARE/ EXTRON/ CRESTRON
11	TABLE MOUNT ENCLOSURE	KRAMER/CRESTRON/ LOGIC
12	PTZ CAMERAS	SONY/ LUMENS/ QSC/ PANASONIC
13	RECORDER & STREAMING SYSTEM	LUMENS/ MEDIA POINTE/ PANASONIC/ SONY
14	CONTROL TOUCH PANEL AND CONTROL SYSTEM	CRESTRON/QSC/EXTRON
15	SPEAKER & MICROPHONE CABLE	KRAMER / BELDONE / KRYSTAL
	CONTROL CABLE	
16	HDMI CABLE ACTIVE USB CABLE	CRESTRON/ EXTRON/ LIGHTWARE
17	VIDEO CONFERENCE SYSTEM	CISCO/ POLYCOM/ CRESTRON
	CCTV	
1	PTZ, BULLET, DOOM CCTV CAMERA NVR	AXIS / HONEYWELL ENTERPRISES/ MOBOTIX IMPULS
	BOOM BARRIER	
1	BOOM BARRIER	DESIGNA / NEPTUNE / GODREJ
	FIRE SUPPRESSION SYSTEM	
1	FIRE SUPPRESSION SYSTEM	SVS BUILDWELL/ SAFEX / LIFEGUARD
	EV Charging	
1	EV charging	ABB/SCHNEIDER/NEPTUNE
	ACCESS CONTROL SYSTEM	
1	ACCESS CONTROL SYSTEM	SIEMENS/ SCHNEIDER/ GODREJ/HONEYWELL/ BOSCH
	BIKE PARKING	
1	BIKE PARKING SYSTEM	iPARK/ TAR PARKING/
	BUILDING MANAGEMENT SYSTEM(BMS)	
1	CENTRAL CONTROL BMS SERVER	IBM/ HP/ DELL/ SIEMENS / DELTA/ HONEYWELL EBI/ SCHNEIDER / CARRIER ALC
2	PRINTER	HP/ CANON/ EPSON
3	BUILDING MANAGEMENT SYSTEM	SIEMENS/ CARRIER ALC/ HONEYWELL EBI/ DELTA/ SCHNEIDER
4	BUILDING MANAGEMENT WEB BASED SERVER SOFTWARE	SIEMENS/ CARRIER ALC/ HONEYWELL EBI/ DELTA/ SCHNEIDER
5	PROGRAMMABLE & APPLICATION SPECIFIER CONTROLLER (DDC)	SIEMENS/ CARRIER ALC/ HONEYWELL COMFORT POINT/ DELTA/ SCHNEIDER
6	SYSTEM INTERGRATION UNITS FOR 3RD PARTY SOFTWARE INTEGRATION	SIEMENS/ CARRIER ALC/ HONEYWELL COMFORT POINT/ DELTA/ SCHNEIDER

7	ENCLOSURE FOR DDC CONTROLLER	RITTAL/ SIEMENS/ BCH/ DELTA
	SENSOR & FIELD DEVICES	
8	IMMERSION TYPE TEMPERATURE SENSORS	SIEMENS/ HONEYWELL COMFORT POINT/ALC/ DELTA
9	ULTRASONIC BTU METER/FLOW METER	SIEMENS/ HONEYWELL/ BELIMO/ DELTA
10	OUTSIDE T+RH SENSOR	SIEMENS/ HONEYWELL COMFORT POINT/ALC/ DELTA
11	DIFFERENTIAL PRESSURE SWITCH AIR	SIEMENS/ HONEYWELL COMFORT POINT/ ALC/ DELTA
12	DIFFERENTIAL PRESSURE SWITCH WATER	SIEMENS/ HONEYWELL/ DWYER/ DELTA
13	DIFFERENTIAL PRESSURE SENSOR- AIR/WATER	SIEMENS/ HONEYWELL COMFORT POINT/ ALC/ DELTA
14	ROOM/DUCT TYPE TEMP SENSOR	SIEMENS/ HONEYWELL COMFORT POINT/ ALC/ DELTA
15	ROOM/DUCT TYPE TEMP + RH SENSOR	SIEMENS/HONEYWELL COMFORT POINT/ ALC/ DELTA
16	PRESSURE SENSOR WATER	SIEMENS/HONEYWELL COMFORT POINT/ ALC/ DELTA
17	CO2 SENSOR/VOC SENSOR/ PM2. 5&10	SIEMENS/HONEYWELL COMFORT POINT/ ALC/ DELTA
18	WATER LEVEL SWITCHES	VEKSLER/ FLIPRO/ OMICRON/ DWYER
19	FLAME PROOF LEVEL TRANSMITTER	VEKSLER/ FLIPRO/ OMICRON/ DWYER
20	DC VOLTAGE / CURRENT/ POWER FACTOR TRANSDUCER	L&T/ABB/ DWYER/ MECO
21	CURRENT RELAY	L&T/ABB/ DWYER/ MECO
22	VFD DRIVES	SCHNEIDER/ SIEMENS/ ALLEN BRADLEY
	WIRING & CONDUCTING	
23	SIGNAL CABLE, PVC INSULATED, TINNED COPPER	POLYCAB/ SKYTON/ FINOLEX/ BONTON/ LAPP
24	LAN CABLE	BELDEN/ MOLEX/ PANDUIT
25	NETWORKING PASSIVE	PANDUIT/ AVAYA/ LEGRAND/ HP
26	NETWORKING ACTIVE	CISCO/ HP/ JUNIPER/ EXTREME/ AVAYA/
27	LAN PASSIVE (CABLE /IO'S/ PATCH CORDS/ FACE PLATE/ JACK PANEL) & OFC COMPONENTS	LEVITON/ SYSTIMAX/ PANDUIT/ POLYCOM / LEGRAND
28	CONTROL SOFTWARE, CONTROLLERS	HONEYWELL / SCHNEIDER ELECTRIC /SIEMENS / ALC/ SAUTER/ JOHNSON CONTROL
29	TEMP GAUGE, PRGAUGE, FLOW SWITCH, PR SWITCH, ACTUATORS, ROOM THERMOSTAT, HUMIDSTAT, WATER FLOW METER, HARDNESS ANALYSER, PH, CHLORINE, TDS,CO,CO2 SENSORS ETC.	HONEYWELL/ SCHNEIDER ELECTRIC /SIEMENS / JOHNSON CONTROL/ KELE/ VEKSLER/ L&T/ DANFOSS/GE/ TRANE/ AZBIL

Note: The articles/materials which are not mentioned in the above said list shall be approved by the NIT approving authority before execution of work.

SCHEDULE OF QUANTITY FOR ELECTRICAL WORK

SCHEDULE OF QUANTITY (E&M WORK)

Item No.	Description of Item	Qty.	Unit	Rate	Amount
	SUB HEAD - I (Point Wiring)	-			
1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLSH/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLSH/HFFR PVC insulated copper conductor single core cable etc as required.				
(a)	Group C	226	Points	2590.53	585459.78
2	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLSH/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLSH/HFFR PVC insulated copper conductor single core cable etc. as required.				
(a)	Group C	128	Points	1536.32	196648.96
3	Wiring for twin control light point with 1.5 sq.mm FRLSH/HFFR PVC insulated copper conductor single core cable in surface / recessed steel conduit, 2 way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLSH/HFFR PVC insulated copper conductor single core cable etc as required.	12	Points	2764.39	33172.68
4	Wiring for light/ power plug with 2X4 sq. mm FRLSH/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit along with 1 No 4 sq. mm FRLSH/HFFR PVC insulated copper conductor single core cable for loop earthing as required.	1600	Mtr	591.84	946944.00
5	Wiring for light/ power plug with 4X4 sq. mm FRLSH/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit along with 2 Nos 4 sq. mm FRLSH/HFFR PVC insulated copper conductor single core cable for loop earthing as required.	600	Mtr	892.69	535614.00
6	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLSH/HFFR PVC insulated copper				

	conductor, single core cable in surface/ recessed steel conduit as required				
a)	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	1540	Mtr	456.21	702563.40
b)	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	600	Mtr	586.91	352146.00
c)	2 X 6 sq mm + 1 X 6 sq mm earth wire	700	Mtr	803.92	562744.00
d)	2 X 10 sq mm + 1 X 6 sq mm earth wire	500	Mtr	959.27	479635.00
e)	4 X 10 sq. mm + 2 X 6 sq. mm earth wire	300	Mtr	1544.95	463485.00
7	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
a)	20 mm	100	Mtr	313.18	31318.00
b)	25 mm	150	Mtr	356.34	53451.00
8	Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.(for FA, CCTV & Wifi)				
a)	20 mm	400	Mtr	186.18	74472.00
b)	25 mm	600	Mtr	207.14	124284.00
c)	32 mm	100	Mtr	257.70	25770.00
9	Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess etc as required.				
a)	1 or 2 Module (75mmX75mm)	94	Each	436.48	41029.12
b)	6 Module (200mmX75mm)	10	Each	569.65	5696.50
c)	8 Module (125mmX125mm)	10	Each	637.46	6374.60
10	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a)	Telephone socket outlet	20	Each	207.14	4142.80
b)	TV antenna socket outlet	10	Each	207.14	2071.40
11	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	50	Each	57.95	2897.50
12	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	70	Each	671.99	47039.30
13	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or	47	Each	812.55	38189.85

	in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.				
14	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 2 nos. 3 pin 5/6 A modular socket outlet and 2 nos. 5/6 A modular switch, connections etc. as required. (For light plugs to be used in non residential buildings).	109	Each	933.38	101738.42
15	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.	9	Each	995.03	8955.27
16	Supplying and fixing call bell/ buzzer suitable for single phase, 230 V, complete as required.	8	Each	138.10	1104.80
	SUB HEAD II :- DISTRIBUTION BOARDS & MCB's				
17	Supplying and fixing 5 A to 32 A rating, 240/415 V, 10 kA, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	Single pole	338	Each	351.41	118776.58
18	Supplying and fixing following way, Single Pole and Neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator).				
a)	8 way, Double door	8	Each	3419.11	27352.88
b)	12 way, Double door	8	Each	3539.94	28319.52
19	Supplying and fixing following way, horizontal type Three Pole and Neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	6 way (4 + 18), Double door	5	Each	6533.67	32668.35
b)	8 way (4 + 24), Double door	5	Each	7813.52	39067.60

20	Supplying and fixing following Rating, Double pole, 240 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as Required.				
a)	40 Amps	16	Each	701.58	11225.28
21	Supplying and fixing following rating, four pole, 415 V, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	63 Amps	10	Each	1374.80	13748.00
22	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as Required.				
a)	40 Amps	6	Each	3097.30	18583.80
23	Supplying and fixing Cable End Box (Loose wire box) suitable for following single pole and neutral, sheet steel, MCB distribution board, 240 V, on surface/ recess, complete with testing and commissioning etc. as required.				
a)	For 8 way, Double door SPN MCBDB	8	Each	1131.89	9055.12
b)	For 14 way, Double door SPN MCBDB	8	Each	1220.67	9765.36
24	Supplying and fixing Cable End Box (Loose wire box) suitable for following triple pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with testing and commissioning etc. as required.				
a)	For 6 way, Double door TPN MCBDB	5	Each	1507.96	7539.80
b)	For 8 way, Double door TPN MCBDB	5	Each	1785.38	8926.90
	SUB HEAD III :- INTERNAL LIGHTING FIXTURES & FANS				
25	LED Down lighter (SMD Type) (System lumen efficacy $\geq 120 < 135$ lm/Watt)				
	LED Batten light (System lumen efficacy $\geq 120 < 135$ lm/Watt). Supplying, Installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency $> 85\%$, Operating voltage AC 140- 270 Volt, frequency 50/60 hz, Operating temp range -5 °C to 40 °C, internal surge protection of 2.5 KV with Short & Open circuit protection, THD $< 10\%$, P. F. ≥ 0.95 , IP20, CRI > 80 ,				

	Flicker free, (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM(Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard. Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c external connections with 1.5 sq mm FRLSH/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥ 105 <120 lm/Watt output . LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in- Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm) (With 5 Years Warranty)				
a)	12 -15 watt	27	Each	881.60	23803.20
b)	18 wat	52	Each	1161.49	60397.48
26	LED Panel light 2x2 ft. (System lumen efficacy ≥ 120 <135 lm/Watt) Supplying, installation, Testing & Commissioning of Panel light 2x2 ft., of following body material and construction as per IS: 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -5 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F. ≥ 0.95 , IP20, CRI ≥ 80 , UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K/ 5700°K /6500°K (As per ANSI Bin), SDCM (Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing.				

	complete in all respect i/c external connections with 1.5 sq. mm FRLSH/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥ 120 <135 lm/Watt output. LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				
	Powder coated die cast /Extruded aluminium Body (Thickness ≥ 1.20 mm)				
a)	36 watt	183	Each	3652.15	668343.45
27	LED Batten light (System lumen efficacy ≥ 120 <135 lm/Watt) Supplying, installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS: 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -5 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F. ≥ 0.95 , IP20, CRI ≥ 80 , Flicker free, (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6500°K (As per ANSI Bin), SDCM (Standard Deviation Colour Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c external connections with 1.5 sq. mm FRLSH/HFFR, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥ 120 <135 lm/Watt output. LM79 & LM80 Test report and all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C).				

	Powder coated die cast /Extruded aluminium Body (Thickness ≥ 1.20 mm)				
a)	18-22 watt	6	Each	905.02	5430.12
28	Supply & Installation, testing and commissioning of Linear & Compact 10W Mirror Light with colour temp 6500K with Decorative Grey Caps, Polycarbonate Body & Ribbed Opal Diffuser.				
(a)	10 W	11	Each	220.00	2420.00
29	FANS				
29.1	Supplying, installation, testing & commissioning of Fresh Air Exhaust Fan, 250 mm sweep 1100-1350 rpm, 36-40 W and Air Delivery 800 m ³ /h with Louvers & Rust proof body and blades etc. complete as required.	16	Each	2126.00	34016.00
29.2	Brush Less Direct Current (BLDC) Fan without Remote Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal(Aluminium alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, suitable for operation with regulator for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as required.				
(a)	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	18	Each	3322.94	59812.92
29.3	Supplying, installation, testing & commissioning of Wall Fan 450 mm sweep, 1250-1400 rpm, 70-100 W and Air Delivery 70-80 CMM, Rust proof body and blades etc. complete as required.	45	Each	3227.00	145215.00
	SUB HEAD IV :- H T CABLE, LT CABLE,LAYING AND ACCESSORIES				
30	Supplying of Following Sizes of 1.1 KV Grade Multicore Aluminium Conductor XLPE insulated & PVC sheathed Power armoured cable conforming to IS : 7098 (Part - I) or as per Relevant IS Code complete with all Amendments etc as required.				
a)	3.5 C X 35 Sq.mm Al. XLPE arm.	320	Mtrs	416.00	133120.00

b)	3.5 C X 50 Sq.mm Al. XLPE arm.	200	Mtrs	563.00	112600.00
c)	3.5 C X 70 Sq.mm Al. XLPE arm.	100	Mtrs	759.00	75900.00
d)	3.5 C X 95 Sq.mm Al. XLPE arm.	100	Mtrs	947.00	94700.00
e)	3.5 C X 150 Sq.mm Al. XLPE arm.	100	Mtrs	1406.00	140600.00
f)	3.5 C X 240 Sq.mm Al. XLPE arm.	50	Mtrs	2236.00	111800.00
31	Supplying of one number Earthed armoured Aluminium conductor XLPE insulated power cable of 11 KV grade confirming to IS:7098 (Part-II)1985 as amended up to date.				
a)	3C X 240 Sq.mm	40	Mtrs	3508.00	140320.00
32	Supply and making Indoor cable end Termination with heat shrinkable jointing kit complete with all accessories, including lugs suitable for following size of 3 core XLPE aluminium conductor cable of 11KV grade as required.				
a)	3C 240 sq. mm	6	Nos	21471.46	128828.76
33	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required :				
a)	3C 240 sq. mm	2	Nos	29906.42	59812.84
34	Supplying of Following Sizes of 1.1 KV Grade Multicore Copper Conductor XLPE insulated & PVC sheathed Power armoured cable conforming to IS : 7098 (Part - I) or as per Relevant IS Code complete with all Amendments etc as required.				
a)	3.5 C X 25 Sq.mm Copper XLPE armoured.	100	Mtrs	2153.00	215300.00
35	Laying of one number XLPE insulated and PVC sheathed aluminium armoured power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
a)	Upto 35 sq. mm	920	Mtrs	57.95	53314.00
b)	Above 35 sq. mm and upto 95 sq. mm	400	Mtrs	88.78	35512.00
c)	Above 95 sq. mm and upto 185 sq. mm	100	Mtrs	119.60	11960.00
d)	Above 185 sq. mm and upto 400 sq. mm	50	Mtrs	209.61	10480.50
35.1	Laying of one number XLPE insulated and PVC sheathed power cable of 11 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
a)	Above 120 sq. mm and upto 400 sq. mm	30	Mtrs	855.70	25671.00

36	Supplying and making end termination with brass compression gland and aluminium lugs for following size of XLPE insulated and PVC sheathed aluminium conductor cable of 1.1 KV grade as required				
a)	4 X 16 sq. mm (28mm)	50	Nos.	451.28	22564.00
b)	3½ X 35 sq. mm (32mm)	20	Nos.	538.82	10776.40
c)	3½ X 50 sq. mm (35mm)	10	Nos.	596.77	5967.70
d)	3½ X 70 sq. mm (38mm)	20	Nos.	668.29	13365.80
e)	3½ X 95 sq. mm (45mm)	10	Nos.	843.37	8433.70
f)	3½ X 150 sq. mm (50mm)	8	Nos.	983.93	7871.44
g)	3½ X 240 sq. mm (62mm)	6	Nos.	1430.28	8581.68
37	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.				
a)	63 mm dia (OD-63 mm & ID-51 mm nominal)	420	Mtrs	167.69	70429.80
b)	90 mm dia (OD-90 mm & ID-76 mm nominal)	200	Mtrs	225.64	45128.00
c)	120 mm dia (OD-120 mm & ID-103 mm nominal)	100	Mtrs	325.51	32551.00
38	Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc as required.				
a)	100 mm dia	30	Mtrs	950.64	28519.20
b)	150 mm dia	30	Mtrs	1043.12	31293.60
	SUB HEAD V :- EARTHING				
39	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	16	Nos.	10296.78	164748.48
40	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	12	Nos.	18499.93	221999.16

41	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.	120	Mtrs	2019.65	242358.00
42	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.	160	Mtrs	930.92	148947.20
43	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	60	Mtrs	1536.32	92179.20
44	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	80	Mtrs	353.87	28309.60
45	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.	4000	Mtrs	61.65	246600.00
	SUB HEAD VI :- LIGHTNING CONDUCTOR				
46	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	8	Set	10296.78	82374.24
47	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required.	16	Each	750.90	12014.40
48	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For horizontal run)	600	Mtrs	182.48	109488.00
49	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required. (For vertical run)	160	Mtrs	293.45	46952.00
50	Providing and fixing testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.	20	Each	172.62	3452.40
51	Providing and laying G.I. tape 32 mm X 6 mm from earth electrode directly in ground as required.	120	Mtrs	272.49	32698.80
	SUB HEAD VII :- IP CCTV SYSTEM & LAN				

52	Supplying, installation, Testing and commissioning of following capacity 24 port Layer 2 indoor Network Switch having features and specifications etc. as mentioned here under: At least 24 X RJ-45 Gigabit Ethernet Ports and additional 2 X 10GBase -T with 4 X SFP Ports with 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, Stacking support of min. 4 units per stack. Internal dual AC Power supply, STP, RSTP, MSTP, BPDU Filter, BPDU Restriction, Min. 9K Jumbo Frame, LBD, IGMP Snooping V1/V2/V3, MLD Snooping V1/V2. IGMP/ MLD Groups 1K or more, IPv4/ IPv6 Loopback Interface, 16 L3 IP Interface, Ipv6 ND, VRRPv3, UDP Helper, ECMP. VLAN:802.1Q, Port based, Q-in-Q, Multicast VLAN, Protocol VLAN,VLAN Trunking, DHCP Snooping, Server, server Screening. RADIUS , TACACS+ Authentication, QoS: 802.1P, 8 queues per port, QoS : WRR, Strict + WRR, WRED, 802.1p. ACL: MAC based, IPv4C IPv6, TCP/ UDP Port number, time based ACL, TFTP Client, SNMP V1, v2c, v3, SNMP traps, RMON, DHCP server, relay, client, LLDP, LLDP-MED, OAM, Dying Gasp,802.3ah, sflow, RIP, OSPF v2/v3, policy based route, SSL,SSH. 6 kV surge protection on all Gigabit Ethernet ports and on all GE RJ-45 access ports. Certifications: FCC, CE marked, UL/EN, RoHS and relevant MTCTE(TEC)/BIS compliance/certification as applicable, etc. complete as required.				
a)	24 port PoE Layer 2 Network Switch with PoE Support of 370W or higher with each cooper port supporting 802.3at PoE+ min.	4	Nos.	154609.57	618438.28
53	Supplying, installation, Testing and commissioning of following capacity 8 port Layer 2 indoor Network Switch having features and specifications etc. as mentioned here under: Minimum 8 X RJ-45 Gigabit Ethernet Ports and additional 2 X 1G SFP Ports with non-blocking architecture by having Switching capacity of minimum 20Gbps and packet forwarding rate of 14Mpps or higher, 8K MAC table. Internal dual AC Power supply with operating temperature of -5 degree Celsius to +50 degree Celsius. Jumbo frame: 9KB or higher, IGMP Snooping, IGMP snooping querier and support for IGMP Snooping Fast Leave,Should create 250 or more MLD groups, MLD Snooping, Per				

	VLAN MLD Snooping C MLD Snooping Fast Leave, STP, RSTP, MSTP, Loopback detection, Multicast filtering, VLAN Tagging, QOS: 8 Que per port, WRR, IPv4/ IPv6 Interface: minimum 100 IPv4 static route entries and minimum 50 IPv6 static route entries, 700 Access Control entries, SSH CSSL for IPv4 and IPv6, 802.1x, ARP Spoofing, DHCP Snooping and server screening, IP+MAC+Port Binding, Per Port Bandwidth Control, 802.1X Authentication (Supports local/ RADIUS database, Port-based Access Control and EAP, OTP, TLS,TTLS, PEAP Support) Cable Diagnostic feature, LLDP, LLDPMED, SNT/ NTP, RMON, SNMP v1,v2c, v3 and SNMP Traps. Certifications: FCC, CE marked, UL/EN, RoHS and relevant MTCTE(TEC)/BIS compliance/certification as applicable, etc. complete as required.				
a)	8 port PoE Layer 2 Network Switch with PoE Support of 130W or higher with each copper port supporting 802.3at PoE+.	3	Nos.	43267.20	129801.60
54	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, Preassembled shelves in multiple configurations, Rubber fibre slotted bracket built-in, metal splice shelf to protect the fibres, 2fiber spools built-in for 900µm tight buffered fibre storing, Capable of storing up to 3 meters of 900µm tight buffered fibre 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.				
a)	12 Port LIU	1	Nos.	8680.32	8680.32
55	Supply and fixing of following size Wall Mount Rack having Fixed Structure with 0.8mm CRCA Sheet, completely knocked-down condition (CKD) Shape, Vertical Mounting Rail 1.6 mm with 'U' Marking, Minimum 2 cable entry/exit provision at Top and bottom with rubber protection, Front 5mm Toughened Glass with lock, wall mounting kit, Powder coated Color- RAL- 7035, complied with UL & RoHS, 2 x 6 sockets 16A power distribution units, 3 numbers closed cable organizer, Hardware mounting screws packet of 20 x 1 number, etc. complete as required.				
a)	9U Rack	3	Each	11047.68	33143.04

56	Supplying and drawing following core Multi mode Fibre Optic Cable having corrugated steel armoring, lesser optimize 50/125µm with HDPE jacket, LSZH (Low smoke Zero Halogen), Tight buffered or loose tube, maximum attenuation: ≤ 3.5 dB/km at 850 nm, ≤ 1.5 dB/km at 1300 nm, bandwidth ≥ 2000 MHz-km at 850 nm, ≥ 500 MHz-km at 1300 nm compliance and certifications: ISO/IEC 11801 Ed. 2.2, ANSI/TIA-568-C.3, ITU-TG.651.1 RoHS compliant. Multi Mode Fibre shall be Central loose tube filled with Thixotropic jelly, duly following Standards: ISO 11801, IEC 60793-1/60794-1-2, ITU-T-RECG.652D and Telecordia GR-20-core, High quality Electro Chromium Coated Corrugated Steel tape (ECCS) and HDPE Sheath, Operating ambient Temperature should be - 5 deg C to +50 deg C and Storage Temperature should be - 5 deg +50 deg C, Maximum Attenuation ± 3.5 db / km at Operational Wavelength 850 nm and ± 1.5 db / km at Operational Wavelength 1300 nm, type of fibre should be 50/125 / G.652D & Refractive Index should be 1.483/1.478, The value for Mode-field, Cladding Diameter 50 ± 2.5 µm and 125 ± 1µm correspondingly etc complete as required.				
a)	Single Mode 6 Core Optical fibre cable	150	Meter	78.91	11836.50
57	Supply and fixing Patch Cord of Optical Fibre Multi Mode or Single Mode LC to LC Fibre Duplex having high precision ceramic ferrule with good concentricity, Fibre corning single mode G652D, Cable Type 2mm with Mechanical specification Apex Offset ≤ 50 µm, Fibre Height ± 100 nm, End-face radius of Curvature 7mm < R < 25mm, Repeatability ≤ 0.2 dB, Working ambient Temperature – 5 deg C to +50 deg C, Storage Temperature – 10 deg C to +50 deg C, Length --2meter, Type -- LC-LC Duplex etc complete as required.	8	Nos.	869.27	6954.16
58	Supply of 24 port Cat6 Patch Panel loaded. Must be of 1U height with clear label holders and white label with the panel. 24 Ports Cat-6 Patch Panel should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D	4	Nos.	6507.77	26031.08
59	Supplying, Installation, Testing and commissioning of following CAT6A Patch Cord should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D				
a)	Copper Patch Cords of length 1m (3ft)	94	Nos.	213.31	20051.14

b)	Copper Patch Cords of length 3m (10ft)	58	Nos.	499.37	28963.46
60	Supplying, Installation, Testing and commissioning of smallform-Pluggable (SFP) for Network Switches. Must be hotPluggable, RoHS Complaint, etc. complete as required.				
a)	10 G SFP + Single Mode/Multi Mode	10	Nos.	18460.48	184604.80
61	Supplying, Installation, Testing and commissioning of CAT6ACopper Information Outlet (IO) with face plate of color as per site requirement, should have ETL/UL verification program certificate for compliance with ANSI/TIA-568.2-D. All copper Cable and Components should be from same OEM to maintain compatibility and interoperability.	58	Nos.	372.37	21597.46
62	Supplying, Installation, Testing and commissioning of RJ45Connector for CAT 6/6A Cables. RJ45 modular plug supports 4twisted pairs, 8 positions, 8 connectors. Housing: PC, UL94V-2, transparent color. Use for 24- 26 AWG stranded wires.	94	Nos.	11.10	1043.40
63	Supplying Installation Testing and Commissioning of 5/6 MP IP IR Bullet Camera having following specifications and features etc :- 1) Type of Camera: Bullet Camera 2) Image Sensor: 1/2.8" or better progressive Scan CMOS get color image even at night condition 3) Signal System: PAL/NTSC 4) Minimum Illumination: 0.006Lux@ F1.4, AGC ON, 0 lux with IR or better 5) Imaging: 1/3s to 1/30000s, Auto Gain Control, White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking. 6) On Screen Display: Camera should display Camera title, Date & Time in live & recorded video both. 7) Signal to Noise Ratio: > 50 dB 8) Lens Type & Focus: 3.6mm/6mm fixed lens (optional as per site requirement) 9) Day & Night: True Day & Night High Performance Mechanical IR cut filter with auto switch, IR Source- Inbuilt IR LED's with effective distance upto 50 Mtrs integrated IR and 30 Mtrs for colour view in night. 10) Video Compression (Minimum): H.265 or better, H.265, H.264H, H.264, Audio:- G.711U/A, G.711Mu, G.726, AAC, G.723				
	11) Wide Dynamic Range: WDR (120db or more) 12) Digital Noise Reduction: DNR (2D/3D) On/Off				

13) Streaming: Triple streaming, configurable 14) Video Streaming & Frame Rates: Triple streaming, configurable Main stream: 5/6MP @25/30 fps, Sub streams: D1@25/30 fps or better 15) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser 16) Profile Management: User configuration import, export 17) Security: User Authentication, Digital Water Marking 18) On board Storage: Camera should support built-in Micro SD/SDHC/SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card.				
19) Recording Management: Format SD, overwrite, storage management, video to NAS device,20) Edge Analytics: Tripwire, Intrusion, Motion Detection21) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection22) Alarm Support: It should have 1/1 Alarm In/ Out Port 23) Audio Support: It should have 1x Built-In Mic and 1/1 Audio In/ Out Port for external Mic. and Speaker (As per site requirement) with G.711U/A / G.711Mu/ AAC/ G.726 audio compression24) Network Protocol: SFTP, IPv6, IPv4, DNS,RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast,25) System Capability: ONVIF26) VMS: Camera shall support open source VMS27) Cyber Security: trusted boot, AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, account lockout, , video encryption, IP/MAC filtering, HTTPS, trusted upgrade.28) Ethernet: 1 RJ 45 10/100 Ethernet port29) Power Input: The camera should support simultaneous dual power input - 12 VDC (via power adapter) and PoE - to ensure continuous operation in the event of a failure in one power source.				
30) Power Requirement: 12VDC/24 VAC/PoE (802.3af)/ePoE 31) Enclosure: IP67 weather proof, IK10 32) Operating Condition: Ambient Temperature:- (-)05°C to 50°C, humidity 95% (max) (non-condensing) 33) IR life: 40000 hours or higher 34) Video Bit rate: 32 KBPS - 8 MBPS or better				

	35) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS				
	5/6MP IP IR Bullet Camera				
a)	5/6MP ((3200 × 1800)@20 fps or better) IP IR 2.8/ 3.6/6/8/12 mm fixed lens (as per site requirement) outdoor bullet Camera	4	Nos.	15443.33	61773.32
64	Supplying Installation Testing and Commissioning of following Channel Network Video Recorder (NVR) with camera licenses to record for all channels having specifications and features etc as mentioned below : 1) Network Video Recorder Embedded/ Installed OS (Linux) along with Camera Licenses to record per NVR and to provide a live view, storage and simultaneously Multi-channel playback of all IP camera or more and must be ONVIF with minimum support of 384 Mbps incoming Bandwidth. 2) NVR should support video compressions : H.265 or better, H.264, MJPEG. 3) Must support 1 channel RCA Input, 2 channel RCA Output for Two-way Talk with G.711U/A, G.711u, PCM, G726 audio compressions. 4) Intelligent auto power on when power resumes after power outage. 5) Storage: It should support minimum 8 SATA Slots with 16TB capacity/ Slot and RAID support of RAID 0/1/5/6/10. (4 SATA (32 Channel) & 8 SATA Slot for 64 channel). 6) Connectivity Interface : 2 Nos. x 10/100/1000 Mbps Ethernet Ports, 1x RS485, 1x RS232, 1x eSATA Port 7) Backup Interface : Its should have 4 Nos USB port (2x USB3.0, 2xUSB2.0) 8) Video Output Ports: 2x HDMI and 2 VGA 9) Alarm Ports: It should have 16/8 Ch In/ Out ports to connect various type of external sensors and output devices like hooter/ Siren etc. 10) Email & SMS Alert options: Option for SMS/ Email Alerts to minimum 5 designated mobile number for power failure, HDD failure, vandalism, tempering, network disconnection and panic 11) Web & Mobile Application: Web, Mobile app (For iPhone, iPad, Android Phone) for alerts and viewing. 12) Protocols: HTTP, HTTPS, TCP/IP, IPv4/IPv6, UDP, DHCP, DNS, SMTP, UPnP, IP Filter, PPPoE, FTP, DDNS, Alarm Server, IP Search, Multicast, Auto Registration, ONVIF 21.12 (Profile T, Profile S, Profile G),				

	CGI, SDK and OEM Cloud for remote monitoring without any public IP need. 13) Standards: CE, FCC, RoHS, BIS Certified 14) Power Supply : Should support AC100-240V, 50/60Hz Power supply.				
	15) Operating Condition : -5°C to 50°C, humidity 90% (max) (non-condensing) 16) The VMS application shall support all the features & functionalities of the offered cameras. 17) VMS should consist Licenses for all channels to record Cameras with General, motion detection, intelligent, alarm and POS recording modes. VMS should be provided with Camera Licenses , with no dependency of VMS licenses by binding with the MAC address of the cameras to achieve the functionality. 18) The NVR OEM shall be responsible for providing a mobile application compatible with both Android and iOS devices, enabling remote monitoring and playback of cameras/NVR footage. 19) The OEM must provide its own DDNS server hosted in India, eliminating the need for a public IP address for remote monitoring over the Internet. 20) Must support Continuous, Alarm, Motion, Instant, Panic Recording Mode 21) It should support Resolution: 32MP; 24MP; 16MP; 12MP; 8MP; 5MP; 4MP; 1080p; 720p; D1; CIF; QCIF 22) When alarm recording is enabled and an event occurs, you can click the alarm icon on monitoring page to view the alert details. The snapshot function is supported on monitoring and playback page				
	23) The Network Video Recorder (NVR) shall be configured to send email whenever a system message is created or an alarm event occurs. The email server shall be a valid SMTP server. Each recipient email address shall be configured to receive any combination of critical, warning, or informational messages or alarm notifications. When an alarm occurs, the email message includes the NVR name, time of alarm and a list of camera that is configured to record upon alarm 24) It should have Web and GUI interface. 25) Built-In Artificial Intelligence: NVR should have built-in AI :- 2 Channel face detection and recognition, - Minimum 4 Channel perimeter protection, - Minimum 8 Channel Smart Motion Detection				

	26) Face Recognition Database Capacity: It should support total Blacklist and Whitelist capacity of Minimum 20,000 Faces or more with Face Detection speed of 12 face images/sec and facility to add Name, gender, birthday, address, credential type, credential No., countries & regions and state to each face image. 27) Face & Human Attributes Search: Search Pictures/ Video by Gender, age group, glasses, expressions, face mask, beard, Top color, top type, hat, bag, age, gender and umbrella. 28) ANPR Capability: It should support ANPR Camera with License plate, plate color, vehicle body, vehicle model, vehicle logo, calling, seatbelt, vehicle registration location etc vehicle attributes. 29) Alarm Notifications based on: Motion detection, video tampering, video loss, scene changing, PIR alarm, Camera external alarm, Face detection, face recognition, perimeter protection (intrusion and tripwire), ANPR, people counting, stereo analysis, crowd distribution, heat map, Disk Full, Storage Error, IP Conflict and abnormal behaviour of fan, cybersecurity exception 30) Alarm Notification should be linked with Recording, snapshots, Camera external alarm output, buzzer, logs, pre-sets and email. 31) General AI Based Search: Search Pictures by channel, time, event type, target classification (Fall Detection, People Approach Detection, People No. Exception Detection, People Staying Detection, Violence Detection. 32) Smart playback function: Should support smart search for the selected area in the video and smart playback to improve the playback efficiency 34) VCA (Video Content Analytic): Should support multiple video contented analytics based on camera analytics 35) Analytics by NVR: Perimeter protection and face recognition				
a)	32 Channel Network Video Recorder (NVR) having display split :- Main screen: 1/4/8/9/16/25/32(36), 2nd screen: 1/4/8/9/16	1	Nos.	79878.67	79878.67
65	Supplying, Installation, Testing and Commissioning following capacity Surveillance grade Hard Disk with upto 256MB/s Transfer Rate, 256 MB Cache, 7200 RPM Disk Speed, 3.5 inch form factor, SATA Interface, BSMI, ICES-003/NNB-003, CE, FCC, KC, Maghreb, RCM, UKCA, VCCI, CB-Scheme, TUV, UL Certifications.				

a)	8 TB (Terabytes)	2	Nos.	24806.73	49613.46
66	LED Display Supplying, Installation, Testing and Commissioning of following size LED display (LED monitor) industrial grade with 3840x2160 resolution or better, USB playback, Bluetooth and miracast connectivity, 4X HDMI 2.0, DP 1.2, HDR 10/10+, brightness: 500-nits or better, Video wall mode should be available, contrast ratio: 1200:1, OPS slot, viewing angle (H/V): 170°/170°, response time less than 12ms, Display control shall be on monitor screen and programmable with remote (remote shall be supplied with system), Key Board, Optical Mouse, etc. as required.				
a)	55 inch or larger	2	Nos.	101176.28	202352.56
67	Supplying Installation Testing and Commissioning of 5/6MP IP IR Dome Camera having following specifications and features etc :- 1) Type of Camera: Dome Camera 2) Image Sensor: 1/2.8" or better progressive Scan CMOS get color image even at night condition 3) Signal System: PAL/NTSC 4) Minimum Illumination: 0.008Lux@ F1.4, AGC ON, 0 lux with IR or better 5) Imaging: 1/3s to 1/30000s Shutter Support, Auto Gain Control , White Balance- Auto, Back Light Compensation, Multi zone Privacy Masking, HLC, Digital Watermarking. 6) On Screen Display: Camera should display Camera title, Date & Time in live & recorded video both. 7) Signal to Noise Ratio: > 50 dB 8) Day & Night: True Day & Night High Performance Mechanical IR cut filter with auto switch, IR Source- Inbuilt IR LED's with effective distance upto 50 Mtrs integrated IR 30 Mtrs for colour view in night. 9) Video Compression (Minimum): H.265 or better, H.265, H.264H, H.264, Audio:- G.711U/A, G.711Mu, G.726, AAC, G.723 10) Wide Dynamic Range: WDR (120db or more) 11) Digital Noise Reduction: DNR (2D/3D) On/Off 12) Streaming: Triple streaming, configurable				

	13) Video Streaming & Frame Rates: Triple streaming, configurable Main stream: 5/6MP @25/30 fps, Sub streams: D1@25/30 fps or better				
	14) Image Setting: Rotate Mode, saturation, brightness, contrast, sharpness adjustable through client software or web browser				
	15) Profile Management: User configuration import, export				
	16) Security: User Authentication, Water Marking				
	17) On board Storage: Camera should support built-in Micro SD/SDHC/SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card. 17) On board Storage: Camera should support built-in Micro SD/SDHC/SDXC Card slot upto 512 GB. It should be supplied with minimum 128GB memory Card. 18) Recording Management: Format SD, overwrite, storage management, video to NAS device, 19) Edge Analytics : Tripwire, Intrusion, Motion Detection 20) Alarm Trigger : Motion/tampering detection; network disconnection detection; IP conflict detection; memory card state detection; memory space detection 21) Alarm Support: It should have 1/1 Alarm In/ Out Port 22) Audio Support: It should have 1x Built-In Mic and 1/1 Audio In/ Out Port for external Mic. and Speaker (As per site requirement) with G.711U/A/ G.711Mu/ AAC/ G.726 audio compression 23) Network Protocol: SFTP, IPv6, IPv4, DNS,RTCP, NTP, RTP, HTTP, HTTPS, SNMP TCP/IP, PPPoE, NFS, UDP, ICMP, SSL, DHCP, SMTP, RTSPS, unicast, 24) System Capability: ONVIF 25) VMS: Camera shall support open source VMS				
	26) Cyber Security: trusted boot, AES 256-bit Encryption, Configuration encryption, trusted execution, Digest, security logs, , account lockout, video encryption, IP/MAC filtering, HTTPS, trusted upgrade. 27) Ethernet: 1 RJ 45 10/100 Ethernet port 28) Power Input: The camera should support simultaneous dual power input—12 VDC (via power adapter) and PoE - to ensure continuous operation in the event of a failure in one power source. 29) Power Requirement: 12VDC/24 VAC/PoE (802.3af)/ePoE				

	30) Enclosure: IP67 weather proof, IK10 31) Operating Condition: Ambient Temperature:- (-)05°C to 50°C, humidity 95% (max) (non-condensing) 32) IR life: 40000 hours or higher 33) Video Bit rate: 32 KBPS - 8 MBPS or better 34) Standards: BIS with ER, STQC Certified, CE, FCC and RoHS				
a)	5/6MP ((3200 × 1800)@20 fps or better) IP IR 2.8/ 3.6/6/8/12 mm fixed lens (as per site requirement) Dome Camera.	22	Nos.	15782.40	347212.80
68	Supplying, drawing, Installation, Testing and commissioning of Cat6A UTP 4 pair, 23 AWG solid copper cable in existing conduit/ on surface, U/FTP, LSZH, Non-Plenum, Horizontal(solid) Cable suitable for high speed data networking application supporting upto 10Gbps over a 100 meter channel. The 4 Unshielded Twisted Pairs (UTP) cable with color coded insulation for easy identification should have FLAMEPROPERTIES i.e. Flammability Test - IEC 60332-1, Smoke Density - IEC 61034, LSZH standards compliance: ANSI/TIA-568 C.2, ISO/IEC 11801, IEEE 802.3an, RoHS. Delay Skew should be < 45NS. The outer Cable Diameter should be 7.5 +2 mm. Cable should have been tested and verified by UL/ ETL.				
a)	1 Run of cable	2000	Mtr	76.45	152900.00
b)	2 Run of cable	1602	Mtr	122.07	195556.14
	SUB HEAD VIII :- EXTERNAL LIGHTING SYSTEM				
69	Erection of metallic pole of following length in cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) foundation including excavation and refilling etc. as required.				
(a)	Above 4.5 metre and upto 6.5 metre	20	Nos	7549.66	150993.20
70	Supplying of Following Sizes of 1.1 KV Grade Multicore Aluminium Conductor XLPE insulated & PVC sheathed Power armoured cable conforming to IS : 7098 (Part - I) or as per Relevant IS Code complete with all Amendments etc as required.				
a)	4x16 sqmm	200	Mtrs	280.00	56000.00
b)	3x10 Sq mm	300	Mtrs	206.00	61800.00

71	Supplying, installing, testing and commissioning of Hybrid 40-45 W Solar LED Street/Area Light luminaire suitable for outdoor use, complete with inbuilt SCC made IP65, LED life time > 50000hrs, Lumen > 2300, CCT 5700K, Battery capacity minimum 60AH, high efficiency LED light source, inbuilt driver, hybrid charge controller, lithium/VRLA battery backup, High Efficiency Mono Crystalline Solar PV Module, Lithium Ferro Phosphate battery with in-built BMS technology, High Efficacy LED, MPPT Solar Charge Controller and Aluminium Extruded body and System should be designed to withstand highly corrosive atmosphere and heavy wind loads. The modules are certified for industry standards IEC61215, IEC61730 (safety class 1 & 11), IEC6170. and provision for both solar power as well as AC mains charging, mounted on existing pole, including necessary wiring, junction box, fixing arrangement, hardware, and all accessories required for complete installation as per specifications.	4	Nos	103913.00	415652.00
72	Supply of Hot-dip galvanised octagonal pole fabricated as per dimensions -Height - 6m Top Dia - 70mm,Base Dia - 150mm,Thick - 3mm, Base plate size - 220x220x12mm, With Stiffeners,M20x700x4 Nos Foundation Nut & Bolts , 3 nos connector, of suitable size and 1 no 6A SP MCB + 3X1.5 Sq.mm Cu cable inside the pole to complete wiring upto LED fittings with door and locking arrangement near bottom of the pole as suitable height etc as required.	4	Nos	11344.00	45376.00
73	Supply Installation, Testing & Commissioning of 12W - 15W LED bollard Light made of aluminium pipe powder coated black after phosphor chromate treatment with aluminium heat sink for effective thermal management, sturdiness & excellent corrosion resistant. Mounting flange of MS sand casting is used at the bottom. PC diffuser cover in opal finish is used for glare free uniform light distribution. High efficiency long life LED module with SMD LED package mounted on MCPCB with lumen efficacy of 100-130 lm/W with system lumen 470Lm. Powered by built-in, isolated electronic LED driver in ABS housing with APFC (SMPS based constant current supply) with lower THD, Output Short / Open Circuit protection, Over Voltage protection, Surge Voltage protection. CCT 3000/4000K, CRI>80, THD<15%, PF>.95, IP65,IK 07 ,Life class of 50,000 hrs @ L70, Operating	16	Nos	9070.00	145120.00

	Temperature:-10 TO +45 DEG.C; Input rated voltage: 240VAC/50HZ.				
74	Supply of Energy efficient 40W LED Post Top luminaire having system power: total luminous flux minimum 4000 Lm, efficacy not less than 100lm/W, CCT 3000/ 4000K, PF >0.95, CRI>70, THD<10%, having pressure die cast Aluminium Housing and Opal diffuser, internal electronic control gear, Service life of 50000Hrs, IP 66/IK08 Protection, min 5Kv Surge protection, operating in power supply 230V,50Hz i/c Open & Short circuit protection, reverse polarity protection, high voltage cut off at 310V±20V. (5 years' warranty)	16	Nos	12210.00	195360.00
75	Supply of Decorative Pole 4meter MS pole suitable for vertical mounting post top with PU painted, Top Dia :60, Bottom Dia: 114, Base plate size Size: 250x250mm, Thickness – 12mm, Base of pole: Red Finish, Top of pole: Grey Finish, connection window available at Base of pole & provision for single pole MCB, having Loop in Loop out Connector.	16	Nos	11229.00	179664.00
	SUB HEAD IX :-INTELLIGENT FIRE ALARM SYSTEM				
76	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 320 character graphics/ LCD 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. 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.				
a)	Two Loop Panel.	1	Each	308767.86	308767.86
77	Supplying, installation, testing & commissioning of intelligent analog	40	Each	3703.93	148157.20

	addressable photothermal detector complete with mounting base complete as required.				
78	Supplying, installation, testing & commissioning of response indicator on surface/recessed MS Box having two LED, metallic cover complete with all connections etc as required.	20	Each	377.30	7546.00
79	Supplying, installation, testing & commissioning of intelligent addressable programmable sounder complete as required.	6	Each	3436.37	20618.22
80	Supplying, installation, testing & commissioning of fault isolator complete with base as required.	6	Each	4234.12	25404.72
81	Supplying, installation, testing & commissioning of addressable manual call point complete as required.	4	Each	5009.68	20038.72
82	Supplying, installation, testing & commissioning of addressable horn cum strobe complete as required.	4	Each	4539.91	18159.64
83	Supplying, installation, testing & commissioning of fire fighter telephone handset complete as required.	2	Each	7417.73	14835.46
84	Supplying, installation, testing & commissioning of fire fighter phone jack complete as required.	2	Each	2082.54	4165.08
85	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.	400	Metre	475.94	190376.00
	SUBHEAD X :- FIRE EXTINGUISHER				
	SITC of Fire Extinguisher				
86	Supplying, installation, testing & commissioning of ISI marked ABC stored pressure type Fire Extinguisher of 6 kg capacity confirming to IS:15683 complete with squeeze grip release valve, discharge pipe, pressure gauge, locking arrangement, initial gas charged, carrying handle and wall mounting bracket etc. as required.				
a)	Capacity 6.0 Kg.	10	Each	5210.00	52100.00
87	Supplying, installation, testing & commissioning of ISI marked CO2 gas type fire extinguisher of 4.5 kg capacity confirming to IS:15683 in complete with delivery hose horn, wheel type release valve, locking arrangement, initial gas charged, carrying				

	handle and wall mounting bracket etc. as required.				
a)	Capacity 4.5 kg	10	Each	13815.00	138150.00
	SUBHEAD XI :- GEYSER'S				
	Geyser's				
88	Supplying, Installation, testing & Commissioning of storage Geysers of 15 Ltrs. capacity BEE 5 star rating, 240 V, 50 Hz, glass lined steel/ stainless steel inner tank, copper/ incoloy heating element, including pressure indicator, 2 nos. connections pipe complete as required. (Equivalent to Venus / Crompton Solarium Care)	9	Each	14823.00	133407.00
	SUB HEAD XII :- LIFTS				
89	Supplying, Installation, Testing & Commissioning of following capacity passenger Machine room less (MRL) lift with regenerative drive as per CPWD General Specification for Electrical Works (Part-III Lift & Escalator) 2003, BIS Codes, NBC 2016 as amended upto date having provision for barrier free access as per Harmonised Guidelines & Standards for Universal Accessibility in India - 2021 of MoHUA, serving different floors in the lift shaft as per detailed specifications enclosed and as under including all other equipment and accessories complete as required :- (i) Speed-1 MPS (ii) Floors-2 (G+1) (iii) Travel -8 Meters (approx.) (iv) Stops & opening- 2 stops and 2 openings (v) Controller: A.C. variable voltage & variable frequency (vi) Automatic rescue device (ARD) complete with dry maintenance free batteries as required. (vii) Operation: Microprocessor based single automatic push button/simplex selective collective/ duplex collective selective with/without attendant (viii) Power-415 Volts+10%, 3 phase, 50 Hz, 4 wires system (ix) Car Enclosure: Stainless steel scratch proof (Moon Rock/Honeycomb/ Hairline Finish) on all sides and stainless steel decorative ceiling with fans (indirect throw) and LED fitting.				

	(x) The car flooring should be smooth and antiskid as approved by engineer-in-charge.				
	(xi) Type of doors a) Car: Power operated, centre opening horizontal sliding stainless steel scratch proof (Moon Rock/Honeycomb/ Hairline Finish). (b) Landing doors: stainless steel scratch proof. (xii) A hand rail not less than 600mm long at 900mm above floor level to be fixed adjacent to control panel in the lift car. (xiii) Voice announcement system in the car to announce the position of the elevator in the hoist way as the car passes or stops at floor served by the elevator. (xiv) Closed loop Control System, protection against power fluctuation, self diagnostic control, Landing doors 2 hours Fire rated, Overload detection and protection, Over speed Governor, Dot Matrix LED D & P Indicators In Car & Landings, BMS Compatibility, tamper proof infrared curtain covering almost the entire height of the lift car door, Alarm horn, Anti Nuisance Operation, CCTV camera system with 4 MP IP camera, suitable NVR and HDD for 30 days storage backup, Firemen switch, 2/3 way intercom, Emergency Stop Switch with battery backup for fan and light fitting for 1 hour, pit ladder. (xv) The lift doors shall have a vision panel to enable persons with hearing impairment to signal for help or assistance in the event of an emergency.				
	(xvi) An appropriate technological support be provided (Through emergency messaging services or alarms etc.) to respond to the emergency requirements of person with hearing impairment or deafness. (xvii) In case of failure of ARD or other electronic devices, a provision of manual rescue be provided				
a)	13 passenger (884kg)	1	Each	2076650.31	2076650.31
	SUB HEAD XIII :- UPS SYSTEM				
90	Online UPS- Input supply: Three Phase, Output supply: Three Phase Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) at operating temperature 0 to 40 deg C, 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 power to the 100% non-linear loads. Current total harmonic effect (THD) 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 overcharging, 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-built 5 inch or more LC Display / LED) to display : a) Input: Voltage, current, Frequency. b) Bypass: Voltage, Frequency. c) Output: Voltage, frequency, Current. d) Battery: Voltage, Capacity. e) Load: KVA, KW, Percentage. f) Temperature: STS, Inverter, PFC. g) Event Logging & Statistical Data (On LCD/LED): UPS should capture and display up to 3000 events like: Over temperature / DC Bus Fail / Fan Fail / Fuse Fail / Overload / Short-circuit / Device Fail / Inverter Fail / Rectifier Fail / Bypass Fail, etc. h) Statistical Data: No. of power failures / Transfers to Bypass / Total Running time, etc. i) Mains Mode of Operation / Battery Mode of Operation / Bypass feeding the load / UPS Fault / Battery charging and discharging, overload, battery voltage and battery capacity. j) Audible Alarms: Mains Failure, Battery Low Alarm, UPS Overload, Fault, Shutdown, Input Over, Under Voltage, Output Over, Under Voltage, Battery Over, Under Voltage, Over Load and short-circuit, Over Temperature. The UPS should have QR code which should contain drawing, test report OEM manual, Geo-Tag of manufacturing location etc.				
a)	20 KVA (Each Power module shall be ≤ 10 KVA)	1	Each	421404.88	421404.88
	SUB HEAD XIV :- SOLAR PHOTO VOLTAIC POWER GENERATION SYSTEM				
91	Solar Photovoltaic Power Plant				
	Supply, Installation, Testing and Commissioning of on-grid Solar Photovoltaic Power Plant conforming to various applicable standards BIS, IEC, MNRE guidelines, the Central Electricity Authority Regulations and CPWD Specifications as amended up to date, consisting of Mono/Poly Crystalline silicon				

	solar cells module, net metering facility, necessary control, protections, earthing, cabling, mounting structure, junction boxes, power conditioning units, Real time online web interfaced Data Monitoring System, Distribution panels, grid connecting arrangement, conduits, pipes, cable trays and other accessories etc. as required. a) High Energy Efficiency Solar Photovoltaic Module of capacity 330 Wp or above, manufactured in India, conforming to IS 14286/IEC 61215, IS/IEC 61730-Part-1, IS/IEC 61730-Part-2. Solar Photovoltaic Module conversion efficiency shall not be less than 23% at STC with temperature coefficient of Pmax better than -0.30% per degree Celsius. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. Solar Modules shall be designed to operate in relative humidity upto 100% with temperature between -10 Deg C and +85 Deg C.				
	Further, each PV module used in any solar power project must have Radio frequency identification tag with information such as name of manufacturer, month and year of manufacturing, country of origin (separately for Solar cell and module), I-V curve, Unique Serial No and Model No of the module, Wattage, Im, Vm and FF, name of test lab issuing IEC certificate.				
	b) Power Conditioning Unit (PCU) of 350-800 V DC Input voltage range and 415 V AC, three phase, 4 wire, 50Hz +/- 2.5 Hz, output voltage suitable to generate AC with a variation of 10% at nominal voltage. Power with efficiency not less than 97%, total harmonic distortion less than 3% and suitable for ambient temperature from 0 to 50 degree C , Minimum IP-65 for outdoor and Minimum IP 21 for indoor, Built-in meter and data logger, MPPT, switching devices IGBT/MOSFETs and controller Microprocessor /DSP . PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown. The PCU shall be able to withstand unbalanced load conforming to IEC standard with shutdown/standby mode. It must be provided with grid islanding along with manual disconnect pole isolation switch besides automatic disconnection. Minimum protections:				

Mains Under/ Over Voltage, Over current, Over/Under grid frequency, Over temperature, Surge voltage induced at output due to external source, Short circuit, Lightning, Anti Islanding (for grid synch. Mode) and other protections as per applicable standards. LCD/LED display of minimum parameters: DC input voltage, DC current, AC Voltage and current (all 3 phases, in case of 3 phase), Instantaneous & cumulative AC output power, Daily DC energy produced and other parameters applicable standard. Communication interface RS 485/ RS 232. c) Module mounting structure: The roof top solar plant generation units shall be installed by using supporting Aluminium/Galvanized MS structure (mass of zinc coating shall be as per IS4759) having minimum head room clearance of 2.4 meter above the terrace level / ground level. The mounting structure would be designed to sustain wind load and seismic parameter of the site of installation. All the structure shall be design as per applicable BIS code and the material shall also confirm the applicable BIS Code. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. The suitable arrangements for maintenance and cleaning shall be provided.				
d) Real time online web interfaced Data Monitoring System complete with accessories for various parameters such as Solar Irradiance, temperature, AC Output Voltage and current, Output Power, Power factor, DC Input Voltage and Current, Time Active, Time disabled, Time Idle, Power produced and other parameters as per standard practices. e) Array junction box & Main junction box with IP 65 protection and termination arrangement for incoming and outgoing cable along with glands, lugs and other accessories etc. as required. Each junction box shall be made of GRP/FRP/Powder Coated Aluminium /cast aluminium alloy with full dust, water & vermin proof arrangement with High quality Suitable capacity Metal Oxide Varistors(MOVs) (semiconductor diode with resistant applied voltage)/ surge arrestors and suitable Reverse Blocking Diodes, isolation switches isolate the DC input to Inverter, copper bus bar etc. f) Lightning ,surge voltage protection, earthing protection and grid islanding. g) Cables: Connections & Interconnections by				

	required size IR/UV protected XLPE insulated copper conductor 1.1 kV grade armoured power and control cables(ISI Marked) along with supplying & fixing of necessary channel/conduit, GI cable trays, supports, lugs, thimble and other accessories etc. as required.				
	h) DC Distribution Board And AC Distribution Panel Board: IP65, free standing, metal cladded, having copper bus bar, having required protection and control gears, connection interconnection, etc. as required.	50	Kwp	66927.24	3346362.00
	SUB HEAD XV :- IPABX/EPABX System				
92	Supply, installation, testing and Commissioning of IP at its core with IP switching technology and 100% non blocking communication system with 04 Port Voicemail, 04 Port FXS, 04Port FXO, 1 PRI Trunk lines (30 Channels) Circuit with CLIP Facility, min 100 IP users License with provision for further additions, 100 analogue users, 01 Number IP based Operator Console, 45 Party Conference, Speed Dial, Music on Hold, Internal/ External ring difference, Call Barring, Call Pickup. The system should be reductant which offer 100% duplication of power supply and CPU card and to match the hybrid IP-PBX asper technical specification including supporting accessories incomplete as required.	1	Each	1537488.1 2	1537488.12
93	Supply, Installation, Testing & Commissioning of Type 1 IP Phone having 2 VoIP account, 120 x40 DOT matrix screen with backlight, Full HD duplex speaker phone, IPV6, Gigabit Ethernet, PoE etc. complete as required.	10	Each	14423.63	144236.30
	SUB HEAD XVI :- BOOM BARRIER				
94	Supply, installation, testing and Commissioning of Automatic Motorised Electromechanical Boom Barrier of 6 mtrs length working on 180-240 volt 50-60 Hz single phase AC supply, minimum IP 54 Protection built in high speed with 4-8 second, opening / closing time, made out of Galvanised and RAL painted Steel/Aluminium with anti corrosive paint, manual operation for power failure, availability to integrate third party / OEM RFID access control system, ambient temperature with -25 degree to +75 degree Celsius complete with entry / exit push button for manual opening and closing, remote panel	2.00	Each	146405.00	292810.00

	with 24 V AC-DC pair of photocell safety senso , photo beam sensor with wireless receiver card in rod including civil work of all type making foundation, fixed rest for boom stand, connection, interconnection complete etc. as required.				
	SUB HEAD XVII:- Emergency Lights & Illuminated Signages				
95	Supply, installation, testing and Commissioning of exit signage unit with resin white body of size: 30cm x 18cm or better with integral battery for display of signages ,weight less than 1 kg, conform to IS:10322, Battery duration+-10%,epoxy polyester powder coating, aluminium housing body, CAD Designed printing on 6mm Acrylic sheet, IP 20,16 to 24 Hrs recharging period, constant current charger and designed for input voltage of 230V 50 Hz connection with wire etc as required.	30.00	Each	4270.00	128100.00
96	Supply, installation, testing and Commissioning of 5 W Ceiling mount rechargeable oculus lights with strong LED Lithium battery backup of 3 hrs conform to IS:10322, Battery duration+-10%,Red Led on for indicating charging, White powder coated aluminium housing body, IP 20,16 to 24 Hrs recharging period, constant current charger and designed for input voltage of 230V 50 Hz connection with wire etc as required.	10.00	Each	6832.00	68320.00
	SUB HEAD XVIII :-DIESEL GENERATOR SET with AMF Panel				
97	Supply, installation, Testing & Commissioning of 'Silent Type Diesel Generating set as per CPCB IV + or better norms along with having Prime Power Rating of KVA as below, 415 volts at1500 RPM, 0.8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0.85 Load Factor, including testing at factory and site with fuel, load for test and other necessary arrangements Complete as per CPWD specifications, should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. and consisting of the followings: (A) Diesel Engine: Tourbo charged Diesel engine 4 stroke water cooled, multi cylinder, dynamically balanced fly wheel, electric start of suitable BHP at 1500 RPM suitable for				

	above output of alternator at 40Degree C, 50% RH & at 1000 Meter MSL , capable of taking10% over loading for one hour after 12 hours of continuous operation. The engine will be with Electronic governor, Dry type Air filter with service indicator, first filling of engine fuel (after commissioning) lubricating Oil, Coolant and other consumables complete with all the required accessories, the Electronic governor shall be as per ISO 8528.The engine shall comply to the latest CPCB norms (CPCB IV + or better) and Conforming to BS 5514, BS 649, IS 10000, IS 10002, IS 13018 and as per CPWD specifications.				
	(B) Engine mounted Instrument Panel fitted with and having digital dis Plate for following: (i) Start-stop switch with key (ii) Water temperature indication (iii) Lubrication oil pressure indication (iv) Lubrication oil temperature indication (v) Battery charging indication and Voltage indication (vi) RPM indication (vii) Over speed indication (viii) Low lubrication Oil trip indication (ix) Engine Running Hours indication (x) Fuel Level (C) Alternator: Synchronous alternator rated of appropriate KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0.8 lagging power factor at 40 Degree C, 50% RH & at 1000 Meter MSL. The alternator shall be having Screen Protected Drip Proof (SPDP) enclosure IP23, brushless, continuous duty, dynamically balanced rotor, capable of taking 10% over loading for one hour after 12 hours of continuous operation, self cooled, self-excited and self-regulated through AVR conforming to IS13364(Part 2)/IS: 4722/BS 2613 suitable for tropical conditions and with class- H insulation.				
	(D) Base Frame & Foundation:Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer.(E) FUEL TANK:Daily service fuel tank of suitable litres capacity as per CPWD Specifications, fabricated out of 3 mm thick M.S. sheet complete with all standard accessories and fuel piping between fuel tank and diesel engine with MS class 'C' pipes of suitable dia. Complete with valves, level				

	indications & accessories as required as per specifications.(F) Exhaust System:Dry exhaust manifold with hospital type exhaust silencer and catalytic convertor.(G) Starting System:12V/24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete with suitable numbers of batteries (180 AH capacity lead acid SMF type) as required as per specifications. The battery shall be housed inside the acoustic enclosure of DG Set.				
	(H) Acoustic and weather proof enclosure with arrangement for fresh air intake for cooling of the engine & alternator, extraction, discharging hot air in to the atmosphere and the temperature rise inside the enclosure, noise level outside enclosure. The acoustic enclosure should be suitable for cable connection/connection through bus-trunking. Such arrangements on acoustic enclosure should be water proof & dust-proof conforming to IP-65 protection. The enclosure shall be as per CPCB IV + or better norms etc. and as per CPWD specifications.				
	(I) AMF Panel: Free standing floor mounted IP 42 automatic mains failure control panel including auto by-pass, suitable for KVA as below for silent type DG set complete with relays, timers, set of CTs for metering & protection and energy analyser to indicate currents, phase and line voltages, frequency, power factor, KWH, Kilo Volt Ampere Reative Hour (KVARH), KVA (Phase & Total), KW & provision for overload, short circuit, restricted earth fault, under frequency, power (aluminium) and control (copper) cabling of suitable size upto 15 meter between AMF panel, LT Panel and DG Set including connection interconnection etc. as required, all complete and inter locking and communication/ Ethernet /RS485/SNMP port open protocol for BMS integration including suitable software, the panel shall be of DG Set OEM make etc. as per approved by Engineering in charge and including the following: 1. Suitable numbers and appropriate capacity 4 pole motorised electrically operated draw out with cradle type 3 position ACB/ MCCB with electronic release for O/C & E/F and shunt trip. 2. Auto/Manual/Test/Off selector switch 3. Protection for under and over voltage phase reversal (2 nos Over voltage relay, 2 Nos. reverse power relay and 2 Nos. under voltage relay).				

	4. 3 Sets of current transformers 15 P 10 accuracy for protection and 15 VA class-I for metering				
	5. Energy analyser unit to indicate current, Voltage(L-N & L_L), kW, kVA (Phase & Total), Frequency, KWH, PF.				
	6. LED Indicating lamps for load on mains and load on set				
	7. Fuse/ MCB for instruments				
	8. Battery charger, complete with transformer/ rectifier, D.C. voltmeter and ammeter, selector switch for trickle, off and boost and current adjustment. 9. Main supply failure monitor 10. Supply failure timer 11. Restoration timer 12. Control unit with three impulse automatic engine start/stop and failure to start lockout. 13. Impulse counter with locking and reset facility. 14. ON/OFF/Control circuit switch with indicator 15. Audio/Video annunciation for (i) High water temperature (ii) Low lubricating oil pressure (iii) Engine over speed (iv) Engine fails to start (v) Full load/maximum load warning 16. Protection for over/under Frequency, Loss of AC sensing, Over Current, Unbalancing load with suitable number of relays and accessories 17. Maintenance notification based on Engine Run Hour & due date.				
	18. Load Management through PLC to achieve auto opening and closing of incomer breakers, bus coupler switching of essential panel, interlocking providing signal to AMF Panel for load status and AMF shall give command to DG Set to auto start / auto stop depending upon load status and requirement etc. and necessary hardware and software required to perform the operation shall be provided by the contractor including all control wiring.				
a)	82.5 KVA	1	No.	914168.39	914168.39
	SUB HEAD XIX :- TRANSFORMER (11/.433KV)				
98	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended				

	upto date of receipt of tender), 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11vector group, ONAN (Oil Natural Air Natural) copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better, suitable for out door/indoor applications with Offload Tap Changer in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300sqmm XLPE cable of 11 KV grade, including bus trunking arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS Code including first filling of filtered dehydrated oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 and duly ISI Marked and as per CPWD specifications complete in all respects etc. as required at site .				
	The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with + 12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 permissible temperature-rise shall not exceed 35 for oil and 40 dg. C up to 200 KVA and 40 for oil and 45 for above 200 KVA for winding. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred to for paint thickness for normal to medium corrosive atmosphere. For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge.				
	Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM - Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminium/ stainless steel material securely				

	fixed on the outer body, easily accessible, as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked. Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾" nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼" nominal size thread) with cover (for sealed type transformers without conservator);				
	i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth); o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1 600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test); w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers.(1W+1S)				
a)	160 KVA	2.00	Each	491059.51	982119.02
	SUB HEAD XX :- HT & LT PANEL				
	11KV THREE PANEL BOARD				

99	Supplying, installation, testing & commissioning of indoor type floor mounted metal clad, 11 KV VCB panel totally enclosed & fully interlocked, horizontal drawout, horizontal/ vertical isolation type breaker as per IS 13118, as amended up to date and additional specifications, having capacities as mentioned below, single break, trip free mechanism, motorised/manually charged and auto/manually closing breaker suitable for use on 11 KV, 3 phase, 50Hz AC supply with short circuit fault level of 350 MVA, complete with self contained, fully interlocked, rack in and rack out mechanism. 11KV HT VCB panel (indoor) - One incomers, & Two outgoings.				
	IN IP-4X ENCLOSURE				
	Design, Manufacture and Supply of 4 Panel, 11 kV HT VCB Switch Board with Following Accessories :				
	Incoming				
	630A, 11kV, 350MVA for 3 Sec., TP, Horizontally isolated, horizontally draw out type, motorised spring charged, closing mechanism, motor voltage 230V AC, shunt tripping & Closing coil Voltage 24V DC, Electrically Operated, Trip Free, Dust & Vermin Proof, Vacuum Circuit Breaker (VCB) With Mechanical & Electrical OFF/ON Indicators & Provided with Following - 1 No.				
	CT chamber with double wound single phase, cast resin CT, 15VA burden with core-1 for metering (CL-1) and core-2 for protection (CL-5P10) and of 100/5/5A ratio - 3 Nos.				
	IDMT relay with 3 elements for over current (50-200%) and 1 element for earth fault protection(10-40%). - 1 Set				
	Anti Pumping Relay - 1 Set				
	Master Trip Relay - 1 Set				
	Trip circuit supervision relay - 1 Set				
	Potential Transformers, 3 Phase, 3 Limb, Draw out Type, Resin Cast 11000/(Root 3)/110/(Root 3) Ratio Class 1 Accuracy, 100 VA Burden, with HV fuse on primary side and MCB / MPCB on secondary side. - 1 Set				
	6 Windows Annunciator with Hooter - 1 Set				
	1 Window for over current trip - 1 Set				
	1 Window for earth fault trip - 1 Set				
	1 Window for master trip relay - 1 Set				
	1 Window for Emergency Stop Push Button - 1 Set				

	2 Windows Spare - 1 Set				
	Digital Ammeter with inbuilt selector switch - 1 Set				
	Digital Voltmeter with inbuilt selector switch - 1 Set				
	A set of breaker ON/OFF/Trip/DC control supply healthy/Trip circuit healthy/ Spring Charged VCB in test / VCB in service & R,Y,B phase indication lamps. - 1 Set				
	Emergency stop push button - 1 Set				
	Limit switches with 4 NO/ 4 NC breaker auxiliary contacts - 1 Set				
	Control:- T-N-C (Trip, Neutral, Close) breaker control switch with indication arrangement. - 1 Set				
	All control wiring with protection & test terminal block as required. - 1 Set				
	Strip heater with thermostat for moisture absorption. - 1 Set				
	Suitable for connection to 3C x 240 sq.mm. Cross linked polyethylene (XLPE) 11kV cables or as called for. - 1 Set				
	Cable box for 3C x 240 sq.mm 11kV XLPE Al. conductor cable. - 1 Set				
	HT Danger Plate - 1 Set				
	Incoming as described above. 1 Sets				
	Bus Bars:				
	800A TP 11KV AL. Busbars With Heat Shrinkable Insulation Sleeves				
	Outgoings :				
	630A, 11kV, 350MVA for 3 Sec., TP, Horizontally Isolated, Horizontally Draw out Type, Motorised Spring Charged, Closing Mechanism, Motor Voltage 230V AC, Shunt Tripping & Closing Coil Voltage 24V DC, Electrically Operated, Trip Free, Dust & Vermin Proof, Vacuum circuit breaker(VCB) with mechanical & Electrical OFF/ON indicators & provided with following - 1 No.				
	CT chamber with double wound single phase, cast resin CT, 15VA burden with core-1 for metering (CL-1) and core-2 for protection (CL-5P10) and of 50/5/5A ratio. - 3 Nos.				
	Digital Ammeter with inbuilt selector switch - 1 Set				
	IDMT Relay with 3 Elements for Over Current (50-200%) and 1 Element for Earth Fault Protection(10-40%) With High Set. 1 Set				
	Anti Pumping Relay - 1 Set				
	Master Trip Relay - 1 Set				

	Trip circuit supervision relay - 1 Set				
	A Set of Breaker ON/OFF/Trip/DC Control Supply Healthy /Trip Circuit Healthy/Spring Charged VCB in Test / VCB in Service. 1 Set				
	Auxiliary Relays for Transformer Faults WTI, OTI and Bucholz Relay. (To be Checked With the Requirement of Transformer i.e. For ONAN or Dry Type) For Alarm & Trip. 1 Set				
	12 windows annunciators with hooter:				
	1 window for over current trip				
	1 window for earth fault trip				
	1 window for earth fault trip				
	1 window for winding temperature trip				
	1 window for Oil temperature alarm				
	1 window for Oil temperature trip				
	1 window for Bucholz alarm				
	1 window for Bucholz trip				
	1 window for master trip relay				
	1 window for emergency stop push button				
	2 windows spare				
	Emergency Stop Push Button - 1 Set				
	Limit Switches With 4 NO/ 4 NC Breaker Auxiliary Contacts - 1 Set				
	Control:- T-N-C (Trip, Neutral, Close) Breaker Control Switch With Indication Arrangement. - 1 Set				
	All control wiring with protection & test terminal block as required. - 1 Set				
	Strip heater with thermostat for moisture absorption. - 1 Set				
	Cable box for 3C x 240 sq.mm 11kV XLPE Al. conductor cable. - 1 Set				
	HT Danger Plate - 1 Set				
	Outgoing as described above. - 2 Set				
	Powerpack as Required to Be Included (220V/24V DC), 7AH Battery for Each Breaker Module.				
	Three Panel 11 KV HT VCB Panel as described above	1.00	No.	1511629.00	1511629.00
	MAIN LT TTA PANEL				
	NOTE:- MCCB's shall have Rotary Handle.				

100	Supply, installation, testing, Design, manufacture, supply inspection, handling, assembling, affecting proper connections, testing and commissioning with minimum of 2mm CRCA sheet steel fabricated sheet, gland plate with 3 mm thick MS sheet, dust and vermin proof, tapered drip proof having 600 mm long 50 mm x 6 mm angle iron legs, cubical type Main L.T. Panel CPRI Approved floor mounting, front operated construction, IP 42 Protection rating, indoor type, As per IEC 61439, IS 2137(Revised) after proper treatment with 9 tank process with top/bottom removable gland plates, as required, double compression type cable glands, earth bus, hinged and lockable doors to achieve dust and vermin proof complete with all inter connections small wiring by min. 2.5 sq. mm. FRLS copper wires, ckt labels etc. The panel feeders shall be suitable for terminating suitable nos. 3.5 /4 core armoured aluminium cable as required. Panel Should Be Internal Arc tested at 50ka for .3 sec as per IEC61641. (Note: the drawing of panel/ feeder pillar has to be approved by the department)				
	(Under no case temperature of main LT panel shall be more at any point of the panel. To avoid heating necessary exhaust fans shall have to be provided along with top louvers).				
	The internal control wiring shall be fuse less. All control wiring and metering protection				
	shall be by MCB's.				
	Colour: Siemens Gray Powder Coated or as per approved shade.				
	INCOMER 1 & 2 FROM 160 KVA				
	OUTDOOR TRANSFORMER EACH HAVING FOLLOWING				
	1 Nos. 400 amps Four Pole MCCB of Fault Breaking Capacity 50 KA (Ics=Icu) fitted with interlocked door, automatic safety shutters, mechanical ON/OFF / Rotary handle and service/test/isolated Position Indicator and Frame Earthing Contact, Confirming to IS 13947-2 1993 as Amended upto				
	Date Complete with Following Accessories.				
	1 set of 3 CT's of ratio 400/5A, Class 1.0 accuracy 15 VA burden for APFCR.				
	Independent manual spring closing mechanism - 1 No.				

	Microprocessor release (EMI and EMC certified) for over current, earth fault and short circuit protection - 1 Set .				
	Multifunction meter with selector switch with suitable CT's and back up MCBs.				
	The instrument chamber shall be separate and shall comprise of flush type ammeter, voltmeter, selector switches, cast resin type CT's & PT's, etc. Separate CT's shall be provided for protective and measuring system and for APFCR of capacitor bank with suitable VA.				
	3Nos. Phase indicating LED lamps with 2 Amp backup MCB, breaker ON/OFF/Trip indication light with 2A MCB , test terminal block set, MCB , circuits as per standard practice , auxiallry contact for positive interlocking of the breakers as required.				
	Shunt trip coil 220 Volt AC.				
	INCOMER FROM DG SET (82.5 KVA)				
	1 Nos. 200 amps four pole MCCB (Motorised) of fault breaking capacity 36 KA (Ics=Icu) fitted with interlocked door, automatic safety shutters, mechanical ON/OFF / Rotary handle and service/test/isolated position indicator and frame earthing contact ,confirming to IS 13947-2 1993 as amended upto date complete with following Accessories.				
	1 set of 3 CT's of ratio 250/5A, Class 1.0				
	Independent manual spring closing mechanism - 1 No.				
	Microprocessor release (EMI and EMC certified) for over current, earth fault and short circuit protection - 1Set .				
	Multifunction meter with selector switch with suitable CT's and back up MCBs.				
	The instrument chamber shall be separate and shall comprise of flush type ammeter, voltmeter, selector switches, cast resin type CT's & PT's, etc. Separate CT's shall be provided for protective and measuring system				
	3 Nos. Phase indicating LED lamps with 2 Amp backup MCB, breaker ON/OFF/Trip indication light with 2A MCB , test terminal block set, MCB , circuits as per standard practice , auxiallry contact for positive interlocking of the breakers as required.				
	Shunt trip coil 220 Volt AC.				

	1 nos battery charger with DC voltmeter and ammeter suitable for the DG sets (82.5 KVA)				
	INTERLOCKING				
	Interlocking logic electrical Interlocking between incomers and bus coupler and it should have auto start and auto trip facility for Automatic Operation of the Breakers With Manual Over Rid Facility.				
	BUS COUPLER				
	Two Number 400A 50KA 4 pole MCCB as Bus Coupler with ON/OFF Indication.				
	BUS BAR				
	500 A TPN Aluminium bus bar with heat Shrink Sleeve				
	OUTGOING				
	All the MCCB's shall be equipped/ Provided with all accessories & in built protection releases.				
	MCCB's shall be thermal-magnetic upto 250A & Above Microprocessor based with inbuilt O/L & S/C release.				
	01 Nos. 250 AMPS TPN MCCB (Capacitor Panel)				
	1 No. 250A 4P MCCB (PANEL 1)				
	1 No. 250A 4P MCCB. (PANEL 2)				
	1 No. 160A 4P MCCB. (COMMON SERVICES PANEL)				
	1 No. 100A 4P MCCB (UPS PANEL)				
	2 No. 160A 4P MCCB (Spare)				
	2 No. 250A 4P MCCB (Spare)	1.00	No.	1611397.00	1611397.00
101	AUTOMATIC POWER FACTOR CORRECTION (APFC) PANEL				
	Automatic Power Factor Correction (APFC) System Supply, Installation, testing and commissioning of Automatic Power Factor Correction (APFC) panel, indoor type floor mounted free standing totally enclosed, extendable, IP 42, of following capacity for 3 phase, 415 V + 10 %, 50 Hz AC System for Ambient temperature -5°C to +40°C, fabricated in compartmentalised designed made of CRCA sheet steel of 2.0mm thick for framework & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process for powder coated of approved shade (RAL 7032-Siemens gray or as approved by Engineer-in-Charge), having				

	front section (switchgear and control accessories) and rear section capacitor and reactor, front and rear access, having suitable current carrying capacity, extensible TPN Aluminium alloy bus bar of high conductivity, DMC/SMC bus bar supports, bottom base channel of MS Section, fabrication shall be done in transportable section, entire panel shall have common copper earth bar of minimum size of 25mm x 5mm with 2 nos. earth studs, the earth terminals provided on the body of capacitor bank shall also be bonded to the main capacitor panel earth bus with 2 nos.				
	8 SWG or 6 SWG GI earth wires/ equivalent size of copper conductor cable, forced ventilation for maintaining temperature rise not more than 5°C from ambient, interconnections, connections with 14% detuned reactor and heavy duty 525 V ISI marked Impregnated MPP (Metalized Polypropylene) Capacitor (IS13340 Part -1 & 2) APFC Panel shall be in compliance with IS:16636 & CPWD Specifications etc. as per below details				
	(A) Incomers Suitable capacity MCCB Microprocessor base with O/C, S/C, E/L release of TPN 50KA breaking capacity ($I_{cs}=I_{cu}$), ON, OFF, Trip, R, Y, B - LED Indicating Lamp set along with required Instruments and accessories with extended rotary handle and door interlocking arrangement. Current rating of the Incomer in ampere shall be APFC Panel rating in KVAR x 1.4 x 1.5 or Nearest higher standards rating. (B) Instruments & Indications i) 3-Phase current sensing APFC microprocessor relay/controller, advance 8/12 stages (8 stages for capacity below 100 KVAR and 12 stages 100 KVAR & above) with Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge and having display of Phase wise V, A, PF, Cos-Phi, Kw, KVA, KVAR, THD-V, THD-I, harmonics up to 31 level. 3 nos of dual core CT's accuracy class 1, 15VA at incomer of PCC Panel for APFC relay. ii) Auto Manual Selector switch, auxiliary contactors with timer for delay in manual mode. iii) Digital Multi function meter with LED Display for V, A, PF, KW, KVA, KVAR, THD-V & I, Frequency. iv) Suitable rating control transformer shall be provided for control and indication circuit. v) All components like control transformer, meter, relay and indicating lamp shall be protected by				

	using suitable rating individual MCB's. vi) Wiring of the control circuit shall be done by using 2.5 sq. mm, FRLSH/HFFR 1100 V grade, PVC insulated multi stranded copper control wire.				
	(C) Bus Bars 1.3 Amp per Sq.mm, TPN, Electrolytic grade Aluminium bus bar of capacity 1.25 times of incomer rating as per CPWD specification.(D) Outgoings (APFC Section)Selection of the capacitors combinations shall be for continuous rating and each capacitor bank shall have suitable capacity Heavy Duty ISI Marked Capacitor, capacitor duty contactor, the capacitor shall be mounted on channel with base of perforated M S Powder coated sheet, connections inter connections etc. and other features as per CPWD Specifications and relevant IS Code having following: (i) Capacitor bank ratings & stages shall be as per the technical specifications sheet of NIT.(ii) Capacitor will be MPP self healing type with discharge resistor, pressure release mechanism.(iii) Since Capacitor Voltage is 525 Volts, thus higher KVAR has to be considered to get rated output at 415 Volts.(iv) 14% Detuned Reactor of class H insulation & 150% linearity in series with Capacitor.(Note: Technical specifications sheet for selection of the capacitors combinations shall be provided by the NIT Approving Authority with due consideration of number of capacitors i.e. 1KVAR, 2 KVAR, 3 KVAR, 5 KVAR, 10 KVAR for smooth correction).				
a)	75 KVAR	1.00	Each	334602.91	334602.91
102	PANEL 1 (GROUND FLOOR PANEL)				
	Design, manufacture, supply, installation, testing and commissioning of duly compartmentalized, having double door arrangement, front and back openable hinge type door with locking arrangement and minimum 350mm depth, made out of 2mm thick CRCA sheet duly power coated paint with approved color, gland plate with 3 mm thick MS sheet , dust and vermin proof, 7 tank process manufacturing , IP-42, floor mounted totally enclosed switchboard suitable for use of 415 volts, 3 phase, 50 HZ complete with suitable capacity of 4 strip aluminium bus bar duly electrolytic grade, control wiring with 2.5 sqmm copper wire, installed on angle iron frame with 4 nos. legs of 600 mm length made				

	out of 45mm x 45mm x 5mm MS angle, 30cm leg shall be grouted in CC foundation 1:3:6 (cement: concrete: core sand) and all accessories including supply and fixing of following incoming and outgoing switchgears. (Note: The drawing of panel/ feeder pillar has to be approved by the department)				
	INCOMER : 250 AMP FP, 36 kA MCCB Complete with all accessories like rotary handle etc.				
	BUS BAR : 315 AMP, 500 Volts, 3 phase 50 HZ 4P high conductivity electrolytic Aluminium bus bar of suitable length, insulated by heat shrinkable sleeves. The current density of bus bar shall be minimum 0.8 sq mm / amp.				
	The Maximum allowable temperature for the Bus bar to be restricted to 90 deg C. The temperature rise should be restricted to 45 deg C above ambient temperature.				
	OUT GOINGS :				
	8 No 63 AMP 4P MCB Including Indication Lights (DB's)				
	3 No 63 AMP 4P MCB (SPARE)				
	complete panel as above and complete	1.00	No.	158217.00	158217.00
103	PANEL 2 (First Floor)				
	Design, manufacture, supply, installation, testing and commissioning of duly compartmentalized, having double door arrangement, front and back openable hinge type door with locking arrangement and minimum 350mm depth, made out of 2mm thick CRCA sheet duly power coated paint with approved color, gland plate with 3 mm thick MS sheet , dust and vermin proof, 7 tank process manufacturing , IP-42, floor mounted totally enclosed switchboard suitable for use of 415 volts, 3 phase, 50 HZ complete with suitable capacity of 4 strip aluminium bus bar duly electrolytic grade, control wiring with 2.5 sqmm copper wire, installed on angle iron frame with 4 nos. legs of 600 mm length made out of 45mm x 45mm x 5mm MS angle, 30cm leg shall be grouted in CC foundation 1:3:6 (cement: concrete: core sand) and all accessories including supply and fixing of following incoming and outgoing switchgears. (Note: The drawing of panel/ feeder pillar has to be approved by the department)				

	INCOMER : 250 AMP FP, 36 kA MCCB Complete with all accessories like rotary handle etc.				
	BUS BAR : 315 AMP, 500 Volts, 3 phase 50 HZ 4P high conductivity electrolytic Aluminium bus bar of suitable length, insulated by heat shrinkable sleeves. The current density of bus bar shall be minimum 0.8 sq mm / amp.				
	The Maximum allowable temperature for the Bus bar to be restricted to 90 deg C. The temperature rise should be restricted to 45 deg C above ambient temperature.				
	OUT GOINGS :				
	9 No 63 AMP 4P MCB Including Indication Lights (DB's)				
	4 No 63 AMP 4P MCB (SPARE)				
	complete panel as above and complete	1.00	No.	162248.00	162248.00
104	UPS PANEL				
	Design, manufacture, supply, installation, testing and commissioning of duly compartmentalized, having double door arrangement, front and back openable hinge type door with locking arrangement and minimum 350mm depth, made out of 2mm thick CRCA sheet duly power coated paint with approved color, gland plate with 3 mm thick MS sheet, dust and vermin proof, 7 tank process manufacturing, IP-42, floor mounted totally enclosed switchboard suitable for use of 415 volts, 3 phase, 50 HZ complete with suitable capacity of 4 strip aluminium bus bar duly electrolytic grade, control wiring with 2.5 sqmm copper wire, installed on angle iron frame with 4 nos. legs of 600 mm length made out of 45mm x 45mm x 5mm MS angle, 30cm leg shall be grouted in CC foundation 1:3:6 (cement: concrete: core sand) and all accessories including supply and fixing of following incoming and outgoing switchgears. (Note: The drawing of panel/ feeder pillar has to be approved by the department).				
	INCOMER : 100 AMP FP MCB, 16KA through 20 KVA UPS bypass panel (Including Bypass Panel)				
	BUS BAR : 150 AMP, 500 Volts, 3 phase 50 HZ 4P high conductivity electrolytic Aluminium bus bar of suitable length, insulated by heat shrinkable sleeves. The current density of bus bar shall be minimum 0.8 sq mm / amp.				

	The Maximum allowable temperature for the Bus bar to be restricted to 90 deg C. The temperature rise should be restricted to 45 deg C above ambient temperature.				
	OUT GOINGS :				
	6 No 63 AMP 16/ 25 kA TPN MCCB Including Indication Lights (DB's) and all accessories.				
	3 No 63 AMP 16/ 25 kA TPN MCCB (SPARE) complete with all accessories.				
	complete panel as above and complete	1.00	No.	142093.00	142093.00
105	EXTERNAL LIGHTING FEEDER PILLAR PANEL				
	Design, manufacture, supply, installation, testing and commissioning of duly compartmentalized, having double door arrangement, front and back openable hinge type door with locking arrangement and minimum 350mm depth, made out of 2mm thick CRCA sheet duly power coated paint with approved color, gland plate with 3 mm thick MS sheet , dust and vermin proof, 7 tank process manufacturing , IP-54, double door outdoor type floor mounted totally enclosed switchboard suitable for use of 415 volts, 3 phase, 50 HZ complete with suitable capacity of 4 strip aluminium bus bar duly electrolytic grade, control wiring with 2.5 sqmm copper wire, installed on angle iron frame with 4 nos. legs of 600 mm length made out of 45mm x 45mm x 5mm MS angle, 30cm leg shall be grouted in CC foundation 1:3:6 (cement: concrete: core sand) and all accessories including supply and fixing of following incoming and outgoing switchgears. (Note: The drawing of panel/ feeder pillar has to be approved by the department)				
	INCOMER:				
	I/C - 125A TPN 25kA MCCB complete will all accessories like rotary handle etc. - 1No O/G - 95A TP Contactor - 1No - 24hrs Timer - 1No - 32A DP MCB - 8Nos. - RYB Indication lamp with control MCB - 1set - ON.OFF Indication lamp with control MCB - 1Set - Auto/Manual selector switch - 1No - Panel board size - 700x600x350mm - 1set - Panel Board base angle iron frame 600x600x350x50x6mm Angle - 1set(				

	including canopy for rain protection and transportation charges)				
	All Items complete as above	1.00	No.	111861.00	111861.00
106	COMMON SERVICES PANEL				
	Design, manufacture, supply, installation, testing and commissioning of duly compartmentalized, having double door arrangement, front and back openable hinge type door with locking arrangement and minimum 350mm depth, made out of 2mm thick CRCA sheet duly power coated paint with approved color, gland plate with 3 mm thick MS sheet, dust and vermin proof, 7 tank process manufacturing, IP-54, double door, outdoor type, floor mounted totally enclosed switchboard suitable for use of 415 volts, 3 phase, 50 HZ complete with suitable capacity of 4 strip aluminium bus bar duly electrolytic grade, control wiring with 2.5 sqmm copper wire, installed on angle iron frame with 4 nos. legs of 600 mm length made out of 45mm x 45mm x 5mm MS angle, 30cm leg shall be grouted in CC foundation 1:3:6 (cement: concrete: core sand) and all accessories including supply and fixing of following incoming and outgoing switchgears. (Note: The drawing of panel/ feeder pillar has to be approved by the department).				
	INCOMER : 160 AMP 25 kA FP MCCB complete with all accessories (from AMF panel)				
	AMF PANEL INCOMER :- 1 From Main LT Panel & 1 From DG Set O/G				
	BUS BAR : 200 AMP, 500 Volts, 3 phase 50 HZ 4P high conductivity electrolytic Aluminium bus bar of suitable length, insulated by heat shrinkable sleeves. The current density of bus bar shall be minimum 0.8 sq mm / amp.				
	The Maximum allowable temperature for the Bus bar to be restricted to 90 deg C. The temperature rise should be restricted to 45 deg C above ambient temperature.				
	OUT GOINGS :				
	5 No 125 AMP 25 kA 4P MCCB complete with all accessories Including Indication Lights				
	3 No 125 AMP 25 kA 4P MCCB (Spare)				
	complete panel as above and complete	1.00	No.	425272.00	425272.00

	SUB HEAD XXI VRV/ VRF SYSTEM				
	Outdoor Unit				
107	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 6.4, Capacity > 40 and <70 ISEER 6.5, Capacity > 70 ISEER 6.6 for ECSBC+ Building)				
	For Cooling or Heating or Both				
a)	6 HP to 8 HP	30	Per HP	27548.92	826467.60
b)	10 HP to 12 HP	50	Per HP	26413.33	1320666.50
c)	14 HP to 22 HP	40	Per HP	25134.71	1005388.40
	Indoor Unit				
108	Supplying, Installation, Testing and Commissioning of following minimum capacity 4 way Cassette Type Indoor ceiling mounted unit equipped with synthetic				

	washable 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, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V $\pm$ 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a signal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement in auto mode. The cooling capacity of indoor unit will be at air inlet conditions of 27 0C DB and 19 0C WB temperature. (Make will be same as of Outdoor)				
a	2.6 TR	2	Each	50323.66	100647.32
b	3.6 TR	10	Each	54583.68	545836.80
c	4.1 TR	6	Each	56447.97	338687.82
109	Supplying, Installation, Testing and Commissioning of following minimum capacity 4-way compact VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable 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, drain pump, grill, necessary supports, vibration Isolation, Corded remote control etc., suitable for operation on single phase 230 V $\pm$ 10%, 50Hz AC supply, complete, as required. The Indoor units must shut down upon receiving a signal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 0C DB and 19 0C WB temperature. (Make will be same as of Outdoor)				
a	1.6 TR	20	Each	49258.35	985167.00
110	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				
a	Indoor Units	15	Each	5591.66	83874.90
	COPPER REFRIGERANT PIPING				
111	Supplying, Installation, testing and commissioning including vacuumization and Nitrogen testing of following nominal sizes of				

	soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastomeric nitrile rubber tubular sleeves sections of 19 mm thick insulation as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :				
a	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	300	Meter	426.62	127986.00
b	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	50	Meter	600.47	30023.50
c	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	300	Meter	758.30	227490.00
d	19 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	60	Meter	911.19	54671.40
e	22.2 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	80	Meter	1114.63	89170.40
f	25.4 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	120	Meter	1316.84	158020.80
112	Providing and fixing in position hard PVC pipes for condensate drain of indoor units cut to required lengths and installed with adhesive joints of following dia and as per the shop drawings and specification				
a	32 mm dia.	300	RMT	313.00	93900.00
	SUB HEAD XXII SEWAGE TREATMENT PLANT (Based on MBBR technology)				
113	Supply, Fabrication, installation, testing and commissioning of fully FRP Prefabricated unit with packaged Sewage treatment plant with tertiary treatment based on MBBR technology for handling capacity 10 KL per day. The entire plant will be constructed in Fiber Reinforced Plastic (FRP) & All secondary treatment tanks which are Separation, Anaerobic, Aerobic, Sedimentation and Disinfectant Chambers housed in single FRP Tank with in built re- circulation system in STP without using any pump to re-circulate the untreated waste water. The packaged STP unit shall be 10% FRP for weather protection and aesthetic appearance. The STP should be suitable to gets installed in aboveground/ underground conditions. The wastewater from canteen shall pass through Oil & Grease Trap before it feed & directly to sedimentation & separation chamber through gravity, without				

	having an equalization tank. The STP shall be designed as water retaining structures, with necessary chemical dosing as required by the manufacturer's design.				
	Incoming Sewage Details				
	Daily average flow : 10 KL/Day				
	pH : 6 -8.5				
	BOD : 250 -350 mg/l				
	S. Solids : 100 - 450 Mg/l				
	COD : 350-450 mg/l				
	Oil & Grease : 20-25 mg/L				
	Effluent discharge standard after treatment:-				
	pH : 6.5 - 8.5				
	BOD : ≤ 10 mg/l				
	T. S. Solids : ≤ 20 mg/l				
	COD : ≤ 50 mg/l				
	Oil & Grease : ≤ 10 mg/l				
	FRP Treatment Tank (MOC: 10% FRP) comprising of the following				
	1. Separation and Sedimentation Chamber				
	2. Anaerobic Chamber				
	3. Moving Bed Chamber				
	4. Sedimentation Chamber				
	5. Disinfection Chamber				
	6. In Built recirculation Line				
	7. Manhole covers				
	8. Air Blowers (1 Set)				
	9. Wire Ropes for anchoring the STP tank				
	Supplying, Installation, Testing and Commissioning of STP (Sewage Treatment Plant) Cap. 10 KLD				
	Bar Screen				
A	Supplying, installing, testing and commissioning of Perforated bar screen of size 500mm x 750mm having provision for chain lifting arrangement as required. Bar spacing not more than 12mm along with sliding rack, nuts bolts for handling peak flow of Raw Domestic Sewage into the equalization tank etc as required. - 1 Nos.				
	RAW SEWAGE TRANSFER PUMP				

B	Supplying, installing, testing and commissioning of raw sewage transfer submersible Non Clog, open impellers, Solid handling pump set with suitable motor 3 phase, 415V, 50 Hz AC power supply with cast iron body and impeller, carbon steel shaft suitable for 3 phase, 415 volt supply with bend, lifting chain arrangement for service & maintenance, MS metallic stand guide Rails etc. as required as per following details: - 2 Nos.				
	Type: Submersible				
	Capacity: 2 cum/hr				
	Head: 12 m				
	MOC of body: CI				
	Agitation Blower for EQT Tank				
C	Supplying, installing, testing and commissioning of Agitation blower for EQT Tank with Upvc air grid . Noise level of blower should be less than 50 db. - 1 Nos.				
	Capacity L/min - 80				
	Motor W - 570				
	Pressure /Head - 20 kpa				
	Voltage - 230				
	Main STP FRP Tank				
D	FRP STP Tank of Cap.10KLD with All secondary treatment tanks which are Separation, Anaerobic, Aerobic, Sedimentation and Disinfectant Chamber housed 1 single FRP Tank with in built re-circulation system in STP without using any pump to re-circulate the untreated waste water. - 1 Set				
	FILTER FEED PUMP				
E	Supplying, Installation, Testing & Commissioning of Centrifugal, Mono block, filter feed pump set with motor 3 phase, 415V, 50 Hz AC power supply having discharge rate of minimum 5 m ³ /hrs. at a head of 30 meters with MS channel base frame duly epoxy painted and grouted suitable for operation on 3phase 415Volt AC supply complete etc as required. - 2 Nos.				
	Type: Centrifugal Monobloc				
	Capacity: 1 cum/hr				
	Head: 30 m				
	MOC: CI				

	MULTIGRADE SAND FILTER :				
F	Supplying, installing, testing and commissioning of vertical type Multi Grade filter capable of filtering 1cum/hour of water at prescribed filtration rate of 16cum/sq.m/hr. The filter shall comprise of FRP shell, suitable for a test pressure of 3.5 kg/sq.cm., Complete with butterfly valve, connected frontal, flanges, pedestal, access cover, bed plate with strainers/lateral pipe distribution, pressure gauges, first charge of filter media bypass arrangement/backwash arrangement. The back wash system can be pre set timer or pressure difference Sensor system as required. - 1 Nos.				
	Capacity : 1m3/hr.				
	ACTIVATED CARBON FILTER :				
G	Supplying, installing, testing and commissioning of vertical type Multi Grade filter capable of filtering 1cum/hour of water at prescribed filtration rate of 16cum/sq.m/hr. The filter shall comprise of FRP shell, suitable for a test pressure of 3.5kg/sq.cm., Complete with butterfly valve, connected frontal, flanges, pedestal, access cover, bed plate with strainers/lateral pipe distribution, pressure gauges, first charge of filter media bypass arrangement/backwash arrangement. The backwash system can be pre set timer or pressure difference Sensor system as required. - 1 No.				
	Capacity : 1m3/hr				
	INTERCONNECTING PIPING				
H	Supply & fixing of all necessary uPVC pipe and MS pipe (AirLine) (medium duty) of various sizes i/c all fittings, valve other accessories complete in all respect etc. as required. - 1 Lot				
	ELECTRICAL PANEL				
I	Supply, installation, testing and commissioning of electrical panel with following accessories in it etc as required with relays, contactors, starters, sequential pump controllers, Aluminum Bus Bars, designation labels as per requirement, continuous earth bar, panel separators, protective screens, cable clamping support system, bottom cable gland plates for incoming and outgoing cable entries, etc as required. - 1 Nos.				
	CABLING				
J	Providing, fixing, connecting, testing and commissioning power and control copper				

	conductor cable between electric control panel, all pumps, blowers, level sensors & controllers, solenoid valves, etc. including cable trays, raceways, conduits /HDPE pipe etc. for satisfactory operation of all equipments as required. - 1 Lot				
	TREATED WATER TANK				
K	Supplying, Installation, Testing & Commissioning of treated water tank. - 1 Nos.				
	Capacity: 1000 Ltr.				
	MOC: FRP				
	All inclusive as per mentioned quantities with complete job for 10 KLD STP plant	1	Job	1045346.00	1045346.00
	SUB HEAD XXIII AV SYSTEM				
	Training Hall				
114	Integrated Audio System				
114.1	Supplying, installation, testing & commissioning of 120W Peak/60W Program/30W RMS Power Handling 2-Way Wall Mount Speaker with 1" dome tweeter and a 3" low-frequency driver, Frequency response - 90 Hz - 18 kHz, Sensitivity @ 1W/1m - 85 dB, Sound Pressure Max. W/1m @ 100 V - 95 dB, Horizontal/Vertical Dispersion - 100°, IP40 Rated etc including connection as per requirement.	4	Each	18254.00	73016.00
114.2	Supplying, installation, testing & commissioning of 120 W Mixer Amplifier with 6 x Microphone Inputs, Remote Mic, Chime & Mute contacts, 5-Zone Output selector, Low impedance and constant voltage output, Priority inputs with phantom power, Convection cooled, Protection - DC Short circuit, Overheating, Overload, Signal limiting - etc including connection as per requirement.	1	Each	124861.00	124861.00
114.3	Supplying, installation, testing & commissioning of Wireless Lapel Microphone System with Frequency Response of 60 Hz - 16 kHz, With a 2 x 4 channel frequency plan for enhanced flexibility, Microphone Element of Condenser Cardioid, Operating Range of 60 m etc including connection as per requirement.	1	Each	46213.00	46213.00
115	Display System				
115.1	Supplying, installation, testing & commissioning of 86" UHD Interactive Board Cum Display with 3840 x 2160 Resolution, Flat form factor, Annotation over any content, Anti-glare toughened display, 178 x 178 Viewing Angle, Multi-touch, 16:9 Aspect	1	Each	336715.00	336715.00

	Ratio, 1200:1 Contrast Ratio, Operable as Landscape/Portrait orientation, 10 W x 2 Inbuilt audio output, 16 x 7 Duty Cycle, Interfaces HDMI/RJ45/USB/WIFI/BLEETOOTH/RS232, Inbuilt content saving, Ultra-responsive touch, Facility for active collaboration, Colour - Black, Slot for Open Pluggable Specification/OPS, Inbuilt Android OS etc including connection as per requirement.				
115.2	Supplying, installation, testing & commissioning of 4K OPS PC Module with Intel Core i5 processor, 8GB RAM, and 256GB SSD, designed to integrate seamlessly with compatible interactive flat panels, digital signage displays, and professional monitors that support the OPS standard. The module installs directly into the OPS slot of the display, eliminating the need for external PCs and reducing cable clutter. Powered by Windows 11 or higher.	1	Each	86163.00	86163.00
116	Digital Podium System				
116.1	Supplying, installation, testing & commissioning of Digital Podium - Customized Audio-Visual metallic platform fitted with cooling fans, , 19" rack, trays/drawers to house multiple HW/SW. Specific provision to accommodate Interactive Monitor with motorized tilt, keyboard/mouse, PC, audio system, all audio video ports such as USB, XLR, HDMI In/Out, Audio In/Out, LAN, Power socket with on/Off switch. Lockable trays and doors for security. Modular universal spike buster with central power control, space for logo on podium front side etc including connection as per requirement.	1	Each	141715.00	141715.00
116.2	Supplying, installation, testing & commissioning of Integrated multimedia controller with keypad for audio volume control, on/off switch for PC, Projector and projection screen, IR device control, RS232, LAN connectivity, USB etc. Switching among PC, Laptop and Document Camera with auto splitting between podium monitor & projection system, switching between displays etc including connection as per requirement.	1	Each	51017.00	51017.00
116.3	Supplying, installation, testing & commissioning of 21.5-inch Interactive Monitor with multi touch, up to 45 deg motorized tilt, Resolution 1920 X 1080-pixel, HDMI/DVI, VGA and USB input Ports, Brightness 250 cd/m2 etc including connection as per requirement.	1	Each	51017.00	51017.00

116.4	Supplying, installation, testing & commissioning of Pipe-neck Microphone for Podium with Back electret condenser, Cardioid polar pattern, 50 Hz - 18 kHz Frequency Response, Signal to Noise ratio of 75 dB, Max. Sound Pressure of 130 dB, 3-pin XLR Connector, Included windscreen etc including connection as per requirement.	1	Each	25995.00	25995.00
116.5	Supplying, installation, testing & commissioning of A Small Form Factor (SFF) Desktop PC powered by an Intel Core i5 processor, equipped with 16GB RAM and 512GB SSD storage, designed to deliver reliable performance for professional and office applications. The system comes pre-installed with Windows 11 or higher, ensuring compatibility with modern software and enterprise environments etc including connection as per requirement.	1	Each	77660.00	77660.00
117	Signal/Power Management				
117.1	Supplying, installation, testing & commissioning of 2 KVA online Interactive UPS complete with battery bank with Cold Start Facility - can be started during power failure, 10-15 minute battery backup, Input Filters for Line Noise and Spikes, Overload, Short Circuit Protection, Sine Wave Output, Microprocessor-Based, Fast Charging Rate etc including connection as per requirement.	1	Each	31744.00	31744.00
117.2	Supplying, installation, testing & commissioning of Surge Protection Device (SPD) designed to protect the UPS system and connected equipment from electrical surges, voltage spikes, and transient over-voltages caused by lightning strikes, power fluctuations, or switching disturbances in the electrical network.	1	Each	11337.00	11337.00
	Conference Room				
118	Audio Conferencing with Integrated Audio System				
118.1	Supplying, installation, testing & commissioning of 120W Peak/60W Program/30W RMS Power Handling 2-Way Wall Mount Speaker with 1" dome tweeter and a 3" low-frequency driver, Frequency response - 90 Hz - 18 kHz, Sensitivity @ 1W/1m - 85 dB, Sound Pressure Max. W/1m @ 100 V - 95 dB, Horizontal/Vertical Dispersion - 100°, IP40 Rated etc including connection as per requirement.	1	Each	18254.00	18254.00

118.2	Supplying, installation, testing & commissioning of Conference Master Controller with built-in Class D 120W Power Amplifier for external speakers and Video conference connection terminals such as USB port or RCA jack and audio refinement via Equalizer connection terminals to connect an equalizer or other signal processor etc including connection as per requirement.	1	Each	151231.00	151231.00
118.3	Supplying, installation, testing & commissioning of Conference Chairman unit with 0.2 W volume-controllable monitor speaker, Priority button to give precedence to chairman, 2 headphone jacks with individual volume control, in-built Electret Condenser microphone and indicator lights on unit's base and microphone stem etc including connection as per requirement.	1	Each	42516.00	42516.00
118.4	Supplying, installation, testing & commissioning of Conference Delegate unit with 0.2 W volume-controllable monitor speaker, 2 headphone jacks with individual volume control, in-built Electret Condenser microphone and indicator lights on unit's base and microphone stem	25	Each	40898.00	1022450.00
119	Display System				
119.1	Supplying, installation, testing & commissioning of 86" UHD Interactive Board Cum Display with 3840 x 2160 Resolution, Flat form factor, Annotation over any content, Anti-glare toughened display, 178 x 178 Viewing Angle, Multi-touch, 16:9 Aspect Ratio, 1200:1 Contrast Ratio, Operable as Landscape/Portrait orientation, 10 W x 2 Inbuilt audio output, 16 x 7 Duty Cycle, Interfaces - HDMI/RJ45/USB/WIFI/BLUETOOTH/ RS232, Inbuilt content saving, Ultra-responsive touch, Facility for active collaboration, Colour - Black, Slot for Open Pluggable Specification/OPS, Inbuilt Android OS	1	Each	336715.00	336715.00
119.2	Supplying, installation, testing & commissioning of 32" Smart Display with 4K Resolution, 16:9 Aspect ratio, 16 x 7 Duty cycle, In-Plane Switching Panel, 178 x 178 Viewing Angle, ≥ 250 cd/m ² Brightness, 1200:1 Contrast Ratio with HDMI interface etc including connection as per requirement.	1	Each	38547.00	38547.00
119.3	Supplying, installation, testing & commissioning of 4K OPS PC Module with Intel Core i5 processor, 8GB RAM, and 256GB SSD, designed to integrate seamlessly with compatible interactive flat panels, digital signage displays, and professional monitors	1	Each	86163.00	86163.00

	that support the OPS standard. The module installs directly into the OPS slot of the display, eliminating the need for external PCs and reducing cable clutter. Powered by Windows 11 or higher.				
119.4	Supplying, installation, testing & commissioning of 1x4 HDMI Splitter to connect one HDMI source to four HDMI sinks at the same time, HDMI 3D, Deep Colour, 4K; HDCP Compatible, supports resolutions of up to Ultra HD, Supports Dolby True HD and DTS HD Master Audio etc including connection as per requirement.	1	Each	28883.00	28883.00
119.5	Supplying, installation, testing & commissioning of a customized floor mount movable/ fixed stand designed for secure installation and support of a 32-inch monitor or display in professional environments such as studios, classrooms, control rooms, and presentation spaces. The stand provides a stable and ergonomic viewing position while maintaining a clean and organized installation.	1	Each	14172.00	14172.00
120	Control System				
120.1	Supplying, installation, testing & commissioning of Digital Smart Mixer with 6 x Mic/Line inputs, 2 x Balanced, 1 x Stereo and 1 x USB Outputs, AEC and 4-Band Equalizer, Compressor/De-Esser for each input channel, 8-Band Feedback Suppressor, 12-Band Parametric Equalizer, Compressor and Limiter for each output channel, Selectable Gain-sharing/Gated mode, Audio configurations/settings are adjustable from front panel etc including connection as per requirement.	1	Each	184620.00	184620.00
	Video Capture System				
121	Supplying, installation, testing & commissioning of Full HD Fixed-Lens PTZ Camera with 12x Optical Zoom, Progressive scanning mode, CMOS sensor, Backlight compensation and White balance support, Support for 2D/3D digital noise reduction, Horizontal and Vertical image inversion, RJ-45 Network interface, Control via RS232/RS485, Protocols supported - TCP/IP, HTTP, RTSP, RTMP, Onvif, DHCP, Multicast, H.264/H.265/MJPEG Video Compression supported etc including connection as per requirement.	1	Each	198401.00	198401.00
121.1	Supplying, installation, testing & commissioning of a ceiling or wall mount bracket designed for secure installation of, PTZ cameras, in indoor environments. The	1	Each	10770.00	10770.00

	mount provides a stable platform that allows the camera to be positioned at the desired angle for optimal field of view and coverage.				
122	Signal/Power Management				
122.1	Supplying, installation, testing & commissioning of 3 KVA Online UPS complete with battery bank with 10-15 min battery backup and pure sine wave output, EMI/RFI Filters, Selectable various output range and operating mode, Cold start function - can be started during power failure, Inbuilt static bypass enhance better protection for critical load, Overload, short-circuit, and overheat protection, Generator Compatibility, IP20 Protection etc including connection as per requirement.	1	Each	77660.00	77660.00
122.2	Supplying, installation, testing & commissioning of Surge Protection Device (SPD) designed to protect the UPS system and connected equipment from electrical surges, voltage spikes, and transient over-voltages caused by lightning strikes, power fluctuations, or switching disturbances in the electrical network etc including connection as per requirement.	1	Each	17006.00	17006.00
122.3	Supplying, installation, testing & commissioning of 4k Professional HDMI signal extension solution designed to transmit high-quality audio and video signals over long distances using a single CAT6 / CAT6A cable. It consists of a transmitter and receiver unit that extend HDMI signals between source and display devices in AV installations etc including connection as per requirement of the system.	1	Each	48588.00	48588.00
122.4	Supplying, drawing, Installation, Testing and commissioning of Cat6A UTP 4 pair, 23 AWG solid copper cable in existing conduit/ on surface, U/FTP, LSZH, Non-Plenum, Horizontal(solid) Cable suitable for high speed data networking application supporting upto 10Gbps over a 100 meter channel. The 4 Unshielded Twisted Pairs (UTP) cable with color coded insulation for easy identification should have FLAMEPROPERTIES i.e. Flammability Test - IEC 60332-1, Smoke Density - IEC 61034, LSZH standards compliance: ANSI/TIA-568 C.2, ISO/IEC 11801, IEEE 802.3an, RoHS. Delay Skew should be < 45NS. The outer Cable Diameter should be 7.5 +2 mm. Cable should have been tested and verified by UL/ ETL.				
a)	1 Run of cable	250	Mtr	76.45	19112.50

122.5	Supplying and drawing of cable Fire Retardant PVC insulated copper conductor cable in the existing surface / recessed steel conduit of following pairs, cores and size including connections and interconnections etc. as required.				
a)	Speaker cable Single pair, 2-core, 1.5 sqmm	220	meter	75.21	16546.20
122.6	Supplying, installation, testing & commissioning of HDMI Cable, High Speed cable conforming to HDMI 2.0 or latest standard, suitable for transmission of high-definition digital video and multi-channel audio signals between HDMI enabled devices such as computers, laptops, LED/LCD monitors, projectors and TVs. i/c both end connectors etc. as required to function properly as per required length.	80	meter	301.00	24080.00
	SUB HEAD XXIV RACEWAY & CABLE TRAY				
123	Supply and fixing following size of under floor GI raceways made out of 1.6mm thick sheet steel, 1/3 compartment complete with jointing sleeves and other accessories under floor installation including cutting and chasing the floor, making good the same, placing in position and cleaning from inside complete of following sizes etc. as required.				
a)	100mm x 25mm x 1.6mm - 1 compartment	31	Meter	1350.00	41850.00
b)	150mm x 25mm x 1.6mm - 1 compartment	30	Meter	1797.00	53910.00
c)	225mm x 25mm x 1.6mm - 3 compartment	15	Meter	2775.00	41625.00
d)	300mm x 25mm x 1.6mm - 3 compartment	15	Meter	3497.00	52455.00
124	Supply & fixing following size of under floor access outlet made out of 1.6mm thick pre-galvanised GI sheet with all accessories including necessary cutting and chasing of floor and making good the same, placing in position, cleaning from inside etc. as required.				
a)	150mm x 150mm x 65 mm	15	Nos	465.00	6975.00
b)	300mm x 300mm x 65 mm	15	Nos	793.00	11895.00
	CABLE TRAY				
125	Supplying and installation following size of perforated painted with powder coating M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with two numbers MS/GI Suspenders i/c base of suitable size MS/GI angle, bolts & nuts, painting suspenders, fastener etc as required.				
a)	150 mm width X 50 mm depth X 1.6 mm thickness	160	Meter	845.84	135334.40

c)	300 mm width X 50 mm depth X 1.6 mm thickness	90	Meter	1067.78	96100.20
126	Supplying and installation following size of perforated painted with powder coating M.S. cable trays bends with perforation not more than 17.5%, joined with connectors, suspended from the ceiling with two numbers MS/GI Suspenders i/c base of suitable size MS/GI angle, bolts & nuts, painting suspenders, fastener etc as required.				
a)	150 mm width X 50 mm depth X 1.6 mm thickness	4	Each	1362.47	5449.88
b)	300 mm width X 50 mm depth X 1.6 mm thickness	4	Each	1903.75	7615.00
127	Supplying and installation following size of perforated painted with powder coating M.S. cable trays Tee with perforation not more than 17.5%, joined with connectors, suspended from the ceiling with two numbers MS/GI Suspenders i/c base of suitable size MS/GI angle, bolts & nuts, painting suspenders, fastner etc as required.				
a)	150 mm width X 50 mm depth X 1.6 mm thickness	4	Each	1579.47	6317.88
b)	300 mm width X 50 mm depth X 1.6 mm thickness	4	Each	2251.46	9005.84
128	Supplying and installing following size of perforated painted with powder coating M.S. cable trays Cross Member with perforation not more than 17.5%, joined with connectors, suspended from the ceiling with two numbers MS/GI Suspenders i/c base of suitable size MS/GI angle, bolts & nuts, painting suspenders, fastner etc as required.				
a)	150 mm width X 50 mm depth X 1.6 mm thickness	1	Each	1797.71	1797.71
b)	300 mm width X 50 mm depth X 1.6 mm thickness	2	Each	2601.63	5203.26
129	Supplying and installing following size of perforated painted with powder coating M.S. cable trays Reducer with perforation not more than 17.5%, joined with connectors, suspended from the ceiling with two numbers MS/GI Suspenders i/c base of suitable size MS/GI angle, bolts & nuts, painting suspenders, fastner etc as required.				
a)	100 mm width X 50 mm depth X 1.6 mm thickness	4	Each	1342.74	5370.96
b)	225 mm width X 50 mm depth X 1.6 mm thickness	4	Each	1925.95	7703.80
	SUB HEAD XXV Water Pump (Domestic)				

130	Supplying, installation, testing & commissioning of three phase monoblock pump set of 5.5KW/ 7.5 H.P. capacity suitable for operation on 415V(+/-10%), 3- phase AC supply, B class insulation having suction and delivery of 65mm X 50mm dia pipe, having IP 55 Protection with cast iron body of impeller and casing, pump shaft of carbon steel, gland packed sealing, suitable to work on head of 32m to 52 m with discharge range of 8.6LPS to 4.5LPS including providing required numbers of heavy duty M.S clamps made of flat iron and suitable size top cover made of suitable thick MS sheet as required. and making of flexible cable connections etc. complete as reqd.(1W+1S)	2	Each	55490.00	110980.00
131	Supplying & fixing PVC insulated PVC sheathed copper conductor submersible flat cable ISI Marked in existing metal/HDPE / PVC/ pipe/ in bore well/ in sump including fixing the cable to GI/HDPE pipe with suitable cable tags of following sizes etc. as required.				
a)	3 Core 6 Sq. mm Flat Cable	150	Meter	327.98	49197.00
132	Supplying, Installation, Testing and Commissioning of fixing of following diameter CI Non Return valve PN1 on the existing pipeline etc. complete as required.				
a)	65 mm dia	2	Each	4815.00	9630.00
132.1	Supplying, Installation, Testing and Commissioning of fixing of following diameter Gun metal Horizontal Non Return valve (screwed type) on the existing pipeline, etc. complete as required.				
a)	50 mm dia	2	Each	10718.47	21436.94
133	Supplying, Installation, Testing and Commissioning of fixing of following diameter Gun metal gate valve (Screwed type) on the existing pipeline, etc. complete as required.				
a)	50 mm dia	2	Each	9717.27	19434.54
133.1	Supplying, Installation, Testing and Commissioning of fixing of following diameter CI gate valve (Screwed type) on the existing pipeline, etc. complete as required.				
a)	65 mm dia	2	Each	15278.00	30556.00
134	Supplying, installation, testing and commissioning of Electrical Panel DOL Starter for 7.5 HP Openwell Submersible Pumps, SPP with auto manual switch, FRLS (Fire retardant low smoke) Internal wiring, Combined V / A meter, Voltmeter selector switch, ON OFF indication, Range : 0.75 kW to 11 kW (1 HP to 15 HP), Conforms to IS/IEC 60947-4-1, Provided with Protection Degree	2	Each	10455.00	20910.00

	IP 54 i/c connections etc complete in all respect as required.				
	SUBHEAD XXVI (DOWN-COMER FIRE FIGHTING SYSTEM)				
135	(A) Supplying, installation, testing and commissioning of electric driven terrace pump suitable for automatic operation and consisting of following, complete in all respects, as required: (Terrace Pump) (B) Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical confirming to IS: 1520 (C) Suitable HP squirrel cage induction motor TEFC type suitable for operation on 415 volts, 3 phase, 50 Hz, AC supply with IP55 class of protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325. (D) M.S. fabricated common base plate, coupling, coupling guard, foundation bolts etc. as required. (E) Suitable cement concrete foundation duly plastered and with anti vibration pads.				
a)	450 lpm at 35 m Head	2	Each	112676.47	225352.94
136	Providing & fixing of pressure switch in M.S. pipe line including connection etc. as required.	2	Each	2059.11	4118.22
137	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.	2	Each	23922.67	47845.34
138	Supplying and fixing single headed internal hydrant valve with instantaneous Gunmetal/Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required :				
a)	Single headed Stainless steel	4	Each	8177.26	32709.04
139	Supplying and fixing first-aid Hose Reel with MS construction spray painted in post office red, conforming to IS 884 complete with the following as required. 20 mm nominal internal dia water hose thermoplastic (Textile reinforced) type -2 as per IS: 12585 20 mm nominal internal dia gun metal globe valve & nozzle. Drum and brackets for fixing the equipment's				

	on wall. Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket.				
a)	30 m	4	Each	11639.52	46558.08
140	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female couplings duly bound with GI wire, rivets etc. conforming to IS 636 (type-A) as required:				
a)	Stainless Steel (Grade 304)	8	Each	5754.41	46035.28
141	Supplying & fixing 63 mm dia gun metal short branch pipe with 20 mm nominal internal diameter size nozzle conforming to IS 903 suitable for instantaneous connection to interconnect hose pipe coupling as required:				
a)	Stainless Steel (Grade 304)	4	Each	2165.15	8660.60
142	Supplying and fixing orifice plate made out of 6 mm thick stainless steel (Grade 304) with orifice of required size to be fitted between flange & landing valve of external and internal hydrants to reduce pressure at the outlet to the level of 3.5 kg/cm ² complete as required.	2	Each	1755.79	3511.58
143	Supplying and fixing of fire brigade connection of cast iron body with gun metal male instantaneous inlet couplings complete with cap and chain as reqd. for suitable dia MS pipe connection conforming to IS 904 as required:				
a)	4 way - 150 mm dia M.S. Pipe	2	Each	18273.06	36546.12
144	Providing, installation, testing and commissioning of stainless steel Y-strainer fabricated out of 1.6 mm thick stainless steel, Grade 304, sheet with 3 mm dia holes with stainless steel flange.				
a)	150 mm dia	2	Each	14403.91	28807.82
145	Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc.as required:				
a)	150 mm dia	2	Each	23283.97	46567.94
146	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required :				
a)	100 mm dia	6	Each	8965.14	53790.84
b)	150 mm dia	4	Each	12005.72	48022.88
147	Providing laying, testing & commissioning of 'C' class heavy duty MS Pipe conforming to IS 1239/3589 i/c fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. in ground including welding, excavation &				

	providing cement concrete blocks as supports, anticorrosive treatment with coaltar/asphalt tape as per IS 10221, refilling the trench etc. of following sizes complete as required.				
a)	150 mm. Dia	20	Meter	6293.23	125864.60
148	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required:				
a)	100 mm dia	48	Meter	3793.94	182109.12
149	Providing and fixing of TAC approved 1.6mm thick M.S. fire hose cabinet (750x600x250mm) made out of 16 gauge M.S. sheet capable of accommodating landing valve, hose pipes, fittings & accessories. The box shall have a front glass door with lock and key arrangement & shall be painted with post office red colour (approval shall be taken on the basis of submitted sample before ordering)	4	Each	5714.00	22856.00
	Total				4,08,36,661.81
	SAY				4,08,36,662.00

FINANCIAL BID

CIVIL CONSTRUCTION UNIT					
NIT No: 05/2026-27/CE/CCU/CED-II/Dehradun					
Name of work: Construction of Office Building of BSI, HAWHRC, Solan (Himachal Pradesh).					
SCHEDULE OF QUANTITY					
Name of the Contractor					
Sl. No.	Name of component	Estimated cost (Rs.)	Percentage above or below the estimated cost	% in Figures	Total Cost (Rs.)
1	2	3	4	5	6
1	Civil Work + Electrical & Mechanical Works	Rs. 15,64,86,955	*	*	*

:- To be filled online in bid document.

- 1) The Column Nos. 4 & 5 are mandatory to be filled by the bidders / tenderers. If these columns are left blank, the tender become invalid.
- 2) The amount in figures in column No.6 shall appear automatically corresponding to the percentage quoted in column No.4 & 5.
- 3) The tenderer is required to quote the percentage only above or below or at par with the estimated cost to cover all the rates of items covered under the respective head/subhead.
- 4) The percentage shall be written in 2 (two) places of decimal.
- 5) If the percentage selection in column No 4 is "At Par", by default the percentage will be considered as "Zero" only. In other words, if "At par" is selected in column No.4, then no need to fill column No. 5