# APPROVAL OF NIT

| | | |
|---|---|---|
| **Notice Inviting Tender No. -** | | **01/2026-27/CE/CCU/CED-II/Dehradun** |
| **Name of work** | : | **Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work).** |
| **Estimate cost** | : | **Rs. 21,09,78,483/-** |
| **Earnest Money** | : | **Rs. 31,09,785/-** |
| **Performance Guarantee** | : | **a) 5% of tendered value or Estimated Cost Put to Tender (ECPT) (whichever is higher).**<br>**(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** | : | **12 (Twelve) Months** |

This NIT amounting to Rs. **21,09,78,483/- (Rupees Twenty-One Crores Nine Lakh Seventy-Eight Thousand Four Hundred Eighty Three Only)** is hereby approved**.**

**Certified that this NIT contains Pages 1 to 220 only.**

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

Assistant Engineer (C) (P)-I
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 New Hostel (G+2) of IGNFA, Dehradun (Balance work).**

**NIT NO.** : 01/2026-27/CE/CCU/CED-II/Dehradun

Chief Engineer
CCU, MoEF&CC, New Delhi

# INDEX

**Name of work:** Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work).

**NIT No.:** 01/2026-27/CE/CCU/CED-II/Dehradun.



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- eeced2ccu-mef@nic.in) on behalf of President of India invites online Percentage rate bid in single bid system from CPWD eligible enlisted contractors of appropriate class in Buildings & Roads (erstwhile composite /Building/ Infrastructure) category for the following work:

| | |
|---|---|
| NIT No. | **01/2026-27/CE/CCU/CED-II/Dehradun** |
| Name of Work | **Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work).** |
| Location | **Dehradun, Uttarakhand** |
| Estimated cost put to bid (Rs.) | Rs. **21,09,78,483/-** |
| Earnest Money (Rs.) | **Rs. 31,09,785/-** |
| Stipulated Period of Completion of work (in months) | **12 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 01.07.2026 |
| Time date of opening of bid | 03:30 PM on 01.07.2026 |

**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.

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** 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) 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.

11) 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.

12) Copy of enlistment order and certificate of work experience and other documents as specified in the tender documents for eligibility shall be scanned and uploaded to the e-tendering website within the period of bid submission.

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.

**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 any Scheduled Bank 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** of this section)

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.

6) 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-D** of this section)

7) 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 for the work "**Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work).**"

   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. **21,09,78,483/-.** 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 **12 Months** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.

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 scope of work include Construction of Hostel-B (63 nos. rooms) and Remaining works of Hostel-A, Lounge-2 & Staff Quarters including substation, STP, RWH and other works to make the buildings functional.**

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) and by the concerned CE/SE (in case of non-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 contract 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 **60 (Sixty) 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. 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 ld 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.

*To be filled in by NIT approving authority

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 New Hostel (G+2) of IGNFA, Dehradun (Balance work).**"

i) To be uploaded by15:00 hours on 01.07.2026 to/upload at
ii) To be opened in presence of tenderers who may be present at **15:30** hours on **01.07.2026** 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 **60 (Sixty) 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 byBidder

**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

## SCHEDULE – 'A', 'B', 'C', 'D', 'E' & 'F' FOR THE WORK

**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 |

**SCHEDULE 'E'**

| | |
|---|---|
| Reference to General Conditions of contract | CPWD General Conditions of Contract 2023 Construction works, as amended / modified upto previous day of the last date of submission of bid. |
| Name of Work | **Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work).** |
| Estimated cost of the work | **Rs. 21,09,78,483/-** |
| Earnest money | **Rs. 31,09,785/-** |
| Performance Guarantee | (a) 5% of tendered value or Estimated Cost Put to Tender (ECPT) (Whichever is higher).<br>(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. |

| | | |
|---|---|---|
| 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)<br><br>DSR 2025 Corrected up to last date of submission of bid (for Elect. work)<br><br>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 upto 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: | Superintending Engineer, CCU, MoEF&CC or his legal successor or Assignee thereof |
| **Clause 5** | | |
| i) | Time allowed for execution of work | 12 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 | Work done amounting to 20% of accepted tender amount including completing all structural work of lounge-2 and staff quarter. | **3 Months** | 1.25 % of accepted tendered amount. |
| 2 | Work done amounting to 50% of accepted tender amount including completion of all work as per scope except Hostel-B. | **6 Months** | 1.25 % of accepted tendered amount. |
| 3 | Work done amounting to 75% of accepted tender amount. | **9 Months** | 1.25 % of accepted tendered amount. |
| 4 | 100% Physically completion of Work done. | **12 Months** | 1.25 % of accepted tendered amount. |

**Note: -** Scope of work is mentioned at Para no. 05 of **CPWD 6 FOR E- TENDERING.**

**Time allowed for execution of work**: **12 Months**

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. | 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 | 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 |

**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. 150 lakh (civil)**<br>**Rs. 35 lakh (electrical)** |

| | |
|---|---|
| **Clause 7A**<br>**Whether clause 7A shall be applicable** | Yes |
| **Clause -7B**<br>**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 | 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)**<br>Whether Clause 10 B (i) shall be applicable? | : | Yes |
| **Clause 10B (ii)**<br>Whether Clause 10 B (ii) shall be applicable? | : | No. |

**Clause 10 C**

| | |
|---|---|
| Whether Clause 10 C shall be applicable | Applicable |

**Clause 10CC** **Not Applicable**

**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.<br>2. MORTH Specifications for Roads and Bridge work.<br>**3. National Building Construction Standards 2026** |
| Specifications to be followed for execution of work **(for Electrical work)** | : | **Electrical & Other works (**amended upto date):<br>1. CPWD General Specification for Electrical Works Part I (Internal) & Part II (External) – 2023.<br>2. General Specification for Electrical Works (Part III Lifts & Escalators)-2003.<br>3. CPWD General Specification for Electrical Works Part IV Substation-2013.<br>4. CPWD General Specification for Electrical Works Part V Wet riser and sprinkler system-2020.<br>5. CPWD General Specification for Electrical Works Part VI fire detection and alarm system-2018.<br>6. CPWD General Specification for Electrical Works Part VII DG Sets– 2013<br>7. CPWD General Specification for Electrical Works Part VIII Gas Based Fire Extinguishing System–2013.<br>8. General Specification for Heating Ventilation & Air-Conditioning-2024.<br>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)-202**5.** |

**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 (including MEP services and horticulture works). | **:** | 100% |

**Clause 16:**

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

**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/-** |
| **Clause 19 D** | Penalty for each default | **Rs. 500/-** |
| **Clause 19 G** | Penalty for each default<br>Enhanced penalty per day for continuous default | **Rs. 500/-**<br>**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** | 20 (and having experience of one similar nature of work) | 1 | Rs.1,50,000/- per Month |
| 2 | Graduate Engineer | Civil | **Deputy Project Manager** | 12 (and having experience of one similar nature of work) | 1 | Rs.1,00,000/- 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 (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 (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**

**Annexure- 'A'**

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

| | | |
|---|---|---|
| Receipt of deposition of original EMD<br>(drawn in favour of **Executive Engineer, CED-II, CCU, MoEF&CC, New Delhi)**<br>(Receipt No. ……../ date…….) | | |
| Name of work | : | Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work). |
| NIT No | : | **01/2026-27/CE/CCU/CED-II/Dehradun** |
| Estimated Cost | : | **Rs. 21,09,78,483/-** |
| Amount of Earnest Money Deposit | : | **Rs. 31,09,785**/- |
| Last date of submission of bid | : | **01.07.2026** |
| 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)<br>Name and Designation of EMD receiving officer<br>(EE/AE(P)/AE/AAO) along with office stamp |

**Annexure-B**

**(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. ……..(Rupees …….only).

4. We, …… (indicate the name of the Bank) ……, further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor in any suit or proceeding pending before any Court or Tribunal, our liability under this Bank Guarantee being absolute and unequivocal. The payment so made by us under this Bank Guarantee shall be a valid discharge of our liability for payment there under and the Contractor shall have no claim against us for making such payment.

5. We, …… (indicate the name of the Bank) ……., further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. We, …… (indicate the name of the Bank) …….., further agree that the Government at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor at the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee the Government may have in relation to the Contractor's liabilities.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor.

8. We, ……. (Indicate the name of the Bank) ……., undertake not to revoke this guarantee except with the consent of the Government in writing.

9. This Bank Guarantee shall be valid up to ……. unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. …… (Rupees …….. only) and unless a claim in writing is lodged with us within the date of expiry or extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.

Date .....

Witnesses:

1. Signature…… 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.

**Annexure- C**

## UNDERTAKING REGARDING ELECTRICAL LICENSE

To,

The Executive Engineer, CED II,
CCU, Dehradun.

**Name of work: "Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work)."**

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)

**Annexure- D**

## 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 this ……day of ……..Two thousand …… between …….son of …… (hereinafter called the GUARANTOR of the one part) and the PRESIDENT OF INDIA (hereinafter called the Government of the other part).

WHEREAS THIS agreement is supplementary to a contract (hereinafter called the contract) dated ……. and made between 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 PRESIDENTOF 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 …… …….

**Annexure- E**

## 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 Obligator _____ 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/-)

## 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 | Construction 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 CPWD-6. 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 as per direction of engineer in charge 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** Ay 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 75 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, good quality projector in conference room etc. and complete wiring, water supply, sewerage and drainage system etc. The office should have Engineered marble flooring in common areas and vitrified tiles in rooms with UPVC windows and hollow metal doors. 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 (of make Godrej/Haworth/Rockworth), fittings/fixtures /electrical fittings etc. and cost of maintenance and the related service charges of the office building 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 it's 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 three months 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.

ii) **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.

iii) 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.

iv) 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.

v) 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 contactor 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) 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 2024 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. He should also keep at site at least one set of BIS Codes and other relevant codes and produce the same if asked for by engineer-in-charge. In case of noncompliance, these codes will be purchased from the Market and actual cost of purchase will be recovered from the next RA Bill of the contractor.

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: -

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 sated 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/ hostel room and toilet unit or any other unit as directed by Engineer-in-charge. 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, presentation on method statement and materials being used for execution of such items etc. 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, mumty

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 NBC 2016 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 Tyers 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 tyers 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 mayo 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 NBC 2016.

xvii) Adopt additional best practices and prescribed norms as in NBC 2016

**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 10 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 metaled 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 metaled 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 Contractor shall ensure that wastage of construction material is within 3%. 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 shall be required to 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 Standards** 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 maneuverability 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 material(malba) 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 40 tons or as decided by the Engineer-in-charge on the basis of requirement of work in progress. The cement godown of Minimum 1000 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.

(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) Damp proof course shall be provided wherever required as per CPWD specification.

(viii) 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.

(ix) 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 NBC 2016) 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 uniformly 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 Modifies 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 and shall confirm to criteria corresponding to Bar set '1' of OM no. CSQ/SE(TAS)/Steel/2024/262(H) dated 14.08.2025 of CPWD Directorate.

**8.5** Bar Bending Schedule: The agency shall prepare bar bending schedule as per structural drawings and submit to Engineer-in-Charge in advance for approval. The bar bending schedule shall conform to Indian Standard IS 2502-Code of Practice for Bending and Fixing of bars for Concrete Reinforcement. Before execution of work, two copies of these bar bending schedules including revision, will be submitted to Engineer-in-Charge for approval.

**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 fiber 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 > 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-

- The identification of the manufacture
- The grade and block density of the unit
- 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 uncarted 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:

**i)** 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.

**ii)** Minimum weight of aluminum section for door, windows and ventilators shall be as per relevant standards.

**iii)** 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.

**iv)** Frames shall be fixed with dash fastener of minimum size 10 x 100 mm as per approved shop drawings.

**v)** 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**.**

**vi)** 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.

**vii)** Fabrication: The factory for fabrication and coating of windows/doors/frameworks shall be got approved from Engineer-charge.

**viii)** 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.

**ix)** 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.

**x)** 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.

**xi)** 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.

**xii) 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 DC 795 of Dow Corning or equivalent in the required bite size, 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.

**xiii) 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:

a) Three representative samples for each type of flooring/cladding specified.

b) 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.
c) Source of supply and confirmation of availability in full quantity and uniformity of colour, tone and textures.
d) 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 contactor 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:

a) Length ± 1mm
b) Width ± 1mm
c) Thickness - 1mm
d) Angularity at corners ± 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/Gl 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, **s**tainless 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 floric 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 stabs 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:

    - 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 450 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 l.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:

- 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 x0.15m 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 x0.6m 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, SIPOREX |
| 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, SOPREMA, 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 |
| 26 | FIRE SEALENT | HILTI, 3M, MCCOY |

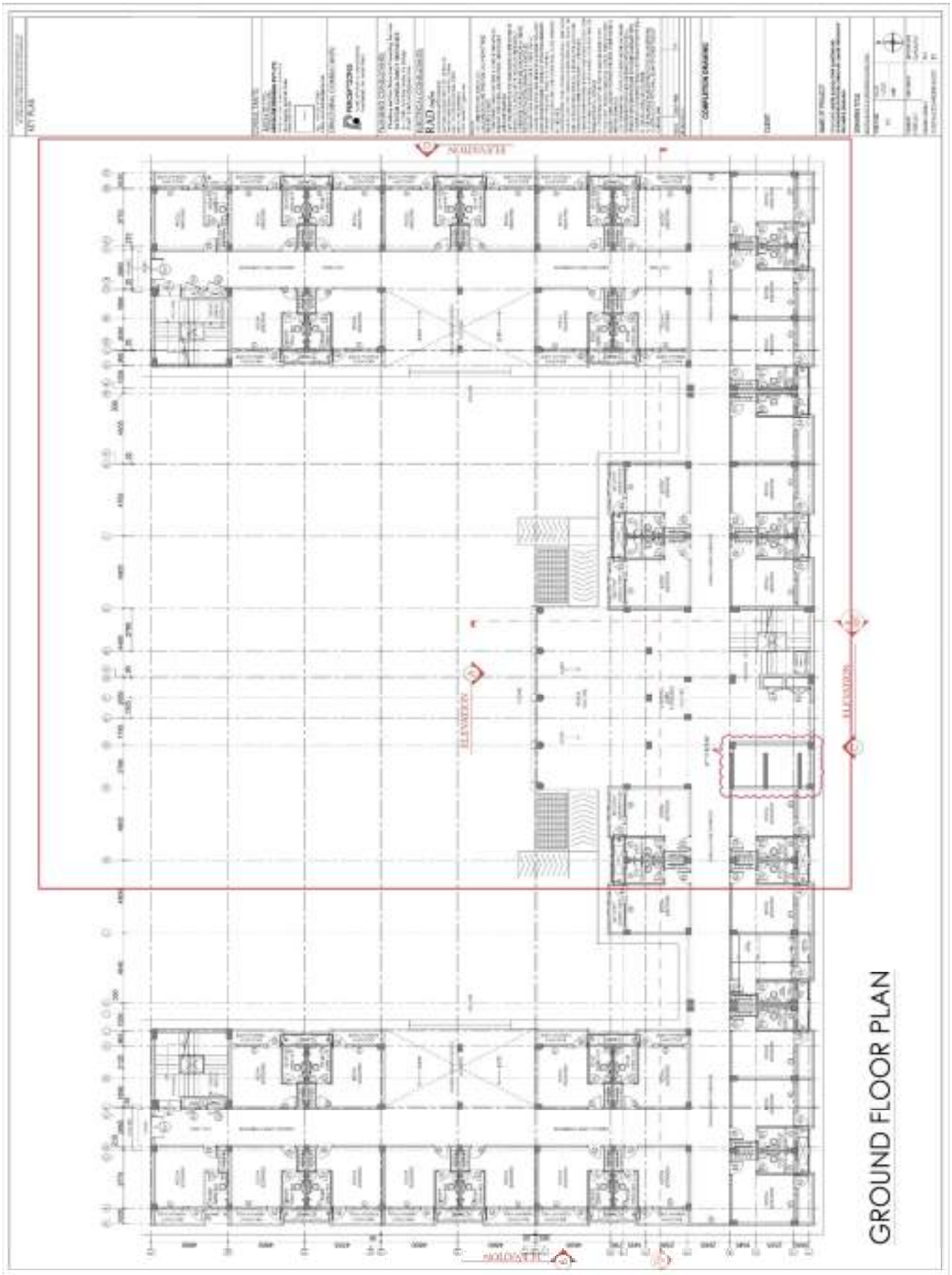
| S. NO. | DETAILS OF MATERIALS | MANUFACTURERS NAME |
|---|---|---|
| 27 | FLOAT GLASS, REFLECTIVE GLASS, TINTED GLASS, HIGH PERFORMANCE GLASS, LOOKING GLASS / MIRROR LACQUERED GLASS, HIGH PERFORMANCE GLASS, FIRE RESISTANT GLASS | MODI GLASS, SAINT GOBAIN GLASS |
| 28 | FIRE CHECK DOORS (METAL/ROLLING/GLAZED) | PACIFIC FIRE CONTROLS, JC FIRE DOOR |
| 29 | FLOOR HARDENER, POLYSULPHIDE SEALANT, WATERPROOFING COMPOUND, ADMIXTURES/ CURING COUMPOUND | FORSROC, PIDILITE, SOPREMA |
| 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 |
| 52 | CORROSION RESISTANT STEEL (TMT FE-500D OR MORE) | TATA., RINL, JINDAL STEEL & POWER LTD, JSW STEEL LTD., SAIL |

| S. NO. | DETAILS OF MATERIALS | MANUFACTURERS NAME |
|---|---|---|
| 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 |
| 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 SEALENT | WACKER, MCCOY, DOW CORNING |
| 71 | AUTOMATIC SLIDING GLASS DOOR WITH COMPLETE MECHANISM | DORMA, AUTO INGRESS, GEZE, GODREJ, HAFELE |
| 72 | FURNITURE | GODREJ, GEEKEN, DURIAN |

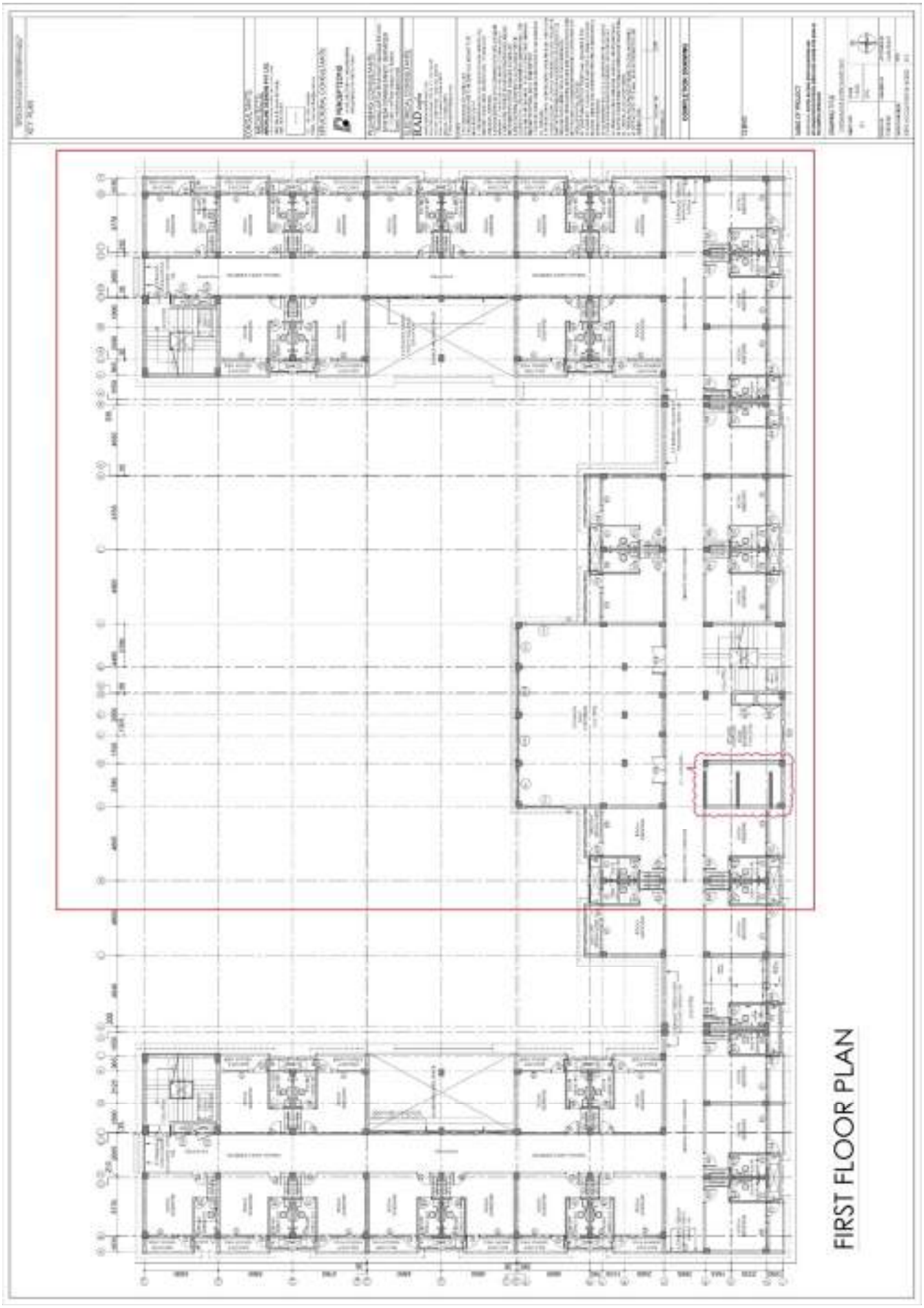
**Note: - The articles / materials which are not mentioned in the above said list shall be approved by the NIT approving authority before execution of work.**

# TENDER DRAWINGS

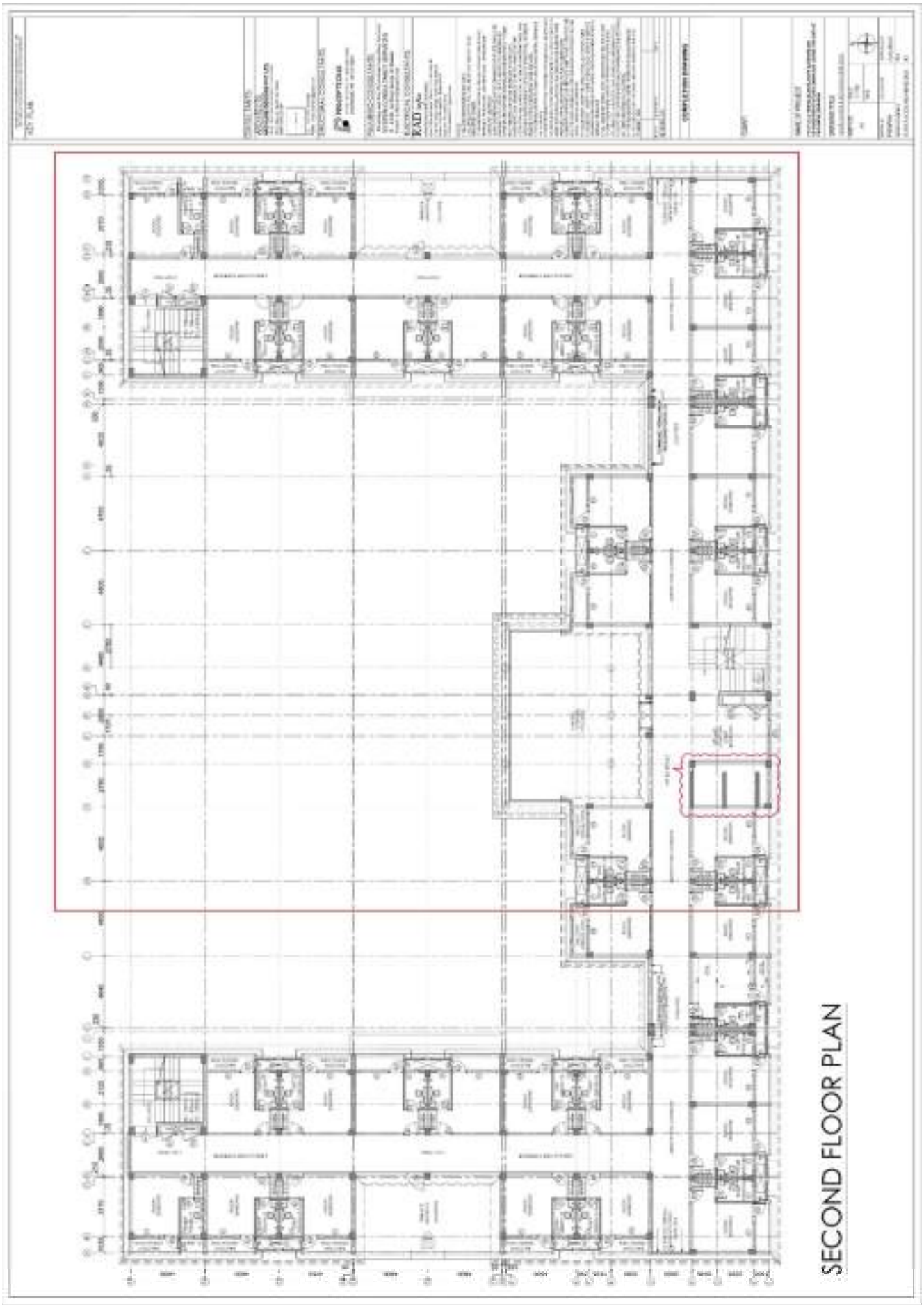
| S. NO. | DRAWINGS TITLE | DRAWING NO. |
|---|---|---|
| | **SITE PLAN & CONCEPTUAL DRAWINGS** | |
| 1 | HOSTEL BLOCK B-GROUND FLOOR PLAN | IGNFA/CD/AR/HB-B/201/R1 |
| 2 | HOSTEL BLOCK B-FIRST FLOOR PLAN | IGNFA/CD/AR/HB-B/202/R1 |
| 3 | HOSTEL BLOCK B-SECOND FLOOR PLAN | IGNFA/CD/AR/HB-B/203/R1 |
| 4 | LOUNGE 2 -GROUND FLOOR PLAN | IGNFA/GFC/AR/L2/201 |
| 5 | STAFF QUARTERS- FLOOR PLANS | IGNFA/GFC/AR/SQ/201/R2 |



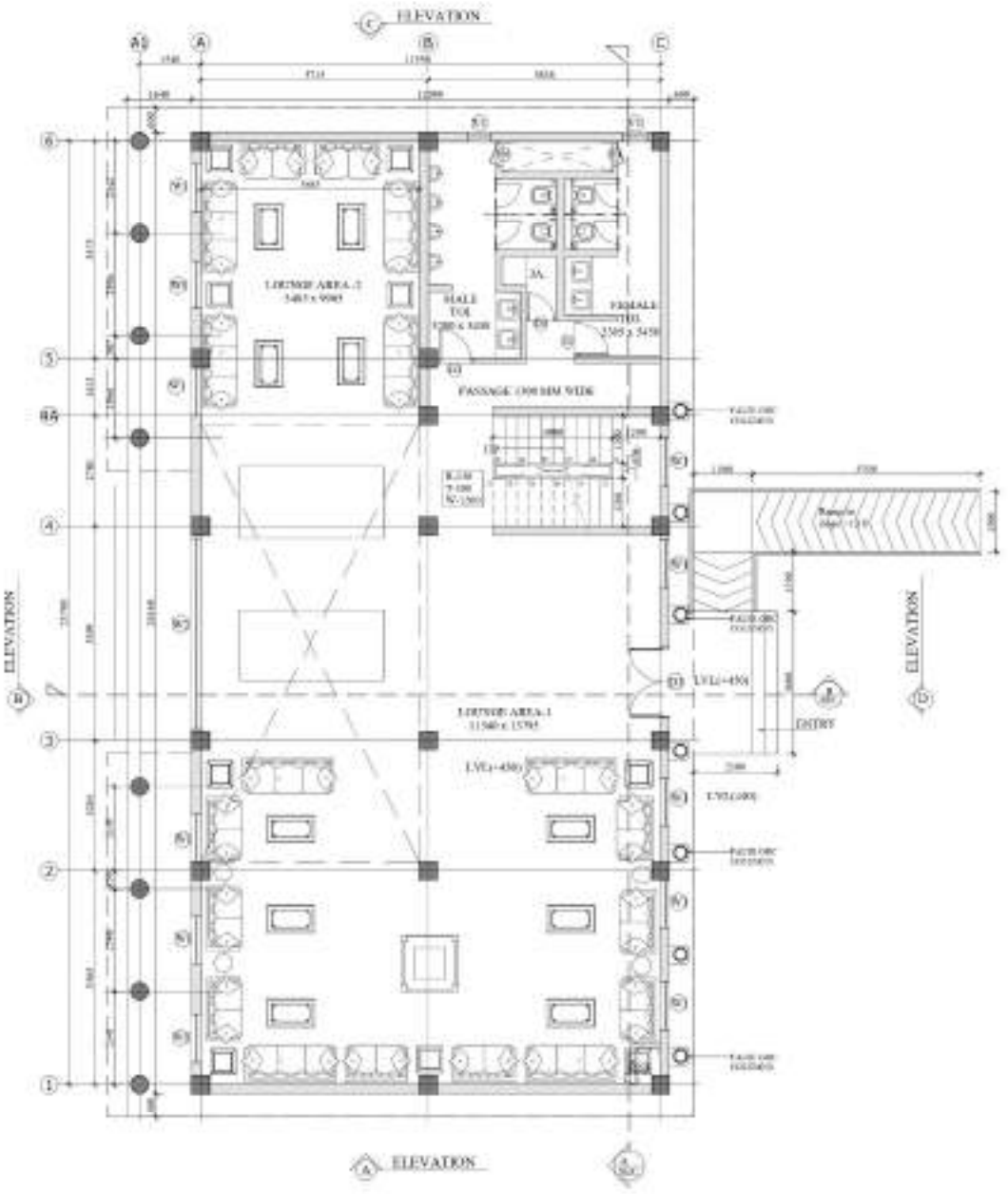

Note: - Only 63 nos. rooms to be constructed.



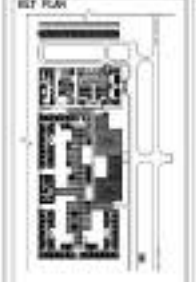

Note: - Only 63 nos. rooms to be constructed.

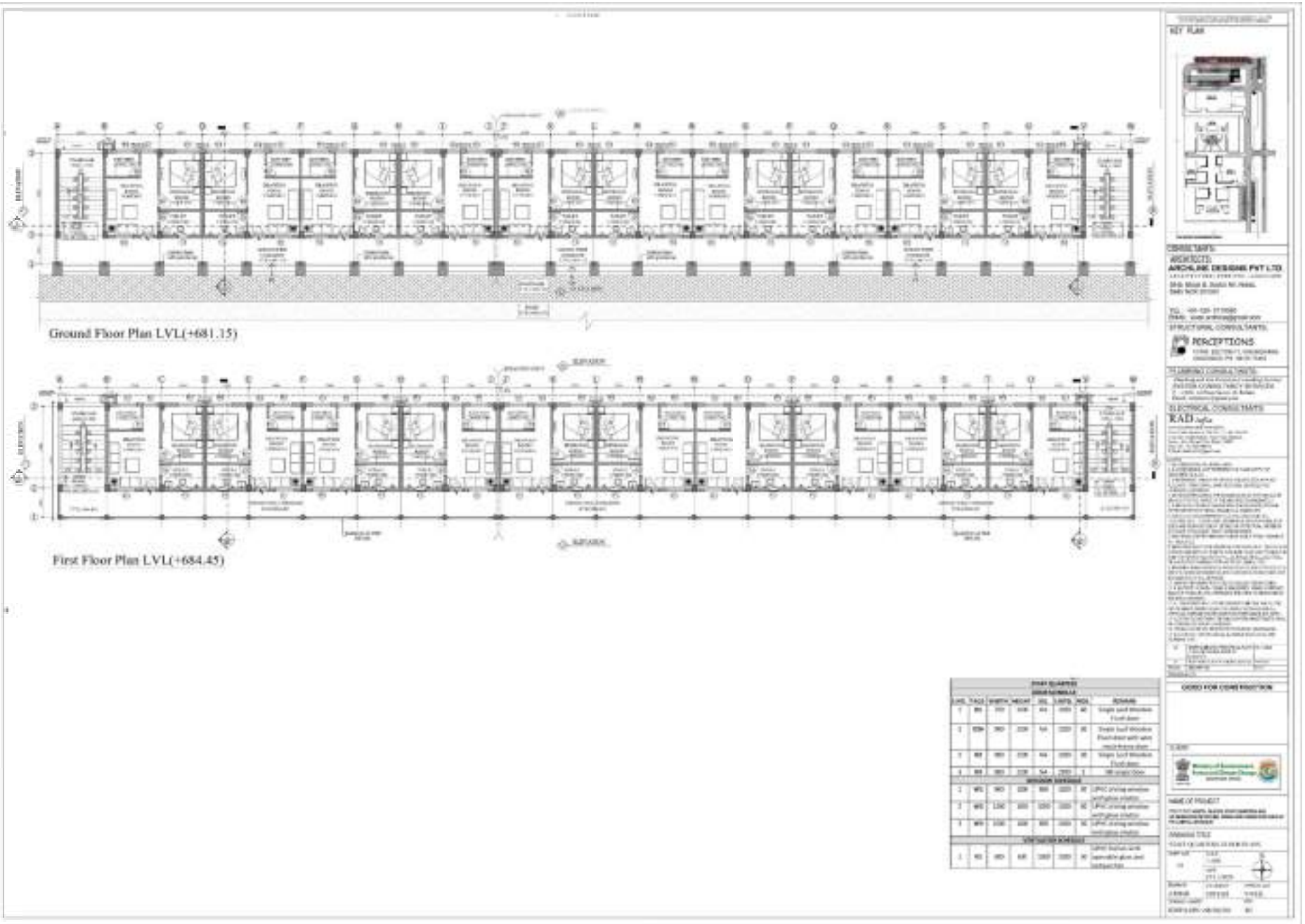



Note: - Only 63 nos. rooms to be constructed.




Ground Floor Plan




Ground Floor Plan LVL(+681.15)
First Floor Plan LVL(+684.45)
KEY PLAN
ISSUED FOR CONSTRUCTION

# Schedule of Quantity
# for
# Civil Work

## SCHEDUE OF QUANTITY

**Name of Work:- Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work).**

| S.No. | DESCRIPTION | Qty. | Unit | Rate (In Rs.) | Amount |
|---|---|---|---|---|---|
| | **SUB HEAD I: EARTHWORK** | | | | |
| 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 | All kinds of soil | 3790.00 | cum | 186.52 | 706911 |
| 2 | 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 : | | | | |
| 2.1 | Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia | 1011.00 | Metre | 370.05 | 374121 |
| 2.2 | Pipes, cables etc. exceeding 300 mm dia but not exceeding 600 mm. | 50.00 | metre | 577.70 | 28885 |
| 3 | 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. | 1526.00 | cum | 205.96 | 314295 |
| 4 | Extra for every additional lift of 1.5 m or part thereof in excavation / banking excavated or stacked materials. | | | | |
| 4.1 | All kinds of soil. | 964.00 | Cum | 133.25 | 128453 |
| 5 | Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete. | 105.00 | cum | 2231.72 | 234331 |
| | **TOTAL FOR EARTHWORK** | | | | **1786996** |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **SUB HEAD II: HORTICULTURE** | | | | |
| 6 | Supplying and stacking of good earth at site including royalty and carriage upto 5 km lead complete (earth measured in stacks will be reduced by 20% for payment). | 279.11 | cum | 803.75 | 224335 |
| 7 | Supplying and stacking at site dump manure from approved source, including carriage upto 5 km lead complete (manure measured in stacks will be reduced by 8% for payment) : | | | | |
| 7.1 | Screened through sieve of l.S. designation 20 mm | 139.00 | cum | 391.35 | 54398 |
| 8 | Fine dressing the ground | 929.18 | SQ.M. | 5.60 | 5203 |
| 9 | Spreading of sludge, dump manure and/or good earth in required thickness as per direction of officer-in-charge (cost of sludge, dump manure and/ or good earth to be paid separately). | 139.00 | cum | 79.70 | 11078 |
| 10 | Mixing earth and sludge or manure in the required proportion specified or directed by the Officer-in-charge | 139.00 | cum | 55.70 | 7742 |
| | | | | | |
| | **TOTAL FOR HORTICULTURE** | | | | **302756** |
| | | | | | |
| | **SUB HEAD III: CONCRETE WORKS** | | | | |
| 11 | Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - All work upto plinth level | | | | |
| 11.1 | 1:2:4 (1 cement : 2 coarse sand (zone-lll) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources) | 2.00 | Cum | 8279.04 | 16558 |
| 11.2 | 1:4:8 (1 Cement : 4 coarse sand (zone-Ill) derived from natural sources : 8 graded stone aggregate 40 mm nominal size derived from natural sources) | 470.00 | cum | 7158.32 | 3364410 |
| 12 | Making plinth protection 50 mm thick of cement concrete1:3:6(1 cement : 3 coarse sand (zone-lll) derived from natural sources : graded stone aggregate 20 mm nominal size derived from natural sources) over 75 mm 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. | 311.00 | sqm | 787.39 | 244878 |
| | **TOTAL CONCRETE WORKS** | | | | **3625846** |

| | | | | | |
|---|---|---|---|---|---|
| | **SUB HEAD IV - REINFORCED CEMENT CONRETE** | | | | |
| 13 | Centring and shuttering including strutting, propping etc. and removal of form for | | | | |
| | All shuttering except slab bottom to be in shuttering grade ply. Only slab bottom to be in MS plates without rivets. | | | | |
| 13.1 | Foundations, footings, bases of columns etc. for mass concrete. | 543.00 | sqm | 412.09 | 223765 |
| 13.2 | Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc. | 400.00 | sqm | 885.33 | 354132 |
| 13.3 | Suspended floors, roofs, landings, balconies and access platform. | 3091.00 | sqm | 974.39 | 3011839 |
| 13.4 | Columns, Pillars, Piers, Abutments, Posts and Struts | 1472.00 | sqm | 1010.17 | 1486970 |
| 13.5 | Stairs, (excluding landings) except spiral-staircases | 67.00 | sqm | 803.84 | 53857 |
| 13.6 | Lintels, beams, plinth beams, girders, bressumers and cantilevers with water proof ply 12mm thk | 2770.00 | sqm | 884.75 | 2450758 |
| 14 | Extra for additional height in centering, shuttering where ever required with adequate bracing, propping etc., including cost of de-shuttering and decentering at all levels, over a height of 3.5 m, for every additional height of 1 metre or part thereof (Plan area to be measured). | | | | |
| 14.1 | Suspended floors, roofs, landings, beams and balconies (Plan area to be measured) | 172.00 | sqm | 403.84 | 69460 |
| 15 | Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level | | | | |
| 15.1 | Corrosion Resistance Thermo-Mechanically Treated bars of Grade Fe-500D or More. | 93196.00 | Kg | 113.33 | 10561903 |
| 16 | Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level. | | | | |
| 16.1 | Corrosion Resistance Thermo-Mechanically Treated bars of grade Fe-500D or more. | 113781.00 | kg | 113.33 | 12894801 |
| 17 | Add for plaster drip course/ groove in plastered surface or moulding to R.C.C. projections. | 2160.00 | metre | 82.39 | 177962 |

| | | | | | |
|---|---|---|---|---|---|
| 18 | 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.<br>Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the specified minimum cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement | | | | |
| 18.1 | All works upto plinth level | | | | |
| 18.1.1 | Concrete of M30 grade with minimum cement content of 350 kg /cum | 745.00 | cum | 10146.60 | 7559217 |
| 18.2 | All works above plinth level upto floor V level | | | | |
| 18.2.1 | Concrete of M30 grade with minimum cement content of 350 kg /cum | 925.00 | cum | 10520.33 | 9731305 |
| 19 | Add for using extra cement in the items of design mix over and above the specified cement content therein. | 462.00 | quintal | 770.79 | 356105 |
| | | | | | |
| 20 | Providing and fixing of expansion joint system related with floor location as per drawings and direction of Engineer-In-Charge. The joints system will be of extruded aluminum base members, self aligning / self centering arrangement and support plates etc. as per ASTM B221-02. The system shall be such that it provides floor to floor /floor to wall expansion control system for various vertical location in load application areas that accommodates multi directional seismic movement without stress to it's components. System shall consist of metal profiles with a universal aluminum | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | base member designed to accommodate various project conditions and finish floor treatments. The cover plate shall be designed of width and thickness required to satisfy projects movement and loading requirements and secured to base members by utilizing manufacturer's pre-engineered self- centering arrangement that freely rotates / moves in all directions. The Self - centering arrangement shall exhibit circular sphere ends that lock and slide inside the corresponding aluminum extrusion cavity to allow freedom of movement and flexure in all directions including vertical displacement. Provision of Moisture Barrier Membrane in the Joint System to have watertight joint is mandatory requirement all as per the manufactures design and as approved by Engineer -in-Charge. (Material shall confirm to ASTM 6063). | | | | |
| | Floor Joint of 100 mm gap | 14.00 | metre | 6717.55 | 94046 |
| | | | | | |
| 21 | Providing and fixing of expansion joint system related with wall joint (internal/external) location as per drawings and direction of Engineer-In-Charge. The joints shall be of extruded aluminum base members, self aligning / centering arrangement and support plates as per ASTM B221- 02. The material shall be such that it provides an Expansion Joints System suitable for vertical wall to wall/ wall to corner application, both new and existing construction in office Buildings & complexes with no slipping down tendency amongst the components of the Joint System. The Joint System shall utilize light weight aluminum profiles exhibiting minimal exposed aluminum surfaces mechanically snap locking the multicellular to facilitate movement. (Material shall confirm to ASTM 6063). | | | | |
| 21.1 | wall Joint of 100 mm gap | 64.00 | metre | 5575.39 | 356825 |
| | | | | | |
| 22 | Providing and fixing of expansion joint system of approved make and manufactures for various roof locations as per approved drawings and direction of Engineer-In-Charge. The joints shall | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | be of extruded aluminum base members with, self aligning and self centering arragement support plates asper ASTM B221-02. The system shall be such that it provides watertight roof to roof/roof to corner joint cover expansion control system that is capable of accommodating multidirectional seismic movement without stress to its components. System shall consist of metal profile that incorporates a universal aluminum base member designed to accommodate various project conditions and roof treatments. The cover plate shall be designed of width and thickness required to satisfy movement and loading requirements and secured to base members by utilizing manufacturer's pre-engineered self-centering arrangement that freely rotates / moves in all directions. The Self centering arrangement shall exhibit circular sphere ends that lock and slide inside the corresponding aluminum extrusion cavity to allow freedom of movement and flexure in all directions including vertical displacement. The Joint System shall resists damage or deterioration from the impact of falling ice, exposure to UV, airborne contaminants and occasional foot traffic from maintenance personnel. Provision of Moisture Barrier Membrane in the Joint System to have water tight joint is mandatory requirement. (Material shall confirm to ASTM 6063). | | | | |
| 22.1 | Roof Joint of 100 mm gap | 17.00 | metre | 6290.01 | 106930 |
| | **TOTAL FOR RCC WORKS** | | | | **49489875** |
| | | | | | |
| | **SUB HEAD V: MASONRY WORK** | | | | |
| 23 | Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: | | | | |
| 23.1 | Cement mortar 1:6 (1 cement : 6 course sand) | 307.00 | cum | 7494.85 | 2300919 |
| 24 | Extra for providing and placing in position 2 Nos 6mm dia. M.S. bars at every third course of half brick masonry. | 2445.00 | sqm | 110.13 | 269268 |
| 25 | Brick work with clay flyash F.P.S. (non modular) brick of class designation | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 7.5 in superstructure above plinth level up to floor five level in : | | | | |
| 25.1 | Cement mortar 1:6 (1 cement : 6 coarse sand) | 633.00 | cum | 9557.44 | 6049860 |
| | | | | | |
| 26 | Half brick masonry with non modular fly ash bricks of class designation 10, conforming to IS :12894, in super structure above plinth upto floor V level. | | | | |
| 26.1 | Cement mortar 1:4 (1 cement :4 coarse sand) | 2445.00 | sqm | 1162.02 | 2841139 |
| 27 | Providing and laying Autoclaved Aerated concrete(AAC) blocks masonry with 150 mm to 300 mm thick with Grade-1 AAC blocks of density 551 to 650 kg/cum conforming to 1S: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 seperately). | 9.00 | cum | 8757.33 | 78816 |
| | | | | | |
| | **TOTAL FOR MASONARY WORKS** | | | | **11540002** |
| | | | | | |
| | **SUB-HEAD VI STONE WORK** | | | | |
| 28 | 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 to edges to give high gloss finish etc. complete at all levels. | | | | |
| 28.1 | Granite stone slab of colour black, Cherry/Ruby red | | | | |
| 28.1.1 | Area of slab upto 0.50 sqm | 351.00 | sqm | 5688.72 | 1996741 |
| 29 | Providing edge moulding to 18 mm thick marble stone counters, Vanities etc., including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge. | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 29.1 | Granite work | 220.00 | metre | 536.93 | 118125 |
| 30 | Extra for fixing marble /granite stone, over and above corresponding basic item, in facia and drops of width upto 150 mm with epoxy resin based adhesive, including cleaning etc. complete. | 491.00 | metre | 597.46 | 293353 |
| 31 | 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. | 2303.00 | sqm | 1332.41 | 3068540 |
| | **TOTAL FOR STONE WORKS** | | | | **5476759** |
| | | | | | |
| | **SUB-HEAD VII: WOODWORK** | | | | |
| 32 | 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). | | | | |
| 32.1 | Second Class Teak Wood | 8.00 | cum | 150217.26 | 1201738 |
| | | | | | |
| 33 | Providing and fixing panelling or panelling and glazing in panelled or panelled and glazed shutters for doors, windows and clerestory windows (Area of opening for panel inserts excluding portion inside grooves or rebates to be measured). Panelling for panelled or panelled and glazed shutters 25 mm to 40 mm thick. | | | | |
| 33.1 | Float glass panes | | | | |
| 33.1.1 | 5.0 mm thick glass panes (weight not less than 12.50 kg/sqm). | 130.00 | sqm | 2732.66 | 355246 |
| | | | | | |
| 34 | Providing and fixing ISI marked flush door shutters conforming to IS : 2202 (Part I) non-decorative type, core of block board construction with frame of | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters: | | | | |
| 34.1 | 35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws | 390.00 | sqm | 2514.29 | 980573 |
| | | | | | |
| 35 | Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 30x10x15cm 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size). | 1188.00 | each | 240.48 | 285690 |
| | | | | | |
| 36 | Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with Si, 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. | 63.00 | each | 1033.13 | 65087 |
| | | | | | |
| 37 | Providing & Fixing decorative high pressure laminated sheet of plain/ wood grain in gloss / matt/ suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS : 2046 Type S, including cost of adhesive of approved quality. | | | | |
| 37.1 | 1.0 mm thick | 519.00 | sqm | 942.92 | 489375 |
| | | | | | |
| 38 | Providing and fixing wire gauge shutters using stainless steel grade 304 wire gauge with wire of dia 0.5 mm and average width of aperture 1.4 mm in both directions for doors, windows and clerestory windows with necessary screws : | | | | |
| | 35 mm thick shutters | | | | |
| | with ISI marked M.S. pressed butt hinges bright finished of required size | | | | |
| | Second class teak wood | 157.00 | sqm | 5279.58 | 828894 |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 39 | Providing and fixing factory made uPVC glazed/ wire mesh windows/ doors comprising of lead free uPVC multichambered frame, sash and mullion/ coupler (wherever 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 (whereever 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 1S: 3548 & IS: 16231 shall be paid separately. Note:- Structural design proof checked from a government engineering institute, to be provided by the manufacturerfor:(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 | | | | |
| 39.1 | Three track three panels sliding window with two glazed & one wire mesh panels | | | | |

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| | with Aluminium channel for roller track, wool pile, nylon rollers with SS 304 body. | | | | |
| 39.1.1 | Using R2 series with frame (70mm & above) x (40mm & above) & both glazed and fly screen sash (25mm & above) x (50mm & above) with zinc alloy (zamak) powder coated touch locks with hook. (Height upto 1.2 meter). | 242.00 | sqm. | 11552.46 | 2795695 |
| 39.2 | Fixed window/ ventilator without mullion/ transom | | | | |
| 39.2.1 | Using R1 series with frame (33mm & above) x (35mm & above). (Height upto 0.90 meter) | 37.00 | sqm | 8666.54 | 320662 |
| 39.2.2 | Using R3 series with frame (55 mm & above) x (45 mm & above). (Height upto 2.5 metre) | 11.00 | sqm | 7440.00 | 81840 |
| | | | | | |
| 40 | Providing and fixing 6mm thick both sides Pre-laminated cement bonded wood particle board as per IS : 15786:2008 of approved brand and shade with suitable full threaded steel screws etc. on the backing of racks, drawer, cupboard, kitchen cabinet under kitchen counter etc. all complete as per direction of Engineer-in-charge. | 189.00 | sqm | 1061.98 | 200714 |
| 41 | Providing and fixing cupboard shutter with 19mm thick one side decorative and other side balancing lamination factory pressed BWP grade marine ply as per IS 710 of approved brand including 2mm thick PVC edge banding tape with hot glue by edge bending machine etc. with auto closing spring loaded hinges (hydraulic type) etc. complete as per direction of Engineer-in-charge.(Payment of providing and fixing auto closing hinges shall be paid separately) | 189.00 | sqm | 2973.09 | 561914 |
| 42 | Providing and fixing 19mm thick both side balancing lamination factory pressed BWP grade marine ply as per IS 710 of approved brand boxes, shelves, racks, almirah, cupboard and drawer etc. including necessary nails, screws etc. complete as per direction of Engineer-in-charge. | 166.00 | sqm | 2724.99 | 452348 |
| 43 | Providing and fixing stainless steel fancy handle of approved make fixed with SS screws etc. complete as per direction of Engineer-in-charge. | | | | |

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| 43.1 | 200 mm | 698.00 | Each | 196.14 | 136906 |
| 44 | Providing and fixing stainless steel soft closing spring hinges at 0 degree hinges (hydraulic type) of approved make/brand to cupboard shutters with full threaded steel screws including making necessary recess in board and finished etc. complete as per direction of Engineer-in-charge. | 945.00 | Each | 285.83 | 270109 |
| 45 | Providing and fixing stainless steel soft closing heavy type telescopic drawer channels of approved make 500 mm long with screws etc. complete as per direction of Engineer- in-charge. | 206.00 | One Set | 930.10 | 191601 |
| 46 | Providing and fixing 2 mm thick 16 to 19 mm wide PVC edge binding tape of approved quality for cupboard/wardrobe shutters including necessary synthetic resin hot pressed to edges on binding machine etc. complete as per direction of Engineer- in-charge. | 1188.00 | metre | 46.03 | 54684 |
| | **Total for Woodwork** | | | | **9273076** |
| | | | | | |
| | **SUB-HEAD VIII: STEEL WORK** | | | | |
| 47 | 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. | | | | |
| 47.1 | Hot finished welded type tubes | 15309.00 | kg | 204.28 | 3127323 |
| | | | | | |
| 48 | 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. | | | | |
| 48.1 | In gratings, frames, guard bar, ladder, railings, brackets, gates, and similar works | 120.00 | kg. | 181.37 | 21764 |
| | | | | | |
| 49 | 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/mm2}), counter sunk head, comprising of 10 mm dia polyamide PA 6 grade sleeve, including drilling of hole | 948.00 | each | 235.91 | 223643 |

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| | in frame , concrete/ masonry, etc. as per direction of Engineer-in-charge. | | | | |
| 49.1 | 10 x 160 mm | | | | |
| | | | | | |
| 50 | 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.). | 1853.00 | kg | 811.67 | 1504025 |
| | **TOTAL FOR STEEL WORKS** | | | | **4876755** |
| | | | | | |
| | **SUB-HEAD IX : FLOORING** | | | | |
| | | | | | |
| 51 | Providing and laying rectified Glazed Ceramic floor tiles of size 300x300 mm or more (thickness to be specified by the manufacturer), of 1st quality conforming to IS : 15622, of approved make, in colours White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement: 4 Coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joints with white cement and matching pigments etc., complete. | 493.00 | sqm | 1397.62 | 689027 |
| 52 | 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 | | | | |

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| | 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. | | | | |
| 52.1 | Glazed vitrified floor tiles polished finish of size | | | | |
| 52.1.1 | Size of Tile 600 x 600 mm | 769.00 | sqm | 1579.15 | 1214366 |
| 52.1.2 | Size of Tile 600 x 1200 mm | 1001.00 | sqm | 1890.25 | 1892140 |
| 53 | Providing and laying Vitrified tiles 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, in skirting, riser of steps, laid with cement based high polymer modified quick set tile adhesive (water based) conforming to IS: 15477, in average 6 mm thickness, including grouting of joints (Payment for grouting of joints to be made separately). | | | | |
| 53.1 | Size of Tile 600x600 mm | 112.00 | sqm | 1990.19 | 222901 |
| | | | | | |
| 54 | 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 : | | | | |
| 54.1 | Flamed finish granite stone slab Jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent. | 561.00 | sqm | 3348.71 | 1878626 |
| 55 | 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 | | | | |

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| | 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. | | | | |
| 55.1 | Polished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent | 1136.00 | sqm | 4709.13 | 5349572 |
| | TOTAL FOR FLOORING | | | | **11246632** |
| | | | | | |
| | **SUBHEAD X :Roofing** | | | | |
| 56 | Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1mx1mx400micron, finished with 12mm cement plaster 1:3 (1 cement : 3 coarse sand) and a coat of neat cement, rounding the edges and making and finishing the outlet complete. | 36.00 | Each | 313.41 | 11283 |
| | | | | | |
| 57 | Providing & fixing on wall face unplasticised -Rigid PVC rain water pipes conforming to IS:13592 Tyape A included jointing with seal ring conforming to IS:5382 leaving 10 mm gap for thermal expansion. (i)Single socketed pipes. | | | | |
| 57.1 | 110 mm diameter | 313.00 | Metre | 396.59 | 124133 |
| | | | | | |
| 58 | Providing, 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. | | | | |
| 58.1 | Coupler | | | | |
| | 110 mm diameter | 102.00 | Each | 143.07 | 14593 |
| 58.2 | Bend -87.5 deg | | | | |
| | 110 mm diameter | 80.00 | Each | 157.99 | 12639 |
| 58.3 | Shoe | | | | |
| | 110mm shoe | 36.00 | Each | 138.55 | 4988 |
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| 59 | Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams. | 36.00 | Each | 57.48 | 2069 |
| | | | | | |
| 60 | 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 Gl slotted cleats of size 27 x 37 x 25 x1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm Gl adjustable rods with galvanised butterfly level clips of size 85 x30 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. | | | | |
| 60.1 | GI Metal Ceiling Lay in perforated Tegular edge global white color tiles of size 595x595 mm and 0.5 mm thick with 8 mm drop; made of Gl sheet having galvanizing of 100 gms/sgm (both sides inclusive) and 20% perforation area with 1.8 mm dia holes and having NRC (Noise Reduction Coefficient ) of 0.5, electro statically polyester powder | 373.00 | sqm | 2173.93 | 810876 |

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| | coated of thickness 60 microns (minimum), including factory painted after bending and perforation and backed with a black Glass fiber acoustical fleece. | | | | |
| 61 | Providing and fixing multi walled transparent/opaque 10 mm thick polycarbonate sheet of required colour blue, brown or green etc. UV co-extruded and having UV coating on one side multi walled sheet of weight not less than 1.60 to 2.05 kg/sqm as approved by Engineer-in-charge. The light transmission from transparent or translucent or opaque polycarbonate sheet varies from 30 to 80% and shall be decided by engineer-in charge as per requirement. The panel shall satisfy the Dart drop impact test for value above 15 and upto 60 Joules and confirm either flame retardancy of class UL-94HB/94V-0 category as per IS 14434:2023 or category V0 & HB as per ASTM D635-18 or BS1D0 classification as per EN13501 for fire safety. The yellowness index tested as per ASTM E313 (D1925) shall be less than or equal to 2 it shall be 1 unit as per ASTM D 2244 at the time of installation an shall be less than or equal to 10 as per ASTM E313 (D 1925) or 6 units as per ASTM D 2244 on a sample after 5000 hours of exposure of UV/sunlight. The multi walled poly carbonate sheet shall be fixed on tubular steel structure with aluminium Alcox section of size 60x18x2 mm (anodized 25 microns thick) and weight not less than 0.462 kg/m. Weather proof Neoprene/ EPDM rubber gasket shall be fixed on both side of joints to make the whole structure water tight as per approved design/drawings. | | | | |
| | The aluminium section shall be fixed on Joints at both sides (top & bottom) of polycarbonate sheet to hold the sheets rigidly together. The weather proof neoprene gasket and aluminum profile shall be fixed and sealed with silicon sealant to make the joints fully water proof. The open overhead ends of | | | | |

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| | polycarbonate sheet to be sealed with anodized aluminum U Profile/ channel of size 10x10x1.5 mm thick of weight not less than 0.2 kg/m. The polycarbonate sheet and aluminum profile shall be fixed to MS framed structure with self-taping and self-drilling 55 mm long steel screws to be fixed @ 300 mm centre to centre. The rate shall be inclusive of cost of all material involved such as polycarbonate sheet, aluminium profile and aluminum channel, EPDM gasket, self-taping screws, nuts bolts, silicon sealant or any other material required for fixing the sheet but excluding the cost of steel structure which shall be paid separately including hoisting the sheet and fixing in position in required scaffolding shape. The rate shall also include the cost of all T&P scaffolding and safety precautions required during execution of the work. The entire work shall be executed as per required design/drawings and direction of Engineer-in-charge, all complete. | | | | |
| 61.1 | 10 mm thick and U- value not more than 2.50 W/m2k | 9.00 | Sqm | 978.00 | 8802 |
| | **TOTAL FOR Roofing** | | | | **989383** |
| | | | | | |
| | **SUB-HEAD XI : Finishing** | | | | |
| 62 | 12 mm cement plaster of mix : | | | | |
| 62.1 | 1:6 (1 cement : 6 coarse sand) | 5896.00 | sqm | 361.12 | 2129164 |
| 63 | 15 mmcement plaster on rough side of single or half brick wall of mix: | | | | |
| 63.1 | 1:6 (1 cement : 6 coarse sand) | 2620.00 | sqm | 415.45 | 1088479 |
| 64 | 20 mm cement plaster of mix : | | | | |
| 64.1 | 1:6 (1 cement: 6 coarse sand) | 3706.00 | sqm | 489.74 | 1814976 |
| 65 | 6 mm cement plaster of mix : | | | | |
| 65.1 | 1:3 (1 cement : 3 fine sand) | 2898.00 | sqm | 315.72 | 914957 |
| 66 | Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete. | 11684.00 | sqm | 276.06 | 3225485 |
| 67 | Finishing walls with textured exterior paint of required shade : | | | | |
| 67.1 | 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 | 262.00 | sqm | 234.97 | 61562 |

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| 68 | Finishing walls with Acrylic Smooth exterior paint of required shade : | | | | |
| 68.1 | New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 0.90 litre/10 sqm) | 3770.00 | sqm | 168.76 | 636225 |
| 69 | Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : | | | | |
| 69.1 | Two or more coats on new work | 2000.00 | sqm | 163.83 | 327660 |
| 70 | Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete. | 4032.00 | sqm | 163.98 | 661167 |
| 71 | Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound ) content less than 50 grams/ litre, of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour. | | | | |
| 71.1 | Two coats | 11684.00 | sqm | 144.44 | 1687637 |
| 72 | Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound ) content. | | | | |
| 72.1 | With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre | 11684.00 | sqm | 77.71 | 907964 |
| 73 | Painting (one or more coats) with black Japan paint of approved brand and manufacture to give an even shade. | 86.00 | sqm | 100.67 | 8658 |
| 74 | 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 | 265.00 | sqm | 1429.62 | 378849 |

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| | 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.) | | | | |
| | TOTAL FOR FINISHING | | | | **13842783** |
| | | | | | |
| | **SUBHEAD XII : Road Work** | | | | |
| 75 | 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 earthwith lead upto 50 metres. | 961.00 | sqm. | 230.03 | 221059 |
| 76 | 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 | | | | |

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| | joint fillers, sealants, dowel bars with sleeve! tie bars to be paid separately).<br>Note:- Cement content considered in M-30 is @ 340 kg/cum. Excess/ less cement used as per design mix is payable/ recoverable separately. | | | | |
| 76.1 | Cement concrete prepared with batch mixing machine | 145.00 | cum. | 11064.66 | 1604376 |
| 77 | 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 fine sand etc. all complete as per the direction of Engineer-in charge. | 768.00 | sqm | 1021.42 | 784451 |
| 78 | 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 to calculate volume for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge). | 16.00 | cum. | 10631.98 | 170112 |
| | | | | | |
| 79 | 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. | 193.00 | cum. | 2925.54 | 564629 |
| 79.1 | With material conforming to Grade-I (size range 75 mm to 0.075 mm) having CBR Value-30 | | | | |

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| | TOTAL FOR ROAD WORKS | | | | **3344627** |
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| | **SUBHEAD XIII : SANITARY INSTALLATION** | | | | |
| 80 | Providing and fixing wash basin with C.I. brackets, 15 mm dia CP Brass single hole basin mixer of approved quality and make, including painting of fittings and brackets, cutting and making good the walls wherever required:- : | | | | |
| 80.1 | White Vitreous China Wash basin size 550x400 mm with a 15 mm CP Brass single hole basin mixer | 24.00 | Each | 4161.90 | 99886 |
| 81 | 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 : | | | | |
| 81.1 | Kitchen sink with drain board 510x1040 mm bowl depth 200 mm | 20.00 | Each | 7522.96 | 150459 |
| 82 | Providing and fixing 8 mm dia C.P. / S.S. Jet with flexible tube upto 1 metre long with S.S. triangular plate to Eureopean type W.C. of quality and make as approved by Engineer - in - charge. | 24.00 | Each | 366.90 | 8806 |
| 83 | Providing and fixing CP Brass 32mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge. | 87.00 | Each | 1087.41 | 94605 |
| 84 | Providing and fixing CP Brass Single lever telephonic wall mixer of quality & make as approved by Engineer in charge. | | | | |
| 84.1 | 15 mm nominal dia | 20.00 | Each | 7293.62 | 145872 |
| 85 | Providing and fixing P.V.C. Waste pipe for sink or wash basin including P.V.C. waste fittings complete. | | | | |
| 85.1 | Semi rigid pipe | | | | |
| 85.1.1 | 40 mm dia. | 21.00 | Each | 122.63 | 2575 |
| 86 | Providing and fixing toilet paper holder : | | | | |
| 86.1 | C.P. brass | 87.00 | Each | 844.56 | 73477 |
| 87 | Providing and fixing soil, waste and vent pipes : | | | | |
| 87.1 | 100 mm dia. | | | | |
| 87.1.1 | Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905 | 935.00 | Metre | 1228.75 | 1148881 |

| | | | | | |
|---|---|---|---|---|---|
| 88 | Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete. | | | | |
| 88.1 | 100 mm dia. | | | | |
| 88.1.1 | Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905 | 106.00 | Each | 596.04 | 63180 |
| 89 | Providing and fixing plain bend of required degree. | | | | |
| 89.1 | 100 mm dia. | | | | |
| 89.1.1 | Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905. | 191.00 | Each | 386.71 | 73862 |
| 90 | Providing and fixing double equal plain junction of required degree. | | | | |
| 90.1 | 100x100x100x100 mm | | | | |
| 90.1.1 | Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905 | 88.00 | Each | 799.37 | 70345 |
| 91 | Providing and fixing single equal plain junction of required degree. | | | | |
| 91.1 | 100x100x100 mm | | | | |
| 91.1.1 | Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905 | 88.00 | Each | 611.01 | 53769 |
| 92 | Providing and fixing single unequal plain junction of required degree. | | | | |
| 92.1 | 100x100x75 mm | | | | |
| 92.1.1 | Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905 | 88.00 | Each | 579.59 | 51004 |
| 93 | Providing and fixing Hubless cast iron offsets epoxy coated inside & outside as per IS : 15905 | | | | |
| 93.1 | 130 mm offsets | | | | |
| 93.1.1 | With 100 mm dia | 22.00 | Each | 664.81 | 14626 |
| 94 | Providing and fixing terminal guard.. | | | | |
| 94.1 | 100 mm | | | | |
| 94.1.1 | Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905 | 72.00 | Each | 449.55 | 32368 |
| 95 | Providing and fixing shielded coupling for Hubless centrifugally cast iron pipe | | | | |
| 95.1 | 100mm | | | | |
| 95.1.1 | SS 304 grade coupling with EPDM rubber gasket | 2755.00 | Each | 454.02 | 1250825 |

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| 96 | Providing and fixing M.S. stays and clamps for sand cast iron/ centrifugally cast (spun) iron pipes of diameter : | | | | |
| 96.1 | 100 mm dia | 35.00 | Each | 146.80 | 5138 |
| 97 | Providing and fixing trap of self cleansing design with screwed down or hinged with or without vent arm complete, including cost of cutting and making good the walls and floors. | | | | |
| 97.1 | 100 mm inlet and 100 mm outlet | | | | |
| 97.1.1 | Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905 | 170.00 | Each | 898.00 | 152660 |
| 98 | Painting sand cast iron/ centrifugally cast (spun) iron soil, waste vent pipes and fittings with two coats of synthetic enamel paint of any colour such as chocolate grey, or buff etc. over a coat of primer (of approved quality) for new work : | | | | |
| 98.1 | 100 mm diameter pipe | 935.00 | Metre | 87.01 | 81354 |
| 99 | 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. | 20.00 | Each | 15761.71 | 315234 |
| | | | | | |
| | TOTAL FOR SANITARY INSTALLATION | | | | **3888926** |
| | | | | | |
| | **SUBHEAD XIV : WATER SUPPLY** | | | | |
| 100 | Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. | | | | |
| | **Concealed work** including cutting chases and making good the walls etc. | | | | |
| 100.1 | 20 mm nominal dia .Pipes. | 1000.00 | Metre | 564.93 | 564930 |

| | | | | | |
|---|---|---|---|---|---|
| 100.2 | 25 mm nominal dia .Pipes. | 276.00 | Metre | 659.14 | 181923 |
| 100.3 | 32 mm nominal dia .Pipes. | 213.00 | Metre | 776.89 | 165478 |
| 101 | Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. | | | | |
| | Internal work - Exposed on Wall | | | | |
| 101.1 | 15 mm dia nominal bore | 25.00 | Metre | 385.03 | 9626 |
| 101.2 | 20 mm dia nominal bore | 98.00 | Metre | 459.53 | 45034 |
| 101.3 | 25 mm dia nominal bore | 83.00 | Metre | 579.75 | 48119 |
| 101.4 | 32 mm dia nominal bore | 70.00 | Metre | 700.91 | 49064 |
| 101.5 | 40 mm dia nominal bore | 115.00 | Metre | 853.18 | 98116 |
| 101.6 | 50 mm dia nominal bore | 120.00 | Metre | 1101.65 | 132198 |
| 102 | Providing and fixing G.I. pipes complete with G.I. fittings including trenching and refilling etc. | | | | |
| | External work | | | | |
| 102.1 | 25 mm dia nominal bore | 90.00 | Metre | 491.53 | 44238 |
| 102.2 | 40 mm dia nominal bore | 25.00 | Metre | 648.42 | 16211 |
| 102.3 | 50 mm dia nominal bore | 150.00 | Metre | 800.90 | 120135 |
| 102.4 | 65 mm dia nominal bore | 90.00 | Metre | 942.18 | 84796 |
| 102.5 | 80 mm dia nominal bore | 50.00 | Metre | 1094.66 | 54733 |
| 103 | Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete | | | | |
| 103.1 | 25 mm nominal bore | 5.00 | Each | 487.64 | 2438 |
| 104 | Providing and fixing uplasticised PVC connection pipe with brass unions : | | | | |
| 104.1 | 45 cm length | | | | |
| 104.1.1 | 15 mm nominal bore | 268.00 | Each | 102.72 | 27529 |
| 105 | Providing and fixing C.P. brass shower rose with 15 or 20 mm inlet : | | | | |
| 105.1 | 150 mm dia. | 20.00 | Each | 233.65 | 4673 |
| 106 | Constructing masonry Chamber 30x30x50 cm inside, in brick work in cement mortar 1:4 (1 cement :4 coarse sand) for stop cock, with C. I. surface box 100x100 x75 mm (inside) with hinged cover fixed in reinforced cement concrete slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size), including necessary excavation, foundation concrete 1:5:10 ( 1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size ) and inside plastering with | | | | |

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| | cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design : | | | | |
| 106.1 | With common burnt clay F.P.S.(non modular) bricks of class designation 7.5 | 18.00 | Each | 2093.90 | 37690 |
| 107 | Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:1.5:3 mix (1 cement: 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size), including necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design : | | | | |
| 107.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 8.00 | Each | 11414.64 | 91317 |
| 108 | Constructing masonry Chamber 90x90x100 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:1.5:3 mix (1 cement: 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size), including necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size ) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design : | | | | |
| 108.1 | With common burnt clay F.P.S.(non modular) bricks of class designation 7.5 | 4.00 | Each | 19857.41 | 79430 |
| 109 | Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality : | | | | |
| 109.1 | 15 mm dia pipe | 25.00 | Metre | 12.66 | 317 |
| 109.2 | 20 mm dia pipe | 98.00 | Metre | 15.18 | 1488 |
| 109.3 | 25 mm dia pipe | 173.00 | Metre | 19.28 | 3335 |

| | | | | | |
|---|---|---|---|---|---|
| 109.4 | 32 mm dia pipe | 70.00 | Metre | 23.33 | 1633 |
| 109.5 | 40 mm dia pipe | 140.00 | Metre | 26.53 | 3714 |
| 109.6 | 50 mm dia pipe | 270.00 | Metre | 32.05 | 8654 |
| 109.7 | 65 mm dia pipe | 190.00 | Metre | 39.77 | 7556 |
| 109.8 | 80 mm dia pipe | 160.00 | Metre | 46.24 | 7398 |
| 110 | Providing and filling sand of grading zone V or coarser grade, allround the G.I. pipes in external work : | | | | |
| 110.1 | 25 mm dia pipe | 90.00 | Metre | 168.87 | 15198 |
| 110.2 | 40 mm dia pipe | 25.00 | Metre | 175.49 | 4387 |
| 110.3 | 50 mm dia pipe | 150.00 | Metre | 182.06 | 27309 |
| 110.4 | 65 mm dia pipe | 90.00 | Metre | 287.35 | 25862 |
| 110.5 | 80 mm dia pipe | 50.00 | Metre | 296.13 | 14807 |
| 111 | Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work) : | | | | |
| 111.1 | 20 mm dia nominal bore | 22.00 | Each | 364.43 | 8017 |
| 111.2 | 25 mm dia nominal bore | 32.00 | Each | 461.58 | 14771 |
| 111.3 | 32 mm dia nominal bore | 17.00 | Each | 513.91 | 8736 |
| 111.4 | 40 mm dia nominal bore | 27.00 | Each | 663.40 | 17912 |
| 111.5 | 50 mm dia nominal bore | 22.00 | Each | 865.68 | 19045 |
| 111.6 | 65 mm dia nominal bore | 5.00 | Each | 1194.59 | 5973 |
| 111.7 | 80 mm dia nominal bore | 5.00 | Each | 1269.36 | 6347 |
| 112 | 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. | 40000.00 | per Litre | 11.56 | 462400 |
| 113 | Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931 : | | | | |
| 113.1 | 15 mm nominal bore | 25.00 | Each | 532.57 | 13314 |
| 114 | Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms. | | | | |
| 114.1 | 15 mm nominal bore | 84.00 | Each | 839.57 | 70524 |
| 115 | Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931 | | | | |
| 115.1 | 15 mm nominal bore | 436.00 | Each | 603.50 | 263126 |

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| | | | | | |
| 116 | Providing and fixing C.P. Brass extension nipple (size 15mmx50mm) of approved make and quality as per direction of Engineer-in-charge. | 436.00 | Each | 78.60 | 34270 |
| | | | | | |
| 117 | Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete so as to make it leak proof. | 124.00 | Each | 474.98 | 58898 |
| | **TOTAL FOR - WATER SUPPLY** | | | | **2962669** |
| | | | | | |
| | **SUBHEAD XV : DRAINAGE** | | | | |
| 118 | Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40 mm nominal size) up to haunches of RCC. pipes including bed concrete as per standard design : | | | | |
| 118.1 | 250 mm dia RCC pipe | 826.00 | Metre | 1068.60 | 882664 |
| 118.2 | 300 mm dia RCC pipe | 170.00 | Metre | 1233.00 | 209610 |
| 119 | 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 x 300 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: | | | | |
| | 180x150 mm size P type | | | | |
| 119.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 97.00 | Each | 2944.61 | 285627 |
| 120 | Providing and laying non-pressure NP2 class (light duty) RCC 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. (for storm drainage) | | | | |
| 120.1 | 250 mm dia RCC pipe | 826.00 | Metre | 945.55 | 781024 |
| 120.2 | 300 mm dia RCC pipe | 170.00 | Metre | 1044.85 | 177625 |
| 120.3 | 450 mm dia. R.C.C. pipe | 50.00 | metre | 1703.36 | 85168 |

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| 121 | 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 : | | | | |
| 121.1 | Inside size 90×80 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) | | | | |
| 121.1.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 35.00 | Each | 13419.80 | 469693 |
| 121.2 | Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) | | | | |
| 121.2.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 15.00 | Each | 27747.96 | 416219 |
| 122 | Extra for depth for manholes | | | | |
| 122.1 | Size 90x80 cm | | | | |
| 122.1.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 23.00 | metre | 9274.08 | 213304 |
| 122.2 | Size 120x90 cm | | | | |
| 122.2.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 10.00 | metre | 11123.67 | 111237 |
| 123 | Constructing brick masonry circular manhole 1.22 m internal dia at bottom and 0.56 m dia at top in cement mortar 1:4 (1 cement :4 coarse sand) inside cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement foundation concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making necessary channel in cement concrete 1:2:4 (1 cement : 2 coarse sand | | | | |

| | | | | | |
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| | : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement, all complete as per standard design : | | | | |
| 123.1 | 1.68 m deep with SFRC Cover and frame (heavy duty HD- 20 grade designation) 560 mm internal diameter conforming to I.S. 12592, total weight of cover and frame to be not less than 182 kg. fixed in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including centering, shuttering all complete. (Excavation, foot rests and 12 mm thick cement plaster at the external surface shall be paid for separately) : | | | | |
| 123.1.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 2.00 | Each | 25958.64 | 51917 |
| 124 | Extra depth for circular type manhole 1.22 m internal dia (at bottom) beyond 1.68 m to 2.29 m : | | | | |
| 124.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 2.00 | metre | 10362.81 | 20726 |
| 125 | Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design. | 137.00 | Each | 581.85 | 79713 |
| 126 | Providing and fixing in position precast RCC manhole cover and frame of required shape and approved quality. | | | | |
| | HD-20 | | | | |
| 126.1 | circular shape 560 mm internal diameter. | 6.00 | Each | 1760.89 | 10565 |

| | | | | | |
|---|---|---|---|---|---|
| 127 | Making connection of drain or sewer line with existing manhole including breaking into and making good the walls, floors with cement cincrete 1:2:4 mix (1cement: 2 coarse sand : 4 graded stone aggregate 20mm nominal size) cement plastered on both sides with cement mortar 1:3 (1cement : 3 coarse sand) finished with a floating coat of neat cement and making necessary channels for the drain etc. complete | | | | |
| 127.1 | For pipes 100 to 250 mm dia. | 2.00 | EACH | 851.65 | 1703 |
| 128 | Constructing bricks 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 : | | | | |
| 128.1 | With common burnt clay F.P.S. (non modular) bricks of class designation 7.5 | 35.00 | Each | 6260.80 | 219128 |
| | TOTAL FOR DRAINAGE | | | | **4015923** |
| | | | | | |
| | **SUB-HEAD XVI: ALUMINIUM WORKS** | | | | |
| 129 | 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) : | | | | |
| 129.1 | For fixed portion | | | | |
| 129.1.1 | Powder coated aluminium (minimum thickness of powder coating 50 micron) | 164.00 | kg | 557.89 | 91494 |

| | | | | | |
|---|---|---|---|---|---|
| 129.2 | 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) | | | | |
| 129.2.1 | Powder coated aluminium (minimum thickness of powder coating 50 micron) | 32.00 | kg | 666.71 | 21335 |
| | | | | | |
| 130 | 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. | 53.00 | sqm. | 5251.78 | 278344 |
| | **TOTAL FOR ALUMINIUM WORKS -** | | | | **391173** |
| | | | | | |
| | **SUB-HEAD XVII: WATERPROOFING** | | | | |
| | | | | | |
| 131 | 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 : | | | | |
| | Ist 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/m2 (each time) mixed with water proofing compound conforming to 1S: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. | | | | |
| | 2nd layer of 25 mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportions. | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Finishing top with stone aggregate of 10 mm to 12 mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer | | | | |
| | Using rough kota stone. | 297.00 | sqm | 1592.65 | 473017 |
| 132 | Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C., kitchen and the like consisting of: | | | | |
| | (i)Ist course of applying cement slurry @ 4.4 kg/sqm mixed with water proofing compound conforming to IS 2645 in recommended proportions including rounding off junction of vertical and horizontal surface. | | | | |
| | (ii) IInd course of 20 mm cement plaster 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound in recommended proportion including rounding off junction of vertical and horizontal surface. | | | | |
| | (iii) IIIrd course of applying blown or residual bitumen applied hot at 1.7 kg. per sqm of area. | | | | |
| | (iv) IVth course of 400 micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100 mm wide and pasted to each other with bitumen @ 1.7 kg/sqm). | 299.00 | sqm | 808.73 | 241810 |
| | | | | | |
| 133 | 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 : | | | | |
| 133.1 | With average thickness of 120 mm and minimum thickness at khurra as 65 mm. | 1621.00 | sqm | 1770.25 | 2869575 |
| | | | | | |
| 134 | Providing and applying integral crystalline slurry of hydrophilic in nature for waterproofing treatment to the RCC structures like retaining walls of the basement, water tanks, roof slabs, podiums, reservior, sewage & water treatment plant, tunnels / subway and bridge deck etc., prepared by mixing in the ratio of 5 : 2 (5 parts integral crystalline slurry : 2 parts water) for vertical surfaces and 3 : 1 (3 parts integral crystalline slurry : 1 part water) for horizontal surfaces and applying the same from negative (internal) side with the help of synthetic fiber brush. The material shall meet the requirements as specified in ACI- 212-3R-2010 i.e by reducing permeability of concrete by | | | | |

| | | | | | |
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| | more than 90% compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure on negative side. The crystalline slurry shall be capable of self-healing of cracks up to a width of 0.50mm. The work shall be carried out all complete as per specification and the direction of the engineer-in-charge. The product performance shall carry guarantee for 10 years against any leakage. | | | | |
| 134.1 | For vertical surface two coats @ 0.70 kg per sqm per coat | 308.00 | sq.m. | 496.94 | 153058 |
| | | | | | |
| | TOTAL FOR WATERPROOFING | | | | **3737460** |
| | | | | | |
| | **SUBHEAD XVIII: RAIN WATER HARVESTING AND TUBEWELLS** | | | | |
| 135 | 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. | | | | |
| 135.1 | Rocky strata including Boulders | | | | |
| 135.1.1 | 300 mm dia | 250.00 | Metre | 1781.28 | 445320 |
| 136 | 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. | | | | |
| 136.1 | Rocky strata including Boulders | | | | |
| 136.1.1 | 300 mm dia | 120.00 | Metre | 1965.70 | 235884 |
| 137 | Supplying, filling, spreading & levelling stone boulders of size range 5 cm to 20 cm, in recharge pit, in the required thickness, for all leads & lifts, all | 16.00 | Cum | 1586.56 | 25385 |

| | | | | | |
|---|---|---|---|---|---|
| | complete as per direction of Engineer-in-charge. | | | | |
| 138 | Supplying, filling, spreading & levelling gravels of size range 5 mm to 10 mm, in the recharge pit, over the existing layer of boulders, in required thickness, for all leads & lifts, all complete as per direction of Engineer-in-charge. | 16.00 | Cum | 1616.45 | 25863 |
| | | | | | |
| 139 | Supplying, filling, spreading & levelling coarse sand of size range 1.5 mm to 2 mm in recharge pit, in required thickness over gravel layer, for all leads & lifts, all complete as per direction of Engineer – in-charge. | 16.00 | Cum | 1616.45 | 25863 |
| | | | | | |
| 140 | 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. | 36.00 | Cum | 2127.43 | 76587 |
| 141 | Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 mild steel screwed and socketed/plain ended casing pipes of required dia, conforming to IS: 4270, of reputed & approved make, including painted with outside surface with two coats of anticorrosive paint of approved brand and manufacture, including required hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge. | | | | |
| 141.1 | 200 mm nominal size dia having minimum wall thickness 5.40 mm | 120.00 | Metre | 2566.94 | 308033 |
| 142 | Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 plain slotted (having slot of size 1.6/3.2 mm) mild steel threaded and socketed/ plain bevel ended pipe (type A) of required dia, conforming to IS: 8110, of reputed and approved make, having wall thickness not less than 5.40 mm, including painted with outside surface with two coats of anticorrosive bitumestic paint of approved brand and manufacture, including hire & labour | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | charges, fittings & accessories, all complete, for all depths, as per direction of Engineer -in-charge. | | | | |
| 142.1 | 200 mm nominal size dia | 180.00 | Metre | 2701.76 | 486317 |
| 143 | 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, 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. | 132.00 | Hours | 1140.21 | 150508 |
| 144 | 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: | | | | |
| 144.1 | 200 mm dia | 2.00 | Each | 337.48 | 675 |
| 145 | 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. | | | | |
| 145.1 | 200 mm clamp | 2.00 | Each | 2410.26 | 4821 |
| 146 | Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I). | | | | |
| | 200 mm dia | 2.00 | Each | 375.78 | 752 |
| | | | | | |
| | **TOTAL FOR RAIN WATER HARVESTING AND TUBEWELLS** | | | | **1786008** |
| | | | | | |

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| | **SUBHEAD XIX : New Technologies and Materials** | | | | |
| 147 | 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/mm2, modulus of elasticity 900 N/mm2 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. | | | | |
| 147.1 | Frame size 65 x 125 mm | 711.00 | **metre** | 1451.84 | 1032258 |
| | | | | | |
| 148 | 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 850 kg/cum and screw withdrawal strength of 1800 N (Face) & of 900 N (Edge), minimum compressive strength 50 N/mm2, | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | modulus elasticity 850 N/mm2 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) | | | | |
| 148.1 | 35 mm thick | 193.00 | **sqm** | 5270.33 | 1017174 |
| 149 | Providing and fixing factory made single extruded WPC (Wood Polymer Composite) solid board one side white color and other side of board laminted with PVC foil of minimum 14 micron thickness of approved design pasted with hot melt adhesive for cup boards, work stations and bathroom/kitchen cabinet etc. of required sizes 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/mm2, modulus of elasticity 850 N/mm2 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 piano hinges/soft close clip on concealed 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 piano hinges/soft close clip on concealed hinges and necessary S.S screws shall be paid separately) | | | | |
| 149.1 | 18 mm thick | 714.00 | **sqm** | 3145.06 | 2245573 |
| 149.2 | 25 mm thick | 256.00 | **sqm** | 4086.87 | 1046239 |

| | | | | | |
|---|---|---|---|---|---|
| 150 | Providing and fixing factory made single extruded WPC (Wood Polymer Composite) solid plain white color board for backing of cup boards and bathroom/kitchen cabinets etc. 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/mm2, modulus of elasticity 850 N/mm2 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 screws etc. all as per direction of Engineer-In- Charge. (Note: stainless steel screws shall be paid separately) | | | | |
| 150.1 | 6 mm thick | 256.00 | **sqm** | 1155.24 | 295741 |
| | **TOTAL FOR New Technologies and Materials** | | | | **5636985** |
| | | | | | |
| | **SUBHEAD XX :NSR** | | | | |
| | | | | | |
| | **FAÇADE TREATMENT** | | | | |
| 151 | Providing and fixing Glass Reinforced Concrete (GFRC) product with 'Spray Mix' concrete design in approved size, pattern, and shade. The GRC Work should be made from '53 Grade in white Portland cement manufactured by 'JK Cement' or 'Birla white white quartz fine graded sieve Silica sand, Alkali Resistant glass fiber by 'NEG Japan', Owens corning 'Saint Gobain' or equivalent, superplasticizer manufactured by 'Sika/Basf/Perma' or equivalent and UV Resistant Synthetic inorganic pigments should be used for pigmentation manufactured by Bayferrox Lanxess or equivalent. The GRC casting shall take place with layering methodology using-spray machines. The fixing of GRC should be done using 'Dry Cladding' method on to | | | | |

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|---|---|---|---|---|---|
| | MS structural support members. Painted with Red oxide primer paint and Epoxy paint on mild steel or RCC or Brickwork . The fixtures, fasteners and self-tapping screws to be used for dry fixing should be of HP/HILTI or equivalent. The quantity of fasteners or self-tapping screws shall be calculated in accordance to the weight of GRC and actual site fixing conditions. If there shall be a requirement of joint filling then Elastomeric exterior grade paintable PU Sealant will be used. For Final finishing of screen one weather shield exterior grade water based diluted paint coat will be done if required. Vendor shall submit shop drawings of the same, the drawings to be duly approved by the engineer in charge at site. MS Framework if required to be paid extra as per actual with following incridents & ratio.GLASS/FIBRE - NEG JAPAN/OWENS CORNINGWHITE CEMENT – BIRLA & JK ADDMIXTURE CHEMICALS - SIKAMEMTS CILIKA QUARTZ SAND MOULD (DESIGN, TESTING & MAKING) - INHOUSE | | | | |
| | Aggregate/cement ratio - 0.5 to 1.5<br>Water cement ratio - 0.3 to 0.4<br>Glass fiber content (% by weight of total mix) - 3.5 to 4%<br>Minimum bulk dry density kg/m3 - 1800<br>Minimum bulk wet density kg/m3 - 2000<br>Compressive strength (IS 516) MPA - 40 to 60<br>Tensile Strength (IS 516) MPA - 6 to 11<br>Impact strength kg/m2 - 7 to 20 | | | | |
| 151.1 | Cornices | 517.00 | RnMt. | 5196.55 | 2686616 |
| 151.2 | False Column (RCC and MS columns) of minimum thickness 25 mm and Diameter 400-600mm | | | | |
| 151.2.1 | Column 1 (2.85M) | 53.00 | Nos | 26896.50 | 1425515 |
| 151.2.2 | Column 4 (4.35 M) | 10.00 | Nos | 39426.95 | 394270 |
| 151.3 | GRC Jaali (With 50mm of border and 35mm internal thkness) | 232.00 | Sqm | 4433.85 | 1028653 |
| | | | | | |

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| 152 | Add or deduct for Designing, Manufacturing, Installation of Glass Reinforced Concrete (G.R.C) in approved size, pattern, design, thickness and color with Dry Fixing method, The form liners should be made from '53 grade approved White Portland cement in quartz, fine silica sand, alkali resistant glass fiber manufactured. Polymers manufactured by approved manufacturer or equivalent, super plasticizers manufactured by approved manufacturer or equivalent with UV resistant synthetic inorganic pigments made by approved manufacturer or equivalent. The material casting should be done in synthetic rubber / FRP. Fixing of GRC Form to be fixed on/between RCC / Block work Column or structural steel work with Dry Fixing method with appropriate steel frame work, using fasteners, and necessary hardware etc. in Building Façade. The formliners shall be securely fixed with stainless steel bolts and anchor fasteners (304 grade) of required size at specified locations. The fixing shall be done by the specialized approved agency as directed by Engineer-in-Charge. Base structure framework to be paid extra. | 128.00 | cm | 83.55 | 10694 |
| | | | | | |
| 153 | Tile work (GRC) for wall lining with cement based high polymer modified quick set tile adhesive in average 3 mm thickness including pointing in grey cement complete of required brand, shade & texture including scaffiolding for all heights as per direction of Engineer in Charge. | 387.00 | sqm | 2769.35 | 1071738 |
| | | | | | |

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| 154 | Providing and applying Ultraplast B APP- 3mm (Atactic Polypropylene Polymer) modified water proofing membrane reinforced with non-woven polyester matt 160±20 g/m2 having polymer film as a top surface of technonicol or equavalent. Minimum tensile strength in longitudinal and transverse direction as 750N±150 / 600N±120/5cm (ASTM D 5147). Minimum nail shank tear resistance in longitudinal and transverse direction as 300/300N±100 Nelongation in Longitudinal and transverse direction 40±8% / 45±9%. Softening point of membrane not less than 150±5 Degree Celsius, with cold flexibility -2 degree, consisting of a coat of Technonicol no 01 primer (organic solvent based primer) @ 0.25- 0.35 ltr./sq.mtr with a relative viscosity of 15-40 s over the primer coat, the layer of membrane shall be laid using Butane / LPG torch and sealing all joints with minimum 75 mm side laps & 100 mm end laps to form a monolithic system. Approved make : Technonicol or equivalent | 611.00 | sqm | 406.65 | 248463 |
| 154.1 | Providing and applying of High Definition, Laminated Asphalt based roofing shingles called "Country Series of Shinglas Brand" of Technonicol or equavalent (having 50 yrs product warranty and wt of 12.50 kg per sqm) with the help of Nailing/Screwing method. | 611.00 | sqm | 1340.55 | 819076 |
| 154.2 | Providing and covering the entire ridges with SBS bitumen modified,high end,factory made ridge called HIP and Ridge of Technonicol with the help of nailing method. Std assumption taken for ridge is 5% of surface area. All complete as per engineer-in-charge or as per the instruction of manufacturer. The complete system shall be got done through the authorized applicator of the manufacturer of membrane & Shingles | 775.00 | RnMt. | 590.25 | 457444 |
| | | | | | |
| 155 | Providing and fixing 15mm C.P brass Sink Mixer for kitchen sink with swinging spout complete. Including cutting and making good the walls wherever required . | 20.00 | Each | 3543.80 | 70876 |

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| 156 | 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. | | | | |
| 156.1 | 250x10 mm | 329.00 | each | 416.00 | 136864 |
| 156.2 | 200x10 mm | 329.00 | each | 350.35 | 115265 |
| | | | | | |
| 157 | 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) | 373.00 | each | 879.65 | 328109 |
| 157.1 | 250x16 mm | | | | |
| 158 | Providing and fixing ISI marked SS 304 butt hinges with necessary screws etc. complete | | | | |
| 158.1 | 125x75x3 mm | 474.00 | each | 477.00 | 226098 |
| 159 | Providing and fixing SS 304 handles, ISI marked with necessary screws etc. complete | | | | |
| 159.1 | 125 mm | 880.00 | each | 105.10 | 92488 |
| 160 | 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 | | | | |
| 160.1 | Twin rubber stopper | 263.00 | each | 269.85 | 70971 |
| | | | | | |
| 161 | Providing and fixing SS grating of approved quality and colour. | | | | |
| | Circular type | | | | |
| 161.1 | 125 mm nominal dia | 218.00 | Each | 712.10 | 155238 |
| | | | | | |
| 162 | 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. | | | | |
| 162.1 | Polished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent | 292.00 | sqm | 5427.30 | 1584772 |
| | | | | | |

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|---|---|---|---|---|---|
| 163 | 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. | 113.00 | sqm. | 1165.00 | 131645 |
| . | | | | | |
| 164 | Providing and fixing Chicken wire mesh before the plaster i/c holding the Chicken mesh on the joints between surface like RCC/Brick/ACC with suitable nails and mortars so as to hold the mesh in position, all complete as per direction of Engineer-in-Charge. 22.23.A | 823.00 | sqm. | 109.80 | 90365 |
| . | | | | | |
| 165 | Providing and fixing CP Brass Single lever wall mixer of quality & make as approved by Engineer in charge. | | | | |
| 165.1 | (a) 15 mm nominal dia | 63.00 | each | 5126.90 | 322995 |
| | | | | | |
| 166 | Providing and fixing CP Brass Single lever Basin mixer of quality & make as approved by Engineer in charge. | | | | |
| 166.1 | (a) 15 mm nominal dia | 63.00 | each | 6461.35 | 407065 |
| | | | | | |
| 167 | Providing and fixing Sheer Demout Blind with Decorative Cassett Vista or equivalent make with all the necessary fittings and accessories complete in all respect as per direction of Engineer-in-charge. | 375.00 | sqm | 4097.45 | 1536544 |
| | | | | | |
| 168 | Providing and fixing SS Waste Coupling for wash basin and sink, of approved quality and colour etc complete as per direction of engineer in charge | | | | |
| 168.1 | (a) 32 mm dia | 63.00 | each | 347.95 | 21921 |
| | | | | | |
| 169 | Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with C.P. brass screws and SS studs complete. | 63.00 | each | 1455.40 | 91690 |
| | | | | | |
| 170 | Providing and fixing CP Brass towel ring of approved shape with concealed fittings arrangement of approved quality | 63.00 | each | 1183.55 | 74564 |

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| | etc complete as per direction of engineer in charge | | | | |
| | | | | | |
| 171 | Providing and fixing Health fuacet (Rubit cleaning system) lift up function with hook and 1 mtr ss crome plated hose of quality and make as approved by Engineer - in - charge. | 63.00 | each | 1269.25 | 79963 |
| | | | | | |
| 172 | Providing and fixing CP Hydrus Bath tub spout with flange of approved quality & make as approved by Engineer in charge. | | | | |
| 172.1 | (a) 15 mm nominal dia | 63.00 | each | 2015.10 | 126951 |
| | | | | | |
| 173 | Providing and fixing CP Brass towel rail fixed with CP brass screws with concealed fittings arrangement of approved quality etc complete as per direction of engineer in charge. | | | | |
| 173.1 | 600 mm long towel rail | 63.00 | each | 2292.55 | 144431 |
| | | | | | |
| 174 | Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. | | | | |
| 174.1 | Internal work - Exposed on wall | | | | |
| 174.1.1 | 80 mm dia nominal bore | 30.00 | metre | 1328.55 | 39857 |
| | | | | | |
| 175 | Providing and fixing table top wash basin of approved quality and shape with necessary fittings etc complete as per direction of engineer in charge.: | | | | |
| 175.1 | White Vitreous China Wash basin size 410x355 mm | 63.00 | each | 2086.85 | 131472 |
| | | | | | |
| 176 | Providing and fixing C.P. brass stop cock (concealed) of standard design and of approved make conforming to 1S:8931. | | | | |
| 176.1 | (a) 15 mm nominal dia | 63.00 | each | 1769.45 | 111475 |
| | | | | | |
| | | | | | |
| 177 | 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 | | | | |

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| | & 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. | | | | |
| 177.1 | Size of Tile 600X1200 mm | 151.00 | sqm | 1882.80 | 284303 |
| | | | | | |
| 178 | Providing and fixing wooden moulded beading to door and window frames with iron screws, plugs and priming coat on unexposed surface etc. complete : | | | | |
| 178.1 | 2nd class teak wood | | | | |
| 178.1.1 | 30x12 mm | 995.00 | metre | 191.80 | 190841 |
| | | | | | |
| 179 | Providing and fixing wooden moulded beading to door and window frames with iron screws, plugs and priming coat on unexposed surface etc. complete : | | | | |
| 179.1 | 2nd class teak wood | | | | |
| 179.1.1 | 15x12 mm | 995.00 | metre | 167.40 | 166563 |
| | | | | | |
| 180 | Providing and fixing 2mm thick 25mm wide PVC edge binding tape of approved quality for cupboard/wardrobe shutters including necessary synthetic resin hot pressed to edges on binding machine etc. complete as per directions of Engineer- in-charge. | 1399.00 | metre | 34.60 | 48405 |
| | | | | | |
| 181 | Providing and fixing (150 X 150 mm) CP brass Rain shower rose with Rod 300 mm long all complete as per direction of Engineer incharge. | 63.00 | each | 2586.70 | 162962 |
| | | | | | |
| 182 | Providing and fixing dual flushing concealed cistern of capacity 5 ltr for wall mounted WC of approved quality and make complete as per direction of Engineer In Charge | 67.00 | each | 7045.10 | 472022 |
| | | | | | |
| 183 | Providing and fixing white vitreous china wall mounting water closet of size 540 X 370 X 380 mm of approved shape including pvc seat cover, nuts, bolts and gasket etc complete. as per direction of engineer in charge | 67.00 | each | 11351.20 | 760530 |

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| 184 | Providing, fitting and fixing in position, glazing, of superior (selected) quality, first grade toughened glass, at all levels, for all kind of works, including for doors, windows, walls, partitions with/ without frame etc. finished in line, length and plumb, butt jointing of glass panels with any surface, seamlessly with silicon / epoxy adhesive including all labour, material, equipment, handling, transportation, scaffolding, staging, workmanship. All glass shall be of Saint Gobain orequivalent in approved design and colour. | | | | |
| 184.1 | 6mm thick toughened glass | 137.00 | sqm | 2373.60 | 325183 |
| | | | | | |
| | **FURNITURE** | | | | |
| 185 | Providing and placing in position factory made design out of teak wood single bed. Supported on four legs with Melamine Matt Polish with 50% gloss. (All Process to be done as required in doing polish). Overall size is 2050L x 1160D x 940H mm with 12mm thick BWP commercial plywood of approved make supported on 1 No. slats of size 65mm x 25mm and side rails of size 150mm x 25mm. Height of Head from ply is 300mm. Ply painted with synthetic enamel paint and all other wooden parts of bed will be melamine polished matt finish. Side rails to be joined with Head & Foot with nuts and bolts. Head Side are of Hight is 760mm respectively & Foot Side are Hight is 460mm respectively. Bed structure consisting of Head Side of two nos. end rails of size 70mm x 55mm 8 Nos. vertical members between them of size 50mm x 25mm. teak wood planks between the Head side legs of size is 125 height x 19mm thk. Length of Head Top Rail shall be of size 1160 & thickness of top rail is 65mm x 12mm. The foot side consisting of two posts of 70mm x 55mm and of height 448mm and having Top rail of size length is 1160 & thickness of top rail is 65mm x 12mm teak wood planks between the Foot side legs of size is 250mm height x 19mm thk. Bed having One Sliding Drawer of size 990W x 1130D x 240H mm are | 63.00 | each | 55027.20 | 3466714 |

| | | | | | |
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| | made up of 11mm thk. mdf board with melamine polish as per approved shade. Complete as per specifications and direction of Engineer in Charge. | | | | |
| 186 | Providing and placing in position Factory made design Study Table of overall size is 1050L x 600D x 750H mm are made up of teak wood with Melamine Matt Polish with 50% gloss. (All Process to be done as required in doing polish). Table top shall be made out of 18mm thick laminated teak wood planks.Table supported on six vertical legs of size 50mm x 25mm. Keyboard tray are made of wooden board with melamine polish will run on two telescopic channel rails.The pedestal unit of size is 450 width consist of 2 Drawers & 1 openable shutter shall be constructed teak wood frame of 45mm x 25mm thk. with 8mm MDF inserted in wooden frame. Side and back of pedestal unit is duly melamine polish. The drawer will run on two telescopic channel rails. The shutter and drawer shall have know type handle of approved quality with necessary screws. Bottom of top & inner area of table drawer/shelve duly melamine polished matt finish/50% gloss finish.Complete as per specifications and direction of Engineer in Charge. | 63.00 | each | 40178.60 | 2531252 |
| 187 | Providing and placing factory made design Chair for Study table of overall size is 550W x 550D x 900H mm are made up of teak wood sections withmelamine matt polish / 50% gloss polish. (All process to be done as required in doing as required in doing polish). The seat size is 480L x 480D with PU Foam+Fibre Pad Cushion upholster with V&J fabric (upto ₹750/Rmt.) as per approved color / shade. The legs are of size 40mm x 40mm. Cross rails of all three side of size is 30mm x 25mm . The back support having 9 Nos. spindles of size 18mm x 18mm. Bottom legs to be reinforced with spindles of size 60mm x 19mm thk. with each other. The back members to be of size 30mm x 30mm. joining of different member of thick will be done with Nails Nut-bolts, Screws etc. as best required | 63.00 | each | 22272.90 | 1403193 |

| | | | | | |
|---|---|---|---|---|---|
| | and & wooden Parts of chair will be polished complete as required. Complete as per specifications and direction of Engineer in Charge. | | | | |
| 188 | Providing and placing in position factory made design wooden wall hanging rack of outer size:- 1200L x 300D x 450H mm. The rack are made out teak wood with Melamine Matt Polish / 50% gloss. (All Process to be done as required in doing polish). The wooden rack with three compartments , central compartment shall be divided into two sub compartment by providing horizontal shelf of 15mm thick teak as per approved design. Top, Bottom, Sides & shelf are made up of 15mm thick teak wood sections with melamine matt polish / 50% gloss polish. Cabinet having provision of wall hanging arrangement. Back panel to be added with 8mm ply. Grooves to be added in all panels in all either sides. Item shall be complete as per specifications and direction of Engineer in Charge. | 63.00 | each | 26648.30 | 1678843 |
| 189 | Providing and placing in position factory made design out of teak wood Round coffee table of overall size is 600 dia x 450H mm. Table top with bevelled design are made up of 26mm thk teak wood planks with Melamine Matt Polish (All Process to be done as required in doing polish). Table supported on four legs of teak wood section of size 70 x 25mm with Melamine Matt Polish (All Process to be done as required in doing polish). Complete as per specifications and direction of Engineer in Charge. | 63.00 | each | 14499.25 | 913453 |
| 190 | Providing and placing factory made design Chair for coffee table of overall size is 560W x 540D x 820H mm are made up of teak wood sections with melamine matt polish / 50% gloss polish. (All process to be done as required in doing as required in doing polish). The seat size is 520W x 450D with PU Foam+Fibre Pad Cushion upholster with V&J fabric (upto ₹750/Rmt.) as per approved color/shade. Back panel are made up of teak wood section of 155mm x 25mm thk. with curved design with melamine matt polish / 50% gloss polish. The legs and handle teak wood section | 63.00 | each | 22272.90 | 1403193 |

| | | | | | |
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| | are of size is 30mm x 40mm. All wooden Parts of chair will be polished complete as required. Complete as per specifications and direction of Engineer in Charge. | | | | |
| 191 | Providing and placing Single bed Mattress ET size 75"x40"x6" with an attractive premium knited fabric with hard and normal PU foam to ensure that both side are usable with different level of comfort. Complete as per specifications and direction of Engineer in Charge. | 63.00 | each | 20962.75 | 1320653 |
| | | | | | |
| | **TOTAL NSR** | | **TOTAL NSR** | | **29362198** |
| | | | | | |
| | **TOTAL OF ALL SUBHEADS** | | | | **167576832** |

# 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, General Specification for Electrical works Part-VII (DG set) 2013, General Specification for Heating Ventilation & Air Conditioning (HVAC) 2024, Part V Wet Riser & Sprinkler Systems 2020, Part VI Fire Detection and Alarm System 2018 as amended up to date, and in accordance with Indian Electricity Rules, 1956, India Electricity Act, 2003, ECSBC 2024, 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 (Internal Wiring, DB, MCB, MCCB, LED Lights, Fans, LT & HT Cable, AC and External Lighting etc):***

CPWD Enlisted Contractor in composite category having valid electric license or the main 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 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* *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 CCTV 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 System***"

g) ***Eligibility Criteria for 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 *LAN System***"

h) ***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***"

i) ***Eligibility Criteria for Passenger 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 Passenger *Lifts*".**

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 in Rs.) |
|---|---|---|
| 1 | Internal & External Electrical | 2,49,00,489/- |
| 2 | Fire Fighting System | 11,33,790/- |
| 3 | Fire Alarm System | 1,31,416/- |
| 4 | Electrical Sub-Station Work | 44,94,781/- |
| 5 | DG set | 13,10,219/- |
| 6 | CCTV System | 4,55,361/- |
| 7 | LAN System | 9,34,245/- |
| 8 | STP | 28,61,885/- |
| 9 | Passenger Lift | 71,79,464/- |

**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 supplyof equipment. The Engineer- In-charge shall, if he so desires inspect and witness the pre-deliverytests. 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 floordrawings 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 floordrawings 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 ofanticorrosive 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.

**FORM –A**

## 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<br>Address | Signature with date of Associate/Minor Component Contractor<br>Address |
| Witness with address<br>(From major component contractor side) | Witness with address<br>(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

**FORM "C"**

## 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<br>Date:<br>Place: | SIGNATURE OF ASSOCIATED CONTRACTOR<br>Date :<br>Place: |
| Witness with address<br>(From major component contractor side) | Witness with address<br>(From minor component contractor side) |

**FORM "D"**

**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

| sssss | ITEMS | MAKES |
|---|---|---|
| | **ELECTRICAL INSTALLATIONS & GENERAL** | |
| 1 | WIRES AND CABLES<br>a) PVC INSULATED FRLS COPPER CONDUCTOR SINGLE CORE CABLE<br>b) 1.1 KV GRADE XLPE POWER CABLE AND CONTROL CABLE<br>c) FIRE SURVIVAL CABLE<br>d) 11 KV GRADE XLPE POWER CABLE<br>e) COMMUNICATION CABLE | POLYCAB/ KEI/ HAVELLS/ FINOLEX |
| 2 | a) MS CONDUIT/ PVC CONDUIT AND ITS ACCESSORIES<br>b) GI PERFORATED CABLE TRAY<br>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<br>CAT-6A, UTP<br>UTP PATCH CORD<br>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 |
| | **DG SET** | |
| 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 |
| | | |
| | **SUB-STATION** | |
| 1 | 11 KV VCB PANEL | ABB / SCHNEIDER ELECTRIC/ SIEMENS/ TRICOLITE |
| 2 | a) DRY TYPE (11KV/433 VOLT) | KIRLOSKAR/ VOLTAMP/ ABB/ CROMPTON GREEVES |
| | b) OIL TYPE TRANSFORMER (11KV/433 | |

| | | |
|---|---|---|
| | VOLT) | |
| 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<br>B) LED DECORATIVE LIGHT LUMINAIRES<br>C) LED STREET LIGHT<br>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<br>b) ADDRESSABLE DETECTORS<br>c) GRAPHIC USER INTERFACE SOFTWARE<br>d) MONITOR & CONTROL MODULE<br>e) RESPONSE INDICATORS<br>f) MANUAL CALL BOXES & HOOTERS<br>g) INPUT /OUTPUT DEVICES | NOTIFIER (HONEYWELL)/ BOSCH/ SCHNEIDER/ EATON/ NOHMI |
| | **PUBLIC ADDRESS SYSTEM** | |
| 1 | a) PUBLIC ADDRESS SYSTEM CONSOLE AND ALL ACCESSORIES<br>b) P.A. SPEAKERS<br>c) AMPLIFIERS | BOSCH/ BIAMP/ HONEYWELL |
| | **FIRE FIGHTING SYSTEM** | |
| | a) 2-WAY/4-WAY FIRE BRIGADE CONNECTION<br>b) AIR RELEASE VALVE | SAFEX/ NEWAGE/ LIFE GUARD/ EXFLAME |

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| 1 | c) LANDING VALVE<br>d) BRANCH PIPE<br>e) FIRST AID HOSE REEL AND DRUM<br>f) RRL HOSE PIPE<br>g) FIRE MAN AXE | |
| 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<br>b) DELUGE VALVE<br>c) SPRINKLER HEADS | TYCO / VICTAULIC / HD / HONEYWELL |
| 6 | SPRINKLER PANEL, CURTAIN SYSTEM PANEL<br>PRESSURE RELEASE VALVE<br>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,<br>NON-RETURN VALVES, SLUICE VALVES<br>Y-TYPE STRAINER<br>FOOT VALVE WITH STRAINER AIR RELEASE VALVE<br>BALL VALVES | AUDCO / ZOLOTO / SANT / HONEYWELL |
| 13 | TAMPER SWITCH FOR BUTTERFLY VALVE | HONEYWELL/ POTTER/ RAPID CONTROL/ SYSTEM SENSOR/ PACIFIC FIRE |
| 14 | PRESSURE SWITCH<br>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 SHRAMIK |
| 4 | CLOSED CELL NITRILE RUBBER INSULATION/ EPDM INSULATION | ARMAFLEX /AEROCELL / 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 |

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| 16 | VIBRATION ISOLATOR RUBBED PAD<br>DUCT SUPPORT ARRANGEMENT | DUNLOP/ RESISTOFLEX/ GERB |
| 17 | GRILL DIFFUSER FIRE DAMPERS LOUVERS<br>VOLUME CONTROL DAMPER | SYSTEM AIR/ CARRYAIRE/ COSMOS/ TRISTER / GREENHECK/ BALANCE |
| 18 | FLEXIBLE GROOVED FITTINGS<br>COUPLINGS | VICTAULIC/ TYCOGRINNEL/ VIKING |
| 19 | PRE-FABRICATED DUCT<br>DUCT FLANGE (WITH GI SHEETS OF MAKES) | ZECO/ ROLLASTAR/ DUCTOFAB/ WAVES |
| 20 | VARIABLE FREQUENCY DRIVE | DANFOSS/ ABB / HONEYWELL/<br>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/ SOLAREDGE/ 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 / ZOLOTO / 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 WIRELESS GOOSNECK MICEOPHONE ANTENNA & SPLITTER/ COMBINER | SHURE / SENNHEISER / AUDIO TECHNICA |
| 4 | DIGITAL PODIUM | AHA/ UNI/ MAXHUB/ TECCOM |
| 5 | NETWORK VIDEO ENDPOINT | QSC/KRAMER/EXTRON/ LIGHTWARE/ |

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| | | 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 AMPLIFER, 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 |

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| 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 BRADELY |
| | **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 |

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

# SCHEDUE OF QUANTITY FOR ELECTRICAL WORK

## SCHEDUE OF QUANTITY (E&M WORK)

**Name of Work : Construction of New Hostel Block (G+2) For IGNFA at FRI Campus, Dehradun.**

| S.No | DESCRIPTON | QUANTITY | UNIT | Rate (DSR 2025 + Cost index @ 4.85%) | Amount |
|---|---|---|---|---|---|
| | | | | | |
| **I** | **SUB HEAD I :- INTERNAL WIRING** | | | | |
| 1 | Wiring for light point/fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/ HFFR PVC insulated copper conductor single core cable in already laid PVC/ Steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. | | | | |
| a) | Group A ( Staff Quarters) | 286 | Point | 1021.00 | 292006.00 |
| b) | Group C (Lounge) | 59 | Point | 1425.00 | 84075.00 |
| 2 | Wiring for twin control light point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in already laid PVC/ Steel conduit, 2 way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable etc. as required. | 48 | Point | 1472.00 | 70656.00 |
| 3 | Wiring for light/ power plug with 2X4 sq. mm FRLS/ HFFR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required. | 1650 | Metre | 391.09 | 645298.50 |
| 4 | Wiring for light/ power plug with 4X4 sq. mm FRLS/ HFFR PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 2 Nos. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required. | 710 | Metre | 615.47 | 436983.70 |
| | **Circuit / Sub main wiring in PVC Conduit :-** | | | | |
| 5 | Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS/ HFFR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required | | | | |
| (a) | 2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire. | 1000 | Metre | 279.95 | 279950.00 |

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| (b) | 2 x 6 sq.mm. + 1 x 6 sq.mm. Earth wire. | 1320 | Metre | 505.38 | 667101.60 |
| (c) | 4 x 10 sq.mm. + 2 x 6 sq.mm. Earth wire. | 40 | Metre | 1130.28 | 45211.20 |
| 6 | Supplying and drawing following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required. | | | | |
| a) | 3 x 1.5 sq. mm | 900 | Metre | 109.04 | 98136.00 |
| b) | 3 x 4 sq. mm | 700 | Metre | 232.77 | 162939.00 |
| c) | 3 x 6 sq. mm | 450 | Metre | 341.81 | 153814.50 |
| 7 | Supplying and drawing following pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, Unarmored Telephone cable in the existing surface/ recessed steel/ PVC conduit as required. | | | | |
| a) | 2 Pair | 1600 | Metre | 40.89 | 65424.00 |
| 8 | Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC conduit as required. | 1560 | Metre | 56.62 | 88327.20 |
| 9 | Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required | | | | |
| (a) | 20 mm | 1900 | Metre | 158.32 | 300808.00 |
| (b) | 25 mm. | 2260 | Metre | 176.15 | 398099.00 |
| 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) | 15/16 A Switch | 25 | Each | 184.54 | 4613.50 |
| b) | 3 Pin 5/6 A Socket Outlet | 20 | Each | 142.60 | 2852.00 |
| (c) | Telephone Socket outlet. | 40 | Each | 176.15 | 7046.00 |
| (d) | TV Antenna socket outlet. | 42 | Each | 176.15 | 7398.30 |
| 11 | Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required. | 46 | Each | 49.28 | 2266.88 |
| 12 | Supplying and Fixing Following Size/ Modules, GI Box Alongwith Modular Base & Cover Plate for Modular Switches in Recess etc. as required. | | | | |
| (a) | 1 or 2 Module (75 mm x 75 mm) | 82 | Each | 371.17 | 30435.94 |
| (b) | 6 Module (200mmX75mm) | 5 | Each | 484.41 | 2422.05 |
| 13 | Supplying and fixing following Modular base & cover plate on existing modular metal boxes etc. as required. | | | | |
| (a) | 6 Module | 1 | Each | 217.04 | 217.04 |
| (b) | 3 Module | 14 | Each | 183.49 | 2568.86 |

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| 14 | 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. | 143 | Each | 571.43 | 81714.49 |
| 15 | Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required. | 346 | Each | 690.96 | 239072.16 |
| 16 | Supplying and fixing call bell/ buzzer suitable for single phase, 230 V, complete as required. | 83 | Each | 117.43 | 9746.69 |
| 17 | Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS/ HFFR PVC insulated copper conductor single core cable in already laid PVC/ Steel conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required. | | | | |
| (a) | Group A | 76 | Point | 706.00 | 53656.00 |
| (b) | Group C | 25 | Point | 864.00 | 21600.00 |
| 18 | Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providng 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). | 183 | Each | 793.71 | 145248.93 |
| 19 | Supplying and fixing suitable size GI Box with modular plate & cover in front on surface or in recess including providing and fixing 25A modular socket outlet and 25A modular SP MCB, "C" curve including connection, painting etc as required. | 114 | Each | 846.14 | 96459.96 |
| 20 | Providing, fixing, connecting & testing of Telephone Tag Block krone type in a suitable size 1.6 mm thick dust and vermin proof Sheet steel enclosure duly painted by synthetic enamel over anti corrosive primer, lockable,IP67 and hinged cover with provision for cable through glands complete in all Respect. | | | | |
| a) | 40 pair krone | 1 | Each | 1982.00 | 1982.00 |
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| 21 | Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS/HFFR PVC insulated copper conductor single core cable etc as required. | | | | |
| a) | Group A | 662 | Point | 1509.84 | 999514.08 |
| | | | | | |
| 22 | Wiring for twin control light point with 1.5 sq.mm FRLS/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. FRLS/HFFR PVC insulated copper conductor single core cable etc as required. | 48 | | 2350.74 | 112835.52 |
| | | | | | |
| 23 | Wiring for light/ power plug with 2X4 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit along with 1 No 4 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable for loop earthing as required. | 1500 | Metre | 503.28 | 754920.00 |
| | | | | | |
| 24 | Wiring for light/ power plug with 4X4 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit along with 2 Nos 4 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable for loop earthing as required. | 500 | Metre | 759.11 | 379555.00 |
| | | | | | |
| 25 | Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required | | | | |
| a) | 2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire | 900 | Metre | 387.95 | 349155.00 |
| b) | 2 X 6 sq. mm + 1 X 6 sq. mm earth wire | 1000 | Metre | 683.62 | 683620.00 |
| c) | 2 X 10 sq. mm + 1 X 6 sq. mm earth wire | 500 | Metre | 815.73 | 407865.00 |
| d) | 4 X 10 sq. mm + 2 X 6 sq. mm earth wire | 250 | Metre | 1313.77 | 328442.50 |
| | | | | | |
| | **TOTAL SUB HEAD I :- INTERNAL WIRING** | | | | **8514038.00** |
| | | | | | |
| **II** | **SUB HEAD II :- DISTRIBUTION BOARDS & MCB's** | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 26 | 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 | 762 | Each | 298.82 | 227700.84 |
| 27 | 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 | 3 | Each | 2907.49 | 8722.47 |
| (b) | 12 Way Double door. | 27 | Each | 3010.24 | 81276.48 |
| 28 | 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) | 4 Way (4+12), Double Door | 24 | Each | 4589.28 | 110142.72 |
| (b) | 6 way (4 + 18), Double door | 1 | Each | 5556.00 | 5556.00 |
| (c) | 8 way (4 + 24), Double door | 7 | Each | 6644.34 | 46510.38 |
| 29 | 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 | 30 | Each | 494.89 | 14846.70 |
| 30 | 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 | 32 | Each | 1169.08 | 37410.56 |
| 31 | Supplying and fixing Cable End Box (Loose wire box)(IP 43) 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 | 3 | Each | 962.52 | 2887.56 |
| b) | For 14 way, Double door SPN MCBDB | 27 | Each | 1038.02 | 28026.54 |
| | | | | | |
| 32 | Supplying and fixing Cable End Box (Loose wire box)(IP 43) 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 4 way, Double door TPN MCBDB | 24 | Each | 1234.08 | 29617.92 |
| b) | For 6 way, Double door TPN MCBDB | 1 | Each | 1282.32 | 1282.32 |
| c) | For 8 way, Double door TPN MCBDB | 7 | Each | 1518.23 | 10627.61 |
| | | | | | |
| | **TOTAL SUB HEAD II :- DISTRIBUTION BOARDS & MCB's** | | | | **604608.00** |
| | | | | | |
| **III** | **SUB HEAD III :- INTERNAL LIGHTING FIXTURES & FANS** | | | | |
| 33 | Supply & Installation, testing and commissioning of **9-15W LED Bracket Light fitting** with 9-15 W LED Bulb , Efficiency >= 95 lm/W, Lumens 849 lm or higher , Pf>= 0.9, THD< 0.33 , Ip rating 20 or higher , surge protection 4KV , CCT 3000K/4000K/5700K/6500K , of minimum 50000 Burning Hours LED Light with all accessories as required. | 226 | Each | 941.00 | 212666.00 |
| 34 | LED Down lighter (SMD Type) (System lumen efficacy ≥ 120 < 135 lm/Watt) Supplying, installation, Testing & Commissioning of LED Recessed/ surface Down lighter (Round/ square/ Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS: 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, frequency 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, 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 confirming to relevant BIS standards 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 FRLS/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 including trim | | | | |
| a) | 12 -15 watt | 184 | Each | 749.68 | 137941.12 |
| b) | 18 watt | 289 | Each | 987.69 | 285442.41 |
| 35 | 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 FRLS/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 | 123 | Each | 769.60 | 94660.80 |

| | | | | | |
|---|---|---|---|---|---|
| 36 | Supply & Installation, testing and commissioning of PDC housing **LED bulkhead** Luminiaries with Opal diffuser and minimum IP66 Protection, 10W to 15W, high-efficiency LED module with a lumen efficacy ≥100lm/W, lumen 1000 or higher, THD =< 10%, CCT 5700K/6500K, P. F.≥0.95, IP20, CRI ≥80 , internal wiring, etc. as required. | 6 | Each | 1646.00 | 9876.00 |
| 37 | Supply & Installation, testing and commissioning of Linear & Compact **10W Mirror Light** with colour temp 5700K/6500K, high-efficiency LED module with a lumen efficiency >140lm/W, lumen 1100 or higher, THD =< 10%, CCT 5700K/6500K, P. F.≥0.95, IP20, CRI ≥80 of minimum 50000 Burning Hours with Decorative Grey Caps, Polycarbonate Body & Ribbed Opal Diffuser, mounting accessories including 1.5 inch screw/ fastener , internal wiring, etc. as required. | 149 | Each | 678.00 | 101022.00 |
| 38 | Supply, Installation, Testing and Commissioning of **LED Pendant type** light fitting having nominal wattage 36 Watt or higher, CCT 4000K/5700K/6500K, UGR < 16 having system lumen efficacy not less than 120 lumen/watt, THD =< 10%, PF >=0.95, CRI >= 80, minimum 50000 Burning Hours complete with electronic driver, diffuser, aluminium housing, mounting accessories including 1.5 inch screw/ fastener , internal wiring, etc. as required | 8 | Each | 14147.00 | 113176.00 |
| 39 | Supplying, Installation, Testing and Commissioning of Fresh Air Fan of 35-40 W with guard suitable for operation on single phase 230 V, 50Hz. AC Supply, with louvers/shutters in the existing opening. 250 mm sweep, 1200 rpm or higher complete connections with 1.5 sqmm FRLS Cu wire complete etc as reqd. | 107 | Nos | 2440.00 | 261080.00 |
| 40 | Supplying, Installation, Testing and Commissioning of AC 230/250 volts, 50 HZ Wall Fan 90-100 W Including providing not less than 1.5-2 inch Nuts, Bolts, Fastener, screw & Other Accessories as Required. 450 mm Sweep, 1400 or higher rpm with Aluminium Blade complete connections with 1.5 sqmm FRLS Cu wire complete etc as reqd. | 6 | Nos | 5600.00 | 33600.00 |

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| 41 | 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 req. | | | | |
| a) | 1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum) | 133 | Each | 2825.71 | 375819.43 |
| 42 | Supplying, Installation, testing & Commissioning of storage Geysers of 15 Ltrs. capacity BEE 5 star rating with 2000W, 240 V, 50 Hz, including pressure indicator, incoloy/ copper heating element, 2 nos. connections pipe complete as required. | 65 | Each | 14043.00 | 912795.00 |
| | | | | | |
| | **TOTAL - SUB HEAD III :- INTERNAL LIGHTING FIXTURES & FANS** | | | | **2538079.00** |
| | | | | | |
| | **SUB HEAD IV :- SUBSTATION & HT PANEL** | | | | |
| **43** | 11KV SINGLE VCB PANEL BOARD | | | | |
| | 11KV SINGLE PANEL HT VCB (Indoor Type) - ONE INCOMERS CUM OUTGOING | | | | |
| | Design, Manufacture and Supply of 1 Panel, 11 kV HT VCB Switch Board with Following Accessories : indoor type floor mounted free standing totally enclosed, extendable, IP 42, Ambient temperature - 5°C to +40°C, fabricated in compartmentalised designed made of CRCA sheet steel of 3.0mm thick for framework, MS angle iron of minimum size 50 mm x 50 mm x 6 mm & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process. | | | | |
| | **Incoming Cum Outgoing** | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Indoor Type - 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 6 NO/ 6 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 | | | | |
| | Space heater with thermostat for moisture absorption. - 1 Set | | | | |

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| | Suitable for connection to **3C x 240 sq.mm.** Cross linked polythelene (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 - 2 Set | | | | |
| | Incoming as described above. 1 Sets | | | | |
| | **Powerpack as Required to Be Included (220V/24V DC), 7AH Battery for Each Breaker Module.** | | | | |
| | **SINGLE PANEL 11KV HT VCB PANEL AS DESCRIBED ABOVE** | 1 | SET | 593854.00 | 593854.00 |
| | | | | | |
| **44** | **11KV FOUR PANEL BOARD** | | | | |
| | 11KV FOUR PANEL HT VCB (INDOOR)-ONE INCOMERS, & Three OUTGOINGS IN IP-4X ENCLOSURE | | | | |
| | Design, Manufacture and Supply of 4 Panel, 11 kV HT VCB Switch Board with Following Accessories : indoor type floor mounted free standing totally enclosed, extendable, IP 42, Ambient temperature - 5°C to +40°C, fabricated in compartmentalised designed made of CRCA sheet steel of 3.0mm thick for framework, MS angle iron of minimum size 50 mm x 50 mm x 6 mm & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process. | | | | |
| | **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, Drawout 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 polythelene(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 Drawout 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 annunciator with hooter: | | | | |
| | 1 window for over current trip | | | | |
| | 1 window for earth fault trip | | | | |
| | 1 window for winding temperature alarm | | | | |
| | 1 window for winding temperature trip | | | | |
| | 1 window for Oil temperature alarm | | | | |
| | 1 window for Oil temperature trip | | | | |
| | 1 window for Buchloz alarm | | | | |
| | 1 window for Buchloz 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. - 3 Set** | | | | |
| | **Powerpack as Required to Be Included (220V/24V DC), 7AH Battery for Each Breaker Module.** | | | | |

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|---|---|---|---|---|---|
| | **FOUR PANEL 11KV HT VCB PANEL AS DESCRIBED ABOVE** | 1 | SET | 1943523.00 | 1943523.00 |
| | | | | | |
| 45 | **11KV TRANSFORMER (11 KV /0.433 KV) (250 KVA)** | | | | |
| | 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/ On Load Tap Changer (OLTC) ( below500 KVA offload and above 500 KVA On Load Tap Changer)on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15%in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm 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/ 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 exceed1.9 Tesla. The permissible temperature-rise shall not exceed35 for oil and 40 dg. C up to 200 KVA and 40 for oil and 45 dg. C 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 above200 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. | | | | |
| **a)** | 250 KVA | 3 | Nos. | 652467.92 | 1957403.76 |
| | | | | | |
| | **TOTAL SUB HEAD IV :- SUBSTATION & HT PANEL** | | | | **4494780.76** |
| | | | | | |
| | **SUB HEAD V :- DG SET** | | | | |
| 46 | DIESEL GENERATOR SETS : 160 KVA DG SET | | | | |
| | 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:<br>(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.<br>(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.<br>(F) Exhaust System: Dry exhaust manifold with hospital type exhaust silencer and catalytic convertor.<br>(G) Starting System: 12V/24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete | | | | |

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| | 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.<br>(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, KiloVolt 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 switch3. 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 metering5. Energy analyser unit to indicate current, Voltage( L-N & L_L), kW, kVA (Phase & Total), Frequency, KWH, PF.6. LED | | | | |

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| | Indicating lamps for load on mains and load on set7. 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.<br>9. Main supply failure monitor<br>10. Supply failure timer<br>11. Restoration timer<br>12. Control unit with three impulse automatic engine start/stop and failure to start lockout.<br>13. Impulse counter with locking and reset facility.<br>14. ON/OFF/Control circuit switch with indicator<br>15. Audio/Video annunciation for<br>(i) High water temperature<br>(ii) Low lubricating oil pressure<br>(iii) Engine over speed<br>(iv) Engine fails to start<br>(v) Full load/maximum load warning<br>16. Protection for over/under Frequency, Loss of AC sensing, Over Current, Unbalancing load with suitable number of relays and accessories<br>17. Maintenance notification based on Engine Run Hour & due date.<br>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. | | | | |
| | **160 KVA DG Set** | 1.00 | | 1310219.23 | 1310219.23 |
| | **TOTAL FOR SUB HEAD V :- DG SYSTEM** | | | | **1310219.23** |
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| | **SUB HEAD VI :- H T CABLE, LT CABLE AND ACCESSORIES** | | | | |
| 47 | Supplying of one number Earthed armoured Aluminium conductor XLPE power cable of 11 KV grade confirming to IS:7098 (Part-II)1985 as ameded up to date. | | | | |
| a | 3 C x 240 Sq. mm 11 KV (E) | 100 | Metre | 3664.00 | 366400.00 |

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| 48 | Supplying of Following Sizes of 1.1 KV Grade Multicore Aluminium Conductor XLPE Power Cable Insulated 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 240 Sq.mm Al. XLPE arm. | 200 | Metre | 2592.00 | 518400.00 |
| b | 3.5 C X 95 Sq.mm Al. XLPE arm. | 450 | Metre | 1099.00 | 494550.00 |
| c | 3.5 C X 70 Sq.mm Al. XLPE arm. | 40 | Metre | 868.00 | 34720.00 |
| d | 3.5 C X 35 Sq.mm Al. XLPE arm. | 590 | Metre | 478.00 | 282020.00 |
| e | 3.5 C X 25 Sq.mm Al. XLPE arm. | 150 | Metre | 370.00 | 55500.00 |
| 49 | Laying of One Number PVC Insulated And PVC Sheathed / XLPE Power Cable of 1.1 kV Grade of Following Size Direct in Ground Including Excavation, Sand Cushioning, Protective Covering and Refilling the Trench etc. as required. | | | | |
| a | Upto 35 sq. mm | 50 | Metre | 474.97 | 23748.50 |
| b | Above 35 sq. mm and upto 95 sq. mm | 40 | Metre | 498.04 | 19921.60 |
| c | Above 95 sq. mm and upto 185 sq. mm | 30 | Metre | 521.10 | 15633.00 |
| d | Above 185 sq. mm and upto 400 sq. mm | 15 | Metre | 591.35 | 8870.25 |
| | | | | | |
| 50 | Laying of One Number PVC Insulated And PVC Sheathed/ XLPE Power Cable of 1.1 kV Grade of Following Size in the exisiting RCC/Hume/metal as required | | | | |
| a | Upto 35 sq. mm | 1200 | Metre | 49.28 | 59136.00 |
| b | Above 35 sq. mm and upto 95 sq. mm | 1360 | Metre | 75.49 | 102666.40 |
| c | Above 95 sq. mm and upto 185 sq. mm | 170 | Metre | 101.70 | 17289.00 |
| d | Above 185 sq. mm and upto 400 sq. mm | 285 | Metre | 178.25 | 50801.25 |
| 51 | Supplying & fixing cable route marker with 10mm x 10mm x 5mm thick GI Plate with inscription there on, bolted/ welded to 35mm x 35mm x 6mm angle iron, 60 cm long and fixing the same in ground as required. | 4 | each | 627.00 | 2508.00 |
| 52 | Laying of one number PVC insulated and PVC sheathed / XLPE 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 | 20 | Metre | 727.66 | 14553.20 |
| | | | | | |
| 53 | Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/Hume/Metal pipe as required | | | | |
| a) | Above 120 sq. mm and upto 400 sq. mm | 80 | Metre | 178.25 | 14260.00 |

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| 54 | Supplying and Making End Termination With Brass Compression Gland and Aluminium lugs for Following Size of PVC Insulated and PVC Sheathed / XLPE Aluminium Conductor Cable of 1.1 kV Grade as Required. | | | | |
| a) | 3½ X 25 sq. mm (28mm) | 20 | Each | 388.99 | 7779.80 |
| b | 3½ X 35 sq. mm (32mm) | 20 | Each | 458.19 | 9163.80 |
| c | 3½ X 50 sq. mm (35mm) | 20 | Each | 507.47 | 10149.40 |
| d | 3½ X 70 sq. mm (38mm) | 20 | Each | 568.29 | 11365.80 |
| e | 3½ X 95 sq. mm (45mm) | 20 | Each | 717.17 | 14343.40 |
| f | 3½ X 150 sq. mm (50mm) | 20 | Each | 836.70 | 16734.00 |
| g | 3½ X 240 sq. mm (62mm) | 15 | Each | 1216.26 | 18243.90 |
| 55 | 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 | 3 C x 240 Sq.mm (11KV) | 6 | Sets | 18258.58 | 109551.48 |
| 56 | Supply 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 11KV grade as required. | | | | |
| a | 3 C x 240 Sq.mm (11KV) | 2 | Sets | 25431.37 | 50862.74 |
| | **TOTAL SUB HEAD VI :- H T CABLE, LT CABLE AND ACCESSORIES** | | | | **2329171.52** |
| | | | | | |
| | **SUB HEAD VII :- SAFTEY EQUIPMENTS.** | | | | |
| 57 | Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required. | 20 | Nos. | 330.28 | 6605.60 |
| 58 | Providing and fixing H.T. danger notice plate of 250 mm X 200 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single Red colour on front side as required. | 2 | Nos. | 356.49 | 712.98 |
| 59 | Supplying & fixing safety instruction chart duly framed with 5 mm thick glass as required. (approx. front area 1.20 sq.mt.) | 6 | Nos. | 1464.00 | 8784.00 |
| 60 | Providing & fixing of set of 4 nos. minimun 9 litre capacity GI bucket painted in post office red colour with prior coat of re-oxide paint, Canopy with 18 SWG ,Angle Size: 50 mm x 50 mm x 6 mm or higher (Mild Steel), Base will be 0.6 Mtr wide , Capacity atleast | 6 | Nos. | 2879.00 | 17274.00 |

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| | 50 kg and written with white paint FIRE and mounted on MS angle iron frame with bracket of appropriate size 6'x5'x3' as per IS Code 2526 & capacity i/c filling sand etc. | | | | |
| 61 | Providing & fixing of rubber mat in position, Class A, withstand upto 3.3 KV, 1 mtr wide , 2 mm Thick , anti skid , sock proof, and as per IS 15652-(2006) as required. | 10 | Mtrs. | 1014.00 | 10140.00 |
| 62 | Providing & fixing of rubber mat in position, Class C, withstand upto 33 KV, 1 mtr wide ,3 mm Thick , anti skid , sock proof, and as per IS 15652-(2006) as required. | 10 | Mtrs. | 1542.00 | 15420.00 |
| 63 | Supplying, Installation, Testing and Commissioning of **First aid box** with first aid Kit , size 12"x12"x5.5", wall mountable as approved by Indian red cross conforming to IS : 2217. | 8 | Nos. | 2562.00 | 20496.00 |
| 64 | Supplying and fixing of CO2 type 4.5 Kg fire extinguisher ISI marked as per IS 15683,CO2 cylinder as per IS 7285 CCE approved, valve as per IS 3224,CO2 gas as per IS 307,Internal discharge tube as per IS 738 complete with wheel discharge valve, hose and horn duly charged with CO2 gas i/c fixing with bracket on existing wall complete as reqd. 4.5 Kg | 30 | Nos. | 9390.00 | 281700.00 |
| 65 | Supplying and fixing of ISI marked 6Kg ABC type fire extinguishers ISI marked (IS: 15683) filled with MAP 90% stored pressure type ABC powder with jet pipe of standerd length comprising of easy snap safety seal, State of the art pressure gauge, Controllable discharge mechanism, Instalert, EPDM rubber hosepipe, squeeze grip valve, painting, clamp and dash fastners complete in all respect as required. 6 KG. | 30 | Nos. | 4427.00 | 132810.00 |
| 66 | Providing and installation of outdoor type Fire Panel compartmentalised totally enclosed double door wheather/ vermin proof CPRI approved motor starter panel 3 strip 125 amp aluminium bus bar fabricated out of 2mm thick CRCA sheet and 35mm X 6mm angle iron legs (450mm long) complete with hinged door having locking arrangements and providing detachable gland plate at the bottom of the feeder pillar inclined roof for protection against rain water and providing therein 15amp switch and socket set of indicating lights complete with interconnections with required rated aluminium thimble/ lugs of suitable capacity i/c testing and commissioning i/c finishing etc complete with providing and | 2 | No. | 153754.00 | 307508.00 |

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| | fixing the following switch gears therein etc as required (a) 100 A 25 KA TPMCCB - 1 No. (b) 63 A 25 KA TPMCCB - 5 Nos. (c) DOL Starter with upto date protection suitable for 450 LPM fire pump - 2 Nos. (d) 96mm X 96mm flush digital type ammeter with inbuilt selector switch, 5A MCB's and cts 160/5- 1 Set (e) 96mm X 96mm flush digital type Voltmeter( 0-500 v with inbuilt selector switch, 5A MCB's - 1 Set (f) LED type phase indicating lamp for RYB - 01 Set (g)Danger notice plate vitreous enamelled white on both sides and incription in signal red colour or mild steel - 01 No. (Panel Size 1.00 mtr. x 1.00 mtr. x 300 mm deep) | | | | |
| | | | | | |
| | **TOTAL SUB HEAD VII :- SAFTEY EQUIPMENTS.** | | | | **801451.00** |
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| | **SUB HEAD VIII :- EARTHING** | | | | |
| 67 | Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required. | 26 | Set | 8756.02 | 227656.52 |
| 68 | Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 meter long etc. with charcoal/ coke and salt as required. **(NEUTRAL EARTHING)** | 10 | Set | 15731.69 | 157316.90 |
| 69 | 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 | Metre | 1717.44 | 206092.80 |
| 70 | 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. | 150 | Metre | 791.62 | 118743.00 |
| 71 | Providing and fixing 25 mm X 5 mm Copper Strip on surface or in recess for connections etc. as required. | 100 | Metre | 1306.43 | 130643.00 |
| 72 | Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required. | 300 | Metre | 300.92 | 90276.00 |
| 73 | Providing and Fixing 6 SWG dia GI wire on surface or in recess for loop earthing along | 1000 | Metre | 52.43 | 52430.00 |

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| | with existing surface / recessed conduit / submain wiring/cable etc. as required. | | | | |
| | **TOTAL SUB HEAD VIII :- EARTHING** | | | | **983158.00** |
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| | **SUB HEAD IX :- LIGHTNING CONDUCTOR :-** | | | | |
| 74 | Earthing with GI earth plate 600mm x 600 mm x 6mm thick including accessories and providing masonary enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc, with charcoal/ coke and salt as required. | 10 | Set | 8756.02 | 87560.20 |
| 75 | Providing and fixing of lighting 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. | 14 | Each | 638.54 | 8939.56 |
| 76 | Providing and fixing G.I.tape 20 mm x 3 mm thick on parapet or surface of wall for lighting conductor complete as required. (For Horizontal Run) | 1150 | Meter | 155.18 | 178457.00 |
| 77 | Providing and fixing G.I.tape 20 mm x 3 mm thick on parapet or surface of wall for lighting conductor complete as required. (For Vertical Run) | 200 | Metre | 249.54 | 49908.00 |
| 78 | Providing and fixing testing joint, made of 20mm. x 3mm. thick G.I. strip, 125mm. long, with 4 nos of G.I. bolts, nuts, check nuts and spring washers etc. complete as required. | 10 | Each | 146.79 | 1467.90 |
| 79 | Providing & laying G.I. tape, 32mm x 6mm thick, from earth electrode directly in ground as required. | 140 | Metre | 231.72 | 32440.80 |
| | **TOTAL SUB HEAD IX :- LIGHTNING CONDUCTOR :-** | | | | **358773.46** |
| | | | | | |
| | **SUB HEAD X :- PIPE LAYING** | | | | |
| **80** | 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** | 150 mm dia | 30 | Metre | 887.03 | 26610.90 |
| b | 250 mm dia | 25 | Metre | 1174.32 | 29358.00 |
| c | 300 mm dia | 20 | Metre | 1366.20 | 27324.00 |
| 81 | 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 | | | | |

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| | but excluding sand cushioning and protective covering etc., complete as required. | | | | |
| a | 63 mm dia (OD-63 mm & ID-51 mm nominal) | 1200 | Meter | 303.02 | 363624.00 |
| b | 120 mm dia (OD-120 mm & ID-103 mm nominal) | 700 | Meter | 437.22 | 306054.00 |
| c | 200 mm dia (OD-200 mm & ID-175 mm nominal) | 100 | Meter | 768.55 | 76855.00 |
| | | | | | |
| | **TOTAL SUB HEAD X :- PIPE LAYING** | | | | **829825.90** |
| | | | | | |
| | **SUB HEAD XI :- EXTERNAL LIGHTING SYSTEM** | | | | |
| | **POLE ERECTION** | | | | |
| 82 | 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 | 18 | Each | 6419.97 | 115559.46 |
| 83 | Supplying and embedding following dia G.I. pipe (medium class) in pole collar/ foundation (during casting) for cable entry including bending the pipe to the required shape, Hole Seeling to be done complete as required. | | | | |
| a | 32 mm dia | 100 | Metre | 586.11 | 58611.00 |
| 84 | Supply, Installation, Testing and Commissioning of **Hybrid 50-60 Watt Solar Street Light luminaire** & inbuilt SCC, IP 65 or higher , CCT 4000K/5700K/6500K, efficiency > 120lm/W, Minimum Lumens 7000 lm CRI> 70 , Controller efficiency >=90%, Battery with 30Ah or higher , operating temperature -10-50 degree celsius, Pf >0.9 , Panel with 100Wp & with MPPT (Maximum Power Point Tracking) which provides about more charging efficiency by utilizing maximum energy harvested by solar PV modules. System should designed to withstand highly corrosive atmosphere and heavy wind loads. The modules are certified for industry standards IEC61215, IEC61730 (safety class 1 & 11), IEC61701 Complete with all Accessories & Control Gears etc. | 18 | Nos. | 46151.00 | 830718.00 |
| 85 | Supplying of Following Sizes of 1.1 KV Grade Multicore Aluminium Conductor XLPE Insulated armoured power cable conforming to IS: 7098 (Part - I) or as per | | | | |

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| | Relevant IS Code complete with all Amendments etc as required. | | | | |
| a | 4 C X 16 Sq.mm Al. XLPE arm. | 400 | Metre | 363.00 | 145200.00 |
| 86 | Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size direct in ground including excavation and refilling the trench etc. as required, but excluding sand cushioning and protective covering. | | | | |
| a | Upto 35 sq. mm | 50 | Metre | 265.27 | 13263.50 |
| 87 | Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 kV grade of following size in the existing RCC/ HUME/ METAL pipe as required. | | | | |
| a | Upto 35 sq. mm | 350 | Metre | 49.28 | 17248.00 |
| 88 | Supplying and Making End Termination With Brass Compression Gland and Aluminium lugs for Following Size of PVC Insulated and PVC Sheathed / XLPE Aluminium Conductor Cable of 1.1 kV Grade as Required. | | | | |
| a | 4 X 16 sq. mm (28mm) | 38 | Each | 383.75 | 14582.50 |
| 89 | Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required. | | | | |
| a | 4 core 1.5 sq.mm (for 6/4 Mtr Poles) | 100 | Metre | 136.31 | 13631.00 |
| 90 | Supplying of 6 mtr. long octagonal pole galvanized continuously tapered (bolt fixing type) in single section made out of 3mm thick sheet having top dia 70mm and bottom dia 130mm with 04 Nos. hot dip galvanized foundation bolts of size 20mm dia x 700mm long alongwith suitable size GI single arm bracket 1500mm long, i/c providing and fixing bakelite sheet of size 25cm x 10cm x 6mm thick, 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. | 18 | Each | 11344.00 | 204192.00 |
| | **TOTAL SUB HEAD XI :- EXTERNAL LIGHTING SYSTEM** | | | | **1413005.46** |
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| | **SUB HEAD XII :- LOCAL AREA NETWORK (LAN)** | | | | |

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| 91 | 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 XRJ-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 Acess 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, SNTP/ 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. | | | | |
| | 8 port PoE Layer 2 Network Switch with PoE Support of 130W or higher with each copper port supporting 802.3at PoE+. | 2 | | 36792.91 | 73585.82 |
| | | | | | |
| 92 | 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. 168Gbps and packet forwarding rate of 125Mpps or higher, 16K MAC table. Console Port, USB port, Stacking support of min. 8 units per stack. Internal dual AC Power supply, STP, RSTP, MSTP, BPDU Filter, BPDU Restriction, | | | | |

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| | 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. | | | | |
| | 24 port PoE Layer 2 Network Switch with PoE Support of 370W or higher with each cooper port supporting 802.3at PoE+ min. | 4 | Each | 131474.56 | 525898.24 |
| | | | | | |
| 93 | Supplying, Installation, Testing and commissioning of small form-Pluggable (SFP) for Network Switches. Must be hot Pluggable, RoHS Complaint, etc. complete as required. | | | | |
| a) | 10 G SFP + Single Mode/Multi Mode | 6 | Each | 15698.14 | 94188.84 |
| 94 | Supplying and drawing following core Fibre Optic Cable having corrugated steel armouring. The Fibre should be SM Fibre 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 shall be - 5 deg C to+50 deg C, Max Attenuation ± 0.36 (db / km) at Operational Wavelength 1310 nm and ± 0.22 db / km at Operational Wavelength 1550 nm. type of fibre should be 9/125 / G.652D& Refractive Index should be 1.4670/1.4675. The value for Mode-filed, Cladding Diameter 9.2 ± 0.4 μm and 125 ± 0.7 μm correspondingly. The Dispersion value ≤ 3.5 ≤ 18 ps/nm-km and | | | | |

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| | PMD value ≤ 0.2 ps/km and Cable Cut-off wavelength ≤ 1260 nm etc complete as required. | | | | |
| a) | Single Mode 6 Core Optical fibre cable | 350 | Meter | 67.10 | 23485.00 |
| 95 | 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) | 6 Port LIU | 4 | | 5736.34 | 22945.36 |
| 96 | 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. | 739.19 | 5913.52 |
| 97 | Supplying, drawing, Installation, Testing and commissioning ofCat6A 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 | | | | |

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| | 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 | 500 | Meter | 65.01 | 32505.00 |
| b) | 2 Run of cable | 420 | Meter | 103.80 | 43596.00 |
| 98 | Supply of 24 port Cat6 Patch Panel loaded. Must be of 1Uheight 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 | 5 | Nos. | 5533.98 | 27669.90 |
| 99 | 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) | 6U Rack | 2 | Nos. | 7275.54 | 14551.08 |
| b) | 15U Rack | 2 | Nos. | 13976.51 | 27953.02 |
| 100 | Supplying, Installation, Testing and commissioning of followingCAT6A 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) | 95 | Each | 181.39 | 17232.05 |
| 101 | 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. | 75 | Nos. | 316.65 | 23748.75 |
| 102 | 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. | 103 | Each | 9.44 | 972.32 |
| | **TOTAL SUB HEAD XII : - LOCAL AREA NETWORK (LAN)** | | | | **934244.90** |

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| | **SUB HEAD XIII :- IP CCTV SYSTEM** | | | | |
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| 103 | Supply, installation, testing and commissioning of 5 MP Dome camera ,ONVIF profile S,G & T. BIS,UL, CE , FCC Certified ,1/2.7" Progressive Scan CMOS ,3.6 mm fixed lens , Quad stream Each stram support H.265 compression simultaneously ,min illumination : Color 0.05lux @ F1.2(AGC ON) ; B/W 0 lux @ IR ON , Shutter speed : 1 / 5s ~ 1 / 100,000 s, WDR, Compression : H.265/H.265+/H.264/H.264+ .SD card support upto 256GB , frame rate : Main stream should support 25/30 fps@5MP, Built in Mic, Edge analytics : Face Detection, Customer Flow staistics, Heat Map, Human & Vehicle Detection, Pedestrian Intrusion Detection & Line cross Detection. Queue length detection Regional population statistics, SOD-Stationary Object Detection, Motion Detection, Tempring Detection, Rare Sound Detection, License Plate Detection. Defog. Protocols:- TCP/IP, HTTP, DHCP, DNS, DDNS, RTP/RTSP, SMTP, NTP, UPnP, SNMP, HTTPS, FTP, P2P, UDP, PPPoE, QoS, Bonjour. In built IR LED , IR Distance upto 30 meters , IP 66 , POE. | 6 | Nos. | 13420.80 | 80524.80 |
| 104 | Supply, installation, testing and commissioning of 5 MP Bullet camera ,ONVIF profile S,G & T. BIS,UL, CE , FCC Certified ,1/2.7" Progressive Scan CMOS ,3.6 mm fixed lens , Quad stream Each stram support H.265 compression simultaneously ,min illumination : Color 0.05lux @ F1.2(AGC ON) ; B/W 0 lux @ IR ON , Shutter speed : 1 / 5s ~ 1 / 100,000 s , WDR , Compression : H.265/H.265+/H.264/H.264+ .SD card support upto 256GB , frame rate : Main stream should support 25/30 fps@5MP, Built in Mic, Edge analytics : Customer Flow staistics, Face Detection, Heat Map, Human & Vehicle Detection, Pedestrian Intrusion Detection & Line cross Detection. Queue length detection Regional population statistics, SOD-Stationary Object Detection, Motion Detection, Tempring Detection, Rare Sound Detection, License Plate Detection. Defog. Protocols:- TCP/IP, HTTP, DHCP, DNS, DDNS, RTP/RTSP, SMTP, NTP, UPnP, SNMP, HTTPS, FTP, P2P, UDP, PPPoE, QoS, Bonjour. In built | 12 | Nos. | 13132.46 | 157589.52 |

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| | IR LED , IR Distance upto 30 meters , IP 66, POE. | | | | |
| 105 | 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 :<br>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.<br>2) NVR should support video compressions : H.265 or better, H.264, MJPEG.<br>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.<br>4) Intelligent auto power on when power resumes after power outage.<br>5) Storage: It should support minimum 8 SATA Slots with 20TB capacity/ Slot and RAID support of RAID 0/1/5/6/10.<br>6) Connectivity Interface : 2 Nos. x 10/100/1000 Mbps Ethernet Ports, 1x RS485, 1x RS232, 1x eSATA Port<br>7) Backup Interface : Its should have 4 Nos USB port (2x USB3.0, 2xUSB2.0)<br>8) Video Output Ports: 2x HDMI and 2 VGA<br>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.<br>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 Certified14) Power Supply : Should support AC100-240V, 50/60Hz Power supply.15) Operating Condition : -5°C to 50°C, | | | | |

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| | 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 Mode21) 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: | | | | |

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| | 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.<br>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.<br>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.<br>32) Smart playback function: Should support smart search for the selected area in the video and smart playback to improve the playback efficiency<br>34) VCA (Video Content Analytic): Should support multiple video contented analytics based on camera analytics<br>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 | | 67926.02 | 67926.02 |
| | | | | | |
| 106 | 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) | 3 | | 21094.77 | 63284.31 |
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| 107 | LED Display Supplying, Installation, Testing and Commissioning of following size LED display (LED monitor) industrial grade with3840x2160 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 | 1 | | 86036.76 | 86036.76 |
| | | | | | |
| | **TOTAL SUB HEAD XIII :- IP CCTV SYSTEM** | | | | **455361.41** |
| | | | | | |
| | **SUB HEAD XIV :- LIFT** | | | | |
| 108 | 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 :-<br>(i) Speed-1 MPS<br>(ii) Floors-4(G+3)<br>(iii) Travel -17 Meters (approx.)<br>(iv) Stops & opening- 4 stops and 4 openings<br>(v) Controller: A.C. variable voltage & variable frequency<br>(vi) Automatic rescue device (ARD) complete with dry maintenance free batteries as required.<br>(vii) Operation: Microprocessor based single automatic push button/simplex selective collective/ duplex collective selective with/without attendant<br>(viii) Power-415 Volts+10%, 3 phase, 50 Hz, 4 wires system<br>(ix) Car Enclosure: Stainless steel scratch proof (Moon Rock/Honeycomb/ Hairline Finish) on all sides and stainless steel decorative ceiling with fans (indirect throw) | | | | |

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| | and LED fitting.<br>(x) The car flooring should be smooth and antiskid as approved by engineer-in-charge. | | | | |
| | (xi) Type of doors<br>a) Car: Power operated, centre opening horizontal sliding stainless steel scratch proof (Moon Rock/Honeycomb/ Hairline Finish).<br>(b) Landing doors: stainless steel scratch proof.<br>(xii) A hand rail not less that 600mm long at 900mm above floor level to be fixed adjacent to control panel in the lift car.<br>(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.<br>(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.<br>(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.<br>(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.<br>(xvii) In case of failure of ARD or other electronic devices, a provision of manual rescue be provided | | | | |
| a) | 8 passenger (544kg) | 4 | No. | 1794866.00 | 7179464.00 |
| | | | | | |
| | **TOTAL OF SUBHEAD- XIV (LIFT)** | | | | **7179464.00** |
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| | **SUBHEAD XV (STP)** | | | | |
| 109 | **SEWAGE TREATMENT PLANT (STP) ON MBBR CAPACITY : 45.0 KLD** | | | | |

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| | Supplying, installing, testing & commissioning of Sewage Treatment Plant of 45 m3/day based on MBBR technology (excluding excavation, back filling & disposal of surplus earth MS / Civil construction work) for the following duty: Nature of Sewage - Domestic Sewage waste water shall be discharged into the STP. Design to take consideration of same. | | | | |
| | The STP design based on the following parameters: | | | | |
| | Daily average flow: 45.0 M3/Day (STP) | | | | |
| | **PH : 6-8.5** | | | | |
| | BOD : 350 mg/l | | | | |
| | S. Solids : 500 mg/l | | | | |
| | COD : 450 mg/l | | | | |
| | Oil & Grease : 45 mg/l | | | | |
| | Sewage discharge standard after treatment :- | | | | |
| | PH : 6.5-7.5 | | | | |
| | BOD : Less than 20 mg/l After ozonator Less than 10mg/l | | | | |
| | S. Solids : Less than 10 mg/l | | | | |
| | COD : Less than 80 mg/l After ozonator Less than 50mg/l | | | | |
| | Oil & Grease : Less than 5 mg/l | | | | |
| | Sewage treatment plant shall include the following Civil Units : **(Client's Scope)** | | | | |
| | Sewage Equalization Tank - 1nos | | | | |
| | Bar Screen cum Oil & Grease Chamber - 1nos | | | | |
| | Tube Settler | | | | |
| | MBBR Tank | | | | |
| | Sludge Holding Tank | | | | |
| | Clear Water Tank | | | | |
| | Treated Water Tank | | | | |
| | Supplying, installing, testing & commissioning of MBBR system based sewage treatment plant including all equipment & accessories as per detail speciftcation / drawings. | | | | |
| | Following equipments shall be part of Sewage Treatment Plant ( for detail of equipment refer technical specification | | | | |
| | 2 x 1.5 HP Flushing / Soft Water Transfer Pumps (1 Duty + 1 Stand by) | | | | |
| | 2 x 1.5 HP treatment plant Feed Water Pumps for STP (1 Duty + 1 Stand by) | | | | |
| | 2 x 1.0 HP Sewage Water Transfer Pumps for STP (1 Duty + 1 Stand by) | | | | |
| | For 2 x 1.0 HP Sludge Transfer Pumps for STP (1 Duty + 1 Stand by) | | | | |

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| | For 2 x 2.0 HP Irrigation Water Supply Pumps for STP (1 Duty + 1 Stand by) | | | | |
| | 2 x 1.5 HP Blower Air Feeder Line (1 Duty + 1 Stand by) | | | | |
| | 2 x 0.5 HP Back Wash Pumps | | | | |
| | Filters (DMF & ACF) | | | | |
| | Softener with brine tank | | | | |
| | Dosing units | | | | |
| | U.V. Sterlizer | | | | |
| | All accessories and media required for STP and WTP | | | | |
| | Instrumentation | | | | |
| | Piping and valves as per specification and drawings | | | | |
| | Additional Feeder For : | | | | |
| | i) For 2 x 1.5 HP Flushing Water Transfer Pumps for STP (1 Duty + 1 Stand by) | | | | |
| | ii) For 2 x 1.0 HP Sewage Water Transfer Pumps for STP (1 Duty + 1 Stand by) - only feeder to sub panels | | | | |
| | iii) For 2 x 2.0 HP irrigation System Feed Pumps (1 duty + 1 stand by) - only feeder to sub panels. | | | | |
| | All elctrical works including all wiring and accessories in side STP. | | | | |
| | Capacity : 45 M3 / Day | 1 | Job | 2861885.00 | 2861885.00 |
| | **TOTAL SUBHEAD XV (STP)** | | | | **2861885.00** |
| | | | | | |
| | **SUBHEAD XVI (AC)** | | | | |
| 110 | Supplying, Installation, Testing & commissioning all weather type (Heating and Cooling type) split AC Unit of 1.5 TR, 5 Star rating , ISEER 5.6 or better with outdoor stand duly powder coated, suitable for operation on 220V + 10% single phase 50 HZ HV AC supply complete with energy efficient rotary compressor, type of refrigerant R32/ 410A, copper condenser, having cooling capacity 17060 Btu/h or better, indoor & outdoor unit, complete in all respect & with cordless remote, copper piping and control cable upto 3 mtrs, , plug Top , i/c making repair to any damage to existing finish and, i/c connection etc, as required as per direction of engineer in charge. | 74 | Each | 74300.00 | 5498200.00 |
| | **TOTAL SUBHEAD XVI(AC's)** | | | | **5498200.00** |
| | | | | | |
| | **SUBHEAD XVII (Fire Fighting System)** | | | | |
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| 111 | (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 squirell 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 | 95816.12 | 191632.24 |
| | | | | | |
| 112 | Providing & fixing of pressure switch in M.S. pipe line including connection etc. as required. | 2 | Each | 1751.00 | 3502.00 |
| | | | | | |
| 113 | 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 | 20343.00 | 40686.00 |
| | | | | | |
| 114 | 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 equipments on wall. Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket. | | | | |
| a) | 30 m | 8 | Each | 9897.84 | 79182.72 |
| | | | | | |
| 115 | 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: | | | | |

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| a) | 4 way - 150 mm dia M.S. Pipe | 1 | Each | 15538.77 | 15538.77 |
| | | | | | |
| 116 | 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 | 12248.58 | 24497.16 |
| | | | | | |
| 117 | Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, Gl bolts, nuts, washers etc.as required: | | | | |
| a) | 65 mm dia | 8 | Each | 7248.28 | 57986.24 |
| b) | 100 mm dia | 4 | Each | 12427.87 | 49711.48 |
| c) | 150 mm dia | 3 | Each | 19799.87 | 59399.61 |
| | | | | | |
| 118 | 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) | 65 mm dia | 8 | Each | 4940.53 | 39524.24 |
| b) | 100 mmm dia | 4 | Each | 7623.64 | 30494.56 |
| c) | 150 mm dia | 3 | Each | 10209.24 | 30627.72 |
| | | | | | |
| 119 | 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 | 15 | Meter | 5351.54 | 80273.10 |
| | | | | | |
| 120 | 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 | 100 | Meter | 3226.23 | 322623.00 |
| b) | 65 mm dia | 50 | Meter | 2049.82 | 102491.00 |

| | | | | | |
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| 121 | Providing, installation, testing and commissioning of Gun Metal Ball valve of following sizes confirming to IS: 5312 complete etc.as required: | | | | |
| a) | 25 mm | 2 | Each | 1247.00 | 2494.00 |
| | | | | | |
| 122 | Providing and fixing in position the industrial type pressure gauges with gun metal /brass valves complete as required | 2 | Each | 1563.31 | 3126.62 |
| | | | | | |
| | **TOTAL SUBHEAD XVII (Fire Fighting System)** | | | | **1133790.00** |
| | | | | | |
| | **SUBHEAD XVIII (Fire Alarm System)** | | | | |
| 123 | Supplying, installation, testing & commissioning of main control and indicating panel made out of 16 SWG MS sheet to accommodate the following items duly powder coated in approved colour with louvers for ventilation, locking arrangement, audio and visual indication for fire alarm and public address system, monitoring system including connections, interconnections etc complete as required. 10 Zone panel for fire alarm system 250 Watt amplifier racks suitable for operation on 230V AC/24V DC supply conforming to IEC-268-3 complete with all accessories as required - 2 Nos.(one to act as standby) Talk back master station with LED PTT (press to talk) push button for operation on 230V AC/24 V DC supply conforming to IEC-268 for simplex mode of operation / communication suitable for 20 Nos. talk back unit -1 set. Announcement control desk suitable for selection of different zones selectively and ON ALL CALL switch with visual indication etc. complete as required -1 set. Amplifier change over switch for inter changing amplifier -1 No. Monitor panel for loudspeaker complete with output selector, ON / OFF switch, fuse, visual indications etc. complete as required - 1 No. Gooseneck microphone with stand and ON/OFF switch- 1 No. Main ON / OFF switch, fuse indication lamps, DC and AC voltmeters & ammeters, terminal blocks etc. complete as required -1 set. Battery charger trickle cum boost to take complete load of fire alarm & PA system complete with all accessories including providing & fixing of 2 nos.12 volt, 60 AH | 1 | Each | 78992.94 | 78992.94 |

| | | | | | |
|---|---|---|---|---|---|
| | each sealed maintenance free batteries -1 set. | | | | |
| 124 | Supplying, installation, testing & commissioning of manual call boxes of MS construction in surface/recess with stainless steel chain & hammer assembly complete with glass and push button etc. as required. | 6 | Each | 537.88 | 3227.28 |
| 125 | Supplying, installation, testing & commissioning fire alarm sounder with facility to make announcement, mounted in M.S. box (16 SWG) with hinged cover plate & suitable for operation with amplifier i/c line matching transformer etc. complete as required. | 6 | Each | 629.10 | 3774.60 |
| 126 | Supplying & laying of 2x1.5 sqmm fire alarm armoured cable, 600/1000V rated with annealed copper conductor having XLPE insulation, steel wire armouring & FRLS/HFFR outer sheath complete as required. | 150 | Metre | 201.31 | 30196.50 |
| 127 | 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 | 120 | Metre | 63.96 | 7675.20 |
| 128 | Supplying and fixing 25 mm dia MS flexible pipe with PVC coating along with all ancillaries and accessories like coupler etc. as required. | 120 | Metre | 62.91 | 7549.20 |
| | | | | | |
| | **TOTAL OF SUBHEAD XVIII (Fire Alarm System)** | | | | **131415.72** |
| | | | | | |
| | **SUB HEAD XIX Water Pump (Domestic)** | | | | |
| 129 | SITC of three phase monobloc 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 no's 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 | 57583.00 | 115166.00 |

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|---|---|---|---|---|---|
| 130 | 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 | 100 | Meter | 278.90 | 27890.00 |
| 131 | Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, Gl bolts, nuts, washers etc.as required: | | | | |
| a) | 65 mm dia | 2 | Each | 7248.28 | 14496.56 |
| 132 | Supply of Installation Testing and Commissioning of fixing of following dia. Gun metal gate valve (Screwed type) on the existing pipeline, including testing & Commissioning etc. as required. | | | | |
| a) | 50 mm dia | 2 | Each | 8263.23 | 16526.46 |
| 133 | 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 IP 54 i/c connections etc complete in all respect as required. | 2 | Each | 9493.00 | 18986.00 |
| | **TOTAL OF SUB HEAD XIX Water Pump (Domestic)** | | | | **193065.00** |
| | | | | | |
| | **SUB HEAD XX Uninterrupted Power Supply (UPS)** | | | | |
| 134 | Online UPS - Input supply: Single Phase, Output Supply : Single Phase Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) ON LINE Uninterrupted Power Supply (UPS) system suitable for Single Phase input, Single Phase output AC Supply. 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. The UPS systems shall be Microprocessor based | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Digital Control, using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter with PWM (Pulse Width Modulation) Technology. The quality of design, manufacturing and inspection process should confirm to the relevant International standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >95% at 100% non-linear loads. Current total harmonic distortion (ITHD)/ total demand distortion (TDD) on the input grid shall be < 5% at 100% load. (The required LC filters shall be included in UPS cost), extreme power factor kit to be include to limit the input 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 single phase 160-270V 50 Hz and delivering output AC supply true sine wave single phase 220/230/240 Volt, 50Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins and 150% for 1 minute. | | | | |
| | Operating temperature 0 to 40 deg C, Relative humidity 0-95%non condensing, noise level less than 60db at 1 meter distance, Protection for Under voltage, over voltage, abnormal output voltage, battery over charging, output over current, short-circuit, battery deep discharge , 10 KV surge. Display for watt/VA, Amp and Voltage power parameters etc. UPS shall 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 (as per standard IEC 62040-1, 2 & 3) . The UPS should be with IGBT Based Inverter Technology, Communication RS232/RS485/SNMP port open protocol for BMS integration asper approved by Engineering in charge. Required battery racks, DC breaker of suitable rating and interconnecting copper conductor cable of suitable size and connectors and all required accessories are inclusive in the cost. The UPS should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc. | | | | |
| a) | 10 KVA | 4 | Each | 176678.54 | 706714.16 |
| 135 | Supplying of Following Sizes of 1.1 KV Grade Multicore Copper Conductor XLPE Power Cable Insulated armoured cable conforming to IS : 7098 (Part - I) or as per | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Relevant IS Code complete with all Amendments etc as required. | | | | |
| a) | 3C X 16 Sq.mm | 100 | Meter | 1304.00 | 130400.00 |
| | | | | | |
| | **TOTAL OF SUB HEAD XX Uninterrupted Power Supply (UPS)** | | | | **837114.16** |
| | | | | | |
| | **Grand Total Amount** | | | | **43401651.00** |

# FINANCIAL BID

| CIVIL CONSTRUCTION UNIT | | | | | |
|---|---|---|---|---|---|
| **NIT No: 01/2026-27/CE/CCU/CED-II/Dehradun** | | | | | |
| **Name of work: Construction of New Hostel (G+2) of IGNFA, Dehradun (Balance work).** | | | | | |
| **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. 21,09,78,483/-** | * | * | * |
| | | | | | |

:*- 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 item covered under the respective packages.

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