



Government of India
Ministry of Environment Forest and Climate Change
O/o the Executive Engineer,
Civil Engineering Division-IV, Kolkata
Civil Construction Unit, AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur- Howrah-711103
Email ID: eeeced4ccu.mef@gmail.com

No.: 54(0004)/EE/CED-IV/CCU/Kol/2024-25/ 55

Dated: 22/08/2024

To,
The Director, Botanic Survey of India,
3rdMSO Building, CGO Complex (5th & 6th Floor),
Salt Lake City, Kolkata-700064
Email ID: hoo-hqrs@bsi.gov.in

Subject: Publishing the tender for the work "Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah"
NIT No.: 9/2023-24/CE/CCU/CED-IV/Howrah Recall1

Dear Sir,

The earlier tender for the above mentioned work is cancelled as per recommendation of tender evaluation committee and approved by the competent authority. Therefore, the tender has been recalled vide above referred NIT No. 9/2023-24/CE/CCU/CED-IV/Howrah Recall1 which will be scheduled to be opened on 12/09/2024 at 03:30PM.

You are therefore, requested to upload the above referred NIT on the BSI website during the publicity period i.e. from 22-08-2024 to 12-09-2024 for wide publicity of the tender as per OM No. ADMIN-65013/63/2023-P-II dated 24-06-2024.

Please do the needful at the earliest.

Thanking you.

Yours faithfully,

Er. Mohan Kumar Ray,
Executive Engineer,
CED-IV, CCU, Kolkata
Mobile: 9433581744

Copy to:

1. The Chief Engineer, Civil Construction Unit, MoEF&CC, New Delhi-110003 for kind information please.
2. The Superintending Engineer, CCU, MoEF&CC, New Delhi-110003 for kind information please.
- ✓ 3. Shri. R.K Gupta Scientist-F and Head of the office, Botanical Survey of India- Kolkata.
4. Notice Board.

Executive Engineer

Title-

Notice inviting e-Tender for the work-“Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.”

Enquiry Particulars	
Regional Office	EE-CED-IV CCU KOL
Office Inviting Bids	EE-CED-IV CCU KOL
Tender ID	86054
NIT/RFP NO	9/2023-24/CE/CCU/CED-IV/Howrah Recall1
Name of Work	Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah
Subwork/Packages	
Time Allowed	18 months
Tender Type	OPEN
Procurement Type	WORKS
Type of Work	Civil Works - Buildings
Category of Tendered	COMPOSITE, NON-CPWD CONTRACTOR
Estimated Cost	51,14,80,844
Bid Type	Percentage
Bid Submission Closing Date & Time	12/09/2024 15:00
Bid Validity Period (In Days)	75
Bid Validity Expiry Date	26/11/2024 15:30 (After Technical cum Eligibility Bid Opening)
Tender Notice Type	Standard Notice Tender
Competitive Bidding Type	NCB

Tender Inviting Authority Particulars	
Office Inviting Bids	EE-CED-IV CCU KOL
Designation	Executive Engineer
Address	AJCB Indian Botanic Garden, CNH Building, Shibpur Howrah
Contact Details	9007026603
Email	eeced4ccu.mef@gmail.com

EMD Details		
EMD(INR)	EMD In Favour Of	Mode of Payment
Rs. 61,14,809	Executive Engineer, CED-I, CCU, MoEF&CC, New Delhi	DD, FDR, BC, BG

Bid Openers						
Department User Name	Region	Mobile Number	Email	Designation	Certificate serial No	Certificate Expiry
MOHAN KUMAR RAY	EE-CED-IV CCU KOL	9007026603	mohankumarray1967@gmail.com	Executive Engineer	171e739	22/08/2025 05:13
Payel Mondal	EE-CED-IV CCU KOL	8967952578	sanchupayel1991@gmail.com	Assistant Engineer	1830e25	09/04/2026 02:40

Tender Documents				
S.No	File Name	File Description	File Size (in Bytes)	Uploaded Date

1	Tender Upload.zip	All documents	12588107	22/08/2024 13:08
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Mandatory Documents Details

S.No	Documents Required from Vendor	Document Type
1	As per NIT Page 8 Sl. No. 18	Mandatory

Tender Covers

S.No	Cover Name	Bid Opening date	Dependent Cover Name
1	Technical cum Eligibility Bid	12/09/2024 15:30	
2	Financial Bid	18/09/2024 12:00	Technical cum Eligibility Bid

Technical cum Eligibility Bid

S.No	Documents Required from Vendor	Mandatory
1	As per NIT Page 8 Sl. No. 18	Mandatory

Financial Bid

S.No	File Name	File Size(in Bytes)
1	86054-PercentageComposite1.xls	61952

Government Of India
Ministry Of Housing & Urban Affairs



Central Public Works Department
Excellence in Public Works

Tender Published

Current Tender Details

Tender ID	86054	NIT/RFP NO	9/2023-24/CE/CCU/CED-IV/Howrah Recall1
Name of Work	Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah		
Procurement Type	Works	Bid Type	Percentage
Tender Type	OPEN	Estimated Cost	₹ 51,14,80,844 (Fifty One Crore Fourteen Lakh Eighty Thousand Eight Hundred and Forty Four Rupees)
Bid Submission Closing Date	12/09/2024 15:00	Competitive Bidding Type	NCB

Tender Published Successfully.

Share to :



APPROVAL OF NIT

Notice Inviting Tender No. - 9/2023-24/CE/CCU/CED-IV/Howrah Recall1

Name of work : Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.

Estimate cost : Rs. 51,14,80,844/- (Civil & Electrical)

Earnest Money : Rs. 61,14,809/-

Performance Guarantee : @ 5% of Tendered Amount

Security Deposit : @ 2.5% of Tendered Amount

Time Allowed : 18 Months

Note: This NIT is approved for Rs. 51,14,80,844/- (Rupees Fifty-One Crores Fourteen Lakh Eighty Thousand Eight Hundred Forty Four only).

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

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

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

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

Superintending Engineer
CCU, MoEF&CC, New Delhi

Chief Engineer
CCU, MoEF&CC, New Delhi

**CIVIL CONSTRUCTION UNIT
MINISTRY OF ENVIRONMENT, FOREST
& CLIMATE CHANGE**

Notice Inviting Tender

Name of Work: Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.

NIT NO. : 9/2023-24/CE/CCU/CED-IV/Howrah Recall1

Chief Engineer
CCU, MoEF&CC, New Delhi.

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Certified that this NIT contains Pages 1 to 333.

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

PART A

GENERAL INFORMATION

INFORMATION & INSTRUCTIONS FOR BIDDERS FOR e-BIDDING

The Executive Engineer, CED-IV, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), AJCB Indian Botanic Garden, CNH Building, Shibpur, Howrah (**email- eeced4ccu.mef@gmail.com, Mo. 9433581744**) on behalf of President of India invites online Percentage rate bids from CPWD enlisted contractors of appropriate class in Buildings & Roads (erstwhile composite /Building/ Infrastructure) category and firms/contractors of repute in two bid system for the following work:

NIT No.	9/2023-24/CE/CCU/CED-IV/Howrah Recall1
Name of Work	Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.
Location	Howrah
Estimated cost put to bid	Rs. 51,14,80,844/-
Earnest Money	Rs. 61,14,809/-
Period of Completion	18 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 12/09/2024
Time date of opening of technical bid	03:30 PM on 12/09/2024
Pre-Bid Conference	Pre-bid conference shall be held on 29/08/2024 at 11 AM with the eligible and intending bidders in office of CE, CCU, 7th floor CGO Complex, Lodhi Road, New Delhi -110003.

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

1. Contractors who fulfill the following requirements shall be eligible to apply [1(a)(i), 1(b), 1(c) & 1(d) are not applicable for CPWD enlisted contractors of appropriate class. 1(e) is applicable for CPWD enlisted contractors also]:
 - a) Should have satisfactorily completed the works as mentioned below during the last Seven years ending last day of the month previous to the one in which tenders are invited-
 - (i) Three similar works each costing not less than **Rs. 20.46 Crores** or two similar works each costing not less than **Rs. 30.69 Crores** or one similar work costing not less than **Rs. 40.92 Crores.**

“Similar Work” “Similar Work” shall mean construction of minimum one multi-storeyed RCC/Composite framed structure building having five storeys or completing

balance Construction work of one building (i/c structural work) minimum up to five storey including finishing works, internal water supply, drainage & sanitary installations, electrical works, Fire fighting, LV Works, Lifts and HVAC all composite executed under one agreement

Note-1: Machine room and mumty shall not be counted as a storey.

Note-2: For this purpose, each basement, stilt constructed in the building shall be considered as a storey.

Note-3: Components of work executed other than those included in definition of similar work shall be deducted while calculating cost of similar work.

Note-4: For the purpose, “Cost of work” shall mean gross value of the completed work including the cost of materials supplied by the Government/Client, but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer / Project Manager or equivalent.

In case the certificate of work experience has been issued by any Pvt. Firm / Agency / Builder, the bidders will have to submit the documentary proof of the TDS (Form -26AS) with income tax department to ensure actual value of work done.

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

- b) Should have had Average Annual Financial Turnover of Rs. 15.34 Crores on construction works during the last three years ending 31st March 2023 (Scanned copy of Certificate from CA with Unique Document Identification Number (UDIN) to be uploaded). The value of annual turnover figures shall be brought to the current value by enhancing the actual turnover figures at simple rate of 7% per annum.
- c) Should not have incurred any loss (profit after tax should be positive) in more than two years during the available last five consecutive balance sheets (standalone financial statement), ending 31st March 2023.
- d) Should have a Banker's Certificate from a commercial Bank for Rs. 20.46 Crores or Net Worth certificate from CA with Unique Document Identification Number (UDIN) of minimum 10 % amount of ECPT (Scanned copy of original to be uploaded).
- e) Should have bidding capacity equal to or more than the estimated cost of the work put to tender. The bidding capacity shall be worked out by the following formula:

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

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

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

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

Notes:

1. The bidder should submit bidding capacity as per Form 'C-2'.
2. Bidding capacity is applicable for all the contractors including CPWD enlisted contractors.
3. Bidding capacity formula, for CPWD contractors who are enlisted based on rule 6.1.7 of Enlistment Rules-2022 i.e. government retired engineer/ architect for three years from the date of issue of enlistment order, is as follows: -

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

Where,

A = Banker certificate figure as submitted by applicant (i.e. government retired engineer/ architect) at the time of enlistment for first year of enlistment and subsequent fresh bankers certificate for second and third year respectively. Value of A for first year will be mentioned in the enlistment order by the member secretary of advisory committee for enlisting authority.

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

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

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

4. Bidding capacity, for CPWD contractors who are enlisted based on rules 9.6.3 & 9.6.4 of Enlistment Rules-2022 i.e. new entity based on previously enlisted entity for three years from date of issue of enlistment order, is as follows:

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

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

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

Bidding Capacity for newly enlisted entity based on rules 9.6.3 & 9.6.4 enlistment rules -2022 shall be as follows: -

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

Where,

A' = Proportionate share of newly enlisted director/partner in originally enlisted company/firm multiplied by the factor A, as given below. Value of A' will be mentioned in the enlistment order by member secretary of Advisory committee for Enlistment Authority, it will remain same for three years.

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

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

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

5. Enlisted entities based on rules 6.1.7, 9.6.3 or 9.6.4 of enlistment rules-2022 can submit MoU from agency having requisite experience for structural system technology if the enlisted entity does not have required experience.
2. The intending bidder must read the terms and conditions of CPWD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.
3. This information and Instructions for bidders posted on website shall form part of bid document.
4. The bid document consisting of Plans, Specifications, Schedule of quantities of various types of items to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website <https://etender.cpwd.gov.in> or www.cpwd.gov.in free of cost.
5. The bid can only be submitted after deposition of original EMD either in the office of Executive Engineer inviting bids or division office of any Executive Engineer, CCU/CPWD within the period of bid submission and uploading the mandatory scanned documents such as Insurance Surety Bonds, Account Payee Demand draft or Banker's Cheque or Fixed Deposit Receipts or/ and Bank Guarantee including e- Bank Guarantee (for balance amount as prescribed) from any of the Commercial Bank towards EMD in favour of Executive Engineer as mentioned in NIT, receipt for

deposition of original EMD to division office of any Executive Engineer (including NIT issuing EE), CCU/CPWD and other documents as specified.

6. Those contractors who are not registered or have not updated their profile on the website mentioned above, are required to get registered/update their profile beforehand. The necessary training 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 instruction available on download section of <https://etender.cpwd.gov.in>.
8. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
9. Contractor can upload documents in the form of JPG format and PDF format.
10. Certificate of Financial Turn Over: At the time of submission of bid contractor may upload Affidavit/Certificate from CA mentioning Financial Turnover of last 7 years ending 31st March 2023 or for the period as specified in the bid document and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.
11. Contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in yellow colour and the moment rate is entered, it turns sky blue. In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (ZERO). However, If a tenderer quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section / sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
12. The Technical Bid shall be opened first on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the technical bid shall be communicated to them at a later date.
13. Pre-Bid conference shall be heLd on 29/08/2024 at 11 AM with the eligible and intending bidders in **office of CE, CCU, 7th floor CGO Complex, Lodhi Road, New Delhi -110003** to clear the doubt of intending bidders, if any.
14. 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.
15. 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.

16. 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.
17. 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.
18. **List of Documents to be filled in by the tenderers in various forms, to be scanned and uploaded in JPG/PDF format within the period of bid submission:**

For CPWD enlisted Contractors

- (i) Copy of enlistment order in in appropriate class and category issued by CPWD
- (ii) Copy of original EMD in proper form.
- (iii) Copy of receipt for deposition of original EMD to division office of any EE, CPWD/CCU.
- (iv) GST registration Certificate of the state where the site is located, if already obtained by the bidder. If the bidder has not obtained GST registration as applicable, then he shall scan and upload following undertaking along with bid documents.

"If work is awarded to me, I/we shall obtain GST registration certificate as applicable within one month from the date of receipt of award letter or before release of any payment by 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".
- (v) Certificate of Financial Turnover from CA (Form 'A').
- (vi) List of projects under execution in Form 'C-1'.
- (vii) Bidding Capacity as per Form- 'C-2'
- (viii) Affidavit for non-execution of eligible similar work(s) through another contractor on back-to-back basis or subletting basis furnished on Rs.100/- non-judicial stamp paper attested by Notary. Undertaking for similar works in Form- 'H'.
- (ix) Affidavit for Non-Black Listing should be furnished on Rs.100/- non-Judicial stamp paper attested by Notary in Form- 'I'.
- (x) Any other document as specified in NIT

For Non-CPWD Registered Contractors -

- a. Copy of original EMD in proper form.
- b. Copy of receipt for deposition of original EMD to division office of any EE, CPWD/CCU.

- c. Letter of transmittal
- d. Certificate of Financial Turnover from CA (Form 'A').
- e. Bankers certificate or Networth (Form 'B' and 'B-1').
- f. List of eligible similar nature of works in Form – 'C'.
- g. List of projects under execution in Form 'C-1'.
- h. Bidding Capacity as per Form- 'C-2'
- i. Performance report of works (mentioned in Form-C and C-1) in Form – 'D'.
- j. Structure & Organisation (Form 'E')
- k. Affidavit for non-execution of eligible similar work(s) through another contractor on back-to-back basis or subletting basis furnished on Rs.100/- non-judicial stamp paper attested by Notary. Undertaking for similar works in Form- 'H'.
- l. GST registration Certificate of the state where the site is located, if already obtained by the bidder. If the bidder has not obtained GST registration as applicable, then he shall scan and upload following undertaking along with bid documents.

"If work is awarded to me, I/we shall obtain GST registration certificate as applicable within one month from the date of receipt of award letter or before release of any payment by 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".

- m. Any other Document as specified in the bid documents.

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

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

(For and on behalf of President of India)

NOTICE INVITING TENDER

1. Percentage rate composite on Engineering, Procurement and Construction basis are invited on behalf of President of India from approved and eligible contractors of CPWD in appropriate composite category and firms/contractor of repute in two bid system for the following work:

Name of work: Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.

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. 51,14,80,844/-** This estimate, however, is given merely as a rough guide.
- 1.2. Intending bidders is eligible to submit the bid provided he has definite proof from the appropriate authority, which shall be to the satisfaction of the competent authority, of having satisfactorily completed similar works of magnitude specified below: -

[1.2.1, 1.2.2, 1.2.3 & 1.2.4 are not applicable for CPWD enlisted contractors of appropriate class. 1.2.5 is applicable for CPWD enlisted contractors also]

- 1.2.1. Should have satisfactorily completed the works as mentioned below during the last 7 years ending last day of the month previous to the one in which tenders are invited –
 - (i) Three similar works each costing not less than **Rs. 20.46 Crores** or two similar works each costing not less than **Rs. 30.69 Crores** or one similar work costing not less than **Rs. 40.92 Crores**.

“Similar Work” “Similar Work” shall mean construction of minimum one multi-storeyed RCC/Composite framed structure building having five storeys or completing balance Construction work of one building (i/c structural work) minimum up to five storey including finishing works, internal water supply, drainage & sanitary installations, electrical works, Fire fighting, LV Works, Lifts and HVAC all composite executed under one agreement

Note-1: Machine room and mumty shall not be counted as a storey.

Note-2: For this purpose, each basement, stilt constructed in the building shall be considered as a storey.

Note-3: Components of work executed other than those included in definition of similar work shall be deducted while calculating cost of similar work.

Note-4: For the purpose, “Cost of work” shall mean gross value of the completed work including the cost of materials supplied by the Government/Client, but excluding those

supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer / Project Manager or equivalent.

In case the certificate of work experience has been issued by any Pvt. Firm / Agency / Builder, the bidders will have to submit the documentary proof of the TDS (Form - 26AS) with income tax department to ensure actual value of work done.

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 bid.

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

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

- 1.2.2. Should have had Average Annual Financial Turnover of Rs. 15.34 Crores on construction works during the last three years ending 31st March 2023 (Scanned copy of Certificate from CA with Unique Document Identification Number (UDIN) to be uploaded). The value of annual turnover figures shall be brought to the current value by enhancing the actual turnover figures at simple rate of 7% per annum.
- 1.2.3. Should not have incurred any loss (profit after tax should be positive) in more than two years during the available last five consecutive balance sheets (standalone financial statement), ending 31st March 2023.
- 1.2.4. Should have a Banker's Certificate from a commercial Bank for Rs. 20.46 Crores or Net Worth certificate from CA with Unique Document Identification Number (UDIN) of minimum 10 % amount of ECPT (Scanned copy of original to be uploaded).
- 1.2.5. Should have bidding capacity equal to or more than the estimated cost of the work put to tender. The bidding capacity shall be worked out by the following formula:

Bidding Capacity = {[A x N x 1.5] - B} Where,

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

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

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

Notes:

1. The bidder should submit bidding capacity as per Form 'C-2'.
2. Bidding capacity is applicable for all the contractors including CPWD enlisted contractors.
3. Bidding capacity formula, for CPWD contractors who are enlisted based on rule 6.1.7 of Enlistment Rules-2022 i.e. government retired engineer/ architect for three years from the date of issue of enlistment order, is as follows: -

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

Where,

A = Banker certificate figure as submitted by applicant (i.e. government retired engineer/ architect) at the time of enlistment for first year of enlistment and subsequent fresh bankers certificate for second and third year respectively. Value of A for first year will be mentioned in the enlistment order by the member secretary of advisory committee for enlisting authority.

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

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

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

4. Bidding capacity, for CPWD contractors who are enlisted based on rules 9.6.3 & 9.6.4 of Enlistment Rules-2022 i.e. new entity based on previously enlisted entity for three years from date of issue of enlistment order, is as follows:

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

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

Bidding Capacity for newly enlisted entity based on rules 9.6.3 & 9.6.4 enlistment rules -2022 shall be as follows: -

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

Where,

A' = Proportionate share of newly enlisted director/partner in originally enlisted company/firm multiplied by the factor A, as given below. Value of A' will be mentioned in the enlistment order by member secretary of Advisory committee for Enlistment Authority, it will remain same for three years.

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

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

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

5. Enlisted entities based on rules 6.1.7, 9.6.3 or 9.6.4 of enlistment rules-2022 can submit MoU from agency having requisite experience for structural system technology if the enlisted entity does not have required experience.
2. Agreement shall be drawn with the successful tenderer 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 **18 months** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
4. The site for the work is available on "as it is where it is" basis. **The bidders have to quote their rates in view of the site conditions and other parameters.**
5. The architectural and structural drawings for the work shall be made available in phased manner, as per requirement of the same as per approved programme of completion submitted by the contractor after award of work.
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 but before last time and date of submission of bid as notified.

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-I, 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 contractor whose bid is accepted will be required to furnish performance guarantee at specified percentage of the tendered amount as mentioned in schedule E and within the period specified in Schedule F. This guarantee shall be in the form of Insurance Surety Bonds, Account

Payee Demand Draft, Fixed Deposit Receipt or Bank Guarantee from any of the Commercial Banks in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the 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 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 subcontractors, 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 bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidder 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/bidder 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 works shall remain open for acceptance for a period of seventy five (75) days from the date of opening of Technical bids. Further,
- I. If any tenderer withdraws his tender or makes any modification in the terms & conditions of the tender which is not acceptable to the department within 7 days after last date 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 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. 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. The pre bid meeting will be held on 29/08/2024 at 11 AM with the eligible and intending bidders in **office of CE, CCU, 7th floor CGO Complex, Lodhi Road, New Delhi -110003** to clear the doubt of intending bidders if any.
20. This notice inviting Bid shall form a part of the contract document. The successful bidder/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
- a) The Notice Inviting Bid, all the documents including additional conditions, special conditions, particular specification, and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - b) Standard CPWD Form '7' and other Standard CPWD Forms as applicable with amendment upto last date of submission of bid.
21. The bidders must associate with himself, with agencies as per NIT conditions.
22. **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 (.....). The work of Lifts shall be carried out by OEM of Lift only. 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. MOU should be submitted within six month of the award of work. It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main 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.

23. The main 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.
24. In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in-charge. 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.
25. The main 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.
26. 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.

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

(For and on behalf of President of India)

TECHNICAL BID

Section-I

BRIEF PARTICULARS OF WORK

- 1) The **Salient details of the work for which bids are invited are as under:**

S. N.	Name of work	Estimated cost	Period of completion
1.	Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.	Rs. 51,14,80,844/-	18 Months

- 2) The site of work is located/situated at Howrah, West Bengal.
- 3) The Scope of work consist of Construction of Headquarters office building, hostel, auditorium and guest house including all civil, electrical, mechanical, horticulture services.
- 4) Scope of work consists obtaining minimum GREEN PLUS Rating as per CPWD Green Rating Manual (GHAR) 2021 and minimum 4-star rating under GRIHA norms.
- 5) Electrical & Mechanical services/works: All the electrical & mechanical services mentioned in Part C of the tender document are in scope of work.
- 6) The Agency shall supply all documents required in obtaining all mandatory approvals and shall also extend full support to getting all required statutory & Muncipal approval “Occupation and Completion” or any other document required to declare all assets eligible for bringing it in use. Contractor shall assist to CPWD/CPWD appointed Consultant to get completion certificate from local body, NOC from fire department and any other statutory approval related to building for handing over the assets. Contractor shall extend necessary support, as per statutory requirements, to the CPWD for these approvals. Nothing extra time Extension/Extra amount shall be paid on this account.
- 7) The Agency shall hand over the assets after completion of work with as built drawings, services route plans, Maintenance manuals, Warrantees / Guarantees or any other document required by the Engineer-in-charge for maintaining these establishments.
- 8) Scope of work also includes to train the 30% workers of the site as per SKILLED INDIA program under National Skill Development Corporation (NSDC) Norms & Conditions.

Section-II
INFORMATION AND GUIDE-LINES FOR BIDDERS

1.0 General:

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

2.0 Definitions:

- 2.1 In this document the following words and expression have their meaning here by assigned to them.
- 2.2 Employer / Engineer-in-Charge means the President of India, acting through the the The Executive Engineer, CED-IV, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103 or his successor or legal assignee thereof. The term Executive Engineer or EE, CED-IV referred in this contract document shall mean Executive Engineer, CED-IV, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103 or his successor or legal assignee thereof.
- 2.3 Bidder/Agency/Contractor/tenderer means the individual, proprietary firm, firm in partnership, limited company, private or public or corporation.
- 2.4 "YEAR" means "Financial year" unless stated otherwise.

3.0 **Method of Application:**

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

4 **Final Decision-Making Authority:**

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

5 **Particulars of works:**

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

6 **Site Visit:**

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

7.0 **Initial Criteria for Eligibility:**

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

Contractors who fulfill the following criteria shall also be eligible to apply [7.1, 7.2, 7.3 & 7.4 are not applicable for CPWD enlisted contractors of appropriate class. 7.5 is applicable for CPWD enlisted contractors also]:

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

- (i) Three similar works each costing not less than **Rs. 20.46 Crores** or two similar works each costing not less than **Rs. 30.69 Crores** or one similar work costing not less than **Rs. 40.92 Crores**.

“Similar Work” “Similar Work” shall mean construction of minimum one multi-storeyed RCC/Composite framed structure building having five storeys or completing balance Construction work of one building (i/c structural work) minimum up to five storey including finishing works, internal water supply, drainage & sanitary installations, electrical works, Fire fighting, LV Works, Lifts and HVAC all composite executed under one agreement

Note-1: Machine room and mumty shall not be counted as a storey.

Note-2: For this purpose, each basement, stilt constructed in the building shall be considered as a storey.

Note-3: Components of work executed other than those included in definition of similar work shall be deducted while calculating cost of similar work.

Note-4: For the purpose, “Cost of work” shall mean gross value of the completed work including the cost of materials supplied by the Government/Client, but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer / Project Manager or equivalent.

In case the certificate of work experience has been issued by any Pvt. Firm / Agency / Builder, the bidders will have to submit the documentary proof of the TDS (Form -26AS) with income tax department to ensure actual value of work done.

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

7.2 Should have had Average Annual Financial Turnover of Rs. 15.34 Crores on construction works during the last three years ending 31st March 2023 (Scanned copy of Certificate from CA with Unique Document Identification Number (UDIN) to be uploaded). The value of annual turnover figures shall be brought to the current value by enhancing the actual turnover figures at simple rate of 7% per annum.

7.3 Should not have incurred any loss (profit after tax should be positive) in more than two years during the available last five consecutive balance sheets (standalone financial statement), ending 31st March 2023.

7.4 Should have a Banker's Certificate from a commercial Bank for Rs. 20.46 Crores or Net Worth certificate from CA with Unique Document Identification Number (UDIN) of minimum 10 % amount of ECPT (Scanned copy of original to be uploaded).

7.5 Should have bidding capacity equal to or more than the estimated cost of the work put to tender. The bidding capacity shall be worked out by the following formula:

Bidding Capacity = {[A x N x 1.5] - B} Where,

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

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

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

Notes:

1. The bidder should submit bidding capacity as per Form 'C-2'.
2. Bidding capacity is applicable for all the contractors including CPWD enlisted contractors.
3. Bidding capacity formula, for CPWD contractors who are enlisted based on rule 6.1.7 of Enlistment Rules-2022 i.e. government retired engineer/ architect for three years from the date of issue of enlistment order, is as follows: -

Bidding Capacity = {[A x N x 1.5] - B}

Where,

A = Banker certificate figure as submitted by applicant (i.e. government retired engineer/ architect) at the time of enlistment for first year of enlistment and subsequent fresh bankers certificate for second and third year respectively. Value of A for first year will be mentioned in the enlistment order by the member secretary of advisory committee for enlisting authority.

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

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

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

4. Bidding capacity, for CPWD contractors who are enlisted based on rules 9.6.3 & 9.6.4 of Enlistment Rules-2022 i.e. new entity based on previously enlisted entity for three years from date of issue of enlistment order, is as follows:

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

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

Bidding Capacity for newly enlisted entity based on rules 9.6.3 & 9.6.4 enlistment rules -2022 shall be as follows: -

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

Where,

A' = Proportionate share of newly enlisted director/partner in originally enlisted company/firm multiplied by the factor A, as given below. Value of A' will be mentioned in the enlistment order by member secretary of Advisory committee for Enlistment Authority, it will remain same for three years.

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

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

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

5. Enlisted entities based on rules 6.1.7, 9.6.3 or 9.6.4 of enlistment rules-2022 can submit MoU from agency having requisite experience for structural system technology if the enlisted entity does not have required experience.

8.0 Evaluation Criteria:

8.1 The details submitted by the bidder will be evaluated in the following manner.

9.0 **Financial Information:** Bidder should furnish the Annual financial statement for the last Five years in Form 'A'. banker's certificate in Form 'B' or Networth Certificate in Form 'B1'.

10.0 Experiences in Works Highlighting Experience in Similar Works:

10.1 Bidder should furnish the list of eligible similar nature of works successfully completed during last seven years in Form 'C' and ongoing works as well (Form C-1).

10.2 Performance reports corresponding to work mentioned in (Form-C) and Form C-1 in Form-D. If needed, the bidder may attach a separate certificate in this regard from performance report issuing authority.

11.0 Organization Information:

Bidder is required to submit the information in respect of his / her /their organization in Form- 'E'.

12.0 Letter of Transmittal:

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

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

14.0 Award criteria:

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

14.1.1 Amend the scope of work and value of contract.

14.1.2 Reject any or all the applications without assigning any reason.

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

Criteria for Evaluation of the performance of contractors for Pre- Eligibility

S.N.	Attributes	Marks	Evaluation	
(a)	Financial Strength	(20 Marks)		
	(i) Average annual turnover	16 Marks	(i) 60% marks for minimum eligibility criteria	
	(ii) Banker's or Networth Certificate	04 Marks	(ii) 100% marks for twice the minimum eligibility criteria or more. (iii) In between (i) & (ii)- on pro-rata basis	
(b)	Experience in similar class of work	(20 marks)	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more. (iii) In between (i) & (ii)- on pro-rata basis	
(c)	Performance on works [Time Over run(TOR)]	(20 marks)		
	Parameter	Calculation for points	Score	Maximum Marks
	If TOR =		1.00 2.00 3.00 >3.50	
	(i) Without levy of compensation		20 15 10 10	<u>20</u>
	(ii) With levy of compensation		20 5 0 -5	
(iii) Levy of compensation not decided		20 10 0 0		
TOR = AT/ST, where AT =Actual Time; ST= Stipulated Time in the agreement plus (+) justified period of Extension of Time. Note: Marks for value in between the stages indicated above is to be determined by straight line variation basis.				
(d)	Performance of works (Quality) as per assessment in Form D-1		(40 Marks)	
	Completed works (max. 25 marks)	Ongoing works (max. 15 marks)	(Total Marks assessed)	

LETTER OF TRANSMITTAL

From:

.....

.....

To

The Executive Engineer, CED-IV,
Civil Construction Unit (CCU), MoEF&CC,
AJCB Indian Botanic Garden, CNH Building,
Ground Floor, Shibpur, Howrah-711103
(email- eeced1ccu-mef@nic.in)

Subject: Submission of Bid for the work of **Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.**

Sir,

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

1. I/We hereby certify that all the statements made and information supplied in the enclosed forms A to I and accompanying statement are true and correct.
2. I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.
3. I/we submit the requisite certified Banker's/Networth certificate and authorize the the Executive Engineer, CED-IV, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103 to approach the Bank issuing the banker's/Networth certificate to confirm the correctness thereof. I/We also authorize the Executive Engineer, CED-IV, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103 to approach individuals, employers, firms and corporation to verify our competence and general reputation.
4. I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following eligible similar works:

S.No.	Name of Work	Certificate From

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

Enclosures:
Date of submission

Seal of bidder:
Signature(s) of bidder(s)

FINANCIAL INFORMATION

Name of the firm / Bidder-

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

Sl. No.	Particulars	Financial Years				
		2018-19	2019-20	2020-21	2021-22	2022-23
i)	Gross Annual Turnover on construction works					
ii)	Profit / Loss (standalone financial statement)					

- II. Financial arrangements for carrying out the proposed work.

Signature of Chartered Accountant with Seal

SIGNATURE OF BIDDER(S)

BANKERS' CERTIFICATE FROM A COMMERCIAL BANK

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

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

(Signature)

For the bank

NOTE: (1) Bankers certificate should be on letter head of the Bank, addressed to the Executive Engineer, CED-IV, Civil Construction Unit (CCU), Ministry of Environment, Forest & Climate Change (MoEF&CC), AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103 (email- eeced4ccu.mef@gmail.com)

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

**FORM FOR CERTIFICATE OF NET WORTH FROM CHARTERED
ACCOUNTANT**

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

Unique Document Identification Number (UDIN)

Signature of Chartered Accountant

Name of Chartered Accountant

Membership No. of ICAI

Date and Seal

FORM 'C'

DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING THE LAST SEVEN YEARS ENDING LAST DAY OF THE MONTH PREVIOUS TO THE ONE IN WHICH TENDERS ARE INVITED

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

* Indicate gross amount claimed and amount awarded by the Arbitration Tribunal.

Signature of Bidder(s)

FORM 'C-1'

PROJECTS UNDER EXECUTION

Sl. No.	Name of work/ project and location	Owner or sponsoring organization	Cost of work in crores of rupees	Date of commencement as per contract	Stipulated date of completion	Upto date percentage progress of works	Slow progress if any and reasons thereof	Name and address / telephone number of officer to whom reference may be	Remarks
1	2	3	4	5	6	7	8	9	10

Signature of Bidder(s)

FORM 'C-2'

Calculation of Bidding Capacity

Details of existing commitments and ongoing works

Sl. No.	Name of work/ project and location	Owner or sponsor- ing organiza tion	Contract value in crores of rupees	Date of commencement as per contract	Stipu- lated date of completion	Upto date percentage progress of work	Remaining work in percentage (100-column 7)	Exixting commitment (column 4 x column 8/100	Name and address / telephone number of officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10	11

Total (B)=

Maximum Turnover in last seven years = Rs.

Updated value of turnover (A) = Rs.

No. of years (N) =.....

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

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

Signature of Bidder(s)

FORM 'D'

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORMS 'C'

1. Name of work/project & location :
2. Agreement no. :
3. Estimated cost :
4. Tendered cost :
5. Date of start :
6. Date of completion
- (i) Stipulated date of completion :
- (ii) Actual date of completion :
7. Amount of compensation levied for delayed Completion, if any
- (a) Whether case of levy of compensation
for delay has been decided or not? : Yes / No
- (b) If decided, amount of compensation levied
for delayed completion, if any. :
8. Amount of reduced rate items, if any :
9. Performance Report :
- (1) Quality of work : Outstanding/Very Good/Good/Poor
- (2) Financial soundness : Outstanding/Very Good/Good/Poor
- (3) Technical Proficiency : Outstanding/Very Good/Good/Poor
- (4) Resourcefulness : Outstanding/Very Good/Good/Poor
- (5) General Behavior : Outstanding/Very Good/Good/Poor

Dated: _____ Executive Engineer or Equivalent

FORM 'D-1'

Assessment of Quality for Completed as well as on-going Works

Name of work:

Date of inspection:

Date of submission of report:

A.	General Observation & Operational aspects	Yes/ No
1.	Availability of approval from local bodies in case of construction of private buildings.	
2.	Availability of approved structural drawings	
3.	Observation on seepage/ leakage in the building	
4.	Whether line & level maintained	
5.	In case of basement, observation on seepage, if any	
6.	Any structural defects/ distress observed. If yes give details	
7.	Whether safety measures adopted at site as per CPWD Safety Code and or govt. guidelines are adequate or not	
8.	Whether the welfare facilities provided to labour as per clause 19 H of GCC for CPWD works/ and or govt. guidelines are adequate or not.	
9.	Whether AHU getting automatically switched off and fire dampers closed in case of fire signal	
10.	Whether thimbles used for termination of wires in DBs, EBDs & panels?	
B.	Quality of work	Marks Assessed
1.	Quality of plaster/ finishing	
2.	Quality of RCC/ CC work	
3.	Quality of flooring	
4.	Quality of wood work	
5.	Quality of steel work/ aluminum work	
6.	Quality of plumbing and sanitary installation	
7.	Quality of Workmanship	
8.	Quality of waterproofing	
9.	If cladding done, observation on efficiency/ quality of cladding/ brick work	
10.	Quality of internal electrification work	
11.	Quality of DBs, EBDs & panels?	
12.	Quality of E&M equipments, panels & feeder pillar	
13.	Quality of fire alarm system/ firefighting system	
14.	Quality of Air Conditioning work	
15.	Quality of Sub-station based on complete live diagram, capacitor panel, power factor, insulating Mat, cleanliness, cable termination, earthing pits, earthing of transformer / DG sets	

16.	Any other aspects (To be elaborated)	
-----	--------------------------------------	--

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

Note:

1. All the above parameters may be considered for assessing the overall quality of work executed by the contractor. Each attribute shall be assessed on maximum marks of 10 under B above.
2. In case, any attribute is not applicable, the same may not be included in assessment and mentioned are not applicable (N/A)
3. The works as assessed above shall be converted on a scale of 25/15 marks for completed/ongoing works respectively.
4. In case of eligible completed works being more than one the average marks assigned for eligible completed works shall be considered for marking purpose. Only one ongoing work to be assessed.

STRUCTURE & ORGANIZATION

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

Signature of bidder(s) with stamp

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

Receipt of deposition of original EMD (drawn in favour of Executive Engineer, CED-I, CCU, MoEF&CC, New Delhi) (Receipt No. / date.....)	
Name of work	: Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.
NIT No	: 09/2023-24/CE/CCU/CED-IV/Howrah Recall I
Estimated Cost	: Rs. 51,14,80,844/-
Amount of Earnest Money Deposit	: Rs. 61,14,809/-
Last date of submission of bid	: 12/09/2024
To be filled by EMD receiving Executive Engineer	
Name of contractor	:
Form of EMD	:
Amount of Earnest Money Deposit	:
Date of Submission of EMD	:
	(Signature) Name and Designation of EMD receiving officer (EE/AE(P)/AO/AAO) along with office stamp

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

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

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

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

OR**

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

2. We, (indicate the name of the bank) (herein after referred to as “the Bank”), hereby undertake to pay to the Government an amount not exceeding Rs. (Rupees..... only) on demand by the Government within 10 days of the demand.

3. We,(indicate the name of the Bank), do hereby undertake to pay the amount due and payable under this guarantee without any demur, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs.(Rupeesonly).

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

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

Date

Witnesses:

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Signature.....
Name and address
Designation 2. Signature
Name and address | <p>Authorized signatory
Name
Staff code no.</p> <p>Bank seal</p> |
|---|--|

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

UNDERTAKING FOR SIMILAR WORKS(S)

I/We undertake and confirm that eligible similar works(s) has/have not been got executed through another contractor on back-to-back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for bidding in CCU 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.

(Note: Scanned copy of this affidavit to be uploaded by bidder(s) at the time of submission of bid.)

Signature of bidder(s) with stamp

PROFORMA OF AFFIDAVIT FOR NON - BLACK LISTING

I/we undertake and confirm that our firm / partnership firm has not been blacklisted by any state /Central Departments /PSUs /Autonomous bodies during the last 7 years of its operations. Further that, if Such information comes to the notice of the department, then I / we shall be debarred for bidding in CCU in future forever. Also, if Such information comes to the notice of department on any day before date of start of work, the Engineer-in-charge shall be free to cancel the agreement and to forfeit the entire amount of Earnest Money Deposit/ Performance Guarantee **(Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)**

NOTE: Affidavit to be furnished on a 'non-judicial' stamp paper worth Rs.100/-

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

Signature of Notary with seal

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

PERCENTAGE RATE BID AND CONTRACT FOR WORKS

Tender for the work of “**Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.**”

- i) To be uploaded by 15:00 hours on 12/029/2024 to/upload at
- ii) To be opened in presence of tenderers who may be present at 15:30 hours on 12/09/2024 in the office of in the office of the **Executive Engineer, CED-IV, CCU, Howrah.**

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 **75** 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 and 12.3 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.

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

SCHEDULE ‘A’

Schedule of work : As per contract document

SCHEDULE ‘D’

Extra schedule for specific requirement/document for the work, if any. : As per contract document

SCHEDULE ‘E’

Reference to : CPWD General Conditions of Contract, 2023 Construction work as amended / modified upto last date of submission of bid.
General Conditions of contract

Name of Work : **Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.**

Estimated cost of work : **Rs. 51,14,80,844/-**

Earnest Money : **Rs. 61,14,809/-** (To be returned after receiving performance guarantee)

Performance Guarantee : 5 % of accepted tendered value

Security deposit : 2.5 % of accepted tendered value

SCHEDULE ‘F’

GENERAL RULES & DIRECTIONS:

Officer inviting tender	:	The Executive Engineer, CED-IV, Civil Construction Unit (CCU), MoEF&CC, AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103.
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Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3.	:	See Below
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Definitions:			
2(vi)	Engineer-in-Charge	:	The Executive Engineer, CED-IV, Civil Construction Unit (CCU), MoEF&CC, AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103
2(viii)	Accepting Authority	:	The Chief Engineer, Civil Construction Unit (CCU), MoEF&CC
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) DAR 2023 Corrected up to last date of submission of bid (for civil work volume I & II) DSR 2022 Corrected up to last date of submission of bid (for Elect. work) Schedule of Rates, Analysis of Rates and Specifications (Horticulture & Landscaping)-2020 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 General Conditions of Contract, 2023 construction work amended / modified upto last date of submission of bid	:	CPWD-7
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 provided in (i) above	:	03 days
Clause 2			
Authority for fixing compensation under clause 2:		:	Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, or his legal successor or Assignee thereof.
Clause 5			
Time allowed for execution of work		:	18 Months
Numbers of days from date of issue of letter of acceptance for reckoning date of start		:	10 days

TABLE OF MILE STONE (S)

S.N.	Description of Milestone	Time Allowed in days (from stipulated date of start)	Amount to be with held in case of non achievement of mile stone
1.	Work done amounting to 8% of accepted tender amount (Civil + Electrical/Mechnaiucal + Horticulture/Landscape)	3 months	0.8 % of the Accepted tendered value.
2.	Work done amounting to 20% of accepted tender amount (Civil + Electrical/Mechnaiucal + Horticulture/Landscape)	6 months	0.8 % of the Accepted tendered value.
3.	Work done amounting to 40% of accepted tender amount (Civil + Electrical/Mechnaiucal + Horticulture/Landscape)	9 months	0.8 % of the Accepted tendered value.
4.	Work done amounting to 70% of accepted tender amount (Civil + Electrical/Mechnaiucal + Horticulture/Landscape)	12 months	0.8 % of the Accepted tendered value.
5.	Work done amounting to 90% of accepted tender amount (Civil + Electrical/Mechnaiucal + Horticulture/Landscape)	15 months	0.8 % of the Accepted tendered value.

6.	All Civil, Electrical & Mechanical, Landscape, Horticulture work complete in all respect, obtaining NOC from Fire deptt & occupancy certificate from local bodies. (100% complete in all respect)	18 months	1.0 % of the Accepted tendered value.
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Note: - With held amount shall be released if and when subsequent milestone is achieved within respective time specified. However, in case milestones are not achieved by the Bidder for the work, the amount shown against milestone shall be withheld.

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	On commencement date or date of start of work by the Engineer-in-Charge.
Part B	Portions with encumbrances	NA
Part C	Portions dependent on work of other agencies	NA

Schedule of issue of Designs	:	As per approved programme chart submitted by contractor
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Authority to decide :

- (i) Extension of time : Executive Engineer-IV, Civil Construction Unit (CCU), MoEF&CC, AJCB Indian Botanic Garden, CNH Building, Ground Floor, Shibpur, Howrah-711103 or his legal successor or Assignee thereof.
- (ii) Rescheduling of mile stones : Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi - 110003 or his legal 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 legal successor or Assignee thereof.

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. 2.5 Crores (civil) Rs. 0.75 Crores (electrical) <i>*Except for initial three running account bills & Final Bill.</i>
Clause -7A Whether clause 7A shall be applicable	YES
Clause -7B Whether clause 7B shall be applicable	YES
Clause -8A Authority to decide compensation on account if contractor fails to submit completion plans Clause 10A	Superintending Engineer, Civil Construction Unit (CCU), MoEF&CC, CGO Complex, Lodhi Road, New Delhi -110003 or his legal successor or Assignee thereof
List of testing equipment to be provided by the contractor at site lab	: (As per Table 1 given)
Clause 10B (i) Whether Clause 10 B (i) shall be applicable	: Yes
Clause 10B (ii) Whether Clause 10 B (ii) shall be applicable	: Yes

Clause 10CC

Applicable

S.N.	Relevant component of Material /Labour for price escalation	Percentage of total value of work
1	Component of Cement	12%
2	Component of Labour	20%
3	Civil component of the other construction materials	35 %
4	Electrical and Mechanical (E&M) Component of Construction Materials	13 %
5	Furniture	5%
6	Reinforcement steel bars/ TMT bars/Structural steel (including strands and cables)	15%
	Total	100 %

Clause 11

Specifications to be followed for execution of work (for civil work)	:	<ol style="list-style-type: none"> 1. Civil work: CPWD Specifications 2019 Volume- I & II with up to the date corrections slips. 2. MORTH Specifications for Roads and Bridge work.
Specifications to be followed for execution of work (for Electrical work)	:	<p>Electrical & Other works (amended upto date):</p> <ol style="list-style-type: none"> 1. CPWD General Specification for Electrical Works Part I Internal-2023. 2. General Specification for Electrical Works (Part III Lifts & Escalators)-2003. 3. CPWD General Specification for Electrical Works Part IV Substation-2013. 4. CPWD General Specification for Electrical Works Part V Wet riser and sprinkler system-2020. 5. CPWD General Specification for Electrical Works Part VI fire detection and alarm system- 2018. 6. CPWD General Specification for Electrical Works Part VII DG Sets- 2013 7. CPWD General Specification for Electrical Works Part VIII Gas Based Fire Extinguishing System-2013. 8. General Specification for Heating Ventilation & Air-Conditioning-2017. 9. CPWD specification of Horticulture & Landscaping – 2020. 10. CPWD General Specification for Medical Gas Pipe System 2022 11. CPWD General Specification for Modular operation Theater. 2022 12. CPWD General Specification for Nurse Call System 2022
Specifications to be followed for execution of work (for Horticulture & Landscaping work)		Schedule of Rates, Analysis of Rates and Specifications (Horticulture & Landscaping)-2020 Corrected up to last date of submission of bid

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

Clause 12 : Construction Works

12.2. &12.3	Deviation limit beyond which clauses 12.2 & 12.3 shall apply for building work.	:	100%
	i) Deviation limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (except items mentioned in earth work sub head in DSR and related items)	:	100%
	ii) Deviation limit for items mentioned in earth work sub head of DSR and related items	:	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 19 C

Penalty for each default : **Rs. 500/-**

Clause 19 D

Penalty for each default : **Rs. 500/-**

Clause 19 G

Penalty for each default : **Rs. 500/-**
Enhanced penalty per day for : **Rs. 500/-**
continuous default

Clause 19 K

Penalty for each default : **Rs. 500/-**

Clause 25

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

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

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	Electrical	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
	Graduate Engineer Or Diploma Engineer	Electrical	Project/Site Engineer	5 or 10 respectively	1	Rs. 50000/- Per month
4	Graduate Engineer	Civil	Quality Engineer	8	1	Rs. 70000/- Per month
	Graduate Engineer	Electrical	Quality Engineer	8	1	Rs. 70000/- Per month
5	Diploma Engineer	Civil	Surveyor	8	1	Rs. 50000/- Per month
6	Graduate Engineer	Civil	Project Planning/Billing	6	1	Rs. 60000/- Per month
	Graduate Engineer	Electrical	Project Planning/Billing	6	1	Rs. 60000/- Per month

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

Clause 38

(i)	(a)	Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of (for civil work)	:	Delhi Schedule of Rates 2023 printed by C.P.W.D. with upto date correction slip upto last date of bid submission.
		Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of (for Electrical work)	:	Delhi Schedule of Rates 2022 printed by C.P.W.D. 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-IV, Civil Construction Unit (CCU),
MoEF&CC, AJCB Indian Botanic Garden,
CNH Building, Ground Floor, Shibpur, Howrah-711103

Table - 1**Equipment's for Testing of Materials & Concrete at Site Laboratory**

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

Sl. No.	Equipment	Numbers (Minimum)
1.	100MT compression testing machine, electrical-cum-manually operated)	1
2.	Slump cone, steel plate, tamping rod, steel scale, scoop	3
3.	Pumps and pressure gauges for hydraulic testing of pipes	2
4.	Weighing scale platform type 100 Kg capacity	1
5.	Graduated glass measuring cylinder	As per requirement
6.	Sets of sieves of 450mm internal dia for coarse aggregate [100mm, 80mm, 40mm; 20mm; 12.5mm, 10mm; 4.75mm complete with lid and pan.	2
7.	Sets of sieves of 200mm internal dia for fine aggregate [4.75mm; 2.36mm; 1.18mm; 600 microns; 300 microns & 150 micron, with lid and pan]	2
8.	Sieve Brushes and sieve shaker capable of 200mm and 450 mm diasieves, manually operated with timing switch assembly	2
9.	Cube moulds size 70mmx70mmx70mm	18
10.	Cube moulds size 150mmx150mmx150mm	30
11.	Hot air oven temp. Range 50°C to 300°C- sensitivity 1 degree	1
12.	Electronic balance	2
13.	Physical balance weight upto 5 kg	1
14.	Air Content of concrete testing machine	As per requirement
15.	Measuring jars 100ml, 200ml, 500ml	3 nos. each size
16.	Spatula 100mm & 200mm with long blade wooden handle	3
17.	Digital Verniercalipers 150 mm , 200mm , 300 mm	1 each
18.	Digital PH meter	1
19.	Digital Micrometer	1
20.	Digital paint thickness meter for steel 500 micron Range	1
21.	GI tray 600x450x50mm, 450x300x40mm, 300x250x40mm	1 no. each
22.	Electric Motor mixer 0.25 cum capacity	1
23.	Digital rebound hammer	2
24.	Screw gauge 0.1mm-10mm, North count 0.05 mm	2

Sl. No.	Equipment	Numbers (Minimum)
25.	Water testing kit	2
26.	Motorized sieve shaker	1
27.	Extra Bottom plates for 15 cm cube mould	10
28.	Standard Vibration Table	1
29.	Concrete temperature measuring thermometer with Brass protection sheath 0- 100 degree centigrade	3
30.	Dial type spring balance preferable with zero correction knob capacity 100 kgs.reading to ½ kg.	1
31.	Counter scale capacity 1 kg and 10 kg	1
32.	Iron Weight of 5 kg, 2 kg, 1 kg, 500 gm, 200 gm, 100 gm	As per actual requirement.
33.	Brass Weight of 50 gm, 20 gm, 10 gm, 5 gm, 2 gm, 1 gm	
34.	Measuring cylinder TPX or Poly propylene capacity 100 ml, 500 ml, 250 ml	
35.	Set of box spanner ratchet	
36.	Hammer 1lb & 2lb	
37.	Hacksaw with 6 blades	
38.	Measuring tape 3 meter, 5 meter, 10 meter, 30 meter	
39.	Shovels & Spade	
40.	Steel plates 5 mm thick 75x75 cm	
41.	Plastic or G.I. Buckets 15 ltr, 10 ltr, 5 ltr	
42.	Vernier calipers	
43.	Micrometer screw 25 mm gauge	
44.	A good quality plumb bob	
45.	Spirit level, minimum 30 cms long with 3 bubbles for horizontal vertical	
46.	Wire gauge (circular type) disc	
47.	Foot rule	
48.	Long nylon thread	
49.	Rebound hammer for testing concrete	
50.	Dynamic penetrometer	
51.	Magnifying glass	
52.	Screw driver 30 cms long	
53.	Ball pin hammer, 100 gm	
54.	Plastic bags for taking samples	
55.	Moisture meter for timber	
56.	Any other equipment for site tests as outlined in BIS codes and as directed by the Engineer-in-charge.	

Table – 2

PLANT AND EQUIPMENT REQUIRED TO BE OWNED / TAKEN ON LEASE BY THE CONTRACTOR

Sl. No.	Equipment	Numbers
1.	Builders hoist	1
2.	Centralized concrete batch mix plant of capacity 30 cum per hour (fully automatic with computer control)	1
3.	Excavator cum loader (JCB 3D model or equivalent).	3
4.	Compressor machine minimum 20 CFM with rock Breaker.	1
5.	DG set of minimum capacities of 62.5 KVA.	As per requirement
6.	Transit mixers.	As per requirement
7.	Concrete pump	2
8.	Needle Vibrators.	10
9.	Screed leveller.	As per requirement
10.	Plate Vibrator	As per requirement
11.	Dumper/Tipper	As per requirement
12.	Reinforcement bending machine.	As per requirement
13.	Reinforcement cutting machine.	As per requirement
14.	Power driven earth rammer (Soil compactor).	As per requirement
15.	Total Station Machine.	2
16.	Water tanker (Minimum capacity of 5000 liters)	As per requirement
17.	Welding machine 400 Ampere	As per requirement
18.	Screener for coarse sand and fine sand	As per requirement
19.	Centrifugal mono block water pump minimum capacity 2 HP	As per requirement
20.	Road roller 8 to 10 tons	As per requirement
21.	Vibratory roller	As per requirement
22.	Drilling machine	As per requirement
23.	Double steel scaffolding and staging materials	As per requirement
24.	Air compressor	As per requirement

26.	Floor grinding/polishing machines	1 Nos.
27.	Granite cutting machine	3 Nos.
28.	Ceramic tile cutting machine	5 Nos.
29.	Granite polishing machine	1 Nos.
30.	Granite hand polishing machine	5 Nos.
31.	Mobile tower crane	1 Nos.
32.	Any other machinery required for completion of the work as per decision of Engineer-in-charge.	As per Actual requirement

Note: The above list is only indicative and not exhaustive. However, quantity may be optimised commensurate to progress of work with the approval of engineer in Charge.

PART B

SPECIAL CONDITIONS, PARTICULAR SPECIFICATION FOR CIVIL AND HORTICULTURE WORK

SPECIAL CONDITIONS

1.0 GENERAL

- 1.1** The Contractors are advised to inspect and examine the site and its surroundings and satisfy themselves with the nature of site, the means of access to the site, the constraints of space for stacking material / machinery, accommodation of labour etc., constraints put by local regulations (if any), weather conditions at site (rainfall, snowfall, winter/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 or scope of work, provided that the same can be reasonably inferred. There may be several incidental works, which are not mentioned in the contract document but will be necessary to complete the item in all respect. All these incidental works / costs which are not mentioned in specifications/drawings/tender document but are necessary to complete the item shall be deemed to have been included in the rates quoted by the contractor. No adjustment of rates shall be made for any variation in quantum of incidental works due to variation / change in actual detailed working drawings. Also, no adjustment of rates shall be made due to any change in incidental works or any other deviation in such element of work (which is incidental to the items of work and are necessary to complete such works in all respects) on account of the directions of Engineer-in-Charge. **Nothing shall be payable on the account of incidental works.**
- 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/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, to be issued by the Engineer-in-Charge. 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 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 plot, 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 6.0 meters in height, 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 plot 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 may be allowed to erect labour huts on the plot without disturbing the construction area and other occupants/establishments operating/residing therein. However, the contractor shall make his own arrangements to provide for additional accommodation, if required (in addition to available area at site), as per the rules of the local bodies. The Engineer-in-Charge shall in no way be responsible for any delay on this account and no claim, whatsoever, on this account shall be entertained. Nothing extra shall be payable on this account.
- 1.18** No tools and plants including any special T&P etc. shall be supplied by the Department and the Contractor shall have to make his own arrangements at his own cost. No claim of hindrance (or any other claim) shall be entertained on this account.
- 1.19** The Contractor shall take all precautions to abide by the environmental related restrictions imposed by any statutory body having jurisdiction in the state as well as prevent any pollution

of streams, ravines, river bed and waterways. All waste or superfluous materials shall be transported by the Contractor and disposed off at designated places only. Nothing extra shall be payable on this account.

1.20 No claim on account of site constraints mentioned in this document or any other site constraints such as lack of public transport, inadequate availability of skilled, semi-skilled or unskilled workers in the near vicinity, non-availability of construction machinery spare parts etc. or any other constraints not specifically stated here shall be entertained from the Contractor. Therefore, the tenderers are advised to visit site and get first-hand information of site constraints. Accordingly, they should quote their tenders. Nothing extra shall be payable on this account. Any hindrances claimed by the contractor on this account shall not be considered while action under clause '2' and '5' of General condition of contract amended upto date till last date or extended last date of submission of tender.

1.21 Other agencies may also simultaneously execute and install the works of other civil and E&M services for the work. The contractor shall afford necessary facilities for the same. The contractor shall leave such recesses, holes, openings, trenches etc. as may be required for such related works and the contractor shall fix the same at time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.

1.22 The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night. The contractor shall ensure entire necessary precaution during the entire period of work and site related activities to ensure full safety to workers and avoid any kind of accident. In case of any accident of labour's/ contractual staffs or any other human being the entire responsibility will rest on the part of the contractor both legally and financially and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor.

1.23 Any cement slurry added over base surface (or) for continuation of concreting for better bond is deemed to have been included in the contract amount and nothing extra shall be payable for extra cement considered in consumption on this account.

1.24 FACILITIES FOR THE DEPARTMENT

(a) **Site Office-** The contractor shall provide 1 No site office accommodations of approximately 200 sqm area (as per layout plan approved by engineer-in-charge) i/c conference hall at location 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 light, fans, air conditioners, heaters, all office utilities, good quality projector in conference room etc. and complete wiring, water supply, sewerage and drainage 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 i/c fan, RO etc.

ii) The contractor shall provide the office accommodation within 03 (Three) months 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 contractor shall arrange to maintain the site offices which includes watch and ward, day to day up keeping of the building and surroundings, periodic whitewashing/ color washing of the building including utilities, payment of AMC charges, Electricity bill, water supply bills, RO/drinking water bills etc.
- iv) The cost of construction, cost of all furniture ((of Godrej/Wipro/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 2 Nos. laptop-cum-tablet (latest surface pro or macbook air models) and 02 Nos. All-in-one Desktop (minimum window 10) with 3G/4G enabled internet connection for the supervisory staff of Employer. The contractor shall also provide 2 nos. Color laser printer (A3 Size) to the department. These accessories shall be retained by the department and the quoted rates are deemed to be inclusive of this cost. No additional payment shall be made to the Contractor on this account. The laptop/computer shall be provided with software viz. with MS-project, Primavera, MS office, Auto Cad, STADD etc.
 - ii) The contractor shall make arrangements for 02 No. of inspection vehicles (Innova Crysta Hybrid or equivalent model) not older than January 2023, from start to completion of entire work, at disposal of Engineer-in-Charge to facilitate work inspection, quality control, coordination with multiple agencies and liasoning. This facility will be provided till six months after the actual date of completion of work. The average mileage of each inspection vehicle shall be approximately 2500 Km/month. The inspection vehicle shall be made available for 12 hours per day on daily basis including holidays as per the direction of Employer. All expenses of this inspection vehicle including running and maintenance, fuel charges, driver's salary, toll tax, parking charges etc. shall be borne by the contractor. **Recovery @ Rs. 4000/- per day per Inspection vehicles shall be made, if contractor fails to provide Inspection vehicles within 15 days of letter of award/acceptance. Recovery @ Rs. 4000/- per day per Inspection vehicles shall be made, in case of occurrence of a default i.e. non-availability of vehicle, breakdown of vehicle etc.**
 - iii) 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.
- (c) **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 accommodation, stores, field office, batching plant etc. The contractor may be allowed to erect labour huts, 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 shoring, strutting and planking or cut slopes with or without steps including maintaining water level low enough so as not to cause any harm to work 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 Authority of the controlling body 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 immediate next 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 Foundation system and Soil Investigation: The foundation shall be laid on firm strata as per soil bearing capacity determined by carrying out geotechnical/soil investigation by contractor. Subsurface conditions encountered during construction may vary somewhat from the conditions encountered during site investigation. Therefore, it is essential to examine the founding levels very carefully during excavation and remove the localized clay if met with till firm strata is ensured prior to laying of PCC. It should be ensured that at foundation level, no

voids are there, if voids are observed the same shall be grouted. The contractor shall quote the rate accordingly.

1.39 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/GHAR rating etc. and any other unforeseen but essential incidental works required to complete this work. Nothing extra shall be payable on this.
- 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 or any other activity which is necessary (for execution of work and as directed by Engineer-in-Charge), shall be deemed to be included in rates quoted by the Contractor. 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.

1.40 SAFETY PRACTICES

- i. **WARNING/ CAUTION BOARDS:** All temporary warning / caution boards / glow signage display such as "Construction Work in Progress", "Keep Away", "No Parking", Diversions & protective Barricades, barricading as required from environmental protection view as per NGT etc. shall be provided and displayed by the Contractor, wherever required. These glow signage and red lights shall be suitably illuminated

during night also. The Contractor shall be solely responsible for damage and accident caused, if any, due to negligence on his part. Also, he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. Nothing extra shall be payable on this account. If the contractor fails to provide the warning /caution boards within 7 days of written direction of Engineer In charge or his authorized representative, **recovery of Rs. 1000/- on per day basis shall be made.**

- ii. **SIGN BOARDS:** The Contractor shall provide and erect a display board of size and shape as required and paint over it, in a legible and workman like manner, the details about the salient features of the project, as required by the Engineer-in-Charge. The Contractor shall fabricate and put up a sign board in an approved location and to an approved design indicating name of the project, Client/Owner, Engineer-in-charges, Structural Consultants, Department etc. besides providing space for names of other Contractors, Sub-Contractors and specialized agencies within 15 days from issuance of letter of acceptance. Nothing extra shall be payable on this account. In case of noncompliance/delay in compliance, a **recovery @ Rs. 500/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.**
- 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.

1.41 QUALITY ASSURANCE

- i. The proposed work is a prestigious project and quality of work is of paramount importance. Contractor shall have to engage well-experienced skilled labour and deploy modern T&P and other equipment to execute the work. Many items like exposed finish form work, specialized flooring work, Oxysulphide sealant and backer rod fixing in structural glazing works, factory made door- window shutters, proper slope maintaining in toilet units, sanitary- water supply installation, water proofing treatment will specially require engagement of skilled workers having experience particularly in execution of such items.
- ii. The contractor shall ensure quality construction in a planned and time bound manner. Any sub-standard material/work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-charge & contractor shall be bound to replace / remove such sub-standard / defective work immediately. If any material, even though approved by Engineer-In-Charge is found defective or not conforming to specifications shall be replaced / removed by the contractor at his own risk & cost.
- iii. The contractor/ associated agency shall extend full cooperation to **Third Party Quality Assurance Agencies** engaged by the department for the Project during their field visits.

- iv. In addition to the supervision of work by Engineer- in-charge or his representatives, the Consultants deployed by the department shall also be carrying out regular and periodic inspection of the ongoing activities in the work and deficiencies, shortcomings, inferior workmanship pointed out by them shall be communicated by Engineer- in-charge or his representatives to the contractor. Upon receipt of instructions from Engineer in Charge, the work so pointed out shall be made good by necessary improvement, rectification, replacement upto his complete satisfaction. Special attention shall be paid towards line and level of internal and external plastering, exposed smooth surface of RCC members by providing fresh shuttering plates, rubberized linings to all the shuttering joints, accurate joinery work in wooden doors and windows, thinnest joints in stone/ tiling / cladding work, non-hollowness in floor and dado tiles work, protection from scratches over flooring by impounding layer of plaster of Paris, water tight pipe linings, absence of hollow vertical joints in brick masonry, proper compaction of filled up earth etc. to achieve an facility of international standards.
- v. The Contractor shall submit immediately after the issuance of letter of acceptance within 20 days, Minimum Quality Assurance Plan (a detailed and complete method statement for the execution, testing and Quality Assurance Plan/procedures for basic materials and such items, to be followed during the execution of the work), for approval of the Engineer-in-Charge. All the materials to be used in the work, to give the finished work complete in all respects, shall comply with the requirements of the specifications and shall pass all the tests required as per specifications as applicable or such specifications / standards as directed by the Engineer-in-Charge. Further, **a recovery of Rs. 1000/- shall be made on per day basis in case of delay in submission of the Minimum Quality Assurance Plan.**
- vi. All materials and fittings brought by the contractor to the site for use shall conform to the samples approved by the Engineer-in-charge which shall be preserved till the completion of the work. If a particular brand of material is specified in the particular specification, the same shall be used after getting the same approved from Engineer-In-Charge. Wherever brand / quality of materials are not specified in the particular specifications; the contractor shall submit the sample as per list of preferred make given in tender documents. For all other items, materials and fittings of ISI Marked shall be used with the approval of Engineer-In-Charge. Wherever ISI Marked material / fittings are not available, the contractor shall submit samples of materials / fittings manufactured by firms of repute conforming to relevant specifications or IS codes and use the same only after getting the approval of Engineer-In-Charge.
- vii. The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the item description/particular specifications for the work. The equivalent brand other than brand / make mentioned in particular specification for any item, shall be permitted to be used in the work, only when the specified make is not available subject to documentary evidence produced by the contractor for non-availability of the brand specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, the decision of Engineer-in-Charge as regards 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 Govt. stores or otherwise shall be got checked by the Engineer-in-Charge or his authorized supervisory staff on receipt of the same at site

before use.

- 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 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.
- xviii. 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.

- xix. 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.**
- xx. 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.

1.42 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.

1.43 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 immediate next 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.

1.44 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 20 digital photographs showing all the parts of construction site along with at least 10 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 immediate next R/A Bill of the Contractor.

1.45 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.

1.46 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.

1.47 INSPECTION OF WORK

- (i) 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.
 - a) 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.

- b) 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.
 - i) 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.
 - ii) Keep entrance and surrounding area clean.
 - iii) Display layout plan, key plan, building drawings including plans, elevations and sections.
 - iv) Upto date displays of progress of work in form of Bar chart, CPM and PERT etc.
 - v) Keep details of quantities executed, balance quantities to be executed, deviations, possible Extra item, etc.
 - vi) Keep plastic / cloth mounted one sets of building drawings.
 - vii) Set of Helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.

1.48 PRODUCT DELIVERY, STORAGE AND HANDLING OF CHEMICALS

- (i) The contractor shall construct storage space for Chemicals materials 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 at the request from the 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) All incidental charges of any kind including cartage, storage and wastage and safe custody of material/chemical etc. shall be borne by the contractor and no claim, whatsoever, shall be entertained on this account.
- (xiv) 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. Testing charges shall be borne by the contractor.

1.49 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.

- 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 Agency 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.

1.50 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.

1.51 PRESERVE AND PROTECT LANDSCAPE DURING CONSTRUCTION

- (a) 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.
- (b) The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.
- (c) Contractor should limit all construction activity within the specified area as per the

Construction Management Plan (CMP) approved by Engineer in Charge.

- (d) 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.
- (e) The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.

1.52 PREPARATION OF SAMPLE (MOCK UP)

The contractor shall prepare one sample/Mock-Up for typical units (e.g. Room / Lobby/ Corridor of minimum 10m length/ complete male, female, Handicap toilet unit, external development work etc.). 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, tiles in dado, flooring in platforms & staircase, water supply & sanitary fittings and any other item as per direction of Engineer-in-charge. The contractor shall proceed with further finishing works only after getting the samples of these items approved in writing from Engineer-in-charge.

1.53 SPECIALIZED AGENCIES

- (i) The contractor shall engage specialized agency for carrying out specialized item such as Structural Glazing, Structural Steel Work, Expansion Joint Works, Aluminum work, Waterproofing and insulation work, Doors & Windows Work, Water supply & Plumbing work, Fire check Doors, False Ceiling work, Bamboo works, Furniture Work, 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.

- (ii) 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 item/work. 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 agreement. 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.

- (iii) The main 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 main 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 agreement 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.
- (iv) 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.
- (v) Approval 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.
- (vi) It shall be the responsibility of main contractor to sort out any dispute / litigation with the Specialized Agencies without any time & cost overrun to the Department. The main 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.

1.54 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.

1.55 OTHER CONDITIONS W.R.T EXECUTION OF WORK

- a. 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.
- b. 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.

- c. 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.
- d. 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.
- e. Ready mix plaster shall be executed using pneumatic spray machine of reputed make.
- f. 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.
- g. The Aluminium door-windows-framework, lamination and Lipping on flush doors shall be factory made.
- h. 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.
- i. 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.
- j. Wall mounted door stoppers shall be provided to protect the wall where the door handle would run into it.
- k. 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. Nothing shall be paid extra on this account.
- l. Fall nets and scaffolding nets for protection from debris / dusts and noise etc. are to be provided during the construction period. Nothing extra shall be paid on this account.
- m. Wherever M.S. grill provided in window, weight of grill in each window should not be less than 12 kg/sqm.
- n. 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.
- o. Wherever the doors are required to be fixed to AAC block masonry, the frame shall be fixed in RCC band or concrete block masonry.
- p. 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.
- q. If details for any area/space w.r.t. finishing schedule, door & window schedule, sanitary fitting schedule, hardware schedule etc. are not mentioned in the particular specification/schedules/ drawings, the details of area/space having similar functionality shall be followed.

1.56 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.

1.57 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

2.0 SPECIAL CONDITIONS FOR GREEN BUILDING

The building shall confirm to Green Plus rating as per CPWD GHAR 2021 & 4-Star rating as per GRIHA.

2.1 Construction Stage-

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

a) Construction Wastes Disposal

- i. The pre-identified dump locations will be a part of solid waste management plan to be prepared by the Contractor in consultation with Engineer -in-charge.
- ii. Contractor shall get approved the location of disposal site prior to commencement of the excavation on any section of the project location.
- iii. Contractor shall ensure that any spoils of material will not be disposed off in any municipality solid waste collection bins.

2.2 Procurement of Construction Materials

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

2.3 Water Pollution

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

2.4 Air and Noise Pollution

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

2.5 Personal Safety, Hygiene Measures for Labour

- i) Contractor may provide the following items for safety of workers employed by contractor and associate agencies:
 - a. Protective footwear and gloves to all workers employed for the work on mixing, cement, lime mortars, concrete etc. and works of water pipeline/sewer line.
 - b. Welder's protective eye-shields to workers who are engaged in welding works.
 - c. Safety helmet and Safety harness/ belt.
 - d. Provide adequate sanitation/safety facilities for construction workers to ensure the health and safety of the workers during construction, with effective provisions for the basic facilities such as sanitation, drinking water and safety equipment's or machinery.
- ii) All the workers should be wearing helmet and shoes all the time on site.
- iii) Masks and gloves should be worn whenever and wherever required.
- iv) Adequate drinking water facility should be provided at site, adequate number of decentralized latrines and urinals to be provided for construction workers.
- v) If allowed and full-time workers are residing on site, then they should be provided with clean and adequate temporary hutment.
- vi) First aid facility should also be provided.
- vii) Overhead lifting of heavy materials should be avoided. Barrow wheel and hand-lift boxes should be used to transport materials onsite.
- viii) Tobacco and cigarette smoking should be prohibited onsite.

- ix) All dangerous parts of machinery are well guarded and all precautions for working on machinery are taken.
- x) Maintain hoists and lifts, lifting machines, chains, ropes and other lifting tackles in good condition. Provide safety net of adequate strength to arrest falling material down below.
- xi) Use of durable and reusable formwork systems to replace timber formwork and ensure that formwork is properly maintained.
- xii) Ensure that walking surfaces or boards at height are of sound construction and are provided with safety rails and belts.
- xiii) Provide measure to prevent fire. Fire extinguisher and buckets of sand may be provided in fire-prone area.
- xiv) Provide sufficient and suitable light for working during night.
- xv) Ensure that the construction firm/division/company should have sound safety policies.
- xvi) Comply with the safety procedure, norms and guidelines (as applicable) as outlined in 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. Limit amount of fine particles (smaller than 0.075mm) to 10 -20%. Limit vehicular speed on site 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/GHAR**.
- 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/GHAR guidelines. **Contractor will be penalized @ 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 sites, either all waste is reused within the site or sent for

recycling. Track the waste sent off the site to its final destination. 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. Contractor will be penalized @ Rs. 500 per day of delay on non-submission beyond due date which 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/GHAR).

2.29 The 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.

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

- (i) The contractor shall not store/dump construction material or debris on metalled road.
- (ii) The contractor shall get prior approval from Engineer-in-charge for the area where the construction material or debris can be stored beyond the metalled road. This area shall not cause any obstruction to the free flow of traffic/inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.
- (iii) The contractor shall take appropriate protection measures like raising wind breakers of appropriate height on all sides of the plot /area using CGI sheets or plastic and /or other similar material to ensure that no construction material dust fly outside the plot area.
- (iv) The contractor shall ensure that all the trucks or vehicles of any kind which are used for construction purposes/or are carrying construction material like cement, sand and other allied material are fully covered. The contractor shall take every necessary precaution that the vehicles are properly cleaned and dust free to

ensure that enroute their destination, the dust, sand or any other particles are not released in air/contaminate air.

- (v) The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.
- (vi) The contractor shall provide all medical help, investigation and treatment to the workers involved in the construction.
- (vii) The contractor shall ensure that C&D waste is transported to the C&D Waste site only and due record shall be maintained by the contractor.
- (viii) The contractor shall compulsorily use of wet jet in grinding and stone cutting.
- (ix) The contractor shall comply all the preventive and protective environmental steps as stated in the MoEF 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.
- (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.

2.31 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.

2.32 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.

2.33 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.

- 2.34** 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.
- 2.35** 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.
- 2.36** Wherever required, Contractor shall meet and carry out all activities on site, supplement information, and submittals.

2.37 CONSTRUCTION WASTE

- 2.37.1 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.
- 2.37.2 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.
- 2.37.3 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.
- 2.37.4 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.
- 2.37.5 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.
- 2.37.6 The storage of material shall be as per standard good practices as specified in Part 7, Section 2 in Storage, Stacking and Handling practices, NBC 2016 and shall be to the satisfaction of the Engineer in Charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. There should be a proper planning of the layout for stacking and storage of different materials, components and equipment's with proper access and proper

manoeuvrability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipment's at different stages of construction shall be considered.

2.37.7 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.

2.37.8 The Contractor shall remove from site all rubbish and debris generated by the Works and keep Works clean and tidy throughout the Contract Period. All the serviceable and non-serviceable (malba) material shall be segregated and stored separately. The malba obtained during construction shall be collected in well-formed heaps at properly selected places, keeping in a view safe condition for workmen in the area. Materials which are likely to cause dust nuisance or undue environmental pollution in any other way, shall be removed from the site at the earliest and till then they shall be suitable covered. Glass & steel should be dumped or buried separately to prevent injury. The work of removal of debris should be carried out during day. In case of poor visibility artificial light may be provided.

2.38 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 GHAR/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 except for RCC work and Design Mix concrete. However, use of PPC cement for RCC work and design mix concrete may be allowed in case the concrete is produce in batch mix plant installed at site with no cost adjustment in the contract amount. Agency shall procure OPC conforming to IS: 8112 / 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 2000 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 good for construction drawings.
- (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 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 to 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 as per the soil investigation report and structural design, if any recommended shall be carried out.
- (vi) Appropriate foundation system Including isolated footing/combined footing/ Raft/ pile and possible combination of these as per the recommendations of the soil investigation report containing borehole data, seasonal variation of subsoil water table, and as per structural design conforming to relevant Indian Standard Codes shall be provided.
- (vii) Anti-termite treatment as per the necessity of ground shall be carried out as per relevant Indian standard codes/CPWD specifications.
- (viii) Structural Grade slab shall be designed & provided accordingly.
- (ix) Damp proof course shall be provided wherever required as per CPWD specification.
- (x) Drainage and Plinth protection along the perimeter of the buildings shall be provided as per CPWD specifications or as per specific functional requirement.
- (xi) All the excavated earth/soil shall be levelled & neatly dressed. Sand filling of minimum 150mm thickness, with river sand, shall be done under floor.

3.0 Superstructure:

- (i) Expansion joints/seismic separation joints shall be provided as per the approved structural drawing and treated/covered as per CPWD specifications / manufacturer specifications.
- (ii) The structural steel shall be made at least 2 hrs fire resistant by using vermiculite coating as per manufacturer's specifications and by applicators approved 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 drawings and site condition.

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

- 6.1** Design mix is to 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 shall install fully automatic Batch Mix Plant at site or in nearby area wherever permissible. 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. Under special circumstances, Contractor will 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 Modified Cement Mortar /Epoxy Mortar, etc. 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 shall be used for splicing of reinforcement bars.
- 8.4 Reinforcement TMT bars, to be used for the work, shall be corrosion resistance TMT bars of grade Fe 500D or more.
- 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 will be followed.

- 9.1 Adequate (of 300 mm width either side of joint) Chicken mesh 85gsm or fibre mesh of good quality to be provided in plaster at the junction of Masonry and RCC or CC Member/band.
- 9.2 For masonry work above plinth level, RCC band at sill level and lintel level shall be provided. This thickness of the band shall preferably be 100 mm or as approved by the Engineer-in-Charge.
- 9.3 All opening on masonry wall shall be provided with RCC lintels, RCC bands/ lintel over top of parapet wall at corridors, balconies etc.
- 9.4 Fly ash brick masonry of class designation 7.5, with cement mortar 1:6 (1 cement: 6 coarse sand), shall be done in wet areas. FPS bricks of class designation 7.5 in cement mortar 1:6 (1 Cement: 6 Coarse Sand) shall be used in brick work in foundation upto plinth level and other masonry work shown in drawings. All the walls of corridors shall be of full brick thick wall or with 200mm thick AAC blocks.
- 9.5 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 (of make pidilite, ardex endura, weber) mortar shall be provided @ 30 kg per cum. AAC Block confirming the IS Code – 2185 (Part-3) 1984 (Reaffirmed 2005) shall be used.
 - 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/m ³)	Compressive Strength (N/mm ²)		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 min. compressive strength being the average of twelve block units shall be as prescribed in above table, when tested accordance with accordance with IS 6441 (Part-5) -1972.
- h) **Thermal Conductivity** – The thermal conductivity shall not exceed the values specified in above table when tested in accordance with IS 3346 -1980.
- i) **Drying Shrinkage** – The drying shrinkage shall be not more than 0 .05% for grade –1 block and 0.10% for grade-2 block when tested in accordance with IS 6441 (Part-2) -1972.
- j) **Number of tests:** A sample of 24 blocks shall be selected at random. All the 24 Blocks shall be checked for dimensions and inspected for visual defects. Out of the 24 blocks, 12 blocks shall be subjected to the test for compressive strength, 3 blocks to the test for density, 3 blocks to the test for thermal conductivity and 3 blocks to the test for drying shrinkage. The remaining 3 blocks shall be reserved for re-test for drying shrinkage if a need arises.
- k) The samples of AAC blocks (each sample consisting of 6 specimen) shall be chosen randomly from the lot procured and tested for various parameters specified as above. One samples shall be tested for every **200 cum** or part thereof. However, minimum one sample shall be tested from each lot received at site if the quantity procured in the lot is less than 200 cum. If required, Engineer-in-Charge or his authorized representative shall inspect the factory during production of the material for this work and also collect samples (of materials used for making AAC blocks and precast AAC blocks) from the factory itself. The contractor shall consider this contingency also while placing the order with one of the approved firms. Nothing extra shall be payable on this account.
- l) **Criteria for conformity:** The number of blocks with dimensions outside the tolerance limit and or with visual defects, among those inspected, shall not be more than two. For density, the mean value shall be within the range as specified in above Table. For compressive strength, the mean value, say X shall be determined. The test results shall be grouped into groups of 4, individual values of ranges shall be determined, the average range a calculated from these values and shall satisfy the following condition: $X - 0.6 R > \text{minimum value specified in above Table}$. For thermal conductivity, the mean value shall be equal to or less than the value specified in above Table. For drying shrinkage, all the test specimens shall satisfy the requirements of the test. If one or more specimens fail to satisfy the requirements, the remaining 3 blocks shall be subjected to these tests. All these blocks shall satisfy the requirements.
- m) **Manufacturer's Certificate:** The manufacturer shall satisfy himself that the masonry units conform to the requirements of these specification 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 these 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** Roller Blinds shall be provided of approved make and approved shades having 0.40mm thickness in 100% polyster material with 100% Degree of opacity & having Weight of 375gm/Sqm to 450gm/Sqm in all sizes and for all Heights complete as per the direction of Engineer in Charge.
- 10.7** 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 will be followed. Fire Check doors shall be provided in buildings wherever necessary and required as per National Building Code 2016, as per door & window schedule and as per architectural drawing. Unless otherwise specified elsewhere in tender document, all fire 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, which 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. Nothing extra shall be paid on this account.
- 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/brands 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 hardwares. 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 damage units or members. Materials found acceptable on inspection shall be repacked in crates and stored safely.
- 11.7** Just prior to installation, the doors shall be uncartered and stacked on edge on level bars and supported evenly. The frame shall be fixed into position true to line and level using adequate number of fasteners of approved size and manufacture and in an approved manner. The holes in concrete /masonry member for housing anchor bolts shall be drilled with an electric drilling

machine only.

- 11.8** Stainless steel ball bearing hinges, panic bars, door trims, fire rated hydraulic door closers, handles, tower bolts, lock and other fittings shall be provided as per requirement and shall be got approved from Engineer-in-Charge. All Hardware's should have a minimum 02 Years of manufacturer warrantee from the date of supply. Hardware should be "CE" / "UL" certified with required fire ratings and relevant documents to this effect shall be produced at the time of approval of samples.
- 11.9** The design of fire check/rated doors and material to be used in their construction have to be such that the doors shall be capable of providing an effective barrier of desired rating.

12.0 ALUMINIUM WORK:

- (a) Before taking up any procurement/construction activity, shop drawings (for fixing of all kind of Aluminum Works, showing all hardware) shall be prepared and submitted for obtaining approval from Engineer-in-Charge.
- (b) Minimum weight of aluminum section for door, windows and ventilators shall be as per relevant standards.
- (c) Kiln seasoned hard wood shall be filled inside door frames on hinged side and top of frames wherever hydraulic door closers are to be provided.
- (d) Frames shall be fixed with dash fastener of minimum size 10 x 100 mm as per approved shop drawings.
- (e) Gap between aluminum frame / uPVC window and adjacent RCC / masonry work shall be filled by providing weather silicon sealant over backer rod of approved quality as per direction of Engineer-in-Charge.
- (f) The material for the work shall be procured from the approved manufacturer as per preferred make list for materials in this contract agreement. The Contractor shall procure and submit samples of various materials to be used in the work for the approval of Engineer-in-Charge and no work shall commence before such samples are approved. Samples of un-anodized as well as polyester powder coated aluminum sections, microwave cured EPDM gaskets, glass, stainless steel screws, anchor fasteners, hardware and any other material or components requiring approval of samples, in opinion of Engineer-in-Charge, shall be submitted for the approval as mentioned above. The above samples shall be retained as standards of materials and workmanship.
- (g) Aluminum sections to be used for various works shall be appropriate to meet technical, structural, functional and aesthetic considerations. Aluminum work for doors, windows, ventilators and partitions etc. shall be with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285 as applicable, 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. Aluminum sections shall be smooth, rust free, straight, mitered and jointed mechanically wherever required including cleat angle, Aluminum snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. Polyester powder coated aluminum (minimum thickness of polyester powder coating 50 micron) section shall be used. Hinges/ pivots, provision for fixing of fittings, EPDM

rubber / neoprene gasket shall be provided wherever required. The polyester powder coating shall be carried out in a factory / workshop approved by engineer-in-charge.

- (h) Glass in Windows/Ventilators: Glazing in windows, ventilators etc. shall be Double glazed hermetically sealed with 6 mm thick toughened glass both sides, having 12 mm air gap, including providing EPDM gasket, perforated aluminum spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete. The DGU unit shall have visible Light transmittance (VLT) of minimum 65%, Light reflection internal - less than or equal to 23%, Light reflection external - less than or equal to 23 %, SHGC- less than or equal to 0.6 and U value - less than or equal to 2.5 W/m² degree K.
- (i) Fabrication: The factory for fabrication and coating of windows/doors/frameworks shall be got approved from Engineer-charge.
- (j) 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.
- (k) 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.
- (l) 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.
- (m) 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.

(n) 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.

(o) PROTECTIONS AND CLEANING

- a) 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
- b) 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 contractor shall procure additional quantity of the stone and tiles to cover such contingencies. The stone slabs shall not be waxed or touched up with dyes / colours.
- 13.8** The following tolerances shall be allowed in the dimension of granite stone slab:
- a) Length \pm 1mm
 - b) Width \pm 1mm
 - c) Thickness - 1mm
 - d) Angularity at corners \pm 0.25%
- The stone (slab and tiles) not meeting the above tolerance limits shall be rejected and not permitted to be used in the work. Nothing extra shall be payable on this account.
- 13.9** Stones slabs shall have uniform thicknesses within the tolerance limits and linear items like treads, sills and jambs, coping, risers, urinal partitions, kitchen / 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. The protective layer shall be maintained throughout the execution of works and removed just before handing over of the site.
- 13.15** One piece Granite stone for treads / risers in staircase shall be used including rounding of nose.
- 13.16** 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.
- 13.17** 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.
- 13.18** 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.
- 13.19** 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.
- 13.20** 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.

13.21 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.

13.22 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 1 mm thick cement based wall putty, 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.

15.5 Water repellent coat: 2 to 3 coats of Silicone based water repellent, anti-algal paint of approved shade, complete as per manufacturer's specifications, shall be applied on stone cladding.

16.0 STAINLESS STEEL WORK:

Stainless steel of grade SS 316 grade/ Aluminum/Mild steel/GI railings and grills shall be provided as per architectural design in Balconies, staircases, steps, Ramps corridors and in other common circulation area as indicated in drawings and in accordance with provisions of NBC 2016.

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

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

Surface finish of all the stainless-steel materials will be in 240 grit satin finish / matt finish. All stainless-steel material will have to be coated by a solution of Inox to avoid finger in

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

17.0 WATER PROOFING & INSULATION WORK:

For waterproofing of works below plinth/ground/road level complete envelope/box shall be ensured with Pre-applied HDPE waterproofing membrane post applied SBS based self-adhesive waterproofing membrane.

- 17.1** Basically, all the RCC works shall be given waterproofing treatment by adding the cementitious integral crystalline admixture of make KRYTONE, PENETRON, XYPEX @ 0.80% (minimum) to the weight of cement content per cubic meter of concrete) or higher as recommended by the manufacturer's specification in reinforced cement concrete at site of work. The product performance shall carry guarantee for 10 years against any leakage.

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. Irrespective of whether shown in drawings or mentioned in tender document, all 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 NBC 2016 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 NBC 2016 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 to 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 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. The laying of pipes shall be laid with all norms.
- 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 be not 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. Water closets with concealed dual flushing cistern shall be provided. Wash basin shall be over counter / wall hung as shown in drawings. 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.

- o) Piping and drainage works shall be tested as specified under the relevant clauses of the specifications. Tests shall be performed in presence of the Engineer in charge. Entire drainage system shall be tested for water tightness and smoke tightness during and after completion of the installation. No portion of the system shall remain untested. Contractor must have adequate number of expandable rubber bellow plugs, manometers, smoke testing machines, pipe and fitting work test benches and any other equipment necessary and required to conduct the tests. All materials and equipment found defective shall be replaced at contractor cost and whole work shall be tested to meet the requirements of the specifications. Contractor shall perform all such tests as may be necessary and required by the local authorities to meet municipal or other bye-laws in force. All water supply system shall be tested to hydrostatic pressure test of at least one and a half (1.5) times the maximum pressure but not less than 10Kg/Sq.cm for a period of not less than 8 hours. All leaks and defects in joints revealed during the testing shall be rectified and got approved at site by retest. Piping required subsequent to the above pressure test shall be retested in the same manner. System may be tested in sections and such sections shall be entirely retested on completion. In addition to the sectional testing carried out during the construction, contractor shall test the entire installation after connections to the overhead tanks or pumping system or mains. He shall rectify all leakages and shall replace all defective materials in the system. Any damage done due to carelessness, open or burst pipes or failure of fittings, to the building, furniture and fixtures shall be made good by the contractor during the defect liability period without any cost. After commissioning of the water supply system, contractor shall test each valve by closing and opening it a number of times to observe if it is working efficiently. Valves which do not effectively operate shall be replaced by new ones at no extra cost and the same shall be tested as above.
- p) Fittings shall conform to the same Indian Standard as for pipes. Pipes and fittings must be of matching IS Specification. Interchange of pipes of one standard with fittings on the other standard will not be permitted. Fittings shall be of the required degree of curvature with or without access door. Access door shall be made up with 3 mm thick insertion rubber washer and white lead. The bolts shall be lubricated with grease or white lead for easy removal later. The fixing shall be air and water tight. All vertical pipes shall be fixed by Galvanised clamps and galvanised angle brackets. Branch pipes shall be connected to the stack at the same angle as that of the fittings. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl (terminal guard). Horizontal pipes running along ceiling shall be fixed on galvanised structural adjustable clamps of special design shown on the drawings or as

directed by engineer-in-charge. Horizontal pipes shall be laid to uniform slope and the clamps adjusted to the proper levels so that the pipes fully rest on them.

- q) All pipe clamps, supports and hangers shall be galvanised. Factory made pre-fabricated clamps shall be preferred. Contractor may fabricate the clamps of special nature and galvanise them after fabrication but before installation. All nuts, bolts, washers and other fasteners shall be factory galvanised. Clamps shall be of approved designs and fabricated from GI flats (which shall be galvanised after fabrication) of thickness and sizes as per drawings or contractor's shop drawings. Clamps shall be fixed in accordance to manufacturer's details/shop drawings to be submitted by the contractors. When required to be fixed on RCC columns, walls or beam they shall be fixed with approved type of galvanised expansion anchor fasteners (Dash fasteners) of approved design and size according to load. Structural clamps e.g. trapeze or cluster hangers shall be fabricated by electro-welding from M.S. Structural members e.g. rods, angles, channels flats as per Contractors shop drawing shall be galvanised after fabrication. All nuts, bolts and washers shall be galvanised. Galvanised slotted angle/channel supports on walls shall be provided wherever shown on drawings. Angles/channels shall be of sizes shown on drawings or specified in scope of work. Angles/channels shall be fixed to brick walls with bolts embedded in cement concrete blocks and to RCC walls with anchor fasteners mentioned above. The spacing of support bolts on support members fixed horizontally shall not exceed 1 m.

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, as per approved drawings.

- 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 NBC 2016 / CPWD specifications.
- e) Gully traps: Gully traps shall be fixed in cement concrete mix and a brick masonry chamber 30x30 cms inside in cement mortar 1:5 with 15x15 cms grating inside and 30x30 cms C.I sealed cover and frame weighing not less than 7.0 kg (approx.) to be constructed as per detailed drawing.

22.0 Façade Work:

This specification covers the general requirements of external facade work (e.g. Structural Glazing, Curtain Wall, GRC Panel, ACP, Aluminum composite/Puff/sandwich Panels, Exterior Grade HPL etc.) including engineering design involving structural stability of system as a whole e.g. supply, fabrication, installation, testing, ensuring water tightness and maintenance etc. Work under this section shall be performed by specialized agency, who is regularly engaged in the engineering, fabrication, finishing and installation of façade work including glazing and sealing of glass etc. and having experience in similar works. Only after written approval of engineer in charge, the contractor will engage such specialized agency for this work.

22.1 SCOPE OF WORK:

- a) The scope of work includes all labour, material, equipment and services as required for the complete design, engineering, testing, and fabrication, assembly, delivery, anchorage, installation and water tightness of the façade system. The scope of work also includes complete design, engineering, testing, fabrication, assembly, delivery, anchorage and installation of a suitable gondola/jib system for cleaning of the vertical glass/Stone/GRC facade.
- b) The contract documents define only the design intent and general performance requirements. The contractor is fully responsible for detailed design, structural calculations, shop drawings, procurement of materials, fabrication, installation, warranties, certifications and related documentation. The entire work shall be carried out strictly in accordance with the true intent and meaning of the specification and drawings taken together regardless of whether the same may or may not be shown particularly on the drawings or described in the specification provided that the same can be reasonably inferred.
- c) Only suggestive sizes and details are proposed by the Engineer-in-charge that has a visual impact on facade. Contractor's fabrication / shop drawing will seek these suggestions and design the final construction details. The complete design of façade system will be submitted by contractor to engineer- in-charge for approval.
- d) The facade shall be designed, fabricated at works, supplied, delivered and installed in accordance with the shop drawings and samples of materials approved by the Engineer-in-charge and shall be constructed to meet the performance requirements and standards.
- e) In general, the façade system should be designed to suit the aesthetics and performance requirements, taking into consideration the necessary factors to suit fabrication and the site conditions for erection.
- f) The contractor shall strictly follow, at all stages of work, the stipulations contained in the Indian standard safety code and the provisions of the safety rules for ensuring safety of men and material. The successful bidder shall submit a safety plan for approval of the Employer. On approval of the same, the same shall be followed during the currency of the contract.
- g) The contractor must comply with all applicable local-building regulations and all the safety guidelines particularly specified for facade work as per relevant I.S codes.
- h) Shop and field materials and workmanship shall be subject to inspection of the Engineer-

in-charge and his authorized representative at all time. Such inspections do not relieve the contractor from obligations to provide materials conforming to all requirements of the contract documents and industry standards for material quality.

- i) All approvals, instructions, permission, checking, review etc. whatsoever by the Engineer-in-charge shall not relieve the contractor of his responsibility and obligation regarding adequacy, correctness, completeness, safety, strength, quality, workmanship etc. of the facade system.
- j) Testing will be done as per nomenclature of the DSR item of typical DGU Panel of approved size in factory and in field through an approved testing agency.

22.2 Façade System Description

- a) The contractor shall devise a suitable framing system for vertical/roof façade application keeping in view the performance characteristics and aesthetics requirements.
- b) The vertical/roof structural glazing system shall be fully unitized / Toggle based curtain wall or Semi-unitised and shall be designed to suit sealed insulated glass units (hereafter referred to as "IG unit"). Aesthetically the design of the glazing system shall provide a filtering envelope to the building/structure and provide a uniform appearance. The glazing system shall have flush glazed exterior joints both horizontal and vertical. The structural glazing system shall be designed to receive fixed glazing as well as structurally glazed openable vents with protection of the glass edges. The contractor shall take adequate measures to ensure the thermal performance of the glazing system under the increased solar radiation prevalent in the region. No onsite sealant application will be permitted except for weather sealant in case of unitized system. The system shall comprise of factory prefabricated glazed vision and spandrel panels. The system should preferably permit re-glazing of vision panels from outside the building. The contractor should choose an approved system also keeping in view the various requirements arising during future maintenance during the life span of the glazing system.
- c) The structural glazing system shall be designed to allow for three-dimensional adjustments due to dead load, live load, wind load, seismic load and thermal movement. The framing system must be designed to provide adequate support for the IG units to prevent transfer of loads to the glazing below and to provide uniform support to both lites of the IG unit. Intermediate mullions should be of same size as that of outer mullions.
- d) The structural aspects of the structural glazing system must be carefully integrated with the glazing rabbet and drainage details to ensure proper performance. The structural glazing system shall be designed on the rain screen principle with provision for pressure equalization.
- e) The structural silicon sealant to be used in this structural glazing system shall be of such quality & designed to transfer wind, seismic, live and dead loads from the glass to the framed structure of the structural glazing.
- f) The design shall incorporate floor-to-floor noise isolators, fire and smoke stops between the floor slabs and sill flashing etc. as per the NBC of India and also of the best international practices.
- g) The façade system shall have spandrel panel (over solid surfaces e.g. columns, masonry

wall etc.) of Aluminium composite panel or toughened glass backed by shadow box (made of Al assembly).

22.3 PERFORMANCE REQUIREMENTS FOR FAÇADE SYSTEM

(i) Façade System design parameters:

- a. The façade system and its components shall be designed to withstand dead loads and live loads caused by positive and negative wind loads acting normal to the plane of the façade system. Design wind loads shall be 1.74 Kpa design and proof load of 2.61 KPa. The contractor is required to submit the design calculation and weight of aluminium per meter. The system shall also be designed to withstand seismic forces as calculated in accordance with IS: 1893 (latest revision) under seismic zone classification applicable to the site.
- b. Apart from the above, the glass and the glazing system should also be designed to withstand a concentrated load of 100kg applied at any location so as to produce the maximum stresses in the glazing components. This load is envisaged to- be encountered during cleaning of the glass facade.
- c. The stress on structural sealant shall not exceed 20 psi under any circumstances. Thermal breaks shall be considered unable to transfer shear stress for composite action of flexural members. Assume elements joined by thermal breaks to act separately.

(ii) Deflection:

- a. The deflection of any structural member in the plane normal to the glass surface when subjected to the specified loads shall not exceed $L/175$ of its clear span and shall be fully recoverable on withdrawal of the specified loads. Deflection of any framing member shall not exceed 19mm within any glass panel.
- b. Parallel to façade plane, deflection of a framing member when carrying full design load shall not exceed an amount reducing the glazing unit bite below 75% of the design dimension. It shall also not reduce the edge clearance to less than 3mm nor shall it damage or impair the function of any joint seals.
- c. The deflection of the horizontal member due to the weight of the glass shall be limited to 3mm or 25% of the design edge clearance of the glass or panel below whichever is less.
- d. Twisting or rotation of the horizontal member under dead load of glass shall be limited to 1° by calculation from the horizontal plane.
- e. There shall be no in plane raking.
- f. In case either lite of the IG unit develops crack, the remaining lite should be capable of supporting the entire load. The overall strength and deflection behaviour shall be calculated on the basis of the weakest lite.

(iii) System assembly:

The system assembly should accommodate the following without damage to the system, components or deterioration of seals.

- Movement within the system
- Movement between system and perimeter framing components.
- Dynamic loading and release of loads
- Deflection of structural support framing
- Tolerance of supporting components
- Shortening of building concrete structural columns
- Creep of concrete structural members
- Inter story drift
- A mid span slab edge deflection: of 25mm
- Accommodate building construction tolerance of +30mm. These tolerances are not cumulative.

(iv) **Water Tightness:**

Water penetration shall be defined as the appearance of uncontrolled water on inside face of any part of the structural glazing. No water leakage will be permitted when tested in accordance with ASTM E331. The test shall be carried out for duration of 15 minutes with a test pressure difference of 20% of design pressure with a minimum differential of 137 N / mm² and a maximum of 575 N / mm². The minimum uniform water flow rate of 3.4L/rn²/min.

22.4 LABORATORY TESTS FOR WATER INFILTRATION:

(i) Tests:

- a) TESTS FOR WATER INFILTRATION: Static Pressure Test: No water infiltration shall occur when the mock-up is tested accordance with ASTM E-331 with the static pressure differential and the total time as specified.
- b) Dynamic Pressure Test: No water infiltration shall occur when the mock-up is tested in accordance with AAMA 501.1 with the dynamic pressure differential and the total time as specified.

(ii) FILED MOCK – UP:

In the presence of representatives of Owner, Engineer-in-charge, Contractor, Installer and Manufacturers, the Testing Agency shall conduct field tests on each of the installed Mock-Ups in accordance with methods described in AAMA 501.2 "Filed Check of Metal Curtain Walls for Water Leakage" using the loads specified in "performance Criteria". Notice for testing to allow for witnessing test shall be given several weeks before. Approximately 50% of each Field Mock-Up shall be field water tested. All interior finishes including trims should be left off to allow for clear viewing.

(iii) REMEDIAL WORK:

If the Field test of any Mock-Up reveals leakage, points of entry and paths of flow of water shall be identified, analyzed, and necessary remedial work shall be established, subject to Engineer-in-charge's Employer's review and comment. Repairs and/or modifications shall be made to the entire mock-up based on these findings and, after adequate curing of all sealants, re-test to successful conclusion. Re-testing after remedial work shall be from 50 percent to 80 percent of the mock-up at the

Engineer-in-charge's recommendation. The re-test area designated does not necessarily have to be exactly the same as the original test area of the mock-up.

22.5 METHOD STATEMENT FOR HOSE TESTING (ON SHORE) AT SITE: -

- (i) **STANDARD:** - AAMA 501.2 — 94 Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage.
- (ii) **TEST AREA:** - Area (s) to be tested will be selected by the Engineer-in-charge accordance with the standard. The total area will be not more than that can be tested in one day. Testing shall be done at least one area of 100 square feet, in accordance with the test standard, or more, depending on the time, and availability of suitable access to the exterior. In case of failure the prescribed procedure for a reasonable time but not more than that can be completed on the same day shall be followed. The test will be supervised via two-way radio from the inside.
- (iii) **EQUIPMENT:** - Testing equipments generally consists of the following and any other equipments as required for carrying out the test
 - The 'Monarch' nozzle with pressure gauge and valve as prescribed by AAMA and recommended by CWCT.
 - Two-way headset radio for communication between engineers and the people in the cradle.
- (iv) **Other Requirements:**
 - a. (Optional) washing of the area as recommended in Paragraph 7.4 of the CWCT Standard.
 - b. Visual checking of test area for snags, visible defects etc.
 - c. A cradle or scaffolding on the exterior at the locations (s) of the test specimen (s) with an operator, a person to stabilise the cradle, a person to hold and point the nozzle, technical person to communicate between the people on the exterior and test engineer.
 - d. Clean water in a minimum 1/2" supply hose with approximately 4 bar pressure. Note that the pressure given for the test is with the water flowing, much higher actual pressure is necessary. Water pressure drops 1 bar for every 10m rise in height.
 - e. Drying of test area and application and removal of tape if necessary to locate leaks.

(v) **TEST CRITERIA:-**

Water will be sprayed at a pressure of 30 —35 psi (2.07-2.41 Bar) in accordance with the test standard. The flow rate will not be monitored. The nozzle will be held 30 cm. from the wall spraying 1.5m lengths back and forth along each joint, successively, for five minutes each, working from the bottom up. Joints are interfaces between materials, and where these are less than 120mm apart are to be considered one joint.

(vi) **TEST PROCEDURE**

- a) The initial area shall be the width of the cradle. The lowest horizontal joint will be

wetted first, covering each 1.5m length in five minutes.

- b) Next the cradle will be positioned so that the first 1.5m above the bottom horizontal joint can be reached and each vertical will be sprayed in turn over a period of 5 minutes.
- c) The cradle will then be raised to test the next 1.5m and then the next horizontal and so on.

(vii) **LEAKAGE:**

If there is any leakage the test will be stopped and the procedure described in the Standard will be followed up to the time allowed. A compliance report suggesting any modification / corrective steps to be taken if any leakage was observed.

22.6 Air Infiltration: When tested in accordance with ASTM E283, air infiltration shall not exceed 0.03 l/s/sqm. Of wall area, measured at a reference differential pressure across assembly of 200 Pa.

22.7 System internal drainage: Drain water entering joints, condensation occurring in glazing channels, or route moisture occurring within the system to the exterior by a weep drainage network. Drained joint pressure equalised system which shall be 100% water-tight allowing no water to penetrate into the interior of the building. The system shall be designed such that water being drained in the system shall not cause any damage to the permanent works. The system shall not be face sealed and shall not rely on wet seals.

22.8 Expansion/Contraction: The system shall provide for expansion and contraction within system components caused by a cyclical temperature range of 80⁰ Cover a 12hour period without causing any detrimental effect to the system components.

22.9 Test for structural performance: When tested in accordance with; ASTM E330, the glazing system shall conform to the performance requirements.

22.10 Special instructions: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of the system will not be permitted.

22.11 HEAT SOAKING OF GLASS: To minimize nickel sulphide (NIS) fractures at site, heat soaking test is to be conducted within the factory. Minimizing NiS fractures at site is mainly about making sure that fractures happen within the factory rather than at site after installation. Heat soaking tempered glass is the most-common form of ensuring that the chance of NiS infected panes leaving the factory is minimized. The goal during heat soaking is to induce breakage at the factory to avoid on site breakage after installation. It is heating tempering of glass to 280⁰ C for 24 to 48 hours over temperature gradients to induce fracture. Due to inherent safety and security benefits it is highly recommended for tempered glass to be heat-soaked.

22.12 PRODUCTS/MATERIALS

(i) Glass: Standard certification requirements are as under :

- a) Float glass : ASTM C 1036

- b) Tempered/ Toughened Glass: Toughened / Tempered glass shall be examined by the glass manufacturer to detect and discard any glass which exceed the following tolerance: 1.5mm bow in 600mm; 3mm bow in 1500mm; 6mm bow in 3000mm; 9mm bow in 4500mm. Where, the strengthening process results in essentially parallel ripples or waves, the deviation from flatness at any peak shall not exceed 0.13mm, and the difference between adjacent peaks shall not exceed 0.13mm. Where bow tolerance and wave tolerance differ, the stricter requirements shall govern. Direction of ripples shall be consistent and in conformance with architectural design. Following test shall be carried out by the glass processor at his own cost as per following provisions and the test report shall be submitted.

Thickness	Impact strength	Fragmentation	Surface Compression	Bending Strength
IS 2835-1987	IS-2553-PART-I	IS-2553-PART-1	ASTM C-1048-90	DIN 1249-PART:12

- c) Laminated glass: ASTM C 1172. The laminated glass shall comprise of two glasses of equal thickness as per design and bonded with a poly vinyl butyral (PVB) interlayer, meeting criteria of ANSI Z97.1 for safety glazing. The PVB interlayer shall be minimum 0.38mm thick. No deviation will be accepted with respect to the PVB interlayer. Laminated Glass Units shall comply to EN12543.
- d) General Requirements for all types of Glass: All base supply float/coated glass are to comply with the requirement of BS EN 572 parts 1, 2 and 3 or ASTM C1036 and assessed for optical and visual faults as described in BS EN 572-2. Spot faults shall not be no worse than category C. There will be no linear / extended faults. Optical faults shall be within the limits set in BS EN 572-2.
- e) Fully Toughened / Heat Strengthened Glass: It shall comply with the requirements of EN12150 or ASTM 1048 or EN 1863 -1 for heat treated Soda Lime Silicate Safety Glass. The residual surface compressive stress in the heat strengthened glass shall be below 52N/mm² when measured by GASP in accordance with ASTM F218-95 (2000) or > 69 N/mm² for Fully Toughened glass.
- f) Insulating glazed units: Hermetically sealed insulated glazed unit shall comply with BS5713 or EN 1279. Primary seal shall be of poly-isobutylene located between glass and spacer (Lisec / Alupro/ Profil glass or equivalent) providing a continuous vapor proof barrier of a minimum width of 2mm and a secondary two-part silicone sealant of approved make extending around the perimeter of the unit. The insulating glass unit shall be certified under a program approved by the sealed insulating glass manufacturer's association (SIGMA) providing third party validation of compliance to ASTM E 773 & E 774. All glass quality shall be glazing as per relevant ASTM standards.
- g) Coating: Method of coating shall be of vacuum (sputtering) deposition. This coating is applied to control the solar heat gain and enhance the energy performance and comfort level of the building. The coating shall meet the requirements of ASTM C 1376-97 or EN 1096 part 2 and satisfy the thermal

performance of the facade.

- h) Performance requirements: Probability of breakage of glass shall not exceed 8/1000 for vertical glass upon first application of design pressures or due to anticipated thermal stresses.
- (ii) Openable panel (IGU), side hung or top hung, shall be provided as per extant guidelines of NBC, Indian standards and local bodies. These panels shall be installed with all accessories and hardware for the openable panels as specified/required and of approved make such as heavy-duty stainless-steel friction hinges, minimum 4 point cremone locking sets with stainless steel plates, handles, buffers etc. including necessary stainless steel screw, nuts, fasteners, bolts, washers etc.
- (iii) Sealant:
- a) The insulated glass unit shall have poly-Iso-butylene as primary sealant with low moisture vapour transmission rate and a structural silicone sealant for secondary seal. The secondary edge sealant shall conform to ASTM C 1369-97. The contractor shall indicate the classification of the edge sealant as per clause 5.0 of the ASTM C 1369. Structural flush glazed joints shall be a neutral cure high performance silicone sealant applied in accordance with the sealant manufacturer's instructions. Weather seal joints shall be a neutral cure medium modulus silicone sealant applied in accordance with the sealant manufacturer's instructions. Sealants shall be black color. Unexposed, low movement flashing joints shall be non-drying, non-skimming, non-oxidizing, non-bleeding glazing sealant meeting MMA 809.2. The sealant proposed by the contractor shall not bleed or stain under any circumstances. Contractor shall identify the sealant to be used along with the structural glazing system and submit detailed technical parameters of the sealant by way of the sealant manufacturer's printed data sheets. The Contractor will be responsible to carry out all the compatibility tests as listed below but not restricted to the following, with respect to the particular sealant from a laboratory approved by the engineer-in-charge. The following tests shall be carried out with respect to the sealant:
- ASTM C 794 Peel test
 - ASTM C1135 -Test method for determining Tensile-Adhesion Properties of elastomeric sealant
 - ASTM C-719 -Test method for adhesion and cohesion of elastomeric joint sealant under cyclic movement
 - ASTM C-1087 -Compatibility test between the proposed structural silicone sealant and the finished aluminium extrusions (mullions and transom)
- b) For all sealant proposed to be used for this project, the contractor shall submit a letter of certification from the sealant manufacturer stating that the sealant has been tested for adhesion and compatibility on production of samples of metals, glass and other glazing components and that all sealant details and application procedures shown on the shop drawings are acceptable for use.
- c) To prevent excessive shelf life and facilitate the correlation of batches of sealant with panel production, silicone sealant generally shall be used in the sequence of their manufacture.
- d) The structural glazing contractor shall obtain from the manufacturer and the supplier written confirmation of that the material has not been subjected to temperatures in

excess of 27 degree centigrade between manufacture and delivery to the contractor's factory. The contractor shall store all silicone sealant at or below 27 degrees centigrade up to the day of its application.

- e) Silicones which cure by different chemical reactions or which release different chemical by-products, e.g. acetic acid, alcohols, amines etc. during cure, should not come in contact to each other during fabrication, assembly and erection of the glazing system.
- f) All adjoining surfaces not to receive sealant's shall be protected against staining by masking tape.

(iv) Other materials:

- a) The aluminium extrusions shall be 6063 alloy T6 temper conforming to ASTM 8221 or equivalent. They shall be clean, straight, with sharply defined edges and free from distortion and defects impairing appearance, strength and durability. It shall be of suitable wall thickness and profile for strength with respect to tension, shear and bending stresses, and lateral stability. The aluminum extrusions shall be coated with minimum 70% Kynar 500 based PVDF fluoropolymer resin coating (minimum 35 micron thick) of approved color and shade to comply with AAMA 605.2-1980.
- b) Fixing bolts, screws and nuts, where in contact with aluminium, will be of stainless steel 304 grad Glazing tape for structural glazing shall be Norton or approved equivalent.
- c) All dissimilar metal surfaces shall be isolated to prevent anti galvanic action. Materials used for this purpose shall be non absorptive. Metal surfaces shall be separated in such a manner that metal does not move on metal.
- d) Aluminium surface in contact with mortar, concrete fireproofing, plaster, masonry and absorptive materials shall be coated with anti-galvanic moisture-barrier material and nothing extra will be paid for this.

(v) Accessories:

- a) Extruded gaskets, weather stripping, extruded seals and spacers which do not come into contact with structural silicone sealant shall be of ethylene propylene diene monomer (EPDM). Where in parallel contact with structural silicone sealant, all gaskets, setting blocks and spacers other than foam glazing tapes shall be of heat-cured silicone rubber, chemically compatible with the silicone sealant and suitable for the specific purpose intended. All extruded gaskets, weather stripping and spacers other than foam glazing tapes shall have continuous mechanical engagement to framing members; any adhesive attachment is not acceptable. Unless otherwise approved, gaskets, weather stripping, extruded seals and spacers shall have a hardness of 40+5 durometer Shore A.
- b) The cladding system shall be constructed with (and shall maintain during Its design life) a standard of seal which shall not result in any reduction of sound insulation performance. Gaskets, weather stripping and seals used to achieve the required weatherproofing and/or air tightness shall be selected to accommodate fully the range of dimensional tolerances associated with fabrication and installation of the cladding system. Gaskets, weather stripping and seals shall be formed from materials capable

of retaining their elastic qualities, dimensions and resistance to physical and chemical attack sufficient to maintain the full water tightness, air tightness and acoustic performance for the design life of the structural glazing system.

- c) Extruded gaskets, weather stripping, seals and spacers mechanically engaged by flutes or pockets extruded in framing member shall be installed without residual tension or extension. Dry lubricants may be used to reduce drag during installation of synthetic rubber extrusions and to induce compression so as to prevent gradual elastic shrinkage and retraction from their ends. Wet lubricants containing detergent shall not be used in any location from which spillage onto glass and aluminum surfaces cannot be immediately and completely removed at the factory. Concentrated detergents shall not be used for any purpose which may bring the liquid into contact with the coated surfaces of vision and spandrel glass.
- d) Setting blocks shall be dense heat-cured silicone rubber with a hardness of 80 to 90 durometer Shore A. Side blocks and anti-walking blocks shall be dense heat-cured silicone rubber with a hardness of 60 to 70 durometer Shore A.
- (vi) Flashing: To prevent leakage, flashing shall be formed from either stainless steel or aluminium or sheer neoprene of 1.5mm thickness with joints tapped and sealed 150mm minimum. Flashing shall be provided on all sides of glazing where external glazing terminates and wherever else required to provide a completely watertight installation. Wherever visible, it shall have the matching finish of Aluminium.
- (vii) Column closers: The Contractor shall supply and install suitable closer section to seal up the gap between columns and / or walls, which abuts the line of the external glazing. The principal function of the closer piece shall be to provide a neat connection with the external glazing as well as a means of cutting off stray artificial light from the outer face of the column / wall. The column closer shall be installed in such a way as to provide a flexible connection to allow for tolerances, building I external glazing movements and dimensional differences between the external glazing and the column and / or wall face. The column closer shall also be designed in such a way as to allow the following:
- Easy removal for maintenance.
 - Installation after finishes are applied to the column / wall.
 - Easy removal of internal glazing units for cleaning/ maintenance replacement.
 - Compatibility with the requirements of the fire safety requirements.
- (viii) Fire Stop: At each floor edge, the required fire protection is to be maintained between elements of structure by using fire stop insulation to give a minimum of 2 hours fire protection between floors including in front of columns or blank walls. The fire stop material is to be installed to completely seal up the void between the face of the structure and the glazing and shall fully comply with local Codes and Regulations. The fire stop material must be flexible to allow movement between the structure and the external glazing. The fire stop material shall be located and held in position in such a way so as to ensure integrity of the fire protection as well as preventing accidental damage or loss of materials. The Contractor is required to provide full details of all fire stop material including fire test certificates and confirmation of local Fire Service Bureau approved material status. Shop drawings shall also be submitted for approval showing the full details of fire stops.
- (ix) Finishes: All exposed framing members shall be free of scratches and other blemishes. All aluminium surfaces shall be electrostatic powder coated in stainless steel colour or as

approved by the Engineer-in-charge. The anodic coating shall conform to IS:1868 - 1968 / IS- 5523:1983 and shall be of AC25 grade with minimum thickness of 20 microns when measured as per IS: 660/2-1970 and density shall be at least 32 Mg/sqm. The anodic coating shall be tested in an approved laboratory by eddy current method as per IS:6012 for thickness. Sulphuric acid shall be used as the electrolyte for the anodic process. Prior to anodizing, all aluminium shall be rendered uniform in appearance free from disfiguring scratches, stains or other blemishes and etched in caustic soda solution. Requisite tests shall also be carried out at the site as required by the Employer and the contractor shall arrange all assistance and equipment required for the purpose.

22.13 PROGRAMME OF WORK: The contractor shall submit a detailed program of work along with time schedule indicating the various items of work pertaining to the structural glazing work as below-

- Design and approval
- Shop drawings
- Submission of samples
- Mock-up
- Test reports
- Material co-ordination, ordering and delivery
- Fabrication
- Installation
- Inspection and remedial measures.

22.14 DESIGN CALCULATIONS:

- a. The contractor shall be responsible' for the design of the facade system including all its various components like glass, sealant, framing system, gaskets, fixing and anchorages proposed by respective specialists. The contractor shall submit structural design calculations prepared in accordance with relevant Indian/International codes and standards as applicable. The design shall be carried out under the direct supervision of a professional engineer experienced in design of this type of work and licensed at the place where the project is located. Structural design shall include, but not limited to, computations for the justification of external facade sections and connections including fasteners, welds and anchorage assemblies.
- b. The contractor shall submit for Engineer-in-charge's approval all structural calculations with reference to structural properties and physical characteristics and dimensional limitations of the framing members of the facade system. The contractor shall also submit design calculations for all connections, the dimensions of all extrusions and complete data to be used for the project. Approval of structural calculations shall not relieve the contractor from any of the responsibilities and requirements specified therein.
- c. The contractor shall submit the, glass manufacturer's wind pressure analysis, seismic load analysis and thermal analysis showing that the specified maximum deflections and probabilities of breakage are not exceeded.

22.15 SHOP DRAWINGS

- a. The contractor shall submit shop drawings showing clearly the relationship of the structural glazing facade to the building structure, Mechanical and electrical systems, floor slabs and any other related works. They shall show the arrangement of components, instructions and explanatory details for the sequence of fabrication, assembly, erection and installation of all materials including the glass and de-glazing procedures. They shall

include the following:

- i. Plan, elevation and details required to fully describe the structural glazing system.
 - ii. System dimensions framed opening requirements and tolerances for squareness, corner offset and bows.
 - iii. Dimensional position of glass edge/face relative to the aluminium framing, full size junction details between mullion and transom and end details.
 - iv. Isometric drawings of flashing, joints between transom and mullions, end details etc.
 - v. Expansion and contraction joint location and details.
 - vi. Weep and condensation drainage network
 - vii. Full size details including isometric drawing of sealing, flashing and jointing Methods
 - viii. Materials, type, size, location, spacing of all screws, bolts, weld; anchoring devices and all accessories.
 - ix. Die drawings for, all gaskets, extrusions
 - x. Relationship of edge members with architectural stone/ wall finish and flashing at joints.
- b. The contractor shall submit a fully detailed program for the presentation of shop drawings to the Engineer-in-charge for approval, and in no case shall the contractor proceed with any of these works without approved shop drawings.
- c. The contractor shall review and submit all shop drawings in a sequence consistent with the sequence of erection, installation and assembly of the various elements of the work. He shall be deemed to have determined and verified all materials, site measurements and construction criteria related thereto and to have checked the shop drawings for complete dimensional accuracy.
- d. Any approval by the Engineer-in-charge of the shop drawings shall not relieve the contractor of his responsibility for any deviation from the requirements of the contract unless he has specifically informed the engineer in writing of such deviation at the time of submission and the Engineer-in-charge has given written approval to the specific deviation.

22.16 SAMPLES

The contractor shall submit all samples at his own cost. Samples shall be submitted for approval well in advance of the date, on which the particular work involving the use of materials for which samples are submitted, is scheduled to begin. The work shall be carried out in accordance with the approved samples. The following shall be submitted:

- a) 2 samples of 600mm x 600mm in size illustrating pre-coated aluminium mullion and transom junction detail complete with glass skin and glazing materials illustrating edge and corner.
- b) 4 nos. 12" x 12" samples of each type of glass.
- c) 4 nos. 6" long samples of principal extrusions.
- d) 4 nos. manufacturer's samples of each type of aluminium finish.
- e) 4 nos. manufacturer's samples of each type of sealant
- f) 2 nos. manufacturer's samples of all accessories and hardware envisaged to be used for the structural glazing system.

- 22.17 MOCKUP:** The contractor shall construct a mockup including intermediate and edge mullion, vision and spandrel panel. The mockup should illustrate component assembly including framing, glass, glazing materials, weep drainage system, attachments, anchors and perimeter sealant. Location for mockup will be at site approved in advance. Mockup will not remain as part of the work.
- 22.18 TEST REPORTS:** The contractor shall arrange for all testing required with regard to this work at his own cost, at such test laboratories in India or abroad as approved by the Engineer-in-charge. Apart from the tests carried out, the contractor shall substantiate engineering data and provide test results of previous tests, which purport to meet performance criteria and any other supportive data.
- 22.19 SOURCES:** The contractor shall submit the name of the suppliers for the following items of work along with the shop drawings and samples.
- a. All components of the structural glazing system
 - b. Aluminium extrusions
 - c. Anodizing paint from manufacturer I authorized applicator
 - d. Sealant
 - e. Glass
 - f. Hardware
 - g. Gaskets
 - h. Fasteners
 - i. Anchorages
- 22.20 SUBMITTALS:** The contractor shall submit 4(four) copies of the following documents pertaining to the engineering of the structural glazing using structural glazing system to the engineer for approval, review etc.
- a. Shop drawings
 - b. Structural design calculations for aluminium framing, glass thickness and sealant by size
 - c. Calculations for deflection
 - d. Test reports as per the performance requirements
 - e. Special installation requirements, special procedures, safety precautions and perimeter conditions requiring special attention as stated by the manufacturer.
 - f. Samples
 - g. As-built drawings
- 22.21 ORDERING AND DELIVERY:** Before commencement of any fabrication or ordering of any materials, goods or works, the contractor shall be required to submit shop drawings, samples etc. with all relevant details as to materials, sizes, manufacturer's printed specifications and all other details and information as desired by the engineer in charge. Mockup shall have to be approved by engineer-in-charge before placing final order for delivery of the approved products.
- 22.22 PRODUCT HANDLING:** Handling of glass and aluminium frame, to be incorporated in to the facade system, shall be done with utmost care to avoid any damage or surface scratch. Field cutting of anodized components shall not be permitted.
- 22.23 LIGHTNING PROTECTION:** Each complete frame shall be provided with a single bolt, to which the bonding conductor may be connected by the electrical contractor on site. The bolt shall be high tensile, size MB stainless steel, and shall be securely fastened to and in sound electrical connection with the frame. The bolt shall be supplied with two plain washers and

locking washers and nuts, by which the bonding conductor will be connected to the bolt. The bolt shall be supplied and fixed at your works before delivery to site. The electrical connections from bolts which are to be supplied by you including the lightning protection devices, inspection openings for test lamps, etc.

22.24 FABRICATION & INSTALLATION: The façade work shall be fabricated and installed by experienced workmen having specialized skill in façade work/ structural glazing and strictly in accordance with the approved shop drawings. All welding shall be done by the heliarc process and all exposed welds ground to minimum 100 grit finish.

22.25 PROTECTION:

- a) The contractor shall be responsible for all materials against damage from mechanical abuse and foreign matter during installation. A layer of clear transparent laquer based methacrylates or cellulose butyrate shall be applied on anodized members before they are brought to site. The laquer shall be removed on completion of erection. On virtual completion and receiving instruction from the Engineer-in-charge, the Contractor shall remove all protective coverings, manufacturer's seals, labels etc. The contractor shall thoroughly clear the internal and external glazing area and members with cleaning solution recommended by the respective manufacturers. The Contractor shall ensure that the highest possible standards of material protection are maintained both in the fabrication and installation of the external glazing system. The Contractor shall ensure that all materials and completed panels are delivered to site without damage and that all components are fully protected. In this respect a method statement will be required describing the protection measures to be adopted when transporting material to site and hoisting it into the floors for final installation. Panels awaiting installation are to be stacked on pallets to a height to be stored separately on site for possible fabrication in-situ.
- b) All materials stored at site are to be protected in such a manner as to prevent damage from falling objects, dust, water and dirt. The material must be safe from mishandling or damage by any contractor I agency I sub-agency either in the pursuit or their own works or by their personnel.
- c) During installation, the Contractor shall provide protection to the external glazing to prevent the ingress of water from either rain or any other reasons. This protection shall be strong enough to withstand adverse wind conditions, and shall provide complete protection at the top level of the installation necessary to prevent the Ingress of water into or behind the cladding.
- d) The external glazing shall be screened from weld splatter, spray-on fire proofing, concrete, alkaline masonry washes, paint and other deleterious substances. Any such soiling shall be promptly and completely removed. The design of protective screening shall be such as to provide adequate ventilation of the space between the glass and the protective screen and not induce thermal stresses in the glass. In no case shall the protective screening be placed in contact with the glass.
- e) The Contractor shall provide at each completed floor an internal protection of 1000 gauge heavy Polyethylene sheet suspended from the top of the external glazing at slab soffit and extending to the floor. These drop sheets must be maintained until all wet trades are completed on each floor.
- f) The fixing method for sheets is to be indicated in shop drawings and a sample approved

by the Engineer-in-charge.

22.26 CLEANING

- a. The Contractor shall ensure that all actions are taken during Installation to eliminate the effects of corrosive substances on the finishes of the external glazing.
- b. The Contractor shall clean both internal and external surfaces to remove corrosive substances. The Internal surfaces of glass and aluminium frame are to be cleaned with compatible cleaning agents prior to the installation of the internal protective sheeting.
- c. The Contractor shall provide written verification that cleaning agents are compatible with aluminium, stainless steel, glass coatings, granite, glazing materials and sealants. In no case shall alkaline or abrasive agent be used to clean the surface. Care shall be taken during cleaning to avoid scratching of the surface by dirt particles.
- d. Prior to snagging inspections the Contractor shall remove the internal protection sheets and carry out a thorough cleaning of all glass, aluminium and spandrel panels as per the direction of Engineer-in-charge.
- e. The protective sheeting shall then be removed permanently provided that no other wet works or services work are required in the immediate vicinity of the external glazing. The Contractor shall also make good any physical drainage to the wall including scratches, dents, abrasions, pittings, etc., to the satisfaction of the Engineer-in-charge.
- f. Manufacturer's delivery or job marking on glass and adhesive for manufacturers cables shall be either a neutral or slightly acidic material and in no case shall such material be alkaline. Any staining of glass by alkaline material will be cause to rejection of the glass.
- g. After the installation of each panel of glass all markings and labels shall be carefully and completely removed from the panes. Thereafter no markings or labels of any sort shall be placed on the glass.
- h. Glazed openings shall be identified by suitable warning tapes or flags attached with a non-staining adhesive or other suitable means to the framing of the opening. Tapes or flags shall not be in contact with glass.
- i. Prior to the handing over of each floor to the Engineer-in-charge, the Contractor shall carry out a final cleaning of the external glazing. As soon as it is practically possible after the issuance of the occupation certificate for the building, the Contractor shall carry out a complete cleaning of the external face of the external glazing

22.27 REMOVAL OF IMPROPER WORK AND MATERIALS: Any materials/or works which, in the opinion of the Employer, are not in accordance with the specification, shop drawings and instructions shall be removed from the site immediately.

22.28 PERFORMANCE GUARANTEE: The contractor shall be solely responsible for the design including shop drawings and performance of the installed façade system. The installations shall be guaranteed by the contractor during the guarantee period for materials used, workmanship, water tightness (wherever specified), structural design, performance requirements and other requirements as given in the specifications. The contractor shall

submit in the enclosed format a written guarantee for the same for a period of 10 years from the date of completion of the work.

22.29 MAINTENANCE MANUAL: On completion of the works, the contractor shall prepare a detailed maintenance manual for the structural glazing system. The manual should cover the following:

- a) Complete and detailed explanation of operating principles of the structural glazing system Description of all the various components of the glazing system,
- b) Recommended Inspection schedule and periodic inspection procedure,
- c) Complete parts list,
- d) Instructions for proper cleaning procedures and routine maintenance of the facade including frequency,
- e) Cleaning products and their source
- f) Method statement for reglazing and replacement of component parts with appropriate drawings;

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

23.1 MATERIALS:

a) **Plant materials:**

- (i) Plant materials shall be well formed and shaped true to type, and free from disease, insects and defects such as knots, windburn, injuries, abrasion or disfigurement.
- (ii) 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.
- (iii) All plants shall be hardy under climatic conditions similar to those in the locality of the project. Plants supplied shall conform to the names listed on both the plan and the plant list. No plant material will be accepted if branches are damaged or broken. All material must be protected from the sun and weather until planted.
- (iv) Any nursery stock shall have been inspected and approved by the Engineer-in-Charge.
- (v) 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.

23.2 TREES, ORNAMENTAL PLANTS & PALMS PLANTING:

- a. Trees should be supplied with adequate protection as approved. After delivery, if planting is not to be carried out immediately, balled plants should be placed cheek to cheek and the ball covered with sand to prevent drying out. Bare-rooted plants can be heeled in by placing the roots in a prepared trench and covering them with earth which should be watered into avoid air pockets round the roots.
- b. **Digging of Pits:** Tree pits shall be dug a minimum of three weeks prior to backfilling. The pit sizes shall be as specified further herein. It shall be replaced with soil mixture as specified further herein. While digging the pits, the top soil up to a depth of 30 cm may be kept aside, if found good (depending upon site conditions) and mixed with the rest of the soil. If the soil is bad below, it shall be replaced with the soil mixture as specified further herein. The bottom of the pit shall be forked to break up the sub-soil.
- c. **Backfilling:** If the excavated soil is normal, it shall be mixed with manure. River sand shall be added to the soil if it is heavy. However, if the soil is bad, the pit shall be refilled with imported good garden soil mixed with manure 2:1 by volume (2 parts of stacked volume of earth after 20% reduction: 1 part of stacked volume of manure after 8% reduction). The soil backfilled has to be watered through and gently pressed down a day previous to planting to make sure that it may not further settle down after planting. The rest 100mm shall be filled with manure. The soil shall be pressed down firmly by treading it down, leaving a shallow depression all around for watering.
- d. **Planting:** No tree pits shall be dug until final tree positions have been pegged out for approval. Care shall be taken that the plant sapling when planted is not buried deeper than in the nursery, or in the pot. Planting should not be carried out in water logged soil. Plant trees at the original soil depth; the soil marks on the stem are an indication of this and it should be maintained on the finished level, allowing for setting of the soil after

planting. All plastic and other imperishable containers should be removed before planting. Any broken or damaged roots should be cut back to sound growth. The bottom of the planting pit should be covered with 50mm to 75mm of soil. Bare roots should be spread evenly in the planting pit; and small mound in the center of the pits on which the roots are placed will aid an even spread. Soil should be placed around the roots, gently shaking the tree to allow the soil particles to sift into the root system to ensure close contact with all roots and to prevent air pockets. Backfill soil should be firmed as filling proceeds, layer by layer, care being taken to avoid to avoid damaging the roots, as follows:

- o Chlorpyrifos emulsifiable concentrate 0.2% shall be applied on walls of pit, and initially pit shall be filled to 200 depths with earth mixed Chlorpyrifos emulsifiable concentrate 0.2%. The balance earth shall be filled in with manure in proportion as specified further herein. Chlorpyrifos emulsifiable concentrate 0.2% shall be applied every 15 days.
- e. **Staking:** Newly planted trees must be held firmly although not rigidly by staking to prevent a pocket forming around the stem and newly formed fibrous roots being broken by mechanical pulling as the tree rocks.
- f. **Methods:** The main methods of staking shall be:
 - i. A single vertical stake, 900mm longer than the clear stem of the tree, driven 600mm to 900mm into the soil.
 - ii. Two stakes as above driven firmly on either side of the tree with a cross-bar to which the stem is attached. Suitable for bare-rooted or balled material.
 - iii. A single stake driven in at an angle at 45° and leaning towards the prevailing wind, the stem just below the lowest branch being attached to the stake. Suitable for small bare-rooted or balled material.
 - iv. For plant material 3m to 4.50 m high with a single stem a three-wire adjustable guy system may be used in exposed situations.
 - v. The end of stake should be pointed and the lower 1.0m to 1.20m should be coated with a non-injurious wood preservative allowing at least 150mm above ground level.
- g. **Tying:** Each tree should be firmly secured to the stake so as to prevent excessive movement. Abrasion must be avoided by using a buffer, rubber or hessian, between the tree and stake. The tree should be secured at a point just below its lowest branch, and also just above ground Level; normally two ties should be used for tree. These be adjusted or replaced to allow for growth.
- h. **Watering:** The contractor should allow for the adequate watering in of all newly planted trees and shrubs immediately after planting and he shall during the following growing seasons, keep the plant material well-watered.
- i. **Fertilizing:** Fertilizing shall be carried out by application in rotation of the following fertilizers, every 15 days from the beginning of the monsoon till the end of winter: - sludge of organic well-rotted dry farmyard manure or vermicomposting or approved organic manure as per directions of engineer-in-charge.

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

- a) All areas to be planted with shrubs shall be excavated, trenched to a depth of 600 mm,

refilling it with finely mixed good black garden soil and excavated earth (after breaking the clods and mixing with sludge in the ratio as specified further herein. Backfill soil should be firmed as filling proceeds, layer by layer, care being taken to avoid to avoid damaging the roots, as follows:

- o Chlorpyrifos emulsifiable concentrate 0.2% shall be applied on walls of pit. The balance earth shall be filled in a mixture with manure in proportion as specified further herein. Chlorpyrifos emulsifiable concentrate 0.2% concentration shall be applied every 15 days.
- b) Tall shrubs may need staking, which shall be provided if approved by the engineer-in-charge depending upon the conditions of individual plant specimen.
- c) For planting shrubs and ground cover shrubs in planters, good earth shall be mixed with sludge in the proportion as above and filled in planters.
- d) Positions of shrubs to be planted should be marked out in accordance with the planting plan. When shrubs are set out, precautions should be taken to prevent roots drying. Planting holes (of sizes as specified further herein) should be excavated for longer shrubs. Polythene and other non-perishable containers should be removed and any badly damaged roots carefully pruned. The shrubs should then be set in holes so that the soil level, after settlement, will be at the original soil mark on the stem of the shrub. The hole should be backfilled to half pots depth and firmed by treading. The remainder of the soil can then be returned and again firmed by treading.

23.4 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.

23.5 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.

23.6 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.

24.0 BORED CAST-IN-SITU PILES:

- 24.1** The definition of terminology shall be as per (IS-2911 Part I/Section 2 of latest edition).
- 24.2** The construction of bored cast-in-situ concrete piles shall be carried out in all respects as per the provision stipulated in the agreement, as per IS-2911 Part- I/Section-2 (latest edition) and as per direction of Engineer-in-Charge.
- 24.3** The piles shall be bored cast-in-situ concrete piles and shall carry a safe load as mentioned against the item for piling work in the schedule.
- 24.4** The permissible positional deviation from the true position of pile: -
- (i) No pile shall be more than 75 mm out of the true position as shown in the approved plan/drawing at the level of bottom of pile cap. In case the pile is displaced by more than 75 mm from its true position, the contractor shall be required to submit modified design based on actual displacement for approval of the Department. Any extra cost in the work involved on account of such modification shall be borne by the contractor.
 - (ii)
 - (iii) No error in verticality of the pile exceeding 1.5% (One decimal Five percent) from the true vertical shall be permitted. In case the deviation in verticality exceeds this limit, the pile shall be liable for rejection. The contractor in such case may be permitted to re-design the pile as a battered pile or he may provide extra pile/piles to satisfy structural requirements at his own risk and cost.
- 24.5** The contractor shall be responsible for any adverse effect due to providing such extra pile on other piles.
- 24.6** The distance between center to center of piles shall not normally be less than 2.75 to 3 times the diameter of the pile and 2.5 times under exceptional cases. In case different sizes of piles are used the diameter of biggest pile shall be the guiding factor.
- 24.7** A minimum length of one meter of temporary casing shall be inserted in each bored pile. Boring shall be done by rotary type drilling rigs/machine using direct mud circulation method. No auger or cutter boring will be permitted. Stabilization of edges shall be done by use of bentonite solution having specific gravity. 1.1 to 1.2 and conforming to Specification detailed in, Appendix A of IS 2911 (Part-I/Section-2) 1979 or latest edition. The specific gravity of the mud suspension near about the bottom of the hole shall whenever practicable be determined by suitable slurry sampler in a first few piles and at suitable intervals of piles and recorded. Consistency of the drilling mud suspension shall be controlled throughout the boring as well as concreting operation in order to keep the hole stabilized as well as to avoid concrete getting mixed up with thicker suspension of the mud. The bentonite solution shall be used at least from the level of subsoil water and hole shall then be always kept almost full

with bentonite solution, which shall preferably be kept in motion. Where the Engineer-in-Charge is satisfied that it is necessary to do so, he can permit the contractor to use a suitable casing, which may not be left, in place. Such permission shall be given only on the application of the contractor and after the other methods have failed to produce satisfactory results. No extra payment shall be made to the contractor for such alternate method. The bottom of the boreholes shall be cleaned of the spoils and sediments before placing of concrete and after placing of cage reinforcement so that the base of the pile shall be free from loose material.

24.8 In case of boring with casing, the casing shall be used at least from the level of subsoil water. The casing shall be kept ahead of boring in case where there is danger of caving due to subsoil water entering into the borehole or where the soil is loose. While boring below subsoil water level, precaution shall be taken so that no boiling at the bottom of the hole occurs due to difference of hydrostatic head.

24.9 Concreting: -

- (i) Concreting of boreholes shall start as soon as possible after its completion. Should a borehole, which is not cased, be left unconcreted for more than two hours, it shall be cleaned thoroughly before concreting. The concreting under water shall be done in one operation. Where concreting under water, a temporary casing should be installed to the full depth of the borehole or 2 metres into the non-collapsible stratum, so that fragments of ground cannot drop from the sides of the hole into the concrete as it is placed.
- (ii) Concrete shall be placed by means of a tremie pipe (Sec. IS 456-2000, Para 14-2-4a). It shall be ensured that concrete entering the tremie pipe does not get mixed up with the slurry. One of the methods of achieving this is by pouring ¼ Kg, of granulated vermiculite in the tremie pipe before pouring concrete. The vermiculite granules will form a plug separating concrete from the fluid below. Any other approved method of plugging may also be adopted. The tremie pipe shall extend up to the bottom of the bore hole at the start and may be withdrawn in sections as the level of concrete rises in the bore holes, but the discharge end shall at all times be kept at a level below the top of concrete in the bore holes to a minimum depth of one metre. The placing of concrete should be continuous and the tremie pipe should be held concentric in the hole.

24.10 Withdrawal of Casing: -

- (i) Extraction of casing (if used) shall be done in such a way that no knocking or shearing of the concrete in the shaft takes place. Care should be taken to ensure that water does not enter the tremie pipe. At all times, after concreting is started, the lower end of the casing pipe shall remain below the tremie pipe at least 60 cm, till concreting is completed.
- (ii) During the extraction of casing, slumping of concrete shall be observed and when required, additional quantity of concrete shall be poured so that the pile is formed, above the cut off level as per Clause 7.7 and 7.8 of IS – 2911 (Part-I/ Sec. 2) 1979 or latest edition for which nothing extra shall be paid. During extraction of the casing, special slump records shall be maintained. The slump in any case shall not exceed the permissible limit as laid down in IS-2911 (Part-I/Sec 2)/1979 with amendments or latest edition.

- 24.11** Splicing of Reinforcement of Piles: -The longitudinal reinforcement and spiral/ rings of the piles should be provided in pile (as per drawing.) for entire length of piles. The splicing of longitudinal reinforcement should have full development length/bond length of $46 \times d$. where “d” is the diameter of the bar or as shown in drawing.
- 24.12** Initial Load Test: -Contractor shall carry out such load test before execution of the main piling work outside the pile layout as per the direction of the Engineer-in-Charge. The rate for initial load test shall include the construction of test cap and cost of all items of works necessary for testing and dismantling the test cap after the test is completed.
- 24.13** Routine Load Test: - Routine load test shall be carried out on any particular pile or group of piles in the pile layout, selected by the Engineer-in-Charge. The rate of routine load test shall include construction of test cap and all items of works necessary for testing and dismantling the test cap after the test is completed.
- 24.14** All the records of load test data as per agreement item and quantities should be submitted to the Engineer-in-charge as soon as the tests are completed. The related structural drawings shall be released for execution in phased manner after 3 weeks from the date of respective tests reports i.e., pile layout details after receipt of initial load test reports and details of pile cap after receipt of routine load test reports. The time specified in clause-5 of schedule “F” for execution of work is inclusive of the aforesaid time schedule for issue of structural drawings.
- 24.15** The load test on pile/piles of standard length shall not be carried out earlier than 4(four) weeks from the time of casting of the piles. Initial load test and routine load test shall be carried out as per IS 2911 (Part-IV) of latest edition. For the purpose of load test, the pile shall be kept free from any lateral contact with the soil upto a depth of 2000 mm below the ground level/formation level i.e., approximately upto cut off level. The test cap for such tests shall be so constructed that even when the pile had settled fully under load test, the cap would not touch the ground surface below it. The Engineer-in-Charge will have the liberty to direct the contractor to conduct the load test at any stage of piling work.
- 24.16** Rate for testing shall include the extra length of pile required to be constructed for carrying out the tests and any other work considered necessary for that test and the Department will not incur any expenditure in this regard.
- 24.17** Before any load test is carried out the proposed apparatus and loading structure to be used for the load test shall be got approved by the Engineer-in- Charge. The dial gauges and pressure gauge shall be got calibrated through National Test House, Calcutta. The calibration certificate in original should be submitted to the Engineer-In-Charge which shall be returned after verification.
- 24.18** The contractor shall arrange the necessary kentledge and RSJ’s etc. for applying the load in the load test and shall remove the kentledge, RSJ and bags of ballast etc. from the site after the test is completed to the satisfaction of the Engineer- in-Charge. Rate quoted for testing shall include the cost of all the items of the work necessary for such test and submission of the test report as per the direction of Engineer- in-Charge.
- 24.19** Determination of safe load carrying capacity of piles shall be governed by the provision of IS 2911 (Part-IV) latest edition.
- 24.20** The contractor shall be paid for the load tests at his quoted rates. If the results of such tests are found to be erratic and inconclusive, the contractor will be required to carry out additional

tests at his own cost to prove the satisfactory performance of the piles.

- 24.21** In case it becomes necessary to increase the length of the pile beyond the standard length, the payment for the additional length shall be limited to a permissible increase of 10% of the standard length of the piles. The extra length of piles beyond the permissible limit of 10 percent shall be provided by the contractor at his own cost. For the variation within the permissible limit of ten percent, the payment shall be made at pro-rata basis of the quoted rates.
- 24.22** If it is found that the length of pile is to be installed at a lesser length than that of specified in the respective item of works, necessary deduction will be done on prorata basis from the quoted rates in the relevant item of works.
- 24.23** In case the piles which fail in the load test does not come upto the stipulated load capacity, the contractor shall submit his proposal for bringing up the load capacity of the foundation upto the required level by providing extra piles or other corrective measures which shall be provided by the contractor at his own risk and expense. For all such modifications for strengthening and corrective measure, the contractor shall obtain prior approval of the Engineer-in-Charge before execution.
- 24.24** If the safe load bearing capacity of the piles based on the load test data is found to be lower than the designated load capacity guaranteed in tender, the contractor shall modify the foundation system by increasing the length of the pile or by increasing the numbers of pile or by combination of both for which necessary load, moments etc., of the columns shall be supplied by the Engineer-in-charge. The additional payment on account of such strengthening due to revision of design shall be limited to the amount arrived at by multiplying the number of piles “N” (Where “N” is the number of piles required by providing piles of capacity guaranteed by tender) the permissible increase of ten percent in the length “L” specified in the description of the item in the contract at the rate “R” quoted for such type of pile. (That is the additional payment shall be limited to $N \times L \times 1R/10$)
- 24.25** Any extra cost over and above, the permissible increase shall be borne by the contractor and the Department shall not be required to pay for the same.
- 24.26** Testing of piles of different categories shall be done in presence of Engineer- in-Charge or his authorized representative.
- 24.27** The agency has to make the full arrangement for nondestructive integrity testing of piles (NDT) as per IS 14893:2001 and it shall be carried out on selected piles atleast on 5% of total piles or as decided by the Engineer-in-Charge, in case of doubt regarding soundness of cement concrete work (RCC work) on piles as per direction of Engineer-in-Charge and his dicision shall be final and binding. However, testing charges shall be born by the department provided test results meet the acceptance criteria otherwise payment for testing as well as cost of pile shall be born by the agency.
- 25.0 MISCELLANEOUS:** Following miscellaneous works shall be executed wherever required as per below mentioned specifications:
- 25.1** Anti-Termite Chemical Treatment: Post Constructional anti-termite treatment shall be with Chloropyriphos/ lindane emulsifiable concentrate 20% with 1% concentration as per CPWD specification.

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	STEEL (TMT FE-500D)	TATA., RINL, JINDAL STEEL & POWER LTD, JSW STEEL LTD., SAIL
3	STRUCTURAL STEEL SECTIONS	TATA, JINDAL, SAIL, RINL
4	CEMENT [OPC/PPC]	ACC, AMBUJA, ULTRATECH, WONDER
5	PRECAST DUCTS/DRAINS/ DRAIN COVER/KERB CHANNEL	KK, NITCO, KERAKROME, TERRAFIRMA, FUJISILVERTECH
6	READY MIXED CEMENT CONCRETE	ACC, ULTRA TECH, AFCON
7	WHITE CEMENT	BIRLA WHITE, J.K. WHITE, ULTRATECH
8	CC PAVERS	NITCO, UNISTONE, PAVIT, KK
9	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
10	CERAMIC GLAZED TILES	SOMANY, KAJARIA, RAK
11	WATER-PROOF CEMENT PAINT	SNOWCEM, ASIAN PAINT, SIKA, NEROLAC
12	SYNTHETIC ENAMEL PAINT	ASIAN PAINT, AKZONOBEL (DULUX), NEROLAC, ICI
13	PLASTIC EMULSION PAINT	ASIAN PAINT, NEROLAC, AKZONOBEL (DULUX),, ICI
14	DISTEMPER/ACRYLIC EMULSION PAINT	ASIAN PAINT, BERGER, NEROLAC, DULUX
15	TEXTURED PAINT	ASIAN, OIKAS, DULUX
16	STEEL PRIMER	NEROLAC, BERGER, ASIAN PAINTS
17	WOOD PRIMER	NEROLAC, BERGER, ASIAN PAINTS
18	EXTERIOR WATERPROOFING PAINT	RAINCOAT (DR. FIXIT), ASIAN, BERGER

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
19	WOOD FINISH (MELAMINE & PU POLISH)	ASIAN, ICI, JOTUN, NEROLAC
20	LAMINATE	MERINO, GREENLAM, CENTURY, DURO
21	PLY BOARD, PLYWOOD (PINE BOARD)	GREEN, MERINO, CENTURY, DURO
22	SELF LEVELLING COMPOUND	MAPAI, ARDEX ENDURA, BIZZAR
23	EPDM GASKET	HANU, ANAND, VICTOR
24	WOOD ADHESIVE	FEVICOL, 3M, ARALDITE, SIKA
25	FLUSH DOOR (ALL FLUSH DOORS SHALL BE PROCURED FROM FULLY OWNED FACTORY OF THE MANUFACTURER AND NOT FROM JV / OUTSOURCED)	GREEN, MERINO, CENTURY, DURO
26	WATER REPELLENT PAINT	ARDEX ADURA, WEBER, PIDILITE
27	FIRE SEALANT	HILTI, 3M, MCCOY
28	TILE ADHESIVE	PIDILITE, ARDEX ENDURA, WEBER, MAPEI
29	STONE ADHESIVE	PIDILITE, ARDEX ENDURA, WEBER
30	DASH, ANCHORING FASTENERS	HILTI, FISCHER, CANON
31	ALUMINIUM COMPOSITE PANEL	ALUCOBOND, REYNOBOND, ALPOLIC
32	EPOXY GROUTING COMPOUND	PIDILITE, ARDEX ENDURA, WEBER, MAPEI
33	READY MIX GYPSUM PLASTER	SAINT GOBAIN, USG BORAL, ULTRATECH
34	READY MIX CEMENT PLASTER	WEBER, ULTRATECH, BIRLA WHILTE
35	SILICON SEALANT	GE, DOW CORNING, PIDILITE
36	GYPSUM BOARD	USG BORAL, LAFAGE, SAINT GOBAIN, KNAUF DANOLINE
37	FLOAT GLASS	ASAHI, MODI GLASS, SAINT GOBAIN GLASS
38	MECHANICAL COUPERS	USHA MARTIN, DEXTRA, HALFEN
39	CRYSTALLIANE CEMENTITIOUS WATERPROOFING COMPOUND	XYPEX CONSTRUCTION CHEMICAL, KRYTONE, PENETRON
40	WATERPROOFING MEMBRANE (SBS/HDPE/POLYUREA/CEMENTITIOUS ETC.)	SIKA, GRACE, SOPREMA
41	WATERPROOFING CUM PU FOAM INSULATION	SIKA, GRACE, SOPREMA
42	VERMICULLITE TREATMENT	NEWKEM, GRACE, SOPREMA
43	HOLLOW METAL PRESSED DOORS (METAL DOORS)	NAVAIR, TATA PRAVESH, SHAKTI HORMANN
44	ROLLER BLIND	VISTA, MAC, HUNTER DOUGLUS
45	PRELAMINATED PARTICLE BOARD	MERINO, CENTURY PLY, GREENLAM

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
46	HYDRAULIC DOOR CLOSER, FLOOR SPRING, DOOR AUTOMATION	DORMA, GEZE, HAFELE, HORMANN
47	HARDWARES FOR FIRE RATED DOORS	HAFELE, DORMA, GEZE, HORMANN
48	HARDWARE FOR FURNITURE ITEMS	HETTICH, EBCO, HAFELE
49	STAINLESS STEEL FITTINGS/HARDWARE FOR WOODEN/METAL/GLAZED/STEEL DOOR & WINDOWS	HAFELE, DORMA, GEZE, HORMANN
50	WIRE MESH	STERLING ENTERPRISES, MICROMESH, HARVER STANDARD, INDIA WIRE MESH
51	ADHESIVE TAPE	3M, NORTON, BOPD, TESA
52	HIGH PERFORMANCE EPOXY BASED RESIN ANCHOR SYSTEM	FOSROC, CICO, SIKA
53	EPOXY MORTAR	FOSROC, SIKA, MYK LATICRETE, CICO
54	NUTS, BOLTS & SCREWS	GKW, KUNDAN, PRIYA, ATUL
55	ALUMINIUM SECTIONS FOR DOORS & WINDOWS ETC.	JINDAL, HINDALCO, BHORUKA
56	HARDWARE FITTINGS FOR ALUMINIUM WINDOWS & DOORS	GEZE, HAFELE, DORMA
57	MS SECTIONS (PIPES, BOXES CHANNELS)	JINDAL HISAR, TATA, SURYA
58	S.S. MATERIAL/HADRAILS/RAILINGS	JINDAL STAINLESS STEEL LTD., TATA STEEL, SAIL
59	WALL PUTTY	JK, BIRLA, ASAIN PAINT
60	FLOOR HARDENER	PIDILITE, FOSROC, SIKA, CICO
61	POLYSULPHIDE SEALANT	PIDILITE, ARDEX ENDURA, WEBER, BASF.
62	EXPANSION JOINT	MIGUA, CS, CAMEO
63	WATERPROOFING COMPOUND	FOSROC, SIKA, PIDILITE
64	ADMIXTURES/CURING COUMPOUND	FOSROC, SIKA, ATPL, KUNALCOM CHEM, ASIAN PAINT, PIDILITE
65	REFLECTIVE GLASS, TINTED GLASS, HIGH PERFORMANCE GLASS, LACQUERED GLASS	SAINT GOBAIN, ASAHI (INDIA), PILKINGTON
66	LOOKING GLASS / MIRROR	ATUL, MODI GUARD, GOLDEN FISH
67	HIGH PERFORMANCE GLASS	SAINT GOBAIN, ASAHI, PILKINGTON
68	METAL/ALUMINUM FALSE CEILING	SAINT GOBAIN, HUNTER DOUGLUS, ARMSTRONG
69	AAC BLOCK	AEROCON, JINDAL BLOCK, MODCRETE, FINECRETE
70	AAC BLOCK ADHESIVE_	ARDEX ENDURA, PIDILITE, WEBER
71	HIGH PRESSURE LAMINATE INTERIOR/EXTERIOR GRADE	MERINO, FUNDERMAX, GREENLAM

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
72	UPVC WINDOWS	FENESTA, ALUPLAST, KOENMERLING
73	WALL GUARD, HAND RAIL, CORNER GUARD	CONSTRUCTION SPECIALITIES / GRADUS INPROCORP INDIA PVT. LTD./WINDOWTECH
74	SOLID ACRYLIC SURFACE	MERINO, LG, GRANUM, SAMSUNG- STARON
75	VINYL / CONDUCTIVE FLOORING, DADO SKIRTING	FORBO, TARAKETT, ARMSTRONG, GERFLOOR
76	CALCIUM SILICATE TILES FALSE CEILING	AEROLITE, RAMCO, HILUX
77	FIRE CHECK DOORS (METAL/ROLLING/GLAZED)	NAVAIR, TATA PRAVESH, SHAKTI HORMANN
78	FIRE CURTAIN	ORIENT, PACIFIC, KENT, NECO
79	LEAD LINED DOOR	NAVAIR, SHAKTI HORMANN, METAFLEX, RESPONSIVE
80	FIRE RESISTANT GLASS	SAINT GOBAIN, ASAHI, PILKINGTON
81	ALUMINIUM GLAZED DOORS/WINDOWS	HINDALCO, SHAKTI HORMANN, GLAZE TECHNO, SARLA
82	POLYESTER POWDER COATING/ PVDF COATING	JOTUN, AKZONOBEL, ASIAN PPG, NIPPON
83	GLASS PROCESSOR FOR MAKING DGU/TOUGHENING	AIS, ART N GLASS, GSC, KAENAL GLASS, SAINT GOBAIN
84	PVB/ SGP LAMINATE FILM, SENTRY FILM	DUPONT, SAFLEX, EASTMAN, LG, 3M
85	ACOUSTIC SEAL / DOOR SEAL	LORIENT, RAVEN, DORMA, 3M, HAFELE
86	PAINT AND PRIMER FOR FIRE CHECK DOOR.	VIPER, BERGER, NULLIFIRE
87	INTUMESCENT FIRE / SMOKESEAL	ASTRO FLAME, RAVEN, SEALZ, LORIENT
88	CALCIUM SILICATE BOARD FOR FIRE DOOR	PROMOTECH, PROMINA, RAMCO
89	FRP DOOR & FRAMES	FIBREWAYS, JAISHREE, FIBRE TECHNO, BHATT FRP, JAYNA
90	FLY ASH BRICKS	POWERBRICKS, PAUBHARA, YBW
91	INSULATION	UP TWIGA, LLOYD, ROXUL ROCKWOOL, ROCKWOOLINDIA
92	ANTI BACTERIAL PAINT	JOTUN/LIQUIDE PLASTIC /CONSTRUCTION SPECIALITY
93	GRAPHIC FILM	3M, AVERY DENNISON
94	GRC/ FRP	BIRLA WHITE, UNISTONE, SANDERSON, SHENISHA CORPORATION
95	PLASTER OF PARIS	JK, BIRLA, SAKARNI, ULTRATECH
96	MR BOARD	SAINT GOBAIN, USG BORAL, ARMSTRONG
97	MINERAL FIBRE SUSPENDED CEILING SYSTEM	SAINT GOBAIN, USG BORAL, ARMSTRONG, KNAUF AMF

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
98	CURTAIN TRACK AND CURTAIN FABRIC	WINDOWTECH, DECOREX, MEDFRESHE, RESPONSIVE
99	POLYMER MODIFIED ADHESIVE	ULTRATECH, BALL ENDURA, PIDILITE, WEVER
100	ANTI BACTERIAL AND ANTI SKID VITRIFIED TILES	SOMANY, SIMPOLO, KAJARIA, JOHNSON, RAK
101	POLYCARBONATE SHEET	DANPALON, SOLALITE, DPI SYSTEM, EVERLITE, CPI
102	GI PIPES	JINDAL, PRAKASH SURYA
103	GI FITTINGS	UNIK, KS, ICS
104	CPVC PIPES	ASTRAL, PRINCE, SFMC
105	HDPE PIPES	SUPREME, FINOLEX, ASTRAL, RELIANCE, SMARTFLOW
106	CC (SPUN) IRON PIPE	NECO, SKF, HIF
107	CCI SOIL, WASTE, VENT PIPES & FITTINGS	NECO, SKF, HIF
108	C.P. BRASS FITTING	JAQUAR, ROCA, KOHLER
109	SS SINK	NILKANTH, NIRALI, JAYNA
110	C.P. BRASS BATHROOM ACESSORIES / FITTINGS	JAQUAR, ROCA, KOHLER
111	GLASS SHOWER PARTITION	DORMA, HAFELE, GEZE
112	SANITARY WARE (URINAL, WASH BASIN, WC ETC.)	JAQUAR, GROHE, KOHLER
113	GLASS MOSAIC TILE	ITALIA, CORAL, KAJARIA
114	LIQUID SOAP DISPENSER	EURONICS, TOSHI, UTEC, DOLPHY
115	HAND DRIER	EURONICS, TOSHI, UTEC, DOLPHY
116	AROMA DISPENSER	EURONICS, TOSHI, UTEC, DOLPHY
117	SHOE SHINNING MACHINE	EURONICS, TOSHI, UTEC, DOLPHY
118	TISSUE DISPENSER WITH TRASH	EURONICS, TOSHI, UTEC, DOLPHY
119	HAND TOWEL DISPENSER	EURONICS, TOSHI, UTEC, DOLPHY
120	NITRILE RUBBER INSULATION	ARMACELL, K-FLEX, A-FLEX, SUPREME
121	FAÇADE AND WINDOW SYSTEM	SCHUCO, ALUK, REYNAERS, GUTMANN
122	FIRE STOP IN CURTAIN WALL SYSTEM	HILTI, 3M, FISCHER, LORIENT
123	POP OUT VENT FOR FAÇADE AND SYSTEM WINDOW HARDWARE	COTSWOLD, SCHUCO, ALUK, REYNAERS
124	ALUMINIUM OPERABLE LOUVER	TECHNAL, DOMAL, YOGI GLAZE, SCHUCO
125	AIR TRANSFER GRILL	RUSKIN, SYSTEM AIR, TROX, TREMCO
126	POLYURETHANE CONCRETE FLOORING, EPOXY FLOORING, SELF-LEVELLING FLOORING	ARDEX ENDURA, SIKA, MAPEI, SAINT GOBAIN - WEBER

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
127	ENGINEERED WOODEN FLOORING AND SKIRTING	MIKASA (GREENLAM), TARKETT, HAVWOODS, PARADOR (HIL), PERGO, KAHRS
128	RAISED/ FALSE ACCESS FLOORING SYSTEM	LINDNER, UNIFLOOR, TANKARIA, FLEXI FLOOR
129	SOLID SURFACE (CORIAN)	DUPONT, LG, STARON-SAMSUNG, LUXOR (DURLAX)
130	CAR DECK FLOORING SYSTEM	MAPEI, SAINT GOBAIN – WEBER, MYK ARMENT
131	ENGINEERED MARBLE	HR JOHNSON, KALINGA STONE, NITCO, QUASTONE
132	RUBBERISED PAVERS	SUNFLEX, FLOOR GUARD, BORON RUBBERS
133	COLOUR HARDENER	SIKA, FOSROC, PIDILITE
134	IPE WOOD	HKS FLOORING, INDIANA, RESHAWOOD
135	SYNTHETIC THATCH ROOFING	PALMEX, WINROYAL, SYNTHETIC THATCH
136	ASPHALT CEMENT SHINGLES	TAPCO, CERTAINTEED, MALARKEY
137	STRETCH MEMBRANE / TENSILE FABRIC	SERGE FERRARI, CHUKOH, MEHLER, VERSAIDAG
138	STAMP CONCRETE PIGMENT / APPLICATOR	UNITED FLOORING, CONCRETE BY DESIGN, FLEX STONE
139	SS TACTILE	EMINENT, FERROTECH, SUNDARAM, JINDAL
140	BAMBOO DECKING, ROOFING & CLADDING	ECO GREEN FLOORING, EPITOME BAMBOOWOOD, LAMIWOOD
141	OUTDOOR SIGNAGES	3M, AVERY DENNISON, VEDAAANSHI SIGNS
142	ACOUSTIC PANELS	ARMSTRONG, USG BORAL, ANUTONE, ROCKWORTH,
143	C&D WASTE PRECAST ELEMENT	GM CONCRETE, ILFS
144	THERMOPLASTIC PAINT/ROAD MARKING PAINT	NEROLAC, ASIAN, SHALIMAR, BERGER, STP LTD
145	WEATHER/STRUCTURE SILICON SEALANT	WACKER, MCCOY, DOW CORNING
146	BACKER ROD	SUPREME/SYSTRANS
147	POLYSTRENE BOARD	SUPREME, DOW CORNING, TEXAS, PIDILITE
148	DUCTILE IRON PIPES	ELECTROSTEEL, KESORAM, TISCO
149	STAINLESS STEEL PIPES AND FITTINGS	VIEGA, JINDAL STAINLESS STEEL, J-PRESS
150	SLUICE VALVES	SANT, ADVANCE, AUDCO, ZOLOTO, KIRLOSKAR, LEADER
151	GATE / BALL VALVES	SANT, LEADER, ZOLOTO
152	ELECTROMAGNETIC FLOWMETER	ENDRESS HAUSER, KROHNE MARSHALL, NEXTENG ENVIRO PVT LTD, SEIMENS, ABB
153	CI/DI MANHOLE COVER	NECO, SKF, RIF, BIC

S. NO.	DETAILS OF MATERIALS	MANUFACTURERS NAME
154	DWC PIPES	NOBLE POLYTEC, ALOM POLY EXTRUSIONS LTD., ASTRAL, ANEK INDUSTRIAL PLASTICS
155	DRAIN CHANNEL WITH SS SLOTTED GRATING	ACO, KESSEL, PRUTHA
156	WATER BASED MELAMINE POLISH	ASIAN, PIDILITE, DULUX
157	ALL FURNITURE ITEMS (CHAIRS / WORKSTATIONS/BEDS, STORAGE UNITS ETC.)	ROCKWORTH / STEELCASE / HERMAN MILLER/ HAWORTH
158	CARPET	SUPINOE/ MILLIKAN/ SHAW
159	IRRIGATION FITTINGS, VALVES AND OTHER ACCESSORIES	RAIN BIRD / NETAFIM / BERMAD / HUNTER / TORO
160	IRRIGATION PUMPS	LUBI / RAIN BIRD / GRUNDFOS

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

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

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

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

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

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

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

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

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

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

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

1. 2.

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

1. 2.

DRAWING LIST

Sl. No	Title of Drawing	Drawing No
1	Site Plan with Parking Details	T-AR-100-RO
2	Ground Floor Plan	T-AR-101-RO
3	First Floor Plan	T-AR-102-RO
4	Second floor Plan	T-AR-103-RO
5	Third floor Plan	T-AR-104-RO
6	Fourth floor Plan	T-AR-105-RO
7	Fifth floor Plan	T-AR-106-RO
8	Terrace floor Plan	T-AR-107-RO
9	Elevation A & D	T-AR-108-RO
10	Elevation B & C	T-AR-109-RO
11	Section X-X & Y-Y	T-AR-110-RO

Schedule of Quantity (Civil & Horticulture works)

Name of Work: Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.

Item No.	Description of Item	Quantity	Unit	Rate (in Rs.)	Amount (in Rs.)
1	EARTH WORK				
1.1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50m and lift upto 1.5 m, as directed by Engineer-in- charge.				
1.1.1	All kinds of soil	5193.00	Cum	136.35	7,08,065.55
1.2	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
1.2.1	All kinds of soil.	614.00	Cum	198.40	1,21,817.60
1.3	Excavating trenches by mechanical / manual means of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, for all depth, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				
1.3.1	All kinds of soil				
1.3.1.2	Pipes, cables etc. exceeding 80 mm dia. But not exceeding 300 mm dia	1132.00	Metre	307.45	3,48,033.40
1.4	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 m and for all lift.	5139.00	Cum	200.00	10,27,800.00
1.5	Extra for every additional lift of 1.5 m or part thereof in excavation / banking excavated or stacked materials.				
1.5.1	All kinds of soil	2317.00	Cum	129.35	2,99,703.95
1.6	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	349.00	Cum	1769.35	6,17,503.15
	SUBHEAD 1 TOTAL				31,22,923.65
2	CEMENT CONCRETE WORK				
2.1	Providing and laying damp-proof course 50mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20mm nominal size derived from natural sources).	134.00	Sqm	633.40	84,875.60

2.2	Providing & applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7kg per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.	134.00	Sqm	138.40	18,545.60
2.3	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement : 3 coarse sand (zone-III) derived from natural sources : 6 graded stone aggregate 20 mm nominal size derived from natural sources) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	184.00	Sqm	943.65	1,73,631.60
2.4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :				
2.4.1	1:5:10 (1 cement : 5 manufactured sand derived from Recycled Concrete Aggregate (RCA) : 10 graded stone aggregate 40 mm nominal size Recycled Aggregate (RA))	415.00	Cum	4975.50	20,64,832.50
	SUBHEAD 2 TOTAL				23,41,885.30
3	REINFORCED CEMENT CONCRETE				
3.1	Centering and shuttering including strutting, propping etc. and removal of form for				
3.1.1	Foundations, footings, bases of columns, etc. for mass concrete	1539.00	Sqm	366.40	5,63,889.60
3.1.2	Walls (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	2182.00	Sqm	834.45	18,20,769.90
3.1.3	Suspended floors, roofs, landings, balconies and access platform	9106.00	Sqm	905.40	82,44,572.40
3.1.4	Shelves (Cast in situ)	65.00	Sqm	905.40	58,851.00
3.1.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers	8503.00	Sqm	707.00	60,11,621.00
3.1.6	Columns, Pillars, Piers, Abutments, Posts and Struts	6213.00	Sqm	908.40	56,43,889.20
3.1.7	Stairs, (excluding landings) except spiral-staircases	449.00	Sqm	1030.00	4,62,470.00
3.1.9	Weather shed, Chajjas, corbels etc., including edges	27.00	Sqm	1274.40	34,408.80
3.2	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).				
3.2.1	Suspended floors, roofs, landing, beams and balconies (Plan area to be measured)	10474.00	Sqm	385.65	40,39,298.10
3.3	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete in foundation and superstructure.				
3.3.1	Corrosion Resistance Thermo-Mechanically Treated bars of grade Fe-500D or more.	686854.00	Kg	105.85	7,27,03,495.90
3.4	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. 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.				
3.4.1	All works upto plinth level				
3.4.1.1	Concrete of M30 grade with minimum cement content of 350 kg /cum	1101.00	Cum	12292.25	1,35,33,767.25
3.4.2	All works above plinth level upto floor V level				
3.4.2.1	Concrete of M30 grade with minimum cement content of 350 kg /cum	3954.00	Cum	12590.60	4,97,83,232.40
3.5	Extra for R.C.C./ B.M.C/ R.M.C. work above floor V level for each four floors or part thereof.	1358.00	Cum	298.35	4,05,159.30
3.6	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral staircases above plinth level up to floor five level excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement : 1.5 coarse sand including manufactured sand derived from Recycled Concrete Aggregate (RCA) upto 20%: 3 graded stone aggregate 20 mm nominal size including Recycled Concrete Aggregate (RCA) upto 20%)	43.00	Cum	13606.60	5,85,083.80
3.7	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 localtion 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).				
3.7.1	Floor Joint of 200 mm gap	139.00	Meter	8592.15	11,94,308.85

3.8	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).				
3.8.1	Wall Joint of 200 mm gap	178.00	Meter	5879.05	10,46,471.00
3.9	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 arrangement 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 selfcentering 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 resist 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).				
3.9.1	Roof Joint of 200 mm gap	28.00	Meter	6813.70	1,90,783.60
	SUBHEAD 3 TOTAL				16,63,22,072.10
4	MASONRY WORK				
4.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in:				
4.1.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	227.00	Cum	10675.55	24,23,349.85
4.2	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 :				
4.2.1	Cement mortar 1:6 (1 cement : 6 coarse sand)	1285.00	Cum	9338.30	1,19,99,715.50

4.3	Extra for brick work / AAC block masonry / Tile brick masonry in superstructure above floor V level, for each four floors or part thereof by mechanical means.	753.00	Cum	211.40	1,59,184.20
4.4	Half brick masonry with non modular fly ash bricks of class designation 10, conforming to IS :12894, in superstructure above plinth and upto floor V level.				
4.4.1	Cement mortar 1 : 4 (1 cement : 4 coarse sand)	2888.00	Sqm	1355.45	39,14,539.60
4.5	Extra for Providing & Placing in position 2 Nos 6 mm dia. M.S. Bars at every third course of Half Brick Masonary.	2888.00	Sqm	101.60	2,93,420.80
4.6	Providing and laying Autoclaved Aerated concrete(AAC) blocks masonry 100 mm/ 125 mm thick with Grade-1 AAC blocks of density 551 to 650 kg/cum conforming to IS:2185 (Part 3) in superstructure above plinth level up to floor V level in cement mortar 1:4 (1 cement : 4 coarse sand). The rate includes providing and placing in position 2 Nos 6 mm dia M.S. bars at every third course of masonry work.	16.00	Cum	10154.70	1,62,475.20
4.7	Providing and laying autoclaved Aerated Concrete (AAC) blocks masonry with 150mm to 300mm thick with grade AAC blocks of density 551 to 650 kg/cum conforming to IS: 2185 (Part 3) in superstructure 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).	561.00	Cum	7921.90	44,44,185.90
	SUBHEAD 4 TOTAL				2,33,96,871.05
5	CLADDING WORK				
5.1	Designing, fabricating, testing, installing and fixing in position Curtain Wall with Aluminium Composite Panel Cladding, with open grooves for linear as well as curvilinear portions of the building , for all heights and all levels etc. including: (a) Structural analysis & design and preparation of shop drawings for pressure equalisation or rain screen principle as required, proper drainage of water to make it watertight including checking of all the structural and functional design. (b) Providing, fabricating and supplying and fixing panels of aluminium composite panel cladding in pan shape in metallic colour of approved shades made out of 4mm thick aluminium composite panel material consisting of 3mm thick FR grade mineral core sandwiched between two Aluminium sheets (each 0.5mm thick). The aluminium composite panel cladding sheet shall be coil coated, with Kynar 500 based PVDF / Lumiflon based fluoropolymer resin coating of approved colour and shade on face # 1 and polymer (Service) coating on face # 2 as specified using stainless steel screws, nuts, bolts, washers, cleats, weather silicone sealant, backer rods etc. (c) The fastening brackets of Aluminium alloy 6005 T5 / MS with Hot Dip Galvanised with serrations and serrated washers to arrest the wind load movement, fasteners, SS 316 Pins and anchor bolts of approved make in SS 316, Nylon separators to prevent bi-metallic contacts all complete required to perform	220.00	Sqm	5023.55	11,05,181.00

	as per specification and drawing The item includes cost of all material & labour component, the cost of all mock ups at site, cost of all samples of the individual components for testing in an approved laboratory, field tests on the assembled working curtain wall with aluminium composite panel cladding, cleaning and protection of the curtain wall with aluminium composite panel cladding till the handing over of the building for occupation. Base frame work for ACP cladding is payable under the relevant aluminium item.s The Contractor shall provide curtain wall with aluminium composite panel cladding, having all the performance characteristics all complete , as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer-in-Charge. However, for the purpose of payment, only the actual area on the external face of the curtain wall with Aluminum Composite Panel Cladding (including width of groove) shall be measured in sqm. up to two decimal places.				
	SUBHEAD 5 TOTAL				11,05,181.00
6	DOOR & WINDOW WORK				
6.1	Providing and fixing of Standard duty Hollow metal doors confirming to IS 16074 & IS 4351 made of pressed galvanized steel confirming to IS 277 with the following specification. Doors shall be manufactured in ISO 9001: 2015 certified company for quality management. Doors shall be with vision glass and louver as a part of complete assembly. Price are inclusive of 3 no.s Hinges Per Leaf & Fasteners. Door frame shall be single rebate grooved profile of size 125 x 55 mm made out of minimum 1.2 mm thick galvanized steel sheet. Frames shall be mitered and field assembled with self-tabs. Frames shall have inbuilt grooved sealing system and shall be site fitted with PVC seal. All provision should be mortised, drilled and tapped for receiving appropriate hardware. Frames should be provided with back plate bracket and anchor fasteners for installation on a finished plastered masonry/concrete wall opening. Frames shall be filled with non-fire rated puff and the gaps shall be filled with backer rod & silicon sealant. Door frame shall be finished with pure polyester powder coating (minimum 50 micron) and should have passed minimum 500 hours of salt spray test. Door leaf shall be of 46 mm thick fully flush double skin door, with or without vision panel. Door leaf shall be manufactured from minimum 1.2 mm thick galvanized steel sheet. Internal construction of the door should be rigid reinforcement pads type for receiving appropriate hardware. Infill material shall be resin bonded honeycomb core & all doors shall be factory prepared for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers. Edges should be interlocked with a bending radius of 1.4 mm. For pair of doors integrated astragals has to be provided on the meeting stile for both active and inactive leaf. Vision panel wherever applicable should be provided as per manufacturers recommendation with a clip-on arrangement. Door	346.00	Sqm	9209.60	31,86,521.60

	Shutter shall be finished with pure polyester powder coating (minimum 50 micron) and shall have passed minimum 500 hours of salt spray test.				
6.2	Providing and fixing Surface door closer, Medium duty EN 2-4 with standard arm, Silver finish with necessary accessories and screws etc. complete.	188.00	Each	2071.35	3,89,413.80
6.3	Providing & Fixing of Lever Handle with screws in SSS with necessary accessories and screws etc. Complete.	188.00	Each	1241.70	2,33,439.60
6.4	Providing & Fixing Mortice sash lock, 55mm BS/20mm sq. forend, in SSS with necessary accessories and screws etc. complete.	154.00	Each	3186.70	4,90,751.80
6.5	Providing & Fixing 300mm Long Tower Bolt with necessary accessories and screws etc. complete.	188.00	Each	432.50	81,310.00
6.6	Providing and fixing Fiber Glass Reinforced plastic (FRP) Door Frames of cross-section 90 mm x 45 mm having single rebate of 32 mm x 15 mm to receive shutter of 30 mm thickness. The laminate shall be moulded with fire resistant grade unsaturated polyester resin and chopped mat. Door frame laminate shall be 2mm thick and shall be filled with suitable wooden block in all the three legs. The frame shall be covered with fiber glass from all sides. M.S. stay shall be provided at the bottom to steady the frame.	430.00	Meter	522.80	2,24,804.00
6.7	Providing and fixing to existing door frames.				
6.7.1	30 mm thick Glass Fibre Reinforced Plastic (FRP) panelled door shutter of required colour and approved brand and manufacture, made with fire - retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate for forming hollow rails and styles, with wooden frame and suitable blocks of seasoned wood inside at required places for fixing of fittings, cast monolithically with 5 mm thick FRP laminate for panels conforming to IS: 14856, including fixing to frames.	153.00	Sqm	3411.25	5,21,921.25
6.8	Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 36 kg to 80 kg and door width from 701 mm to 1000 mm), with double speed adjustment with necessary accessories and screws etc. complete.	83.00	Each	899.40	74,650.20
6.9	Providing and fixing Tower bolt Surface Mounted, L - 12" (300 mm), SS 304, SSS with necessary S.S. Fixing Screws complete.	83.00	Each	745.80	61,901.40
6.10	Providing and fixing Tower bolt Surface Mounted, L - 6" (150 mm), SS 304, SSS with necessary S.S. Fixing Screws complete.	83.00	Each	442.95	36,764.85
6.11	Providing and fixing chromium plated brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete.	83.00	Each	873.90	72,533.70
6.12	Providing and fixing IS : 12817 marked stainless steel butt hinges with stainless steel screws etc. complete :				
6.12.1	125x64x1.90 mm	249.00	Each	108.65	27,053.85
6.13	Providing and fixing aluminium hanging floor door stopper, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade, with necessary screws etc. complete.				

6.13.1	Single rubber stopper	83.00	Each	35.55	2,950.65
6.14	Providing and fixing factory made uPVC glazed/wire mesh windows/doors comprising of lead free uPVC multi-chambered frame, sash and mullion/coupler (where ever required) extruded profiles having minimum wall thickness of 1.70 mm for Series R1 and R2 profiles and 2.10 mm for Series R3 and R4 profiles conforming to EN: 12608 in any shape, colour and design duly reinforced with galvanized mild steel section made of required shape & size as per CPWD Specification, uPVC extruded glazing beads, interlocks and Inline sash adaptor (where ever required) of appropriate dimension, EPDM gasket, hardware, SS 304 grade fasteners of minimum 8 mm dia with countersunk head, comprising of matching polyamide PA6 grade sleeve for fixing frame to finished wall as per IS 1367 : Part 1 to 14, plastic packers, plastic caps and necessary stainless steel screws etc. Profile of frame, sash & mullion (if required) shall be mitred cut and fusion welded/mechanically jointed duly sealed at all corners, including drilling of holes for fixing hardware and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with weather proof silicon sealant over backer rod of approved size and quality, all complete as per approved drawing conforming to CPWD specification & direction of Engineer-in-Charge. Section of steel reinforcement and cross sections of uPVC profiles to be as per design approved by Engineer-in-Charge. Wire mesh / Glazing of plain/ toughened/ laminated/ double glass unit with / without high performance coatings as per design requirements and conforming to IS: 3548 & IS: 16231 shall be paid separately. Note- Structural Design proof checked from a Government Engineering Institute, to be provided by the manufacturer for : (i) Sites with basis wind speed > 45 m/sec as per IS 875 - Part 3 (ii) Sites with structure height more than 20m for all wind speeds				
6.14.1	Three track three panels sliding window with Aluminium channel for roller track, wool pile, nylon rollers with SS 304 body.				
6.14.1.1	Using R3 series with frame (98mm & above) x (40mm & above) & sash (30mm & above) x (55mm & above) with zinc alloy (zamak) powder coated handle on two end panels along with multi-point locking system (Height upto 1.8 metre).	262.00	Sqm	7943.45	20,81,183.90
6.14.2	Fixed window/ ventilator with mullion/ transom.				
6.14.2.1	Using R2 series with frame (39mm & above) x (39mm & above) & Mullion (39mm & above) x (60mm & above). (Height upto 1.2 metre)	59.00	Sqm	8047.30	4,74,790.70
6.14.2.2	Using R3 series with frame (55mm & above) x (45mm & above) & Mullion (55mm & above) x (65mm & above). (Height upto 2.5 metre)	49.00	Sqm	6937.30	3,39,927.70

6.15	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) :				
6.15.1	For fixed portion				
6.15.1.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	5115.00	Kg	607.00	31,04,805.00
6.15.2	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)				
6.15.2.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	3143.00	Kg	711.30	22,35,615.90
6.16	Filling the gap in between aluminium frame & adjacent RCC/ Brick/ Stone work by providing weather silicon sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete.				
6.16.1	Upto 5mm depth and 5 mm width	1153.00	Meter	122.60	1,41,357.80
6.17	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.	639.00	Sqm	3845.80	24,57,466.20
6.18	Providing and fixing stainless steel (SS 304 grade) adjustable friction windows stays of approved quality with necessary stainless steel screws etc. to the side hung windows as per direction of Engineer-in-charge complete.				
6.18.1	355 X 19mm	198.00	Each	295.50	58,509.00
6.19	Providing and fixing aluminium casement windows fastener of required length for aluminium windows with necessary screws etc. complete.				
6.19.1	Anodized (AC 15) aluminium	198.00	Each	80.60	15,958.80
6.20	Providing & fixing fly proof wire gauze to windows, clerestory windows & doors with M.S. Flat 15x3 mm and nuts & bolts complete.				
6.20.1	Stainless steel (grade 304) wire gauze of 0.5 mm dia wire and 1.4 mm aperture on both sides	262.00	Sqm	979.20	2,56,550.40
6.21	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary				

	fittings complete, including applying a priming coat of approved steel primer.				
6.21.1	Using M.S. angels 40x40x6 mm for diagonal braces	20.00	Sqm	5775.10	1,15,502.00
6.22	Providing and fixing factory made ISI marked steel glazed doors, windows and ventilators, side /top /centre hung, with beading and all members such as F7D,F4B, K11 B and K12 B etc. complete of standard rolled steel sections, joints mitred and flash butt welded and sash bars tenoned and riveted, including providing and fixing of hinges, pivots, including priming coat of approved steel primer, but excluding the cost of other fittings, complete all as per approved design, (sectional weight of only steel members shall be measured for payment).				
6.22.1	Fixing with 15x3 mm lugs 10 cm long embedded in cement concrete block 15x10x10 cm of C.C. 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size)	1681.00	Kg	120.20	2,02,056.20
6.23	Providing and fixing T-iron frames for doors, windows and ventilators of mild steel Tee-sections, joints mitred and welded, including fixing of necessary butt hinges and screws and applying a priming coat of approved steel primer.				
6.23.1	Fixing with 15x3 mm lugs 10 cm long embedded in cement concrete block 15x10x10 cm of C.C. 1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size).	155.00	Kg	140.45	21,769.75
6.24	Providing and fixing of ISI marked medium duty hollow metal fire rated doors as per IS 3614: 2021, for 120 min integrity & 30 min. insulation made of pressed galvanized steel conforming to IS 277 with the following specification. Recommended fire door shall be tested as per IS 17518 (Part 1) : 2022 / ISO 3008-1: 2019 from CBRI/TBW/Exova lab and manufactured in ISO 9001: 2015 certified company for quality management. ISI labeled fire door shall be provided with fire rated hardware and vision panel all as a complete assembly. Proper label confirming the type of door and the hourly rating is mandatory. The Door frame shall be step rebate grooved profile of size 125 x 75 mm made out of 1.20 mm minimum thick galvanized steel sheet. Frames shall be mitred and field assembled with self tabs. Frames shall have inbuilt grooved sealing system for taking fire rated seals. All provision should be mortised, drilled and tapped for receiving appropriate hardware. Frames should be provided with back plate bracket and anchor fasteners for installation on a finished plastered masonry/concrete wall opening. Frames shall be filled with fire rated puff . Door frame shall be finished with pure polyester powder coating (minimum thickness of 50 micron) and shall have passed minimum 500 hours of salt spray test. The Door leaf shall be of 60 mm thick fully flush double skin step design door, insulated with or without vision panel. Door leaf shall be manufactured from 1.2 mm minimum thick galvanized steel sheet. The internal construction of the door should be rigid reinforcement pads for receiving appropriate hardware. The infill material shall be 120 kg/m3 high density mineral wool insulation material.	158.00	Sqm	19353.55	30,57,860.90

	Intumescent seals 15 x 1.5 mm shall be provided. All doors shall be factory prepared for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers. The edges should be interlocked with a bending radius of 1.4mm. For pair of doors integrated astragals has to be provided on the meeting stile for both active and inactive leaf. Vision panel wherever applicable shall be maximum 200 x 300 mm (or max 0.06sq.mt) with clear borosilicate fire rated glass of minimum 6mm thickness. Glass shall be fixed with suitable gasket and with clip-on arrangement. Door Shutter shall be finished Pure Polyester Powder coating (minimum thickness of 50 micron) and shall have passed minimum 500 hours of salt spray test. All Fittings, Vision Glass to be paid separately.				
6.25	Providing and fixing of Medium duty acoustic door as per IS 16074 & IS 4351 made of pressed galvanized steel conforming to IS 277 with the following specification. Door shall be suitable for 39 db, STC rating and manufactured in ISO 9001: 2015 certified company for quality management. The door frame shall be single rebate step grooved profile of size 125 x 75 mm made out of 1.2 mm minimum thick galvanized steel sheet. Frames shall be mitered and field assembled with self tabs. Frames shall have inbuilt grooved sealing system and shall be site fitted with PVC gasket as standard. All provision should be mortised, drilled and tapped for receiving appropriate hardware. Perimeter seal of approved make Athmer/Legancy to be provided on all three sides of the frame jamb. Frames should be provided with back plate bracket and anchor fasteners for installation on a finished plastered masonry/concrete wall opening. Frames shall be filled with puff. All door frames shall be finished with Pure Polyester Powder coating (minimum 50 micron thick) and shall have passed minimum 500 hours of salt spray test. The Door leaf shall be 60 mm thick step design fully flush double skin door, insulated without vision panel. Door leaf shall be manufactured from 1.2 mm thick galvanized steel sheet. The internal construction of the door should be rigid reinforcement pads for receiving appropriate hardware. The infill material shall be 120 kg/m ³ high density mineral wool material. All doors shall be factory prepared for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers. The edges should be interlocked with a bending radius of 1.4mm. For pair of doors integrated astragals has to be provided on the meeting stile for both active and inactive leaf. Door shall be equipped with additional seals like auto door bottom. All doors shall be finished with Pure Polyester Powder coating (minimum 50 micron thick) and shall have passed minimum 500 hours of salt spray test. All hardware and seals cost will be paid extra.	22.00	Sqm	13884.95	3,05,468.90
6.26	Providing and fixing Ball bearing butt hinge, SS304, of size 100 x 75 x 3mm in SSS with necessary accessories and screws etc. complete.	344.00	Nos	254.95	87,702.80

6.27	Providing & Fixing CE/UL certified Extruded aluminum body Heavy duty Fire Rated Door Closers (Make: DormaTS89, Hormann HDC35, Geze TS5000, Hafele DCL-97) with full body cover. The Door Closers should be spring adjustable type 2-6, Non handed with back check. The door closer shall have 10 years mechanical warranty from the manufacturer and complies with EN 1154- for 50000 cycles + A1: 2002.	110.00	Nos	7557.05	8,31,275.50
6.28	Providing & Fixing Panic bar / latch (Two point or Double point) with vertical rod and top and bottom latch suitable for double doors or inactive leaf of door of make-Hafele-903.10.625/ Dorma-PHCR/ Geze-8026302 or Hormann XDB5120SV all complete with screws etc.	55.00	Nos	7591.20	4,17,516.00
6.29	Providing & Fixing External lever handle, with locking arrangement, Silver finish with necessary accessories and screws etc. complete	55.00	Nos	4324.80	2,37,864.00
6.30	Providing & Fixing Fire rated Gasket of 4mm x 13mm, Black colour Complete	322.00	Meter	149.10	48,010.20
6.31	Providing & Fixing Fire and smoke seal black colour Complete	322.00	Meter	160.45	51,664.90
6.32	Providing & Fixing Fire door intumescent seal, of size 15x1.5mm, self-adhesive, Black colour complete	322.00	Meter	187.80	60,471.60
6.33	Providing & Fixing 6 mm thick Clear fire rated glass, 120min integrity, of size 200 x 300mm for Vision Panel with necessary accessories and screws etc. complete	110.00	Nos	1889.25	2,07,817.50
6.34	Providing & Fixing Gravity Door coordinator /sequencer for the double leaf doors (Make – Dorma SR390, Hormann, Geze 013525, and Hafele) with necessary accessories and screws etc. complete	55.00	Nos	1707.15	93,893.25
6.35	Providing & Fixing ADB Seal of required thickness as per manufacturer specification etc. complete	34.00	Meter	3556.60	1,20,924.40
6.36	Providing & Filling Puff in Door Frame of required thickness as per manufacturer specification etc. complete	281.00	Meter	466.60	1,31,114.60
6.37	Providing and fixing 12 mm thick frameless toughened glass door of approved brand and manufacture, including making provision for all fittings by making necessary hole etc. for fixing required patch fittings etc. all complete as per direction of Engineer-in-charge. Cost of all S.S/ aluminium fittings, Floor Spring, Patch Fitting and 25mm x 450 long S.S. door handle used shall be paid for seperately.	67.00	Sqm	3395.75	2,27,515.25
6.38	Providing and fixing floor spring with adjustable spring strength Size EN 1 - 4, closing speed with standard spindle and cover plate. featuring hydraulically fully controlled closing cycle and backcheck, including upto box and adjustable closing speed from 175°, Hold open at 90°, Conforming to EN 1154 and CE marked. Durability: 500,000 Cycles, Finish: Satin stainless steel etc. complete as per the direction of Engineer-in-charge.	40.00	Nos	9144.35	3,65,774.00
6.39	Providing and fixing pull Handle (in pair) or equivalent back to back with 350mm CTC, adjustable fixing for glass, wood and metal doors in satin stainless steel. The pull handles should have	40.00	Nos	4078.00	1,63,120.00

	supporting washer with raised bevelling on the outer surface. Length =450mm, 25mm dia, -SS316 etc. complete as per the direction of Engineer-in-charge.				
6.40	Providing and fixing Satin SS Universal Corner Lock Patch with LKP & EPC and Strike Plate of (Model US10 STD, F700 or Equivelant) conforming to IS : 6315, having brand logo embossed on the body etc. complete as per the direction of Engineer-in-charge.	40.00	Nos	6098.45	2,43,938.00
6.41	Providing and fixing Top Pivot Patch of approved Make to 12 mm thick frameless toughened glass door.	40.00	Nos	3102.05	1,24,082.00
6.42	Providing and fixing Bottom Pivot Patch of approved Make to 12 mm thick frameless toughened glass door.	40.00	Nos	3102.05	1,24,082.00
6.43	Providing and fixing PT 24 DI Top Pivot 3 mm with fixing plate of approved Make to 12 mm thick frameless toughened glass door.	40.00	Nos	901.25	36,050.00
6.44	Providing and fixing 12 mm thick frameless toughened glass partition system of approved brand and manufacture, including fine edge polish, all fittings & silicon sealant as along with necessary holes etc. for fixing required door/patch/partition fittings etc. all complete as per direction of Engineer-in-charge. All fittings, fixing arrangements (in SS base rail, wall connector, clamps, EPDM Gasket, screws etc.) and installation, materials, making holes, dash fasteners etc are included in this item.	170.00	Sqm	5285.40	8,98,518.00
6.45	Providing and fixing partition upto ceiling height consisting of G.I. frame and required board, including providing and fixing of frame work made of special section power pressed/ roll form G.I. sheet with zinc coating of 120 gms/sqm(both side inclusive), consisting of floor and ceiling channel 50mm wide having equal flanges of 32 mm and 0.50 mm thick, fixed to the floor and ceiling at the spacing of 610 mm centre to centre with dash fastener of 12.5 mm dia meter 50 mm length or suitable anchor fastener or metal screws with nylon plugs and the studs 48 mm wide having one flange of 34 mm and other flange 36 mm and 0.50 mm thick fixed vertically within flanges of floor and ceiling channel and placed at a spacing of 610 mm centre to centre by 6 mm dia bolts and nuts, including fixing of studs along both ends of partition fixed flush to wall with suitable anchor fastener or metal screws with nylon plugs at spacing of 450 mm centre to centre, and fixing of boards to both side of frame work by 25 mm long dry wall screws on studs, floor and ceiling channels at the spacing of 300 mm centre to centre. The boards are to be fixed to the frame work with joints staggered to avoid through cracks, M.S. fixing channel of 99 mm width (0.9 mm thick having two flanges of 9.5 mm each) to be provided at the horizontal joints of two boards, fixed to the studs using metal to metal flat head screws, including jointing and finishing to a flush finish with recommended jointing compound, jointing tape, angle beads at corners (25 mm x 25 mm x 0.5 mm), joint finisher and two coats of primer suitable for board as per manufacture's specification and direction of engineer in charge all complete.				

6.45.1	66mm overall thickness Partition with 8mm thick double skin Calcium Silicate Board made with Calcareous & Siliceous materials reinforced with cellulose fiber manufactured through autoclaving process with Compressive Strength 225 kg/sq.cm, Bending Strength 100 kg./ sq.cm	198.00	Sqm	2244.25	4,44,362.00
	SUBHEAD 6 TOTAL				2,51,88,535.85
7	STEEL WORK				
7.1	Structural steel work in single section, fixed with or without connecting plate, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete	5609.00	Kg	111.90	6,27,647.10
7.2	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 - part 1 and M.S. top cover of required thickness for rolling shutters.				
7.2.1	80x1.25 mm M.S. laths with 1.25 mm thick top cover	28.00	Sqm	3759.85	1,05,275.80
7.3	Providing and fixing ball bearing for rolling shutters.	12.00	Nos	504.55	6,054.60
7.4	Extra for providing mechanical device chain and crank operation for operating rolling shutters.				
7.4.1	Exceeding 10.00 sqm and upto 16.80 sqm in the area	12.00	Sqm	776.00	9,312.00
7.5	Extra for providing grided rolling shutters manufactured out of 8 mm dia M.S. bar instead of laths as per design approved by Engineer-in-charge, (area of grill to be measured).	5.00	Sqm	1920.55	9,602.75
7.6	Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.				
7.6.1	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	8276.00	Kg	171.70	14,20,989.20
7.7	Providing and fixing Factory Made stainless steel (Grade 316) 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.).	9809.00	Kg	652.50	64,00,372.50
	SUBHEAD 7 TOTAL				85,79,253.95

8	FLOORING & DADO				
8.1	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.				
8.1.1	Granite stone slab colour black, Cherry/Ruby red				
8.1.1.1	Area of slab upto 0.50 sqm	5.00	Sqm	4558.40	22,792.00
8.1.1.2	Area of slab over 0.50 sqm	63.00	Sqm	3899.00	2,45,637.00
8.2	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.	97.00	Metre	589.85	57,215.45
8.3	Extra for providing opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter and similar location in marble/ Granite/ stone work, including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. Complete	73.00	each	1000.35	73,025.55
8.4	Pre-Polished Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab, including rubbing and polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) :				
8.4.1	25 mm thick	1852.00	Sqm	2132.85	39,50,038.20
8.5	Pre-Polished Kota stone slabs 20 mm thick in risers of steps, skirting, dado and pillars laid on 12 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, including rubbing and polishing complete.	195.00	Sqm	2569.20	5,00,994.00
8.6	Extra for pre finished nosing in treads of steps of Kota stone/ sand stone slab.	691.00	Meter	195.25	1,34,917.75
8.7	Extra for Kota stone/ sand stone in treads of steps and risers using single length up to 2.00 metre.	327.00	Sqm	45.05	14,731.35
8.8	Providing and laying Glazed Vitrified tiles in floor in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm including grouting the joints with white cement and matching pigments etc. The tiles must be cut with the zero chipping diamond cutter only . Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily.				
8.8.1	Glazed vitrified floor tiles polished finish of size				
8.8.1.1	Size of Tile 800 x 1600 mm	5442.00	Sqm	1681.00	91,48,002.00
8.9	Providing and laying Glazed Vitrified tiles in floor in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08%				

	and conforming to IS:15622, of approved brand & manufacturer, in all colours and shade, laid on 20 mm thick cement mortar 1:4 (1 cement: 4 coarse sand) jointing with grey cement slurry @3.3 kg/sqm including grouting the joints with white cement and matching pigments etc. The tiles must be cut with the zero chipping diamond cutter only . Laying of tiles will be done with the notch trowel, plier, wedge, clips of required thickness, leveling system and rubber mallet for placing the tiles gently and easily.				
8.9.1	Glazed Vitrified tiles Mat finish of size (Size of Tile 600 x 600 mm)	106.00	Sqm	1388.95	1,47,228.70
8.10	Providing and laying Vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, Dado, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joint with white cement & matching pigments etc. Complete				
8.10.1	Size of Tile 800x1600 mm	382.00	Sqm	1559.80	5,95,843.60
8.10.2	Size of Tile 600x1200mm	3116.00	Sqm	1559.80	48,60,336.80
8.11	Providing and fixing removable raised/ false access flooring with system and its components of approved make for different plenum height with possible height adjustment upto 50 mm, comprising of modular load bearing floor panels supported on G.I. rectangular stinger frame work and G.I. Pedestal etc. all complete, as per the architectural drawings, as specified and as directed by Engineer-in-charge consisting of: (a) Providing at required spacing to form modular framework, pedestals made out of GI tube of thickness minimum 2 mm and 25 mm outer diameter, fully welded on to the G.I. Base plate of size 100mm x 100mm x 3mm at the bottom of the pedestal tube, G.I. pedestal head of size 75mmx75mmx3.5 mm welded with GI fully threaded stud 16mm outer diameter with two GI Check nuts screwed on the stud for level adjustment upto 50mm, locking and stabilizing the pedestal head in position at the required level. The pedestals shall be fixed to the subfloor (base) through base plate using epoxy based adhesive of approved make or the machine screw with rawl plug. (b) Stringers system in all steel construction hot dipped galvanized of rectangular size 570x20x30x0.80mm thick having holes at both ends for securing the stringers on to the pedestal head using fully threaded screws ensuring maximum lateral stability in all directions, the grid formed by the pedestal and stringer assembly shall receive the floor panel, this system shall provide adequate solid, rigid support for access floor panel, the system shall provide a minimum clear uninterrupted clearance between the bottom of the floor for electrical conduits and wiring etc. all complete as per the architectural drawings, as specified and as directed by the Engineer-in-charge. (c) Providing and fixing Access Floor panel of 600x600x32 mm medium grade Filled Steel anti static high pressure Lamination of 800H grade (FS800H).				

	Access Floor panel shall be steel welded construction with an enclosed bottom pan with uniform pattern of 64 hemispherical cones. The top and bottom plates of Steel Gauges: top 0.6 mm and bottom 0.7 mm fused spot welded together (minimum 64 welds in each dome and 20 welds along each flange). The panel should be Corroresist epoxy coated for lifetime rust protection and cavity formed by the top and bottom plate is filled with Pyrogrip noncombustible Portland cementitious core mixed with lightweight foaming compound. The access floor shall be factory finished with Anti-static High Pressure laminate with Non Warp technology upto 1mm thickness for superior adhesion and Surface flatness within 0.75mm. The panel is to withstand a Concentrated Load of 363 kgs applied on area 25mm x 25mm without collapse in the centre of the panel which is placed on four steel blocks. The panel will withstand and Uniformly Distributed Load (UDL) minimum 1250 kg/sqm and an impact load of 50kg all complete as per the approved manufacturers specification and as per the direction of Engineer-in-charge. All specification must be printed on the side of the panel to ensure the quality of the product.				
8.11.1	300 mm Finished Floor Height (FFH)	110.00	Sqm	5154.00	5,66,940.00
8.12	Providing and laying polished Granite stone slabs 16 mm thick of in risers of steps, skirting, dado and pillars laid on 20 mm (average) thick cement mortar 1:3 (1 cement: 3 coarse sand) and jointed with grey cement slurry mixed with pigment to match the shade of the slabs, with copper pins 7.5 cm long, 6 mm diameter for securing adjacent stones in stone wall lining, including rubbing and polishing complete.	425.00	Sqm	4465.90	18,98,007.50
8.13	Providing and laying flamed finish Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing, curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge :				
8.13.1	Flamed finish granite stone slab Jet Black, Cherry Red, Elite Brown, Cat Eye or equivalent.	66.00	Sqm	3597.05	2,37,405.30
8.14	Providing and laying Polished Granite stone flooring in required design and patterns, in linear as well as curvilinear portions of the building all complete as per the architectural drawings with 18 mm thick stone slab over 20 mm (average) thick base of cement mortar 1:4 (1 cement : 4 coarse sand) laid and jointed with cement slurry and pointing with white cement slurry admixed with pigment of matching shade including rubbing , curing and polishing etc. all complete as specified and as directed by the Engineer-in-Charge.				
8.14.1	Polished Granite stone slab colour of Black, Cherry/Ruby Red or equivalent	1879.00	Sqm	3066.00	57,61,014.00

8.15	Providing and laying 12 mm thick AC-4, grade laminate wooden flooring & skirting of having 0.2 mm thick direct laminate on top of specially developed substrate core (high density fibre board) of plank size as per manufacturer's specification having smart lock, joint tongue and groove construction i/c top of skirting should be sealed with 4mm thick teak wood lipping. The under layer has to be a 0.2 mm thick alkali resistant polyethylene sheet of density 30-32 kg. per cum on top to secure the floor. The work shall be carried out as per manufacturer's installation procedure and as per direction of Engineer-in-charge.	782.00	Sqm	2010.60	15,72,289.20
	SUBHEAD 8 TOTAL				2,97,86,418.40
9	ROOFING				
9.1	Providing and fixing, in position concealed G.I. section for wall paneling using board of required thickness fixed on the 'W' profile (0.55 mm thick) having a knurled web of 51.55 mm and two flanges of 26 mm each with lips of 10.55 mm, placed @ 610 mm C/C in perimeter channel having one flange of 20 mm and another flange of 30 mm with thickness of 0.55 mm and web of length 27 mm. Perimeter channel is fixed on the floor and the ceiling with the nylon sleeves @ 610 mm C/C with fully threaded self-tapping dry wall screws. Board is fixed to the 'W' profile with 25 mm countersunk ribbed head screws @ 200 mm C/C., all complete as per the drawing & directions of engineer-in-charge, the joints of the boards are finished with specially formulated jointing compound and 48mm wide jointing tape to provide seamless finish.				
9.1.1	Tapered edge calcium silicate board made with calcareous & siliceous materials reinforced with cellulose fiber manufactured through autoclaving process to give stable crystalline structure with compressive strength 225 kg/ sq.cm, Bending strength 100 kg/sq.cm.	880.00	Sqm	1808.50	15,91,480.00

9.2	Providing and fixing false ceiling at all heights with integral densified calcium silicate reinforced with fibre and natural filler false ceiling tiles of Size 595x595 mm of approved texture, design and patterns having NRC (Noise Reduction coefficient) of 0.50 (minimum) as per IS 8225:1987, Light reflectance of 85% (minimum). Non combustible as per BS:476 (part-4), fire performance as per BS:476 (part 6 &7), humidity resistance of 100%, thermal conductivity < 0.043 W/m K as per ASTM 518:1991, in true horizontal level suspended on inter- locking metal powder coated T-Grid of hot dipped galvanised iron section of 0.40 mm thick on Silhouette profile, rotary stiched double webbed white with 6mm reveal profile (white/black), comprising of main-T runners of size 15x42mm of length 3000 mm, cross - T of size 15x42 mm of length 1200 mm and secondary intermediate cross- T of size 15x42 mm of length 600mm to form grid module of size 600 x 600 mm, suspended from ceiling using galvanised mild steel items (galvanizing @ 80 grams per Sqm) i.e. 50 mm long, 8 mm outer diameter M-6 dash fasteners, 6 mm dia fully threaded hanger rod upto 1000 mm length and L-shape level adjuster of size 85x25x2 mm. Galvanised iron perimeter wall angle of size 22x19x0.40 mm of length 3000 mm to be fixed on periphery wall / partition with the help of plastic rawl plugs at 450 mm center to center and 40mm long dry wall S.S screws. The work shall be carried out as per specifications, drawing and as per directions of the Engineer-in-Charge				
9.2.1	With 15 mm thick integral densified micro edge light weight calcium silicate false ceiling tiles	3530.00	Sqm	2511.55	88,65,771.50
9.3	Providing and fixing GI Clip in Metal Ceiling System of 600x600 mm module which includes providing and fixing 'C' wall angle of size 20x30x20 mm made of 0.5 mm thick pre painted steel along the perimeter of the room with help of nylon sleeves and wooden screws at 300 mm center to centre, suspending the main C carrier of size 10x38x10 mm made of G.I steel 0.7 mm thick from the soffit with help of soffit cleat 37x27x25x1.6 mm, rawl plugs of size 38x12 mm and C carrier suspension clip and main carrier bracket at 1000 mm c/c. Inverted triangle shaped Spring Tee having height of 24 mm and width of 34 mm made of GI steel 0.45 mm thick is then fixed to the main C carrier and in direction perpendicular to it at 600 mm centers with help of suspension brackets. Wherever the main C carrier and spring T have to join, C carrier and spring T connectors have to be used. All sections to be galvanized @ 120 gms/sqm (both side inclusive), fixing with clip in tiles into spring T with :				
9.3.1	GI Metal Ceiling Clip in plain Beveled edge global white color tiles of size 600x600 and 0.5 mm thick with 25 mm height, made of G I sheet having galvanizing of 100 gms/ sqm (both sides inclusive) and 20% perforation area with 1.8 mm dia holes and having NRC of 0.5, electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending.	972.00	Sqm	2075.90	20,17,774.80

9.4	Providing & Fixing Ceiling tiles having size of 600x600x15mm. It comprises a high-density glass wool panel covered with painted glass wool tissue for decorative ceiling effect and glass wool tissue on the backside and having sealed edges. It shall have a noise reduction co-efficient of greater than 0.90, light reflection of over 85%, density 100kg/m ³ , humidity resistant of greater than 95% to be laid on exposed 15mm G.I. powder coated grid system. The 15mm main Tee runner shall be suspended at an interval of 1200mm center to center. The 1200mm cross tee shall be attached between two main runners at every 600 mm and further 600mm cross Tee shall be interconnected between two 1200mm cross Tees. Thus a grid system of 600 mm X 600 mm is formed.	416.00	Sqm	2013.05	8,37,428.80
9.5	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.	26	Each	334.25	8,690.50
	SUBHEAD 9 TOTAL				1,33,21,145.60
10	FINISHING WORK				
10.1	12 mm cement plaster of mix :				
10.1.1	1:6 (1 cement: 6 fine sand)	19800.00	Sqm	373.20	73,89,360.00
10.2	15 mm cement plaster on rough side of single or half brick wall of mix:				
10.2.1	1:6 (1 cement: 6 fine sand)	8107.00	Sqm	430.35	34,88,847.45
10.3	Finishing walls with textured exterior paint of required shade :				
10.3.1	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	5824.00	Sqm	252.95	14,73,180.80
10.4	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade:				
10.4.1	New work (Two or more coats applied @ 1.43 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm)	577.00	Sqm	184.15	1,06,254.55
10.5	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade :				
10.5.1	Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacturer.	331.00	Sqm	242.80	80,366.80
10.6	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.	5824.00	Sqm	148.80	8,66,611.20
10.7	Providing and applying plaster of paris putty of 2 mm thickness over plastered surface to prepare the surface even and smooth complete.	22082.00	Sqm	265.00	58,51,730.00

10.8	Wall & Ceiling painting with premium acrylic emulsion paint of interior grade, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required to achieve even shade and colour.				
10.9.1	Two coats	5403.00	Sqm	143.25	7,73,979.75
	SUBHEAD 10 TOTAL				2,00,30,330.55
11	ROAD WORK				
11.1	Preparation and consolidation of sub grade with power road roller of 8 to 12 tonne capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade and disposal of surplus earthwith lead upto 50 metres.	4447.00	Sqm	220.70	9,81,452.90
11.2	Providing and filling in position rubberized bitumen hot sealing compound for sealing of expansion joints in roads / pavements all complete as per direction of the Engineer-in-Charge.				
11.2.1	Providing & filling in position rubberized bitumen hot sealing compound for sealing of expansion joint in roads/ pavements all complete as per direction of the Engineer-in-Charge.	3600.00	per cm depth per cm width per metre length	12.25	44,100.00
11.3	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand), including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	44.00	Cum	9334.45	4,10,715.80
11.4	Providing and laying C.C. pavement of mix M-25 with ready mixed concrete from batching plant. The ready mixed concrete shall be laid and finished with screed board vibrator , vacuum dewatering process and finally finished by floating, brooming with wire brush etc. complete as per specifications and directions of Engineer-in- charge. (The panel shuttering work shall be paid for separately) (Note:- Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/ recoverable separately).	575.00	Cum	12448.05	71,57,628.75
11.5	Construction of dry lean cement concrete sub base over a prepared sub-grade with coarse and fine aggregate conforming to IS:383, the size of coarse aggregate not exceeding 25 mm, aggregate cement ratio not to exceed 15:1, aggregate gradation after blending to be as per specifications, cement content not to be less than 150 Kg/cum, optimum moisture content to be determined during trial length construction, concrete strength not to be less than 10	310.00	Cum	4807.00	14,90,170.00

	Mpa at 7 days, mixed in a batching plant, transported to site, for all leads & lifts, laid with a mechanical paver, compacting with 8-10 tonne vibratory roller, finishing and curing etc. complete as per direction of Engineer-in-charge.				
11.6	Construction of granular sub-base by providing close graded Material conforming to specifications, mixing in a mechanical mix plant at OMC, carriage of mixed material by tippers to work site, for all leads & lifts, spreading in uniform layers of specified thickness with motor grader on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per specifications and directions of Engineer-in-Charge.				
11.6.1	With material conforming to Grade-II (size range 53 mm to 0.075 mm) having CBR Value-25	465.00	Cum	3062.80	14,24,202.00
11.7	Providing and laying tactile tile (for vision impaired persons as per standards) of size 300x300x9.8mm having with water absorption less than 0.5% and conforming to IS:15622 of approved make in all colours and shades in for outdoor floors such as footpath, court yard, multi modals location etc., laid on 20mm thick base of cement mortar 1:4 (1 cement : 4 coarse sand) in all shapes & patterns including grouting the joints with white cement mixed with matching pigments etc. complete as per direction of Engineer-in-Charge.	23.00	Sqm	2156.60	49,601.80
11.8	Providing and laying factory made chamfered edge Cement Concrete paver blocks in footpath, parks, lawns, drive ways or light traffic parking etc, of required strength, thickness & size/ shape, made by table vibratory method using PU mould, laid in required colour & pattern over 50mm thick compacted bed of sand, compacting and proper embedding/laying of inter locking paver blocks into the sand bedding layer through vibratory compaction by using plate vibrator, filling the joints with sand and cutting of paver blocks as per required size and pattern, finishing and sweeping extra sand. complete all as per direction of Engineer-in-Charge.				
11.8.1	60mm thick cement concrete paver block of M-35 grade with approved colour, design & pattern.	225.00	Sqm	1266.95	2,85,063.75
11.9	Making groove of required size 10x50mm in Cement concrete/ RCC pavement by diamond cutter in proper shape and size including filling bitumen hot sealing compound (Using grade 'A' sealing compound) in joints etc. removing left over material (cement concrete etc) complete , as per direction of Engineer in charge.				
11.9.1	Size of groove 50 X 10 mm	475.00	Metre	128.30	60,942.50
	SUBHEAD 11 TOTAL				1,19,03,877.50
12	PILE WORK				
12.1	Boring, providing and installation bored cast-in-situ reinforced cement concrete piles of grade M-25 of specified diameter and length below the pile cap, to carry a safe working load not less than specified, excluding the cost of steel reinforcement but including the cost of boring with bentonite solution and temporary casing of appropriate length for setting out				

	and removal of same and the length of the pile to be embedded in the pile cap etc. by percussion drilling using Direct mud circulation (DMC) or Bailer and chisel technique by tripod and mechanical Winch Machine all complete, including removal of excavated earth with all its lifts and leads (length of pile for payment shall be measured up to bottom of pile cap).				
a	600 mm dia piles	7350.00	Meter	4079.10	2,99,81,385.00
12.2	Add for using extra cement in the items of design mix over and above the specified cement content therein.	1454.00	Quintal	850.25	12,36,263.50
12.3	Vertical load testing of piles in accordance with IS 2911 (Part IV) including installation of loading platform by Kentledge/Anchor piles method and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of Engineer in-charge. Note 1- Initial and Routine Load Test shall not be carried out by Dynamic method of testing. Note 2- Testing agency shall submit the design of loading platform for the approval of Engineer In Charge.				
a	Single pile above 50 tonne and upto 100 tonne Safe capacity				
i	Initial test (Test Load Till Failure)	2.00	Each	57616.75	1,15,233.50
ii	Routine test (Test Load 1.5 times the Safe capacity)	4.00	Each	32009.30	1,28,037.20
12.4	Integrity testing of Pile using Low Strain/ Sonic Integrity Test/ Sonic Echo Test method in accordance with IS 14893 including surface preparation of pile top by removing soil, mud, dust & chipping lean concrete lumps etc. and use of computerised equipment and high skill trained personal for conducting the test & submission of results, all complete as per direction of Engineer-in-charge. Note- The inclusion of the above item in the schedule of work shall be judiciously decided by the technical sanctioning authority, keeping in view the quality control, type of soil strata & importance of the project.	8.00	Each	1008.25	8,066.00
	SUBHEAD 12 TOTAL				3,14,68,985.20
13	WATER PROOFING				
13.1	Providing and Placing in position suitable PVC water stops conforming to IS:12200 for construction/ expansion joints between two RCC members and fixed to the reinforcement with binding wire before pouring concrete etc. complete				
13.1.1	Serrated with central bulb (225 mm wide, 8-11 mm thick)	238.00	Meter	265.55	63,200.90
13.2	Water proofing treatment to vertical and horizontal surfaces in all internal wet areas of building (e.g. Toilets/Kitchens/AHU/balconies etc.) shall be done with two-component, high elasticity acrylic modified cementitious coating system (GRACE, SIKA, SOPREMA) made from best quality Portland cement, properly selected & graded aggregates additives & acrylic emulsion polymer as a binder. The product consumption shall be at least @ 2kg/sqm. The coating system must have the following characteristics: i) Powder to Liquid Ratio 2:1, ii) Bond Strength with concrete > 2 Mpa, iii) Elongation > 200% and shall be applied as per manufacturer specification. The coating shall be continued to the entire horizontal area and	597.00	Sqm	924.70	5,52,045.90

	should be terminated at 300mm above the floor finish level complete as per manufacturer's specification. The coating shall be followed by providing and applying 15 mm thick Protective mortar of (1 Cement: 4 Coarse Sand) mixed with integral waterproofing compound of approved make as per manufacturer's specifications. All systems shall be installed by authorized applicators (in house team of manufacturer) as per manufacturer's recommendations and includes all lead and lift for all materials and labor.				
13.3	Providing and mixing integral crystalline admixture for water proofing treatment to RCC structures like basement raft, retaining walls, reservoir, sewage & water treatment plant, tunnels / subway and bridge deck etc. at the time of transporting of concrete into the drum of the ready-mix truck , using integral crystalline admixture @0.80% (minimum) to the weight of cement content per cubic meter of concrete) or higher as recommended by the manufacturer's specification in reinforced cement concrete at site of work. The material shall meet the requirements as specified in ACI-212-3R- 2010 i.e. by reducing permeability of concrete by more than 90%, compared with control concrete as per DIN 1048 and resistant to 16 bar hydrostatic pressure. The crystalline admixture 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.	14126.00	Kg	314.30	44,39,801.80
13.4	Terrace water proofing cum insulation (GRACE, SIKA, SOPREMA) shall consist the following:				
	<p>First Part (Surface Preparation): Mechanically grinding of substrate so as to achieve surface free of dust, loose particles. All cracks to be treated by cutting a groove and sealing cracks with Polymer modified cement mortar. Making coving with 1:3 cement mortar modified with 10% SBR polymer. Providing and laying reinforcing mesh on all horizontal and vertical members of termination points and cracks.</p> <p>Second Part (Waterproofing Membrane) : Supplying and installing spray/ roller applied a high performance, low odour, one-part, fast curing, high solids, cold applied polyurethane elastomer waterproof membrane over uniform surface. The material shall be pure polyurethane with DFT of 1.5mm and consumption of 2.2 - 2.4 Kg/Sqm. It should not contain bitumen or tar and should not bleed or stain and should have following minimum properties: i) Solid % Vol: > 85 ii) Tensile Strength > 2 Mpa iii) Elongation > 500% iv) Tear Strength > 12 N/mm shall be applied as per manufacturer specification.</p>	1873.00	Sqm	4232.35	7927191.55

	<p>Third Part- SPRAY APPLIED INSULATION (PUF) : Providing & supplying instant setting spray applied two component Rigid Polyurethane Foam Insulation avg 50mm thick on the terrace having density 45-50 kg/m³, Thermal conductivity 0.020-0.030 W/mK, closed cell content of >90%, Fire resistance conforming to Class - B2 to be applied as per the manufacturer's recommendations applied over the RCC slab and on the vertical surfaces on the parapet walls upto 300mm above FFL, etc. complete.</p> <p>Fourth Part (PU Sealer coat over PUF) : Supplying and installing spray/ roller applied a high performance, low odour, one-part, fast curing, high solids, cold applied polyurethane elastomer waterproof membrane over uniform surface. The material shall be pure polyurethane with consumption of 1.5 Kg/Sqm. It should not contain bitumen or tar and should not bleed or stain and should have following minimum properties: i) Solid % Vol: > 85 ii) Tensile Strength > 2 Mpa iii) Elongation > 500% iv) Tear Strength > 12 N/mm shall be applied as per manufacturer specification.</p> <p>Fifth Part (Laying of Protection Geotextile Membrane) : Providing and laying geotextile membrane of 200 GSM as a separation layer. Geotextile membrane shall be overlapped by 50mm and spot bonded.</p> <p>Sixth Part (Laying of Protection screed) : Providing & laying avg 100mm protective screed of M20 grade with slope 1:100 containing 100% virgin polypropylene fibers @ 0.9 Kg per Cum with a broom finish, well compacted, curing for 7 days etc. complete. The screed shall be laid in panels with 10mm wide construction joint and filling the panel joints with PU Sealant.</p>				
13.5	<p>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, reservoir, 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 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.</p>				
13.5.1	For vertical surface two coats @ 0.70 kg per sqm per coat.	478.00	Sqm	433.00	2,06,974.00
13.5.2	For horizontal surface one coat @1.10 kg per sqm.	216.00	Sqm	331.00	71,496.00

	SUBHEAD 13 TOTAL				1,32,60,710.15
14	STRUCTURAL GLAZING				
14.1	Providing and supplying aluminium extruded tubular and other aluminium sections as per the architectural drawings and approved shop drawings , the aluminium quality as per grade 6063 T5 or T6 as per BS 1474,including super durable powder coating of 60-80 microns conforming to AAMA 2604 of required colour and shade as approved by the Engineer-in-Charge. (The item includes cost of material such as cleats, sleeves, screws etc. necessary for fabrication of extruded aluminium frame work. Nothing extra shall be paid on this account). The weight of aluminium extruded section shall be taken for purpose of payment.	8913.00	Kg	495.75	44,18,619.75
14.2	Designing, fabricating, testing, protection, installing and fixing in position semi (grid) unitized system of structural glazing (with open joints) for linear as well as curvilinear portions of the building for all heights and all levels, including: (a) Structural analysis & design and preparation of shop drawings for the specified design loads conforming to IS 875 part III (the system must passed the proof test at 1.5 times design wind pressure without any failure), including functional design of the aluminum sections for fixing glazing panels of various thicknesses, aluminium cleats, sleeves and splice plates etc. gaskets, screws, toggles, nuts, bolts, clamps etc., structural and weather silicone sealants, flashings, fire stop (barrier)- cum-smoke seals, microwave cured EPDM gaskets for water tightness, pressure equalisation & drainage and protection against fire hazard including: (b) Fabricating and supplying serrated M.S. hot dip galvanised / Aluminium alloy of 6005 T5 brackets of required sizes, sections and profiles etc. to accommodate 3 Dimensional movement for achieving perfect verticality and fixing structural glazing system rigidly to the RCC/ masonry/structural steel framework of building structure using stainless steel anchor fasteners/ bolts, nylon seperator to prevent bimetallic contacts with nuts and washers etc. of stainless steel grade 316, of the required capacity and in required numbers. (c) Providing and filling, two part pump filled, structural silicone sealant and one part weather silicone sealant compatible with the structural silicone sealant of required bite size in a clean and controlled factory / work shop environment, including double sided spacer tape, setting blocks and backer rod, all of approved grade, brand and manufacture, as per the approved sealant design, within and all around the perimeter for holding glass.				

	<p>(d) Providing and fixing in position flashings of solid aluminium sheet 1 mm thick and of sizes, shapes and profiles, as required as per the site conditions, to seal the gap between the building structure and all its interfaces with curtain glazing to make it watertight.</p> <p>(e) Making provision for drainage of moisture/ water that enters the curtain glazing system to make it watertight, by incorporating principles of pressure equalization, providing suitable gutter profiles at bottom (if required), making necessary holes of required sizes and of required numbers etc. complete. This item includes cost of all inputs of designing, labour for fabricating and installation of aluminium grid, installation of glazed units, T&P, scaffolding and other incidental charges including wastages etc., enabling temporary structures and services, cranes or cradles etc. as described above and as specified. The item includes the cost of getting all the structural and functional design including shop drawings checked by a structural designer, dully approved by Engineer-in-charge. The item also includes the cost of all mock ups at site, cost of all samples of the individual components for testing in an approved laboratory, field tests on the assembled working structural glazing as specified, cleaning and protection till the handing over of the building for occupation. In the end, the Contractor shall provide a water tight structural glazing having all the performance characteristics etc. all complete as required, as per the Architectural drawings, as per item description, as specified, as per the approved shop drawings and as directed by the Engineer- in-Charge.</p>				
	<p>Note:- 1. The cost of providing extruded aluminium frames, shadow boxes, extruded aluminium section capping for fixing in the grooves of the curtain glazing and vermin proof stainless steel wire mesh shall be paid for separately under relevant items under this sub- head. However, for the purpose of payment, only the actual area of structural glazing (including width of grooves) on the external face shall be measured in sqm. up to two decimal places.Note:-2. The following performance test are to be conducted on structural glazing system if area of structural glazing exceeds 2500 Sqm from the certified laboratories accredited by NABL(National Accreditation Board for Testing and Calibration Laboratories), Department of Science & Technologies, India. Cost of testing is payable separately.</p>				

	<p>Performance Testing of Structural glazing system Tests to be conducted in the NABL accredited lab or any other accreditation body which operates in accordance with ISO/ IEC 17011 and accredits labs as per ISO/IEC 17025</p> <p>1. Performance Laboratory Test for Air Leakage Test (-50pa to - 300pa) & (+50pa to +300pa) as per ASTM E-283-04 testing method for a range of testing limit 1 to 200 mVhr</p> <p>2. Static Water Penetration Test. (50pa to 1500pa) as per ASTM E- 331-09 testing method for a range up to 2000 ml.</p> <p>3. Dynamic Water Penetration (50pa to 1500pa) as per AAMA 501.01- 05 testing method for a range upto 2000 ml</p> <p>4. Structural Performance Deflection and deformation by static air pressure test (1.5 times design wind pressure without any failure) as per ASTM E-330-10 testing method for a range upto 50 mm</p> <p>5. Seismic Movement Test (upto 30 mm) as per AAMA 501.4-09 testing method for Qualitative test, Tests to be conducted on site.</p> <p>6. Onsite Test for Water Leakage for a pressure range 50 kpa to 240 kpa (35psi) upto 2000 ml</p>	1485.00	Sqm	3672.90	54,54,256.50
14.3	<p>Providing, assembling and supplying vision glass panels (IGUs) comprising of hermetically-sealed 6-12- 6 mm insulated glass (double glazed) vision panel units of size and shape as required and specified, comprising of an outer heat strengthened float glass 6mm thick, of approved colour and shade with reflective soft coating on surface # 2 of approved colour and shade, an inner Heat strengthened clear float glass 6mm thick, spacer tube 12mm wide, dessicants, including primary seal and secondary seal (structural silicone sealant) etc. all complete for the required performances, as per the Architectural drawings, as per the approved shop drawings, as specified and as directed by the Engineer-in-Charge. The IGUs shall be assembled in the factory/ workshop of the glass processor.</p> <p>(Payment for fixing of IGU Panels in the curtain glazing is included in cost of item No.14.2)</p> <p>For payment, only the actual area of glass on face # 1 of the glass panels (excluding the areas of the grooves and weather silicone sealant) provided and fixed in position, shall be measured in sqm.</p> <p>(i) Coloured tinted float glass 6mm thick substrate with reflective soft coating on face # 2, + 12mm Airgap + 6mm Heat Strengthened clear Glass of approved make having properties as visible Light transmittance (VLT) of 45 to 50 %, Light reflection internal 15 to 20%, light reflection external 10 to 20%, shading coefficient (0.25- 0.28) and U value of 1.6 to 2.0 W/ m2 degree K etc. The properties of performance glass shall be decided by technical sanctioning authority as per the site requirement.</p>	1485.00	Sqm	5233.00	77,71,005.00
14.4	<p>Extra for openable side / top hung vision glass panels (IGUs) including providing and supplying at site all accessories and hardwares for the openable panels as specified and of the approved make such as heavy duty stainless steel friction hinges, min 4 -point cremone</p>	149.00	Sqm	4216.45	6,28,251.05

	locking sets with stainless steel plates, handles, buffers etc. including necessary stainless steel screws/ fasteners, nuts, bolts, washers etc. all complete as per the Architectural drawings, as per the approved shop drawings, as specified and as directed by the Engineer-in- Charge.				
14.5	Design supply & installation of suspended Spider Glazing system designed to withstand the wind pressure as per IS 875 (Part-III). The Suspended System held with Spider Fittings of SS-316 Grade Steel of approved manufacturer with glass panel having 12 mm thick clear toughened glass held together with SS- 316 Grade Stainless steel Spider & bolt assembly with laminated glass fins 21 mm thick. The Glass fins and glass panel assembly shall be connected to Slab/ beams by means of SS- 316 Grade stainless steel brackets & Anchor bolts and at the bottom using SS channel of 50x25x2mm using fastener & anchor bolts, non staining weather sealants of approved make, Teflon/ nylon bushes and separators to prevent bi-metallic contacts, all complete to perform as per specification and approved drawings. The complete system to be designed to accommodate thermal expansion & seismic movements etc. The joints between glass panels (6 to 8 mm) and gaps at the perimeter & in U channel of the assembly to be filled with non staining weather sealant, so as to make the entire system fully water proof & dust proof. The rate shall include all design, Engineering and shop drawing including approval from structural designer, labour, T&P, scaffolding, other incidental charges including wastage, enabling temporary services all fitting fixers nut bolts, washer, Buffer plates, fastener, anchors, SS channel laminated glass etc. all complete. For the purpose of payment, actual elevation area of Glazing including thickness of joints and the portion of Glass panel inside the SS channel shall be measured.	49.00	Sqm	8570.40	4,19,949.60
	SUBHEAD 14 TOTAL				1,86,92,081.90
15	MISCELLANEOUS ITEM				
15.1	Providing & Fixing Toilet Cubicle made up of 12mm thick compact board with standard height of 1995mm and 600mm door size width (Greenlam (Sturdo)/Fundermax/Merino make) made up of thermosetting resin treated high pressure, self-supporting decorative compact laminates with permanently incorporating anti-bacterial agents during manufacturing. Compact board should be Moisture resistant, Impact resistant, termite resistant, Scratch resistant, Weather and climatic shock resistant. Compact board should satisfy criteria of FSC and green guard gold certification. It should be manufactured under IS2046 and EN438-2&3:2005 standard and shall have resistance to water immersion through permissible increase on thickness and mass <0.60% and board density >1.35kg/cm ³ . Finish of compact laminates should be suede finish which includes door, pilasters and intermediate panels finished with approved texture/shades as per IS2046 and fulfilling the criteria of fire retardant under BS-476/97 and EN438-6 with classification of BS1D0 standard.	63.00	NOS	47992.65	30,23,536.95

	Pilaster may be supported with SS (grade316) adjustable foot and intermediate panels will be attached to the wall with the help of approved SS (grade316) channels and all required hardware, made up of stainless steel as per manufacturer's specification. All required hardware (e.g. Door knob, gravity hinges, Thumb turn locksets with occupancy indicators, coat hooks with door stopper, U channel, top rail with corner connector, adjustable foot/pedestal, Rubber noise deafening tape, screw & wall plugs) shall be approved by Engineer-in-Charge				
	All screw will be of 304 grade in SS with stain finish. All pilasters are supported by SS bottom cladding. The base of the stainless-steel bottom cladding will be anchored to the floor with a clearance height upto 150 mm for European W/C whereas no clearance from floor shall be kept for Indian W/C.				
15.2	Providing and fixing 12 mm thick toughened glass over Canopy using 25x25mm Aluminium Square Tube section of approved brand and manufacture, includingfixing using cleat, screw etc.complete	118.00	Sqm	3545.20	4,18,333.60
	SUBHEAD 15 TOTAL				34,41,870.55
16	Sanitary Installation				
16.1	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as perIS : 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 :				
	Kitchen Sink With drain Board				
16.1.1	510x1040 mm bowl depth 200 mm	5	Each	7950.15	39,750.75
	Kitchen Sink Without drain Board				
16.1.2	610x510mm bowl depth 200 mm	6	Each	5748.10	34,488.60
16.2	Providing and fixing vitreous china laboratory sink with CI brackets, CP brass chain with rubber plug 40mm CP brass waste and 40mm CP brass trap with necessary CP brass unions complete including painting of fittings and brackets, cutting and making good the wall wherever required.				
16.2.1	Size 450x300x150mm.	6	Each	4740.05	28,440.30
16.3	Providing and fixing wash basin with 32 mm C.P. brass waste of standard pattern (Model K-31460IN-0+K-45432IN-CP of Kohler, SLS-WHT-6801+ALD-705L130 of Jaquar or equivalent make of Roca) and pillar faucet Make Kohler Model no.K-27484IN-4-CP, Make -Jaquar Model. No. OPP-15001PM or equivalent model of Roca with C.I. brackets, including painting of fittings and brackets, cutting and making good the walls wherever require:				
16.4	White Vitreous China Wash basin	15	Each	5096.40	76,446.00
16.4.1	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.				
16.5	Semi rigid pipe				
16.5.1	40 mm dia	11	Each	115.40	1,269.40
16.5.1.1	Providing and fixing CP Brass 32mm size Bottle Trap (Model no. K-16407IN-CP of Kohler, Model no. ALD-CHR-769L250X190 of Jaquar or equivalent model of Roca) of approved quality & make and as per the direction of Engineer-in-charge.	94	Each	1587.45	1,49,220.30

16.6	Providing and fixing CP Brass Single lever wall mixer with overhead shower arrangement (Model no. CQT-23273UPR of Jaquar or equivalent model of Kohler and Roca) of quality & make as approved by Engineer in charge.	7	Each	3663.20	25,642.40
16.7	Providing and fixing toilet paper holder (Model no. :K-25070IN-CP of Kohler, Model no. HS-1551 of Jaquar, or equivalent model of Roca)				
16.7.1	C.P. brass	107	Each	1665.10	1,78,165.70
16.9	Providing and fixing white vitreous china extended wall mounting water closet of (Model no. K-26994IN-0 of Kohler, Model no. ACS-WHT-87953BIUFSM of Jaquar, or equivalent model of Roca) including providing & fixing white vitreous china cistern (Model no. K-26351IN-P-NA of Kohler, Model no. JCS-WHT-2400S of Jaquar, or equivalent model of Roca) with dual flush fitting (model no. K--28476IN-M-CP of Kohler, Model no. JCP-CHR-152415 of Jaquar, or equivalent model of Roca) 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.	107	Each	29858.00	31,94,806.00
16.10	Providing and fixing white vitreous china battery based infrared sensor operated urinal (of model no. K-26475IN-ER-0+K-24199IN-C01-CP of Kohler, Model no. URS-WHT-13263+NR-STL-51093N of Jaquar, or equivalent model of Roca) having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge.	58	Each	22705.45	13,16,916.10
16.11	Providing and fixing stainless steel grating (of Chilly/ Camry or equivalent) approved quality and colour.				
16.11.1	125 mm dia.	263	Each	1071.00	2,81,673.00
16.12	Providing and fixing white vitreous china wash basin (with special fabricated brackets painted white, faucets as required, 32 mm C.P. brass waste pipe, 32 mm C.P. brass bottle trap & pipe to wall with rubber adopter for waste connection and C.P. brass wall flange complete in all respects including cutting and making good the walls where required.				
16.12.1	Under Counter Wash basin (Model no. K-2211IN-0+K-45432IN-CP of make Kohler, Model no. FNS-WHT-40701+ALD-705L130 of Jaquar, or equivalent model of Roca), 32 mm bottle trap (Model no. K-16407IN-CP of Kohler, Model no. ALD-CHR-769L250X190 of Jaquar or equivalent model of Roca) all complete.	79	Each	6719.00	5,30,801.00
16.12.2	Over Counter Wash basin (Model no. K-31459 IN-0+K-20746IN-CP of make Kohler, Model no. LAS-WHT-91903+ALD-705L130 of Jaquar, or equivalent model of Roca), 32 mm bottle trap (Model no. K-16407IN-CP of Kohler, Model no. ALD-CHR-769L250X190 of Jaquar or equivalent model of Roca) all complete.	27	Each	8308.00	2,24,316.00

16.13	Providing and fixing 15mm C.P brass wall mount Faucet Make Kohler Model no.K-27489IN-4ND-CP+K-25149IN-NA, Make - Jaquar Model. No. OPP-15441KPM+ALD-441 or equivalent model of Roca for Wash Basin Including cutting and making good the walls wherever required etc. all complete.	92	Each	3389.00	3,11,788.00
16.14	Providing and fixing 15mm C.P brass Single Lever Basin Mixer Make Kohler Model no.K-27481IN-4ND-CP+K-25150IN-NA, Make -Jaquar Model. No. SOL-6233NK+LD-233NPSO or equivalent model of Roca for Wash Basin Including cutting and making good the walls wherever required etc. all complete.	29	Each	5314.00	1,54,106.00
16.15	Providing and fixing 15mm C.P. copper connecting pipe 450mm long with C.P. brass nuts, washers complete in all respects. Model no. Jaquar Cat No. ALD 803AB or equivalent model of Roca all complete.	150	Each	292.00	43,800.00
16.16	Providing and fixing C.P. brass 15 mm nominal bore two way bib cock Make Kohler K-25432IN-4-CP Jaquar Cat. No. KUP-CHR-35041PM or equivalent model of Roca all complete	67	Each	2792.00	1,87,064.00
16.17	Providing and fixing C.P. cast brass twin coat hooks fixed to PVC rawl plug with SS screws Model no K-5635IN-CP of Kohler/Make- Jaquar Cat. No. AKP-CHR-35761P or equivalent model no. of Roca all complete.	107	Each	1037.00	1,10,959.00
16.18	Providing and fixing health faucet with 1 m long flexible tube and wall hook including all fittings Make Modle no. K--98100IN-CP of kohler/ Jaquar Cat. No. ALD-CHR-577/ equivalent model of Roca all complete.	107	Each	1873.00	2,00,411.00
16.19	Providing and fixing 15mm C.P brass Sink Mixer Model no K--20591IN-4-CP of Kohler/ Jaquar Model. No. DRC-CHR-37165 or equivalent model of Roca for kitchen sink with swinging spout complete. Including cutting and making good the walls wherever required etc. all complete.	11	Each	4572.00	50,292.00
16.20	Providing and fixing of C.P. brass 600 mm size towel rail Model no K-5630IN-CP of Kohler , Model no KP-35715PS of Jaquar equivalent model of Roca fixed with C.P. brass screws complete in all respects etc. all complete.	31	Each	1884.00	58,404.00
16.21	Providing and fixing of C.P. brass Soap Dish, Model no K-25068IN-CP of Kohler/Make Jaquar Cat. No. AQN-7731 or equivalent model of Rocafixed with C.P. brass screws complete in all respects.	31	Each	1329.00	41,199.00
16.22	Providing and fixing liquid soap dispenser including all fittings complete. of Jaquar, Euronix, or equivalent make all complete..	121	Each	1976.00	2,39,096.00
16.23	Providing & fixing SS Grab Bar of Make Euronics Model No. EGR (S02) & SS Grab Rail Euronics Model No. EGR 01 or equivalent model of Jaquar or Roca, Including cutting and making good the walls wherever required etc. all complete..	15	Each	6532.00	97,980.00
16.24	Providing and fixing Air Purifier Make Euronics Model-EA 34 or equivalent model of Jaquar or Roca including all fittings complete in all respect.	107	Each	1965.00	2,10,255.00

16.25	Providing and fixing 150 litre/ hr. cooling and storage capacity,fully stainless steel electric storage type water cooler Make- Blue Star model No.SS SDLX 150150 or equivalent) / MAKE VOLTAS, model no.SS FSS-150, or equivalent model as approved by engineer in charge with inlet hose connection inbuilt float valve. 2 Nos. outlet foucet, drain tray with waste and pipe up to flloor trap heavy compressor and wire up to socket, 3 pin plug etc complete in all respect.	5	Each	47136.00	2,35,680.00
16.26	Supplying, installation, testing and commissioning of skid mounted fully automatic Reverse Osmosis System of output capacity 50 litres / hour designed at a minimum Flux at inlet Make- Blue Star model RO +UF)/ Pentair/ Kent as required or equivalent etc. all complete.	5	Each	43699.00	2,18,495.00
16.27	Providing and Fixing of C.P. Brass Shower set comprising of : One No. CP brass Single Lever Concealed Diverter Model no. (K-27499IN-4FP-CP+ K-882IN-CP) of Kohler/Make Jaquar Cat. No. ALD-CHR-079+OPP-15079NKPM/ or equivalent model no. of Roca One No. CP brass OH shower head Make Kohler, Model no. K-73199IN-CP, Make Jaquar Cat. No. OHS-1633+SHA-477, or equivalent model of Roca all complete. One No. CP brass Bath Spout Kohler Model n. K-99061IN-CP/Make Jaquar Cat. No. SPJ-CHR-91429/or equivalent model of Roca Including cutting and making good the walls wherever required etc. all complete..	24	Each	17401.00	4,17,624.00
16.28	Providing and Fixing of Grease Separator (Nugreen, Kessel, Eneka) for kitchen.	1	Each	45036.00	45,036.00
16.29	Providing and Fixing of MS body in SS finish Hand Dryer with voltage supply of 220V,with touch free infra red sensor.(For Director Room), Make Jaquar HDR-SSF-AK2803D,Make Eurionics ,model no-EH210N or equivalent model of Roca all complete.	5	Each	7362.00	36,810.00
16.30	Providing and Fixing of Hand Dryer, SS 304 grade, total power 1000W,Hot & cold switchwith a air speed of 110m/s, noise level upto 75 DB,Energy efficient.(For Banquet common toilet)Make Jaquar HDR-SSF-AK2803D/Make Eurionics,model no-EH24S or equivalent make of Roca all complete.	4	Each	7362.00	29,448.00
16.31	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	26	Each	72.95	1,896.70
16.32	Providing and fixing SWR pipe conforming to IS:13592 Type B including all fittings, e.g. couplings, tees, bends, reducers and screwed adoptors jointing with solvent cement joint as per manufacturers' recommendations including all fittings complete in all respect. [for Soil & Waste Pipes)				
16.32.1	110 mm OD	1533	Metre	474.00	7,26,642.00

16.33	Providing and fixing uPVC agricultural pipes conforming to IS:4985 (6 kg/sqcm) including all fittings, e.g. couplings, tees, bends, reducers and screwed adoptors jointing with solvent cement joint as per manufacturers' recommendations including all fittings complete in all respect. [for Rain Water Pipes & Waste Pipes).				
16.33.1	40 mm OD	325	Metre	123.00	39,975.00
16.33.2	50 mm OD	128	Metre	152.00	19,456.00
16.33.3	63 mm OD	142	Metre	204.00	28,968.00
16.33.4	90 mm OD	665	Metre	399.00	2,65,335.00
16.33.5	110 mm OD	46	Metre	510.00	23,460.00
16.33.6	160 mm OD	497	Metre	973.00	4,83,581.00
16.34	Providing and fixing of GI split pipe support clamps with EPDM rubber lining, Zinc plated for support of vertical/hanging horizontal soil, waste, vent and rain water pipes, embedded in walls with anchor fastner, including recommended size GI threaded rod of required length etc. including cost of cutting holes and making good the walls complete in all respects.				
16.34.1	For 75 mm dia Pipe (Thickness of clamp 1.7 mm)	183	Each	122.00	22,326.00
16.34.2	For 100 mm dia Pipe (Thickness of clamp 2.0 mm)	313	Each	133.00	41,629.00
16.34.3	For 150 mm dia Pipe (Thickness of clamp 2.0 mm)	158	Each	171.00	27,018.00
16.35	Providing and fixing in position Brass Clean out plug complete in all respects				
16.35.1	110 mm dia	11	Each	667.00	7,337.00
16.36	Providing and fixing 100 mm dia uPVC inlet fitting/ Extension Piece with 2 or 3 inlets of 32 to 50 mmdia, fixed to uPVC trap with Sealent and set in cement concrete as per drawing complete.	170	Each	338.00	57,460.00
16.37	Providing and fixing uPVC trap of self cleansing design with grating with or without vent arm complete, including cost of cutting and making good the walls and floors :	170	Each	352.00	59,840.00
16.38	Providing and fixing in position 110x63 mm dia uPVC floor Drain including fix to floor with cement mortor.	93	Each	277.00	25,761.00
16.39	Providing and fixing in position 110 mm dia Clean out plug complete in all respects	89	Each	88.00	7,832.00
16.40	Providing and fixing in position 110 mm dia Vent Cowl complete in all respects				
16.40.1	90 mm OD	14	Each	77.00	1,078.00
16.40.2	110 mm OD	30	Each	90.00	2,700.00
	SUBHEAD 16 TOTAL				1,06,12,677.25
17	Water Supply System				
17.1	Providing and fixing C.P. brass bib cock (Model no. K-16093IN-4-CP of Kohler, Model no. KUP-CHR-35037PM of Jaquar or equivalent model no. of Roca) of approved quality conforming to IS:8931 :				
17.1.1	15 mm nominal bore	22	Each	1896.20	41,716.40
17.2	Providing and fixing C.P. brass long body bib cock (Kohler, Jaquar or Roca) of approved quality conforming to IS standards and weighing not less than 690 gms.				
17.2.1	15 mm nominal bore	12	Each	2579.35	30,952.20

17.3	Providing and fixing C.P. brass angle valve (Model no. K-25431IN-4-CP of Kohler, Model no. OPP-15053PM of Jaquar or equivalent model no. of Roca) for basin mixer and geyser points of approved quality conforming to IS:8931				
17.3.1	15 mm nominal bore	331	Each	1304.60	4,31,822.60
17.4	Providing and fixing C.P. brass shower rose with 15 or 20 mm inlet:				
17.4.1	150 mm diameter	7	Each	296.40	2,074.80
17.5	Providing and fixing C.P. Brass extension nipple (size 15mmx50mm) of approved make and quality as per direction of Engineer-in-charge.	365	Each	68.75	25,093.75
17.6	Providing and fixing Stainless Steel pipe and fitting of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards complete with press type fitting (fitting shall be paid for separately) i/c fixing of the pipe with clamps at 1.00 m spacing including cutting and making good the walls including testing of joints complete as per direction of Engineer-in-charge. (The pipe length inserted in the fitting shall not be measured for payment).				
	Internal Work - Exposed on Wall				
17.6.1	15 mm outer dia pipe	647	Metre	656.35	4,24,658.45
17.6.2	22 mm outer dia pipe	271	Metre	945.40	2,56,203.40
17.6.3	28 mm outer dia pipe	85	Metre	1167.70	99,254.50
17.7	Providing and fixing Stainless Steel pipe and fitting of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards complete with press type fitting (fitting shall be paid for separately) i/c fixing of the pipe with clamps at 1.00m spacing and also including cutting of chases and making good the walls including testing of joints complete as per direction of Engineer-in-charge. (The pipe length inserted in the fitting shall not be measured for payment)				
	Internal work - Concealed Pipe				
17.7.1	15 mm outer dia pipe	1119	Metre	872.70	9,76,551.30
17.7.2	22 mm outer dia pipe	284	Metre	1161.75	3,29,937.00
17.8	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Coupling/Socket				
17.8.1	For 15 mm outer dia pipe	355	Each	307.30	1,09,091.50
17.8.2	For 22 mm outer dia pipe	74	Each	384.10	28,423.40
17.8.3	For 28 mm outer dia pipe	36	Each	448.15	16,133.40
17.9	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Reducer				
17.9.1	For 22mm x 15 mm outer dia pipe	134	Each	364.90	48,896.60
17.9.2	For 28 mm x 15 mm outer dia pipe	110	Each	441.75	48,592.50
17.9.3	For 28 mm x 22 mm outer dia pipe	35	Each	537.75	18,821.25

17.10	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Sleeve/Slip Coupling/ Socket				
17.10.1	For 15 mm outer dia pipe	2	Each	537.75	1,075.50
17.10.2	For 22 mm outer dia pipe	2	Each	640.20	1,280.40
17.10.3	For 28 mm outer dia pipe	2	Each	742.60	1,485.20
17.11	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Elbow 90°				
17.11.1	For 15 mm outer dia pipe	926	Each	435.35	4,03,134.10
17.11.2	For 22 mm outer dia pipe	350	Each	614.60	2,15,110.00
17.11.3	For 28 mm outer dia pipe	106	Each	819.45	86,861.70
17.12	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Equal Tee				
17.12.1	For 15 mm outer dia pipe	227	Each	717.00	1,62,759.00
17.12.2	For 22 mm outer dia pipe	79	Each	838.65	66,253.35
17.13	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Reducing Tee				
17.13.1	For 22mm x 15 mm outer dia pipe	65	Each	819.45	53,264.25
17.13.2	For 28 mm x 15 mm outer dia pipe	165	Each	1017.90	1,67,953.50
17.13.3	For 28 mm x 22 mm outer dia pipe	50	Each	1024.30	51,215.00
17.14	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Male Thread Connector/ Adapter				
17.14.1	For 15 mm outer dia x 1/2" nominal dia threaded	398	Each	576.15	2,29,307.70
17.14.2	For 22mm outer dia x 1/2" nominal dia threaded	38	Each	685.00	26,030.00
17.14.3	For 22mm outer dia x 3/4" nominal dia threaded	56	Each	723.40	40,510.40
17.14.4	For 28 mm outer dia x 1" nominal dia threaded	28	Each	947.45	26,528.60
17.15	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Female Threaded Elbow 90°				
17.15.1	For 15 mm outer dia x 1/2" nominal dia threaded	539	Each	915.45	4,93,427.55

17.16	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Cap				
17.16.1	For 15 mm outer dia pipe	1	Each	454.55	454.55
17.16.2	For 22 mm outer dia pipe	1	Each	588.95	588.95
17.16.3	For 28 mm outer dia pipe	1	Each	736.20	736.20
17.17	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10317 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Pipe Bridge				
17.17.1	For 15 mm outer dia pipe	141	Each	588.95	83,041.95
17.18	Providing and fixing required Stainless Steel Fitting of press fit design of grade 316L as per IS 6911:2017 and conforming to EN-10312 standards with V-profile and with O-ring sealing gasket of EPDM material of required dia as per direction of Engineer-in-charge.				
	Male Union				
17.18.1	For 22mm outer dia x 1/2" nominal dia threaded	136	Each	1280.35	1,74,127.60
17.18.2	For 22mm outer dia x 3/4" nominal dia threaded	168	Each	1466.05	2,46,296.40
17.18.3	For 28mm outer dia X 1" nominal dia threaded	39	Each	2586.35	1,00,867.65
17.19	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				
17.19.1	20 mm dia nominal bore	80	Metre	418.90	33,512.00
17.19.2	25 mm dia nominal bore	367	Metre	524.20	1,92,381.40
17.19.3	32 mm dia nominal bore	508	Metre	632.00	3,21,056.00
17.19.4	40 mm dia nominal bore	234	Metre	771.40	1,80,507.60
17.19.5	50 mm dia nominal bore	250	Metre	898.75	2,24,687.50
17.19.6	65 mm dia nominal bore	215	Metre	1154.00	2,48,110.00
17.19.7	80 mm dia nominal bore	125	Metre	1335.00	1,66,875.00
17.20	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 cement concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), i/c 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) 12mm thick, finished with a floating coat of neat cement complete as per standard design :				
17.20.1	With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	9	Each	2482.80	22,345.20

17.21	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 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), i/c 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 :				
17.21.1	With common burnt clay F.P.S.(non modular) bricks of class designation 7.5	4	Each	13676.30	54,705.20
17.22	Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :				
17.22.1	20 mm dia nominal bore	80	Metre	24.60	1,968.00
17.22.2	25 mm dia nominal bore	367	Metre	32.00	11,744.00
17.22.3	32 mm dia nominal bore	508	Metre	38.45	19,532.60
17.22.4	40 mm dia nominal bore	234	Metre	45.10	10,553.40
17.22.5	50 mm dia nominal bore	250	Metre	53.95	13,487.50
17.22.6	65 mm dia. nominal bore	215	Metre	77.00	16,555.00
17.22.7	80 mm dia. nominal bore	125	Metre	91.00	11,375.00
17.23	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete (New work) :				
17.23.1	20 mm dia nominal bore	18	Each	865.20	15,573.60
17.23.2	25 mm dia nominal bore	55	Each	948.40	52,162.00
17.23.3	32 mm dia nominal bore	75	Each	993.20	74,490.00
17.23.4	40 mm dia nominal bore	25	Each	1121.25	28,031.25
17.23.5	50 mm dia nominal bore	35	Each	1495.30	52,335.50
17.23.6	65 mm dia. nominal bore	25	Each	1776.95	44,423.75
17.23.7	80 mm dia. nominal bore	15	Each	1841.00	27,615.00
17.24	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.	277	Each	468.45	1,29,760.65
17.25	Making epoxy coating in all the core cuttings , including finishing complete so as to make it leak proof.	277	Each	146.00	40,442.00
17.26	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				
17.26.1	65 mm dia	8	Each	4302.00	34,416.00
17.26.2	80 mm dia	4	Each	4982.00	19,928.00
17.27	Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc.as required :				
17.27.1	65 mm dia	4	Each	6418.00	25,672.00

17.28	Providing and fixing forged brass ball valve of brass body with hard chrome plated steel ball inside PTFE (Teflon) seat & ring with chrome plated centre handle with female BSP threads complete in all respects.				
17.28.1	15 mm nominal bore	22	Each	402.00	8,844.00
17.28.2	20 mm nominal bore	26	Each	537.00	13,962.00
17.28.3	25 mm nominal bore	73	Each	828.00	60,444.00
17.28.4	32 mm nominal bore	25	Each	1315.00	32,875.00
17.28.5	40 mm nominal bore	27	Each	1981.00	53,487.00
17.28.6	50 mm nominal bore	12	Each	2816.00	33,792.00
17.29	Providing and fixing Thermoflex or Kaiflex thermal insulation tubing a elastomeric flexible material having hermetic blister closed cell structure of expanded synthetic rubber over pipes of following nominal bores and thickness including all required accessories complete as per specification.				
17.29.1	For 20 mm dia Pipe 6 mm thick (Concealed Pipes)	130	Metre	65.00	8,450.00
17.30	Providing and fixing forged brass single acting air release valve with screwed inlet 25 mm dia.	2	Each	973.00	1,946.00
17.31	Providing and fixing of Single phase electrical actuator operated wafer type rubber lined butterfly valve with by pass arrangement as per drawing attached including level controller, 3 nos. normal butter fly valves,necessary control and Power cables (Maximum 10 M. Length of each type) and control panel installed on OH tank filling line near the tanks complete in all respects.				
17.31.1	25 mm dia.	1	Each	23328.00	23,328.00
17.31.2	32 mm dia.	1	Each	22266.00	22,266.00
17.32	Providing and fixing threaded end brass digital water meter complete in all respect.				
17.32.1	32 mm dia.	1	Each	5781.00	5,781.00
17.32.2	40 mm dia.	1	Each	11204.00	11,204.00
17.32.3	80 mm dia.(Flanged CI water meter class-B)	1	Each	13643.00	13,643.00
17.33	Providing & laying HDPE pipes conforming to IS: 4984 type PE-80 (10 kg/cm ²) including fittings wherever required e.g., tees, bends of any degree, couplings, adapters, plugs, unions etc. and jointing as manufacturer recommendation etc. complete including necessary earth excavation for trenching & refilling. (For Irrigation System.)				
17.33.1	25 mm OD	5	Metre	235.00	1,175.00
17.33.2	32 mm OD	10	Metre	270.00	2,700.00
17.33.3	40 mm OD	15	Metre	336.00	5,040.00
	SUBHEAD 17 TOTAL				78,93,714.75
18	Drainage				
18.1	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40mm nominal size) all round S.W. pipes including bed concrete as per standard design.				
18.1.1	150 mm diameter	25	Metre	1635.45	40,886.25
18.1.2	200 mm diameter	380	Metre	1906.55	7,24,489.00
18.1.3	250 mm diameter	240	Metre	2204.70	5,29,128.00

18.2	Providing and laying cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40mm nominal size) up to haunches of S.W/RCC pipes including bed concrete as per standard design.				
18.2.1	250 mm diameter	375	Metre	1409.60	5,28,600.00
18.2.2	300 mm diameter	62	Metre	1626.45	1,00,839.90
18.3	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design :				
18.3.1	180x150 mm size P type				
18.3.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	15	Each	2848.60	42,729.00
18.4	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete :				
18.4.1	250 mm dia. R.C.C. pipe	375	Metre	1213.60	4,55,100.00
18.4.2	300 mm dia. R.C.C. pipe	62	Metre	1209.95	75,016.90
18.5	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 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 :				
18.5.1	Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) :				
18.5.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	4	Each	16278.25	65,113.00
18.6	Extra for depth for manholes :				
18.6.1	Size 90x80 cm				
18.6.1.1	With Sewer bricks conforming to IS : 4885	4	Metre	8916.80	35,667.20
18.7	Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (heavy duty) 560 mm internal diameter, total weight of cover and frame to be not less than 208 kg (weightof cover 108 kg and weight of frame 100 kg) :				
18.7.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	28	Each	37372.45	10,46,428.60
18.8	Extra depth for Manholes:				
18.8.1	Size 120x90 cm				
18.8.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	5	Metre	14986.00	74,930.00

18.9	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.	147	Each	567.45	83,415.15
18.10	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 :				
18.10.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	25	Each	7635.55	1,90,888.75
18.11	Extra for depth beyond 45 cm of brick masonry chamber				
18.11.1	For 455x610 mm size				
18.11.1.1	With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	8	Metre	8712.45	69,699.60
18.12	Providing, laying and jointing HDPE Double Wall Coil (DWC) SN-8 Grade pipes confirming to IS: 16098 including all fittings wherever required e.g., tees, bends of any degree, couplings, adapters, plugs, unions etc. and jointing as manufacturer recommondation etc. including testing of joints etc. complete.				
18.12.1	160 mm OD	25	Metre	562.00	14,050.00
18.12.2	200 mm OD	380	Metre	822.00	3,12,360.00
18.12.3	250 mm OD	240	Metre	1296.00	3,11,040.00
	SUBHEAD 18 TOTAL				47,00,381.35
19	Rain Water Harvesting System				
19.1	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.	84	Each	567.45	47,665.80

19.2	Providing and fixing in position precast RCC manhole cover and frame of required shape and approved quality.				
19.2.1	HD-20				
19.2.1.1	circular shape 560 mm internal diameter.	8	Each	1513.65	12,109.20
19.3	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.				
19.3.1	All types of soil				
19.3.1.1	400 mm dia.	120	Metre	902.95	1,08,354.00
19.4	Supplying, assembling, lowering and fixing in vertical position in bore well, unplasticized PVC medium well casing (CM) pipe of required dia, conforming to IS: 12818, including required hire and labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer –in-charge.				
19.4.1	200 mm nominal size dia.	10	Metre	1003.30	10,033.00
19.5	Supplying, assembling, lowering and fixing in vertical position in bore well unplasticized PVC medium well screen (RMS) pipes with ribs, conforming to IS: 12818, including hire & labour charges, fittings & accessories etc. all complete, for all depths, as per direction of Engineer-in-charge.				
19.5.1	200 mm nominal size dia.	110	Metre	1131.45	1,24,459.50
19.6	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 complete as per direction of Engineer-in-charge.	14	Cum	1390.85	19,471.90
19.7	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.	14	Cum	1416.45	19,830.30
19.8	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.	14	Cum	1416.45	19,830.30
19.9	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.	12	Cum	1533.90	18,406.80
19.10	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	100	Hours	1000.70	1,00,070.00




	as per requirement and direction of Engineer-in-charge.				
19.11	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:				
19.11.1	200 mm dia	2	Each	309.20	618.40
19.12	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.				
19.12.1	200 mm clamp.	2	Each	2197.35	4,394.70
	SUBHEAD 19 TOTAL				4,85,243.90
20	HORTICULTURE WORK				
20.1	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).	323.00	Cum	789.35	2,54,960.05
20.2	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) :				
20.2.1	Screened through sieve of I.S. designation 20 mm	10	Cum	379.5	3,795.00
20.2.2	Screened through sieve of I.S. designation 16 mm	10	Cum	446.65	4,466.50
20.2.3	Screened through sieve of I.S. designation 4.75 mm	10	Cum	473.75	4,737.50
20.3	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).	30	Cum	74.95	2,248.50
20.4	Mixing earth and sludge or manure in the required proportion specified or directed by the Officer-in-charge	50	Cum	52.35	2,617.50
20.5	Digging holes in ordinary soil and refilling the same with the excavated earth mixed with manure or sludge in the ratio of 2:1 by volume (2 parts of stacked volume of earth after reduction by 20% : 1 part of stacked volume of manure after reduction by 8%) flooding with water, dressing including removal of rubbish and surplus earth, if any, with all leads and lifts (cost of manure, sludge or extra good earth if needed to be paid for separately)				
20.5.1	Holes 60 cm dia, and 60 cm deep	100.00	Each	67.60	6,760.00
20.5.2	Holes 45 cm dia, and 45 cm deep	70.00	Each	28.75	2,012.50
20.6	Providing & laying Selection no. 1 doob grass turf with earth 50mm to 60mm thickness of existing ground prepared with proper level and ramming with required tools wooden and than rolling the surface with light roller make the surface smoothen and light watering the same and maintenance for 30 days or more till the grass establish properly, as per direction of the officer in charge	1078.00	Per Sqm	131.00	1,41,218.00
20.7	Plantation of Trees, Shrubs, and Hedge at site i/c watering and removal of unserveiceable material's as per direction of officer in charge (excluding cast of plant & water)				
20.7.1	Trees Plant	170.00	Each	10.45	1,776.50
20.7.2	Shrubs Plant	1000.00	Each	5.25	5,250.00
20.7.3	Hedge Plant	1000.00	Each	3.50	3,500.00




20.8	Providing and Displaying Golden Bottle brush Topiary well developed with fresh & healthy foliage 5 to 6 big ball 115 to 180 cm ht in 40 cm Cement Pot as per direction of the officer-in-charge.	20.00	Each	1778.30	35,566.00
20.9	Providing and stacking of Bottle palm of ht. 210-240 cm bottom girth 30-35 cm well developed in big HDPE bags.	10.00	Each	711.30	7,113.00
20.10	Providing and stacking of Cassia fistula (Amaltash) of height 120-135 cm. in big poly bags of size 25 cm as per direction of the officer-in-charge.	20.00	Each	135.15	2,703.00
20.11	Providing and stacking of Delonix regia (Gulmohar) of height 150-165 cm. in big poly bags of size 25 cm as per direction of the officer-in-charge.	10.00	Each	128.05	1,280.50
20.12	Providing and stacking of Ficus benjamina (green) of height 150-165 cm., bushy with healthy branches and lush green foliage in big size HDPE bags as per direction of the officer-in-charge.	10.00	Each	355.65	3,556.50
20.13	Providing and stacking of Grevillea robusta (Silver Oak) of height 150-165 cm. in big poly bags of size 25 cm as per direction of the officer-in-charge.	10.00	Each	113.80	1,138.00
20.14	Providing and stacking of Michelia champa (Golden Champa) of height 90- 105 cm. in earthen pots of size 25 cm as per direction of the officer-in-charge.	10.00	Each	213.40	2,134.00
20.15	Providing and stacking of Ficus panda of height 30-45 cm. with 3-4 branches and healthy foliage in p.bag of size 20 cm as per direction of the officer-in-charge.	300.00	Each	71.15	21,345.00
20.16	Providing and stacking Vernonia elaeagnifolia (curtain creeper) plant of height 30 cm to 45 cm. in 20 cm size of Earthen pots / Plastic pots & as per direction of the officer-in-charge.	300.00	Each	64.00	19,200.00
	SUBHEAD 20 TOTAL				5,27,378.05
					39,61,81,538.05



Schedule of Quantity




(Furniture work for Hostel Building)




Name of Work: Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.




Item No.	Description of Item	Qty.	Unit	Rate	Amount	
1	Providing, assembling and placing in position of Single Bed of following specification- Overall Size: Width- 990 mm Depth— 2050 mm Height -900 mm. Bed Structure shall consist of metal frames made of M S. Channels in 1 mm Thickness. Horizontal plinths and bottom plinth are made of 25 mm Thick Prelaminated Particle Board. Head board is made of 18 mm thick Prelaminated Particle board with all the exposed edges are edge banded with 0.8 mm thick PVC edge banding glued with Hot Melt EVA glue. Tailboard is made of 18 mm thick Prelaminated Particle board .Side rail is made of 18 mm thick Prelaminated Particle board. Mattress panels of Bed are made of 18 mm thick Prelaminated Particle Board with all the exposed edges are edge banded with 0.8 mm thick PVC edge banding glued with Hot Melt EVA glue. The high quality hardware shall be used. The product shall be manufactured by Knock Down construction. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	89	Nos	24,236.60	21,57,057.40	
2	Providing, assembling and placing in position Bed Side Table of following specification- Depth — 450.0 mm Width — 450.0 mm Height — 510.0 mm. Body panels of Bed side table shall be made of 18 mm thick Prelaminated Particle Board. All the exposed edges are edge banded with 0.8 mm thick PVC edge banding glued with Hot Melt EVA glue. Drawer front shall be made of 18 mm thick Prelaminated Particle board. The high quality hardware (Roller slides, Hinges ,minifix, dowels etc.) shall be used. The product shall be manufactured by Knock Down construction. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	89	Nos	7,185.20	6,39,482.80	
3	Providing assembling & placing of Modular Storage (2 Door Wardrobe) following specification- Width : 900 mm, Depth : 550 mm, Height : 1900 mm. 3 Body panels shall be made of 18 mm thick Prelaminated Particle Board. All the exposed edges are edge banded with 0.8 mm thick PVC edge banding glued with Hot Melt EVA glue . Door shall be made of 18 mm thick Prelaminated Particle board with all the exposed edges are edge banded with 0.8 mm thick PVC edge band glued with Hot Melt EVA glue.Drawer components shall be made of 18 mm thick Prelaminated Particle Board. All the exposed edges shall edge banded with 0.8 mm thick PVC edge banding glued with Hot Melt EVA glue.Body back and drawer bottom shall be made of 9 mm thick	30	Nos	34,485.80	10,34,574.00	



	Prelaminated particle board. The high quality hardware (e.g. Roller slides, Hinges , minifix, wooden dowels) shall be used. Lock for middle door shall be 3 way lock. Lock used for right hand door and drawer shall be cam lock. The product shall be manufactured by Knock Down construction. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.					
4	Providing assembling & placing of Study Table with Single Drawer of following specification- Depth — 600.0 mm, Width —1200.0 mm, Height — 740.0 mm. Body panels of Bed side table shall be made of 18 mm thick Prelaminated Particle Board 1. All the exposed edges are edge banded with 0.8 mm thick PVC edge banding glued with Hot Melt EVA glue. Drawer front shall be made of 18 mm thick Prelaminated Particle board. The high quality hardware (e.g. Roller slides, Hinges ,minifix, dowels) shall be used. The product shall be manufactured by Knock Down construction. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	25	Nos	17,051.40	4,26,285.00	
5	Providing, assembling & supplying Visitor Chair of following specification. The seat is made up of 1.4 ± 0.1 cm thick hot - moulded polyurethane foam and upholstered with fabric. It shall have seat size of 48.0cm (W)x 49.0cm(D). The two part assembly upholstered with Mesh fabric shall be made up of back outer injection moulded in glass filled Polyamide and back inner injection moulded in glass filled Polypropylene. The back shall consist of adjustable lumbar support having an adjustment of 4.0 ± 0.5cm. It shall be made of injection moulded Polyoxymethylene (POM) which is upholstered with foam and fabric. It shall have back size of 47.0 cm(W) x 53.0 cm(H). The polyurethane foam for seat shall have density of 55 ± 5 kg/m3.The Powder coated welded tubular frame shall be made of 3.55±0.03 cm x 1.9±0.02 cm x 0.15±0.02 cm thick E.R.W oblong tube.The frame shall be fitted with plastic caps made of injection moulded glass filled Polypropylene (W)61*(D)61*(H)98.5 Seat (H)45.5cm. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	25		9,578.95	2,39,473.75	
6	Providing assembling & placing of Two Seater Sofa a 2 seater-134cm(w)x87cm(d)x78cm(h)x43cm(sh). STITCHING: THREAD : Poly Propilin, PVC. Thickness (mm) : 0.9. Weight (GSM) : 575. FRAME MATERIAL Moisture Content (10 – 12 %) : 16-20%. Thickness of Plywood used(mm) : 12mm & 18mm. SEAT FOAM: (DENSITY, TYPE)-Thickness (mm) : 69, 22 & 10 mm. Density (Kg/m3)- 32d. Type of Foam : Vergin Always / in some case Moulded - Dencity :- 48d. LEG MATERIAL: (Fixing of Leg : Woodscrew provided on frame in addition to M-8 / T-Nut) Material of leg - Plastic * Bush for Leg bottom : Pvc. Bush .BACK FOAM: (DENSITY, TYPE) -Thickness (mm) : 45 mm .Density (Kg/m3): 28 d .ARMREST FOAM: (DENSITY, TYPE) Thickness (mm) : 45 mm .Density (Kg/m3):	4	Nos	57,476.35	2,29,905.40	



	26 d. Sofa to be fully upholstered using leatherette material of approved quality and shade & price shall not be less the 1000 Rs Meter, duly embossed including providing & fixing of all other required materials and hardware etc. all complete as directed by the Engineer in charge. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.					
7	Providing, assembling & placing of 3 Seater Sofa of following specification. The size shall be of 175cm(w)*87cm(d)*78cm(h)*43cm(sh). It shall be stitched with thread of Poly Proplin, PVC of thickness of 0.9 (mm), and having weight of 575 (GSM). FRAME MATERIAL Moisture Content (10 – 12 %) : 16-20%. Thickness of Plywood used(mm) : 12mm & 18mm. SEAT FOAM: (DENSITY, TYPE)-Thickness (mm) : 69, 22 & 10 mm. Density (Kg/m3)- 32d. Type of Foam : Vergin Always / in some case Moulded - Density :- 48d. LEG MATERIAL (Fixing of Leg) : Woodscrew provided on frame in addition to M-8 / T-Nut, Material of leg - Plastic. Bush for Leg bottom :Pvc. Bush. BACK FOAM (DENSITY, TYPE) :Thickness (mm)- 45 mm, Density (Kg/m3)-28 d. ARMREST FOAM (DENSITY, TYPE): Thickness (mm) - 45 mm, Density (Kg/m3):-26 d. Sofa to be fully upholstered using leatherette material of approved quality and shade & price shall not be less the 1000 Rs Meter, duly embossed including providing & fixing of all other required materials and hardware etc. all complete as directed by the Engineer in charge. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	4	Nos	38,318.45	1,53,273.80	
8	Providing, assembling and placing of centre table of 1200L x 600D x 450H mm. Legs shall be made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine. Frame shall be made out of 0.05m x 0.04m teak wood section and top frame 0.08m x 0.04m i/c necessary inbuilt moulding all around out side & rebate for resting of TOP are made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine edge. All teak wood surface shall be finished with high class melamine polish (matt/glossy) polish in walnut or as required shade on all faces of wood complete as per approved sample at site and direction of Engineer-in-charge. All wood shall be second class seasoned and chemically treated teak wood complete and as per direction of Engineer-in-charge. Product should be BIFMA gold rated SC global certified for inhouse air quality and with 05 years warranty.	4	Nos	20,116.75	80,467.00	


9	Providing, assembling and placing of centre table of 600L x 600D x 450H mm. Legs shall be made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine. Frame shall be made out of 0.05m x 0.04m teak wood section and top frame 0.08m x 0.04m i/c necessary inbuilt moulding all around out side& rebate for resting of TOP are made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine edge. All teak wood surface shall be finished with high class melamine polish (matt/glossy) polish in walnut or as required shade on all faces of wood complete as per approved sample at site and direction of Engineer-in-charge. All wood shall be second class seasoned and chemically treated teak wood complete and as per direction of Engineer-in-charge.Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	4	Nos	14,369.10	57,476.40	
10	Providing, assembling, and placing 6 Seater Dining table of size 1200 Dia& 750 H mm. Worktop shall be made out of 25mm thick E-1 grade (Environmental Friendly) particle board cover with laminate and all the edges of worktop shall be provided with machine pressed 1.5-2 mm thick ABS edge banding glued with hot melt EVA glue. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992).Theunderstructure is made of 2mm thick Steel round pole with 8-10mm thick round base plate with Epoxy powder coated spray paint, baked at temperature 200 C° coated of 70-80 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method). Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	4	Nos	18,200.40	72,801.60	
11	Providing, assembling, and placing in position Cafe Chair. The seat and back are made up injection molded high impact strength polypropylene polymer (PP) compound with indoor grade UV Resistance. The Powder coated weled tubular frame is made from M.S.E.R.W tube. Leveller are made of high impact strength polypropylene polymer compound with indoor grad UV Resistance and pressed fitted with tubular frame.Overall size: 420W x 480D x 780-810Hmm. The chair is easy to store when not in use, since you can stack up to 6 chairs on top of each other. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	12	Nos	8,621.45	1,03,457.40	

12	<p>Providing, assembling, and placing of Three seater Waiting Area Chair. The seat and back to be made up of high density self skin PU Foam reinforced with 3 mm MS perforated sheet insert. The PU Foam having density of 680 +/- 10 Kg/m³ with hardness of 55 +/- 5. Seat Size : 52.0 cm (W) X 46.0 cm (D). Back Size : 52.0 cm (W) X 51.0 cm (H). Cross Beam shall be made up of black powder coated MS ERW square tube B27 of size 6.0 +/- 0.05 cm X 6.0 +/- 0.05 cm X 0.018 +/- 0.016 cm thick fitted with polypropylene end caps. Legs & Armrest made up of powder coated High pressure Aluminum Die cast. Legs shall be fitted with Soft grip PVC level adjusting shoes. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	5	Nos	34,964.55	1,74,822.75	
13	<p>Providing assembling, and placing of two seater Waiting Area Chair. The seat and back to be made up of high density self skin PU Foam reinforced with 3 mm MS perforated sheet insert. The PU Foam having density of 680 +/- 10 Kg/m³ with hardness of 55 +/- 5. Seat Size : 52.0 cm (W) X 46.0 cm (D). Back Size : 52.0 cm (W) X 51.0 cm (H). Cross Beam made up of black powder coated MS ERW square tube of size 6.0 +/- 0.05 cm X 6.0 +/- 0.05 cm X 0.018 +/- 0.016 cm thick fitted with polypropylene end caps. Legs & Armrest shall be made up of powder coated High pressure Aluminum Die cast. Legs shall be fitted with Soft grip PVC level adjusting shoes. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge. B22</p>	7	Nos	28,738.20	2,01,167.40	
14	<p>Providing, assembling, and placing of Center Table with following specification- Glass should be 12 ± 0.3 mm thick black tinted toughened glass uv glued with bushes made in ss 202 grade for fixing with under structure. Center table under structure: It should be a welded assembly made in ss 202 grade having dia. 12 ± 0.04 as per should be: 1762. Width of table = 112.0 cm, Depth = 60.0 cm, Height = 35.0 cm. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	4	Nos	13,411.60	53,646.40	

15	Providing, assembling, and placing of Side Table with following specification- Glass should be 12 ±0.3 mm thick black tinted toughened glass uv glued with bushes made in ss 202 grade for fixing with under structure. Center table under structure: It should be a welded assembly made in ss202 grade having dia. 12±0.04 as per should be: 1762. Width of table= 60.0 cm, Depth=60.0 cm, Height=35.0 cm. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	7	Nos	11,495.25	80,466.75	
16	Providing and placing Two Seater Chair. Table with fix desk arrangements. The desk has to be mounted in exam hall theatre. The units have to aligned at side by side as per approved layout. Per seat desk with one book shelf Size- 650-700W x 450-500D x 750H. The Desk tops are made of 25mm thick pre-laminated Particle Board (E-1 Grade), finished with matching 2 mm PVC edge-banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty is pre-laminated Particle board Grade E-1 (Environmental Friendly) thickness 18 mm cover with Edge-Banding (PVC) 2 mm. Understructure consists of MS oval tube 70x32x1.6mm, support beam pipe 25x25x1.6mm, epoxy powder coated of 60-75microns. All tube ends to be provided with high density ABS caps. All corners to have 10mm radius. Product should be BIFMA gold rated SCS global certified for in house air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	42	Str	22,990.55	9,65,603.10	
17	Providing and placing Tip-up for Auditorium Desk. It includes providing & supplying fixed revolving chair. BACKREST: The Back is made up of 12mm thick (7 layers) hot pressed plywood and moulded foam, thickness 40 mm upholstered with fabric. Aura Back - Back Size - 480 mm (W) X 670 mm (H). SEAT:The seat is made up of 12mm thick (7 layers) hot pressed plywood and moulded seat foam, upholstered with fabric. Seat Size 500 mm (W) X 500 mm (D). UNDERSTRUCTURE: Base plate: Ø220mm x 8mm thick MS plate. Vertical Pipe : Ø60 x 2mm thick MS pipe. Armrest Support : 48 x 19 x 1.6mm thick oval MS pipe. Backrest Support: 3mm thick MS plate Finish: Powder Coat (Black)ARM PAD: Fixed Arm : The Arm pad is injection moulded from black polyurethane Arm pad- size 250mm (L) x 80mm (W). The rate will be inclusive all fittings and fixtures etc. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	84	Str	20,116.75	16,89,807.00	

18	<p>Providing, Placing & Fixing Table with Side Return Unit of overall size is 1650 x 1600. Main Table of size - 1650L x 700D x 740H mm, The Table top are made of with top made of 25mm thick Pre-laminated MDF board and balancing laminate on unexposed face. The Gable end is made up of 18mm thk. pre-laminated MDF board. The under structure is made of 18mm thick prelaminated MDF board with all exposed edges sealed with 2mm PVC edge banding tape and all unexposed edges sealed with 0.6mm edge banding tape pressed at 200° C with hot melt glue on special machines. Table shall have a provision for wire manager caps at top. Table Top support on 1 fixed pedestal of size 460mm(l)x 500mm(d)x 650mm(h) , having 2 drawers + 1 filling drawer. The Pedestal are made out 18 mm thick Particle Board (E-1 Grade), melamine finishes with 2 mm PVC edge-banding. Side Return Unit of size 1000L x 450D x 710H mm - Body of storages made out 18 mm thick Particle Board (E-1 Grade), melamine finishes with 2 mm PVC edge-banding. E1 grade laminate to be used which provide no urea formaldehyde emission and formaldehyde should be phenol base with emission of not more than ($\leq 8\text{mg}/100\text{ g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992).The storage should have extruded aluminium handle, as per requirement. Storages should be provided with adjustable shelf. Side Return should be with Lockable castors. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	2	Nos	46,939.90	93,879.80	
19	<p>Providing medium back revolving chairs. Chair seat shall be made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back shall be made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture. Armrests should be adjustable with 120-160 mm adjustability with PU padded. Base: Black nylon base with 5 nos. nylon castors. Chair should be of 360 degree swivel Posture Control with multi pointer locking and synchro tilt mechanism and hydraulic gas lift gas lift to allows 90-100 mm. of height adjustment. Seat size 440 - 550 mm depth, Seat width of 530-550 mm Seat Height of 420-510mm with hydraulic height adjustability of 90-100mm. Sub assembly back size 550 - 620 mm height. Effective back height from Seat - 570mm, polyurethane foam for seat having density 65-70 kg/m3. Pedestal made of nylon base fitted with 5 nos. twin wheel castors (castor wheel dia. 60-70 cm), base pedestal dia 60-70 mm and pitch center dia. 700-720mm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	2	Nos	20,882.75	41,765.50	


20	<p>Providing, assembling, and fixing in position Knock Down Steel Almirah. Overall Size - 910W x 480D x 1980H mm Having 4 shelves making 5 compartments, Whole body, doors and shelf made of 0.8mm CRCA sheet, Shelves and doors should have stiffener for better strength and load bearing capacity. Auto closing CED Coated "HETTICH"/ "HAEFFLE" / equivalent Hinges for better adjustment of doors. Chrome plated three way Recess type spring loaded rectangular snap shut handle cum lock with duplicate keys Highly durable – Made of 100% virgin Epoxy Powder Coated CRCA confirming to IS : 513 CR2 (Cold Reduced Carbon Steel Sheets & Strips (Part 1), 2016, procured from TATA Steel (Test Certificate available on request). Furthermore, Complete material passes through 7 stage, ultra-modern NANO-TECHNOLOGY based Pre-treatment plant prior to powder coating, making it highly corrosive resistant. Superior Finish – Powder coating done on Fully Automatic Powder Coating Plant with world leader GEMA™ spray booth and World Leader AkzoNobel™ Powder ensures smooth, uniform and highest quality levels of Powder Coating Modern Technology - Rigid Know Down Construction done out of complete 0.8 mm thick CRCA sheet. Each Compartment Shelf has uniformly distributed load capacity per shelf is 35 kg. The rigid construction gives extra strength and durability, whereas the epoxy-polyester adds the finishing touch to the unit.</p> <p>Logistic Friendly – 100% Knock Down product makes transportation a very easy and SAFE, product gets assembled at site only. Design Simplicity - Simplistic Design with "NO PEDESTAL" at bottom makes for an aesthetic look and seamless finish, apart from offers large storage capacity that makes sure you have enough space for storage. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	8	Nos	34,485.80	2,75,886.40	
21	<p>Providing, assembling and placing 6 Seater Cafe table. Overall Table size is 1800L x 1050D x 740H mm Worktop shall be made out of 25mm thick E-1 grade (Environmental Friendly) particle board cover with laminate and all the edges of worktop shall be provided with machine pressed 1.5-2 mm thick ABS edge banding glued with hot melt EVA glue. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992).Theunderstructure is made of 2mm thick Steel square pipe dimension 50 X 50 mm with Epoxy powder coated spray paint, baked at temperature 200 C° coated of 70-80 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method). Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	6	Nos	34,485.80	2,06,914.80	


22	<p>Providing, assembling and placing in position Cafe Chair. The seat and back are made up injection molded high impact strength polypropylene polymer (PP) compound with indoor grade UV Resistance. The Powder coated weled tubular frame is made from M.S.E.R.W tub. Leveller are made of high impact strength polypropylene polymer compound with indoor grad UV Resistance and pressed fitted with tubular frame. Overall size: 420W x 480D x 780-810Hmm. .the chair is easy to store when not in use, since you can stack up to 6 chairs on top of each other. Product should be BIFMA gold rated SCS global certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	36	Nos	3,831.30	1,37,926.80	
Total					91,16,141.25	


Schedule of Quantity



(Furniture work for Office Building)


Name of Work: Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.


Item No.	Description of Item	Qty.	Unit	Rate	Amount	Reference Image
1	<p>Providing, assembling & placing of of Workstation. Panel Based workstation of size - 1200mm W x 600mm D x 1200mm H. Frame Work, Partition and Cable management : Frame work shall consist of main spine and return spine of aluminium extruded section of minimum thickness of 1.2 mm. The overall thickness of Panel base System should be minimum 60-70 mm. The thickness of main spine partition panel should be minimum 60-70 mm & minimum 25-28 mm thick for return spine. The panel will be hollow inside to accommodate wiring for electrical/data and outer frame of panel should be made of extruded aluminium. The panel shall be made up of 3 mm thick MDF both sides of the wooden frame to create the hollow for the wire management. The panel outer aluminium frame is designed in such a way that it can be easily slide in to the columns/ Connectors by means of stacking one over the other. Horizontal race way should be 150-170 mm height aluminium profile. There shall be complete cable management arrangement with openable raceway above/ below worktop with provision for fitting electrical/data switches and holes for passing cable.</p> <p>Panel Finishes : Finishes of panel above the worktop can be fabric pinup/fabric/laminate + Glass/metal writable marker board or single finish tile with raceway on main spine. Finishes of main spine panel below the worktop the hollow panel should be made of MDF tile and 0.5mm thick steel sheet pasted on MDF which is powder coated with EPC finish 80-90 microns for durability on the inside as well on the outside. Raceway can be provided above/below the worktop.</p> <p>Connectors/ Brackets: End Post: Aluminium 60-70 mm width – 1180-1220 mm height. Two way post: Aluminium 30-70 mm width –1180-1220 mm height. Three way post: Aluminium 30-70 mm width –1180-1220 mm height. Four way post: Aluminium 30-70 mm width – 1180-1220 mm height. Brackets: Table top supported with 50-60mm width steel bracket. Table top to table top connector: 150-170 mm Width x 120-140 mm Depth width connector.</p>	118.00	Nos	29504.20	3481495.60	


	<p>Worktop : Worktop Made of 25mm thick E-1 grade particle board finished with 2mm ABS edge banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The particle board should be E-1 Grade with pvc edge banding.</p> <p>Drawer Unit : 3 drawer Wooden pedestal of overall dimensions internal and external dimensions 420 mm (W) x 450 mm (D) x 600 mm (H). Drawer body should be made of 18mm thk melamine. Each pedestal should be provided with pencil tray of 40-45 mm(H) x 110-120 mm (D) x 300-310 mm (W).Each pedestal should have 5 Nos castor fitted to it where in one castor will be fitted to lower most drawer to provide extra stability. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>					
2	<p>Providing and placing in position Mid back chair With comfortable Backrest. Backrest designed in a way to offer support to back always. Backrest is of ABS carrier, upholstered with molded Foam and jacked with titch fabric. Supported with adjustable lumbar support. Seat: Pressed and molded plywood with Polypropylene back covered, upholstered with molded high density foam and jacketed with titch fabric. Chair seat made up of insert moulded Polyurethane Foam in High impact polystyrene upholstered with Titch fabric, insert moulded foam assembled over a load bearing HIPS plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with 100 percent polyester woven Titch fabric and mounted on the main assembly, back symmetrical lumbar support adjustment for achieving comfortable seating posture. Chair Armrest should be with Adjustable and with PU padded. The chair should be 360 degree swivel, back tilt & front multi tilt with multi locking position synchronized mechanism and with Seat depth adjustment. The over all dimensions of chair should be 670-690mm (D) 620-650mm (W) 1100-1150mm (H) and seat dimensions 450 - 470 mm depth, Seat width of 530-550 mm Seat Height of 470-490mm with hydraulic height adjustability of 90-100mm. Sub assembly back size 550 - 620 mm height. Effective back height from Seat - 570mm, polyurethane foam for seat having density 65-70 kg/m3. Base should be Aluminum dicast/crome</p>	142.00	Nos	11303.80	1605139.60	


	finish fitted with 5 nos. twin wheel castors (castor wheel dia. 60-70 cm), base pedestal dia 60-70 mm and pitch center dia. 700-720mm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification Chair should be SGS Gold BIFMA Certified product. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.					
3	Providing & Placing medium back revolving chairs. Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture. Armrests should be adjustable with 120-160 mm adjustability with PU padded. Base: Black nylon base with 5 nos. nylon castors. Chair should be of 360 degree swivel Posture Control with multi pointer locking and synchro tilt mechanism and hydraulic gas lift gas lift to allows 90-100 mm. of height adjustment. Seat size 440 - 550 mm depth, Seat width of 530-550 mm Seat Height of 420-510mm with hydraulic height adjustability of 90-100mm. Sub assembly back size 550 - 620 mm height. Effective back height from Seat - 570mm, polyurethane foam for seat having density 65-70 kg/m3. Pedestal made of nylon base fitted with 5 nos. twin wheel castors (castor wheel dia. 60-70 cm), base pedestal dia 60-70 mm and pitch center dia. 700-720mm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	10.00	Nos	19638.00	196380.00	


4	<p>Providing assembling & placing of Table with Side Unit of overall size 1800mm x 2100mm. Main Table : 1800mm X 900mm X 740mm H Side Table Size - 1200mm X 450mm X 740mm H. Table Whose top and legs are made of 38 mm thick MDF (E-1 Grade), finishes with matched 2 mm PVC edge-banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty is Particle board wood Grade E-1 (Environmental Friendly) thickness 18 mm cover MDF with Edge-Banding(PVC) 2 mm. Also legs are made of MDF Grade E-1 (Environmental Friendly) thickness 38 mm. Drawer Unit : 3 drawer Metal pedestal of overall dimensions internal and external dimensions 380-430 mm (W) x 430-480 mm (D) x 600-620 mm (H). Drawer body should be made of CRCA of thickness 0.7-0.8 mm duly powder coated with 70-80 micron. Each pedestal should be provided with pencil tray of 40-45 mm(H) x 110-120 mm (D) x 300-310 mm (W).Each pedestal should have 5 Nos castor fitted to it where in one castor will be fitted to lower most drawer to provide extra stability. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	10.00	Nos	114954.05	1149540.50	
5	<p>Providing and placing in position of Cabin Table. Main Table 1500 Width mm x 600 Depth mm x 740 Height mm & Side Unit 900Wx 450Dx 740Hmm. Table top shall be 25 mm thick plain particle board (PPB) Clad with 0.6 mm thick post formed laminate and 1 mm thick backing laminate (bdl) .Flat edge Duly sealed with 2 mm thick PVC beading.The modesty shall be 18 mm thick plain particle board () PPB Clad with 1.0 mm thick decorative laminate (DL) on both sides. Edge Sealed with 2 mm thick PVC beading. ERU - 1000 Width x 450 Depth x 750Height. The top ERU - 25 mm thick plain particle board (PPB) Clad with 0.6 mm thick post formed laminate and 1 mm thick Backing Laminate (BDL).Flat Edge duly sealed with 2 mm thick PVC beading. The Modesty shall be 18 mm thick plain particle board (PPB) Clad with 1.0 mm thick Decorative Laminate (DL) on both sides. Edge sealed with 2 mm thick PVC Beading. Drawer Unit : Each Table should be provided with 3 drawer Wooden pedestal of overall dimensions internal and external dimensions 400-420 mm (W) x 450-520 mm (D) x 600-640 mm (H). Drawer should be made of 18mm thick Pre-laminated Particle board with proper grooving done near to back side edge for fitment of back panel made up of 9mm thick prelaminated particle board. The Side panel, Bottom and Top panel are to be assembled with the help of wooden dowel, knock down fittings Drum with screw and corner fittings to ensure stability of box structure formed. The small</p>	2.00	Nos	38318.45	76636.90	


	drawers are mounted on Telescopic slide with 3/4 extension. where Big Drawer mounted on Telescopic slide with full extension allowing storage of files with the help of file manager. Provision of centralize locking for all three drawers and D/C type slim Handle for Drawer and Shutter. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.					
6	Providing medium back revolving chairs. Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture. Armrests should be adjustable with 120-160 mm adjustability with PU padded. Base: Black nylon base with 5 nos. nylon castors. Chair should be of 360 degree swivel Posture Control with multi pointer locking and synchro tilt mechanism and hydraulic gas lift gas lift to allows 90-100 mm. of height adjustment. Seat size 440 - 550 mm depth, Seat width of 530-550 mm Seat Height of 420-510mm with hydraulic height adjustability of 90-100mm. Sub assembly back size 550 - 620 mm height. Effective back height from Seat - 570mm, polyurethane foam for seat having density 65-70 kg/m ³ . Pedestal made of nylon base fitted with 5 nos. twin wheel castors (castor wheel dia. 60-70 cm), base pedestal dia 60-70 mm and pitch center dia. 700-720mm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	5.00	Nos	18680.50	93402.50	


7	<p>Providing and placing High Back chairs. Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, Overall chair size: W63.0 -67.0cms , D 63.0-67.0cm , H112.5.0-121.5cm, seat size 44.5 - 52.5 cm depth (approx.), 46.4 - 51.0 cm width (approx.), sub assembly back size 55.5 cm- 62 cm height. (approx.), effective back height from Seat - 57 cm (approx.), polyurethane foam for seat having density 65±4 kg/m3, armrest top injection moulded in polyurethane and mounted on the injection moulded height adjustable type armrest, armrest height adjustable up to 4.5 cm (approx) in 3 steps & width movement adjustable, 360 degree revolving type. mechanism, single point control for seat and back adjustment, front pivot for tilt, tilt adjustment for back in 3position locking with antishock feature, pneumatic height adjustment of 8.5 cm spine bracket made of aluminum die cast piece connecting to back with mechanism, The pedestal shall be made of nylon base.it shall be fitted with 5 nos twin wheel castor. The size of the pedestal shall be 670mm pitch-centre-dia 700-720mm with castors). The twin wheel castors shall be made of Nylon injection moulded in black color. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	10.00	Nos	21074.25	210742.50	
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8	<p>Supplying and fixing in position Knock Down Steel Almirah. Overall Size - 900W x 450D x 11190H mm Having 2 shelves making 3 compartments, Whole body, doors and shelf made of 0.8mm CRCA sheet, Shelves and doors should have stiffener for better strength and load bearing capacity. Auto closing CED Coated “HETTICH”/“HAEFFLE” / equivalent Hinges for better adjustment of doors. Chrome plated three way Recess type spring loaded rectangular snap shut handle cum lock with duplicate keys Highly durable – Made of 100% virgin Epoxy Powder Coated CRCA confirming to IS : 513 CR2 (Cold Reduced Carbon Steel Sheets & Strips (Part 1), 2016, procured from TATA Steel (Test Certificate available on request). Furthermore, Complete material passes through 7 stage, ultra-modern NANO-TECHNOLOGY based Pre-treatment plant prior to powder coating, making it highly corrosive resistant. Superior Finish – Powder coating done on Fully Automatic Powder Coating Plant with world leader GEMA™ spray booth and World Leader AkzoNobel™ Powder ensures smooth, uniform and highest quality levels of Powder Coating Modern Technology - Rigid Knock Down Construction done out of complete 0.8 mm thick CRCA sheet. Each Compartment Shelf has uniformly distributed load capacity per shelf is 35 kg. The rigid construction gives extra strength and durability, whereas the epoxy-polyester adds the finishing touch to the unit. Logistic Friendly – 100% Knock Down product makes transportation a very easy and SAFE, product gets assembled at site only. Design Simplicity - Simplistic Design with “NO PEDESTAL” at bottom makes for an aesthetic look and seamless finish, apart from offers large storage capacity that makes sure you have enough space for storage. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	73.00	Nos	22033.05	1608412.65	
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9	<p>Supplying and fixing in position Knock Down Mobile Compactor Storage System, 3 Bay Compactor SFF Size: 2730Wx450Dx2080H mm. = 01 no., DFM Size: 2710Wx900Dx2080H mm. = 05 nos., SFM Size: 2710Wx450Dx2080H mm. = 01 no. Supplying and fixing in position Mobile Storage of size: 915 W x 450D x 2080Hmm wherein each body should be of following configuration and specification consisting of One no.Fixed Single one side openable Unit & One, one end single openable mobile unit & between the Main Fixed unit & end mobile unit having single/ double side mobile unit. The System shall be modular & movable type(Knock Down) with 4-5 loading levels. Each Shelves loading capacity should be 42-48 kg. Each unit shall be connected from the End back with the Dust proof arrangement with the help of Tong and Groove system arrangement . Handle shall be made of ABS in round type with Dia of 350mm minimum with a safety lock System at the Centre. channel of the compactor shall be U – Channels formation to carry more weight and to get more rigidity. Mechanical arrangement shall be concealed inside the System, only handle shall be installed at the outer Sheet of the Compactor as Shown in the Drawing. The component specification shall be as follows. channel U - Section: Section shall be minimum 1.0mm thk. Material Thickness : Back Sheet : 0.8mm; Shelf: 0.8mm; Side Sheet: 0.8mm;Under Carriage Frame - HR sheet 2.5mm thick. channel Post: U - Shaped Post. Wheel: Iron die casting with anti-rust coating, Loading : 950-1000kg/Wheel There shall be central locking system with wire, handle lock, Rail lock Plate & Rail Lock assembly in the chain box cover. The material used for the system shall be as per following standards:- Steel CRCA IS - 513 D HR 10748 All steel component shall be given 7 tank ntrrust Phosphting treatment and to shall be Powder coated and baked at 200o centigrade with 60 -70 microns quoting thickness. All steel components shall be given a thorough antirust treatment. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	5.00	Set	910049.65	4550248.25	
10	<p>Providing assembling & placing of Of Workstation. Panel Based workstation of size - 1200mm W x 600mm D x 1190mm H. Frame Work, Partition and Cable management : Frame work shall consist of main spine and return spine of aluminium extruded section of minimum thickness of</p>	24.00	Nos	29504.20	708100.80	


<p>1.2 mm. The overall thickness of Panel base System should be minimum 60-70 mm. The thickness of main spine partition panel should be minimum 60-70 mm & minimum 25-28mmmm thick for return spine. The panel will be hollow inside to accommodate wiring for electrical/data and outer frame of panel should be made of extruded aluminium. The panel shall be made up of 3 mm thick MDF both sides of the wooden frame to create the hollow for the wire management. The panel outer aluminium frame is designed in such a way that it can be easily slide in to the columns/ Connectors by means of stacking one over the other. Horizontal race way should be 150-170 mm height aluminium profile. There shall be complete cable management arrangement with openable raceway above/ below worktop with provision for fitting electrical/data switches and holes for passing cable. Panel Finishes : Finishes of panel above the worktop can be fabric pinup/fabric/laminate + Glass/metal writable marker board or single finish tile with raceway on main spine. Finishes of main spine panel below the worktop the hollow panel should be made of MDF tile and 0.5mm thick steel sheet pasted on MDF which is powder coated with EPC finish 80-90 microns for durability on the inside as well on the outside. Raceway can be provided above/below the worktop. Connectors/ Brackets: End Post: Aluminium 60-70 mm width – 1180-1220 mm height. Two way post: Aluminium 30-70 mm width – 1180-1220 mm height. Three way post: Aluminium 30-70 mm width – 1180-1220 mm height. Four way post: Aluminium 30-70 mm width – 1180-1220 mm height. Brackets: Table top supported with 50-60mm width steel bracket. Table top to table top connector: 150-170 mm Width x 120-140 mm Depth width connector. Worktop : Worktop Made of 25mm thick E-1 grade particle board finished with 2mm ABS edge banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The particle board should be E-1 Grade with pvc edge banding. Drawer Unit : 3 drawer Wooden pedestal of overall dimensions internal and external dimensions 420 mm (W) x 450 mm (D) x 600 mm (H). Drawer body should be made of 18mm thk melamine. Each pedestal should be provided with pencil tray of 40-45 mm(H) x 110-120 mm (D) x 300-310 mm (W). Each pedestal should have 5 Nos castor fitted to it where in one castor will be fitted to lower most drawer to provide extra stability. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>					
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11	<p>Providing and placing 15 Seater Conference Table. Size of Two seater Module 1350 Width mm x 600 Depth mm, Whose top and legs are made of 38mm. thick Particle Board (E-1 Grade), melamine finishes with matched 2 mm PVC edge-banding. E1 grade laminate with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{ g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty is Particle board wood Grade E-1 (Environmental Friendly) thickness 25 mm, cover with Melamine Edge-Banding (PVC) 2 mm. Also legs are made of Particle board Grade E-1 (Environmental Friendly) thickness 38 mm cover with Melamine. Wiring tray made from MS sheet 2 mm, flange structure epoxy powder 80-90 microns coated spray color, baked at temperature 200°C with vertical wire uptake from floor via middle leg having removable cover one side and wire separator for data and wire separation, segregates to horizontal cable tray below wooden flipper. Product should be BIFMA gold rated SCS global certified for in-house air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	15.00	Str	11303.80	169557.00	
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12	<p>Providing and placing Leatherite Chair should be high back, cushioned seat assembly, moulded plywood upholstered with moulded polyurethane foam & finished with Leatherite. Back size: (W) 450 - 500 mm (H) 600-620mm; Seat size: (L) 450mm - 500mm (W) 450 - 500mm with Polyurethane Foam. Polyurethane Foam: The polyurethane foam (Recyclable) of minimum density = 30 kg/ cum + 2 kg/cum fixed to moulded plywood and upholstered with Leathrite. Fixed armrest of premium quality of SS Chromed finish with PU cushion pads. Synchro mechanism: 360 degree revolving type, from pivot for tilt with multiple locking position & feet resting on ground for extra comfort. The pneumatic adjustment has an adjustment stroke of 70-120 mm, Pedestal Assembly: should have 5 star aluminium die cast with hard castors suitable for tiles flooring with adjustment, twin wheel castors & the pitch centre Dia is 650 +/- 50mm. (750 +/- 10mm with castors). Twin wheel castors: these are made of injection moulded in black PP having 50-60mm dia, complete in all respect. The above chair should be finished / completed as per above mentioned specifications including providing and fixing of other related materials including hardware, etc. complete or as directed by the Engineer-in-Charge and conforming to the image having back curvature in longitudinal and in trasverse direction as per the image. All complete as per manufacturers specification. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	5.00	Nos	17242.90	86214.50	
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13	<p>Providing and placing Leatherite Chair should be medium back Chair should be high back, cushioned seat assembly, moulded plywood upholstered with moulded polyurethane foam & finished with Leatherite. Back size: (W) 450 - 500 mm (H) 600-620mm; Seat size: (L) 450mm - 500mm (W) 450 - 500mm with Polyurethane Foam. Polyurethane Foam: The polyurethane foam (Recyclable) of minimum density = 30 kg/ cum + 2 kg/cum fixed to moulded plywood and upholstered with Leathrite. Fixed armrest of premium quality of SS Chromed finish with PU cushion pads. Synchro mechanism: 360 degree revolving type, from pivot for tilt with multiple locking position & feet resting on ground for extra comfort. The pneumatic adjustment has an adjustment stroke of 70-120 mm, Pedestal Assembly: should have 5 star aluminium die cast with hard castors suitable for tiles flooring with adjustment, twin wheel castors & the pitch centre Dia is 650 +/- 50mm. (750 +/- 10mm with castors). Twin wheel castors: these are made of injection moulded in black PP having 50-60mm dia, complete in all respect. The above chair should be finished / completed as per above mentioned specifications including providing and fixing of other related materials including hardwares, etc. complete or as directed by the Engineer-in-Charge and conforming to the image having back curvature in longitudinal and in trasverse direction as per the image. All complete as per manufacturers specification. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	75.00	Nos	15326.60	1149495.00	
14	<p>Providing and placing Leatherite Visitors Chair should be medium back. Chair Seat made up of insert moulded polyurethane foam upholstered with leatherite, insert moulded foam assembled over moulded plywood, Seat size 52.5 cm width (approx.), 54.0 cm depth (approx.), sub assembly back size 48.5 cm max. width, 62.0 cm height.(approx.), effective back height from Seat 57.0 cm. (approx.), polyurethane foam for seat moulded with density 30±4 kg/m³, sledbase leg frame welded assembly made of aluminium die cast round tube having outer dia 24mm (approx.) and thickness 2mm., based shoes on frame etc. all complete as per manufacturers specification. ck curvature in longitudinal and in trasverse direction as per the image. All complete as per manufacturers specification. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	32.00	Nos	9578.95	306526.40	


15	<p>Supplying and fixing in position Knock Down Steel Almirah. Overall Size - 900W x 450D x 11190H mm Having 2 shelves making 3 compartments, Whole body, doors and shelf made of 0.8mm CRCA sheet, Shelves and doors should have stiffener for better strength and load bearing capacity. Auto closing CED Coated “HETTICH”/“HAEFFLE” / equivalent Hinges for better adjustment of doors. Chrome plated three way Recess type spring loaded rectangular snap shut handle cum lock with duplicate keys Highly durable – Made of 100% virgin Epoxy Powder Coated CRCA confirming to IS : 513 CR2 (Cold Reduced Carbon Steel Sheets & Strips (Part 1), 2016, procured from TATA Steel (Test Certificate available on request). Furthermore, Complete material passes through 7 stage, ultra-modern NANO-TECHNOLOGY based Pre-treatment plant prior to powder coating, making it highly corrosive resistant. Superior Finish – Powder coating done on Fully Automatic Powder Coating Plant with world leader GEMA™ spray booth and World Leader AkzoNobel™ Powder ensures smooth, uniform and highest quality levels of Powder Coating Modern Technology - Rigid Knock Down Construction done out of complete 0.8 mm thick CRCA sheet. Each Compartment Shelf has uniformly distributed load capacity per shelf is 35 kg. The rigid construction gives extra strength and durability, whereas the epoxy-polyester adds the finishing touch to the unit. Logistic Friendly – 100% Knock Down product makes transportation a very easy and SAFE, product gets assembled at site only. Design Simplicity - Simplistic Design with “NO PEDESTAL” at bottom makes for an aesthetic look and seamless finish, apart from offers large storage capacity that makes sure you have enough space for storage. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	14.00	Nos	22033.05	308462.70	
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16	<p>Providing & Placing medium back revolving chairs ., Chair seat made up of insert moulded Polyurethane Foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back is made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture.Armrests should be adjustable with 120-160 mm adjustability with PU padded.Base: Black nylon base with 5 nos. nylon castors.Chair should be of 360 degree swivel Posture Control with multi pointer locking and synchro tilt mechanism and hydraulic gas lift gas lift to allows 90-100 mm. of height adjustment. Seat size 440 - 550 mm depth, Seat width of 530-550 mm Seat Height of 420-510mm with hydraulic height adjustability of 90-100mm. Sub assembly back size 550 - 620 mm height. Effective back height from Seat - 570mm, polyurethane foam for seat having density 65-70 kg/m3. Pedestal made of nylon base fitted with 5 nos. twin wheel castors (castor wheel dia. 60-70 cm), base pedestal dia 60-70 mm and pitch center dia. 700-720mm with castors, twin wheel castors injection moulded in Nylon etc. all complete as per manufacturers specification, approved sample and direction of Engineer-in-Charge. ck curvature in longitudinal and in trasverse direction as per the image. All complete as per manufacturers specification. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	27.00	Nos	19159.25	517299.75	
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17	<p>Providing & Placing Cabin office Table with side unit, with following Size Table is of Size: 2400mm(L1) x 2300mm(L2) x 1000mm(D1) x 600-650mm(D2)x 740-760mm(H) & details and specification :- whose top is made of 48-52mm thick E1 grade MDF (Environmental Friendly) with 0.4mm thick Veneer Finish, With Key board tray & Leatherite pad on the main table , size of leatherite is 900-1200Wx 460-560Dmm , with edge banding. E1 grade MDF with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Closed wiring tray is made of steel sheet thickness 1.2mm. Epoxy powder coated spray color, baked at temperature 200 C°. Below the access flap/ axial box (2-3 nos socket/Switch), Top supported on one side suspended combo storage & One side Three drawer unit of size: 560Wx 670Dx 680Hmm with Dummy Box which is fixed with modesty panel, Drawer & Modesty are made of 19mm thick E1 grade MDF Board (Environmental Friendly) with 0.4mm thick Veneer Finish, Drawer unit & side combo storage connecting with 19mm thick MDF modesty panel with matching finish cover Edge banding (PVC) . E1 grade Veneer MDF with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). Side Combo Storage: Body of storages made out 19 mm thick (E1 Grade) MDF board with 0.4 mm veneer with PVC edge-banding. Side Combo Storage is combination of 2nos swing shutter & Open space, E1 grade MDF to be used which provide no urea formaldehyde emission and formaldehyde should be phenol base with emission of not more than ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992).The storage should have extruded aluminum handle, as per requirement. Storages should be provided with adjustable levelers. Door Lock should be of three-way lock mechanism, the hinged doors can be locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	3.00	Set	114954.05	344862.15	
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18	<p>Providing & Placing of Conference Table, Table of size 3600L x 1050D x 750H mm, whose top and legs are made of 25 mm. thick Particle Board (E-1 Grade), melamine finishes with matched 2 mm PVC edge-banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty is Particle board wood Grade E-1 (Environmental Friendly) thickness 16 mm cover with Melamine Edge-Banding(PVC) 2 mm. Also legs are made of Particle board wood Grade E-1 (Environmental Friendly) thickness 25 mm, cover with Melamine. Wiremanagement :Aluminum flipper with wiring tray is made of steel sheet thickness 1.2mm. Epoxy powder coated spray color, baked at temperature 200 C°. Raceways contain the horizontal cable channel that fitted with a modesty panel tidily and effectively. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	1.00	Nos	11303.80	11303.80	
19	<p>Providing & Placing Cabin office Table with side unit, with following details with overall size Table is of Size: 3600mm(L1) x 2400mm(L2) x 1000mm(D1) x 600-650mm(D2)x 740-760mm(H) and specification :- whose top is made of 60-70mm thick E1 grade MDF (Environmental Friendly) with 0.4mm thick Veneer Finish, With Key board tray & Leatherite pad on the main table , size of leatherite is 900-1200Wx 460-560Dmm , with edge banding. E1 grade MDF with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Closed wiring tray is made of steel sheet thickness 1.2mm. Epoxy powder coated spray color, baked at temperature 200 C°. Below the access flap/ axial box (2-3 nos socket/Switch), Top supported on one side suspended combo storage & One side Three drawer unit of size: 560Wx 670Dx 680Hmm with Dummy Box which is fixed with modesty panel, Drawer & Modesty are made of 19mm thick E1 grade MDF Board (Environmental Friendly) with 0.4mm thick Veneer Finish, Drawer unit & side combo storage connecting with 19mm thick MDF modesty panel with matching finish cover Edge banding (PVC) . E1 grade Veneer MDF with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). Side Combo Storage: Body of storages made out 19 mm thick (E1 Grade) MDF board with 0.4 mm veneer with PVC edge-banding. Side Combo Storage is combination of 2nos swing shutter & Open space, E1 grade MDF to be used which provide no urea formaldehyde emission and formaldehyde should be phenol base with</p>	1.00	Set	229906.80	229906.80	


	emission of not more than ($\leq 8\text{mg}/100\text{ g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992).The storage should have extruded aluminum handle, as per requirement. Storages should be provided with adjustable levelers. Door Lock should be of three-way lock mechanism, the hinged doors can be locked at once. Door should be provided with Hinge-damping mechanism to enable soft closing of doors. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.					
20	Providing, supplying and placing an open display book case. 1000Width x 450Depth x 2100height mm – as per site measurement Body panels are made of 18 mm thick Melamine Chip Board All the exposed edges are edge banded with 0.8 mm thick PVC edge banding. Door are made of 18 mm thick Melamine Chip Board with all the exposed edges are edge banded with 0.8 mm thick PVC edge banding. Side panel are made of 18 mm thick Melamine Chip Board with all the exposed edges are edge banded with 0.8 mm thick PVC edge banding and with imported H.D.F. foil wrapped decorative trim fixed on to it. Bookcase having Two solid sutter on bootm & Two Glass sutter on top. Drawer components are made of 18 mm thick Melamine Chip Board.All the exposed edges are edge banded with 0.8 mm thick PVC edge banding. Body back and drawer bottom are made of 8 mm thick Prelaminated particle board. Top cornice is made of imported H.D.F. foil wrapped decorative Trim. Mirror used on the door is 4 mm thick. Hardware : The high quality hardware used like Roller slides, Hinges , minifix, wooden dowels is of make Hettich, EBCO or equivalent.. Lock used for main door is 3 way lock and lock used for drawer is cam lock Construction : Knock Down construction. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	2.00	Nos	35444.65	70889.30	



21	<p>Providing and placing High Back chairs. The seat, backrest & arm shall be made up of 12mm thick hot pressed plywood & upholstered with italian leather and moulded medium density foam. Overall dimensions of Chair shall be, Width of Chair - 660-710 mm, Depth of Chair - 650-700mm, Height of Chair-1200-1300mm as measured till pedestal . The back shall be designed with contoured lumber support for extra comfort. Size of back shall be W-520+10m, H-715mm & size of seat shall be W-530+10 mm x D-460mm x H-483-543mm. Medium density foam should be used in making seat & back which shall be moulded with density 45kg/m³ and hardness load 16kgf. The seat and back should be arrested together with spine made of 8mm thick HR steel and should be powder coated in black with 40-60 micron . The fixed armrest . The mechanism of the chair shall have following features: STG mechanism, 360 degree swivel type, Knee Tilt mechanism, Seat & back tilting ration of 1: 1.5, Front pivot for tilt with feet resting on ground ensuring more comfort, multiple locking position. Gas lift allows 10mm of height adjustment. The pedestal shall be made of die-cast aluminium base. it shall be fitted with 5 nos twin wheel castor. The size of the pedestal shall be 670mm pitch-centre-dia 700-720mm with castors). The twin wheel castors shall be made of Nylon injection moulded in black color. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	1.00	Nos	40233.45	40233.45	
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22	<p>Providing and placing Mid Back chairs. The seat, backrest & arm shall be made up of 12mm thick hot pressed plywood & upholstered with italian leather and moulded medium density foam. Overall dimensions of Chair shall be, Width of Chair - 660-710 mm, Depth of Chair - 650-700mm, Height of Chair-950-1050mm as measured till pedestal . The back shall be designed with contoured lumber support for extra comfort. Size of back shall be W-490+10m, H-530mm & size of seat shall be W-500+10 mm x D-450mm x H-470-530mm. Medium density foam should be used in making seat & back which shall be moulded with density 45kg/m³ and hardness load 16kgf. The seat and back should be arrested together with spine made of 8mm thick HR steel and should be powder coated in black with 40-60 micron. The fixed armrest. The mechanism of the chair shall have following features : STG mechanism, 360 degree swivel type, Knee Tilt mechanism, Seat & back tilting ration of 1: 1.5, Front pivot for tilt with feet resting on ground ensuring more comfort, multiple locking position. Gas lift allows 10mm of height adjustment. The pedestal shall be made of die-cast aluminium base. it shall be fitted with 5 nos twin wheel castor. The size of the pedestal shall be 670mm pitch-centre-dia 700-720mm with castors). The twin wheel castors shall be made of Nylon injection moulded in black color. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	8.00	Nos	34485.80	275886.40	
23	<p>Providing & Placing sofa set (3+1+1) seater. Sofa overall dimension - 3 seater sofa overall dimension - 1970mm W x 820-860mm D x 780-820mm H, Seat Size: 1670Wx 530Dx 400hmm & 1 seater sofa overall dimension - 820mm W x 820-860mm D x 780-820mm H,Seat Size: 615Wx 530Dx 400hmm with wooden structure fabricated using hardwood of approved quality, duly seasoned and anti-termite treated with approved chemical and methodology. The wooden base frame of the sofa shall be provided with M.S. helical spring along with high quality elastic belt 70-80mm, sides & back with 40-60mm elastic belt, seat & back covered with jute & foam covered with Polyfilla & finished with thick marking cloth before doing final finish with leatherette material The component specification shall be as follows Seat - 40-45Kg/cum density PU Foam, 100mm thick, Back - 32 - 40Kg/cum density PU foam, 50mm thick, Sides (inside) - 32-40 Kg/cum density PU Foam, 11mm thick Sides (outside) & back (back side) - 35-40 Kg cum density PU foam, 13mm thick. Seat shell rest on MS Powder Coated / Chrome Finish Legs supported</p>	1.00	Set	95794.85	95794.85	




	solid wooden section of height 50-220mm. All Wooden work should be in White Ash / Teak wood polish with melamine & p.u coat Base of sofa should be infilled with suitable wooden sections so as to give proper support to the seat Height of the base of sofa.sofa shall be 75-220mm (Approx). Finished width of arm shall be 100 - 180mm (Approx) after upholstery work. Sofa to be fully upholstered using leatherette material of approved quality and shade & price shall not be less than 1000 Rs Meter, duly embossed including providing & fixing of all other required materials and hardware etc. all complete as directed by the Engineer in charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.					
24	Providing and fixing tables of Centre table. Center Table of Size - 1100mm W x 500mm D x 365mm H for whose top is made of Particle board wood Grade E-1(Environmental Friendly), thickness 19mm cover with Melamine, Edge banding (PVC) 2mm.E1 grade laminate with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992).The understructure is made of SS BASE. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	1.00	Nos	22990.55	22990.55	
25	Providing and fixing tables of Side table . Side Table of Size - 500mm W x 500mm D x 365mm H for whose top is made of Particle board wood Grade E-1(Environmental Friendly), thickness 19mm cover with Melamine, Edge banding (PVC) 2mm.E1 grade laminate with zero urea formaldehyde emissions ($\leq 8\text{mg}/100\text{g}$ oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992).The understructure is made of SS BASE. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	2.00	Nos	21074.25	42148.50	



26	<p>Providing and placing of Confrance Table. Confrance Table of Size - 2800mm W x 1100mm D x 740mm H, Worktop Made of 25mm thick E-1 grade particle board finished with 2mm ABS edge banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The particle board should be E-1 Grade with pvc edge banding. Understructure: MS legs Loop Leg of section 50 x 25mm, where Structure made from cold rolled steel, thickness 1.2 mm. Epoxy powder coated spray paint, baked at temperature 200 C° coated of 80-90 micron thickness. Powder coating should be scratch resistance (cross hatch test 6x6 grid method). well supported with beams under table top. Completely concealed MS wiremanagement and trays epoxy powder 80-90 microns coated spray color, baked at temperature 200c. Wire management: Completely concealed wiremanagement with Aluminium anodized flipper with soft closure. wiring tray & beams Made from MS sheet 2 mm., flange structure epoxy powder 80-90 microns coated spray color, baked at temperature 200c with vertical wire uptake from floor via middle leg having removable cover one side and wire separator for data and wire separation, segregates to horizontal cable tray below flipper. Product should be BIFMA gold rated SCSGlobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	1.00	Nos	76635.60	76635.60	
27	<p>Providing & Placing 2 seater sofa, Sofa overall dimension - 1400mm W x 820-860mm D x 780-820mm H, Seat Size: 1120W x 530D x 400H. with wooden structure fabricated using hardwood of approved quality, duly seasoned and anti-termite treated with approved chemical and methodology. The wooden base frame of the sofa shall be provided with M.S. helical spring along with high quality elastic belt 70-80mm, sides & back with 40-60mm elastic belt, seat & back covered with jute & foam covered with Polyfilla & finished with thick marking cloth before doing final finish with leatherette material. The component specification shall be as follows Seat - 40-45Kg/cum density PU Foam, 100mm thick, Back - 32-40Kg/cum density PU foam, 50mm thick, Sides (inside) - 32-40 Kg/cum density PU Foam, 11mm thick Sides (outside) & back (back side) - 35-40 Kg cum density PU foam, 13mm thick. Seat shell rest on Wooden Legs supported solid wooden section of height 50-180mm. All Wooden work should be in White Ash / Teak wood polish with melamine & p.u coat Base of sofa should be infilled with suitable wooden sections so as to give proper</p>	2.00	Nos	86215.90	172431.80	


	support to the seat Height of the base of sofa. sofa shall be 75-220mm (Approx). Finished width of arm shall be 100 - 180mm (Approx) after upholstery work. Sofa to be fully upholstered using leatherette material of approved quality and shade & price shall not be less the 1000 Rs Meter, duly embossed including providing & fixing of all other required materials and hardware etc. all complete as directed by the Engineer in charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.					
28	Providing & Placing 3 seater sofa, Sofa overall dimension - 1970mm W x 820-860mm D x 780-820mm H, Seat Size: 1670Wx 530Dx 400hmm., with wooden structure fabricated using hardwood of approved quality, duly seasoned and anti-termite treated with approved chemical and methodology. The wooden base frame of the sofa shall be provided with M.S. helical spring along with high quality elastic belt 70-80mm, sides & back with 40-60mm elastic belt, seat & back covered with jute & foam covered with Polyfilla & finished with thick marking cloth before doing final finish with leatherette material The component specification shall be as follows Seat - 40-45Kg/cum density PU Foam, 100mm thick, Back – 32 - 40Kg/cum density PU foam, 50mm thick, Sides (inside) - 32-40 Kg/cum density PU Foam, 11mm thick Sides (outside) & back (back side) - 35-40 Kg cum density PU foam, 13mm thick. Seat shell rest on Wooden Legs supported solid wooden section of height 50-180mm. All Wooden work should be in White Ash / Teak wood polish with melamine & p.u coat Base of sofa should be infilled with suitable wooden sections so as to give proper support to the seat Height of the base of sofa. sofa shall be 75-220mm (Approx). Finished width of arm shall be 100 - 180mm (Approx) after upholstery work. Sofa to be fully upholstered using leatherette material of approved quality and shade & price shall not be less the 1000 Rs Meter, duly embossed including providing & fixing of all other required materials and hardware etc. all complete as directed by the Engineer in charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.	2.00	Nos	114954.05	229908.10	



29	<p>Providing and placing in position of side table, Table of size: 750mm dia x 400mmh with top made 25mm thk. Pre-Lamibated MDF Board and understructure is made of 18mm thick prelaminated MDF board with all exposed edges sealed with 2mm PVC edge banding tape and unexposed edges sealed with 0.6mm PVC edge banding tape pressed at 200o C with hot melt glue on special machines. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	2.00	Nos	11495.25	22990.50	
30	<p>Providing & Placing of Round/Square Discussion Table , Table Size - 900mm Dia x 740mm H. ,Worktop Made of 25mm thick E-1 grade particle board finished with 2mm ABS edge banding. E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house air quality. This should comply with (EN 120-1992). The exposed edge of worktop shall be secured with 2mm thick PVC edge banding tape of approved colour. The height of Worktop shall be 740-760 mm from ground level. The particle board should be E-1 Grade with pvc edge banding. Understructure: MS understructure with pole base of 120 mm. dia. epoxy powder coated steel tube leg welded to a 395 mm. dia. epoxy powder 80-90 microns coated spray color, baked at temperature 200c, well supported with beams under table top. Completely conseled MS wiremanagement and trays epoxy powder 80-90 microns coated spray color, baked at temperature 200c. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	2.00	Nos	24906.85	49813.70	


31	<p>Providing & Placing Waiting Area Chair , Three Seater Size: 1623Wx640Dx850H mm. ,The seat and back to be made up of high density self skin PU Foam reinforced with 3 mm MS perforated sheet insert. The PU Foam having density of 680 +/- 10 Kg/m³ with hardness of 55 +/-5. Seat Size :52.0 cm (W) X 46.5 cm (D). Back Size : 52.0 cm (W) X 51.5 cm (H). Cross Beam made up of black powder coated MS ERW square tube of size 6.0+/- 0.05cm X 6.0+/- 0.05cm X 0.018+/- 0.016 cm thick fitted with polypropylene end caps. Legs & Armrest made up of powder coated High pressure Aluminum Die cast. Legs are fitted with Soft grip PVC level adjusting shoes.Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	1.00	Nos	67056.65	67056.65	
32	<p>Providing and placing of Two seater Waiting Area Chair . The seat and back to be made up of high density self skin PU Foam reinforced with 3 mm MS perforated sheet insert. The PU Foam having density of 680 +/- 10 Kg/m³ with hardness of 55 +/-5. Seat Size :52.0 cm (W) X 46.5 cm (D). Back Size : 52.0 cm (W) X 51.5 cm (H). Cross Beam made up of black powder coated MS ERW square tube of size 6.0+/- 0.05cm X 6.0+/- 0.05cm X 0.018+/- 0.016 cm thick fitted with polypropylene end caps. Legs & Armrest made up of powder coated High pressure Aluminum Die cast. Legs are fitted with Soft grip PVC level adjusting shoes. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	1.00	Nos	43107.30	43107.30	
33	<p>Providing and fixing tables of Side table . Side Table of Size - 500mm W x 500mm D x 365mm H for whose top is made of Particle board wood Grade E-1(Environmental Friendly), thickness 19mm cover with Melamine, Edge banding (PVC) 2mm.E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992).The understructure is made of SS BASE. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	5.00	Nos	5762.70	28813.50	

34	<p>Providing and placing Recliner Chair . ith Overall dimension: 950 x 740 x 1050 mm. Frame material (tropical wood / pine wood/ rubber wood): rubber wood. Seat foam: (density, type) 150kg under per seat. The density is 24 kg/m3 and the thickness is 70. Back foam: (density, type) 150kg under per seat. The density is 24 kg/m3 and the thickness is 70. Armrest foam: (density, type). 150kg under per seat. The density is 24 kg/m3 and the thickness is 70. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	1.00	Nos	44066.10	44066.10	
35	<p>Providing and fixing tables of Side table. Side Table of Size - 450mm W x 450mm D x 365mm H for whose top is made of Particle board wood Grade E-1(Environmental Friendly), thickness 19mm cover with Melamine, Edge banding (PVC) 2mm.E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992).The understructure is made of SS BASE. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	3.00	Nos	19159.25	57477.75	
36	<p>Providing and placing Conference Table 20 Seater. Overall Size:7950Wx2550Dx750H mmble Whose top and legs are made of 38mm. thick Particle Board (E-1 Grade), melamine finishes with matched 2 mm PVC edge-banding.E1 grade laminate with zero urea formaldehyde emissions (<or= 8mg/100 g oven dry board-perforated method) for better in-house quality. This should comply with (EN 120-1992). The Modesty is Particle board wood Grade E-1 (Environmental Friendly) thicness 25 mm, cover with Melamine Edge-Banding(PVC) 2 mm. Also legs are made of Particle board Grade E-1 (Environmental Friendly) thicness 38 mm cover with Melamine. Wiring tray made from MS sheet 2 mm, flange structure epoxy powder 80-90 microns coated spray color, baked at temperature 200c with vertical wire uptake from floor via middle leg having removable cover one side and wire seperator for data and wire separation, segregates to hozizontal cable tray below wooden flipper. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	1.00	Set	229906.80	229906.80	

37	<p>Providing and fixing in position Auditorium Chairs Auditorium Chair With Wooden & PVC Table with Writable tablet of overall dimensions of 515mm (W) x 720mm (D) x 980mm (H). Seat Height from floor should be of 440mm as per Ergonomic standards. The chairs should have following description :The dimensions after push back shall be 515mm wide and seat and Backrest should be made with cutting and moulded foam covered by acrylic fabric.The shell should made up of plywood cover of termite, fire resistant plywood and should be capable of bearing minimum height of 120 kgs. Seat should be with buffering mechanism to enable soft closing of seat when it is folded and all hole on seat shelf should be noise absorbing. Armrest of chairs should be of fixed type made out of wood and should be provided with option of folding table to be used as writing pad.Legs of chairs should be made with cold rolled cold annealed steel duly powder coated with 80-100 micron thickness to provide smooth and clean surface.Seat should be foldable to enable comfortable seating, maintenance and to provide space utilization to walk around. Seat and Back should be wrapped with Titch make O-Farbic of desire colour as per Engineer-Incharge with zero formaldehyde glue. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	300.00	Nos	11495.25	3448575.00	
38	<p>Providing & supplying Training Room Chair, whose Seat shall be made up of insert moulded polyurethane foam upholstered with foam laminated mesh fabric, insert moulded foam assembled over a load bearing plastic seat cover, back made up of two piece injection moulded frame, inner frame upholstered with mesh fabric and mounted on the main assembly, back adjustable lumbar support for achieving comfortable seating posture, seat size 52.5 cm width (approx.), 54.0 cm depth (approx.), sub assembly back size 48.5 cm max. width, 62.0 cm height.(approx.), effective back height from Seat 57.0 cm. (approx.), polyurethane foam for seat moulded with density 65±4 kg/m³, sledbase leg frame welded assembly made of MS ERW round tube having outer dia 24mm (approx.) and thickness 2mm. including powder coating, based shoes on frame etc. all complete as per direction of Engineer-in-Charge.. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	139.00	Nos	9578.95	1331474.05	

39	<p>Providing & Placing of Three Seater Sofa , Three seater sofa overall dimension - 1860mm W x 760-790mm D x 660-690mm H with wooden structure fabricated using hardwood of approved quality, duly seasoned and anti-termite treated with approved chemical and methodology. The wooden base frame of the sofa shall be provided with M.S. helical spring along with high quality elastic belt 70-80mm, sides & back with 40-60mm elastic belt, seat & back covered with jute & foam covered with Polyfilla & finished with thick marking cloth before doing final finish with leatherette material The component specification shall be as follows Seat - 40-45Kg/cum density PU Foam, 100mm thick, Back – 32 - 40Kg/cum density PU foam, 50mm thick, Sides (inside) - 32-40 Kg/cum density PU Foam, 11mm thick Sides (outside) & back (back side) - 35-40 Kg cum density PU foam, 13mm thick. Seat shell rest on MS Powder Coated / Chrome Finish Legs supported solid wooden section of height 50-220mm. All Wooden work should be in White Ash / Teak wood polish with melamine & p.u coat Base of sofa should be infilled with suitable wooden sections so as to give proper support to the seat Height of the base of sofa shall be 75-220mm (Approx). Finished width of arm shall be 100 - 180mm (Approx) after upholstery work. Sofa to be fully upholstered using leatherette material of approved quality and shade & price shall not be less the 1000 Rs Meter, duly embossed including providing & fixing of all other required materials and hardware etc. all complete as directed by the Engineer in charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	2.00	Nos	57476.35	114952.70	
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40	<p>Providing & Placing of Two Seater Sofa, Two seater sofa overall dimension - 1460mm W x 760-790mm D x 660-690mm H with wooden structure fabricated using hardwood of approved quality, duly seasoned and anti-termite treated with approved chemical and methodology. The wooden base frame of the sofa shall be provided with M.S. helical spring along with high quality elastic belt 70-80mm, sides & back with 40-60mm elastic belt, seat & back covered with jute & foam covered with Polyfilla & finished with thick marking cloth before doing final finish with leatherette material The component specification shall be as follows Seat - 40-45Kg/cum density PU Foam, 100mm thick, Back – 32 - 40Kg/cum density PU foam, 50mm thick, Sides (inside) - 32-40 Kg/cum density PU Foam, 11mm thick Sides (outside) & back (back side) - 35-40 Kg cum density PU foam, 13mm thick. Seat shell rest on MS Powder Coated / Chrome Finish Legs supported solid wooden section of height 50-220mm. All Wooden work should be in White Ash / Teak wood polish with melamine & p.u coat Base of sofa should be infilled with suitable wooden sections so as to give proper support to the seat Height of the base of sofa shall be 75-220mm (Approx). Finished width of arm shall be 100 - 180mm (Approx) after upholstery work. Sofa to be fully upholstered using leatherette material of approved quality and shade & price shall not be less the 1000 Rs Meter, duly embossed including providing & fixing of all other required materials and hardware etc. all complete as directed by the Engineer in charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	4.00	Nos	38318.45	153273.80	
	<p>Providing and placing of centre table of 1200L x 600D x 450H mm. Legs: made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine. Frame : made out 0.05m x 0.04m teak wood section and top frame 0.08m x 0.04m i/c necessary inbuilt moulding all around out side & rebate for resting of TOP are made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine edge. All teak wood surface shall be finished with high class melamine polish (matt/glossy) polish in walnut or as required shade on all faces of wood complete as per approved sample at site and direction of Engineer-in-charge. All wood shall be second class seasoned and chemically treated teak wood complete and as per direction of Engineer-in-charge. Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty.</p>	2.00	Nos			

41	<p>Providing and placing of centre table of 600L x 600D x 450H mm . Legs: made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine. Frame : made out 0.05m x 0.04m teak wood section and top frame 0.08m x 0.04m i/c necessary inbuilt moulding all around out side & rebate for resting of TOP are made of 2nd class seasoned and chemically treated teak wood section duly polished in melamine edge. All teak wood surface shall be finished with high class melamine polish (matt/glossy) polish in walnut or as required shade on all faces of wood complete as per approved sample at site and direction of Engineer-in-charge. All wood shall be second class seasoned and chemically treated teak wood complete and as per direction of Engineer-in-charge.Product should be BIFMA gold rated SCSglobal certified for inhouse air quality and with 05 years warranty and complete as per the approved sample and as per the direction of Engineer-In-Charge.</p>	2.00	Nos	14369.10	28738.20	
	Total (A) =				23450892.00	

PART-C

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

ADDITIONAL CONDITIONS

1. The scope includes Planning, Design & preparation of Drawings for E&M services, obtaining approvals from the department, supplying, Installation, testing and commissioning of Internal Electrical Installations, Point Wiring, Power wiring, LT Cabling Work, LED light Fittings, Ceiling fans, Switch boards, MCB / MCCB DBs, 11KV Sub-station, Automatic Fire Alarm System, Fire Fighting with wet riser and sprinkler system, Lifts, DG set, Solar PV generation, LAN, UPS, VRV/VRF system, Water Pumps, Lighting Protection system as per CPWD specifications and relevant BIS standards as amended up to last date of submission of bid including extensions if any.
2. 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 -IV (Substation) 2013, Part-VI Fire detection and alarm System-2018, HVAC 2017, General Specification for Electrical works Part-VII 2013 (DG set), Part-V (Wet riser & Sprinkler System) 2020, Part-III (Lift & Escalator) 2003 and amended up to date and in accordance with Indian Electricity Rules, 1956, India Electricity Act, 2003, ECBC 2017 as amended up to date and NBC 2016 as amended up to date and as per instructions of the Engineer-in-Charge i/c as below and nothing extra will be paid.
3. 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.
4. 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.
5. 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.
6. Agency will get the scheme approved from the local bodies wherever required before start of the work and if required after completion of the work also.
7. The contractor shall obtain all applicable mandatory approval for the work and No Objection Certificate / Consent for Establishment from local body authorities like local Fire department, local town planning authority, local ground water authority, local electricity supply authority, local pollution control board, Forest department, Environment clearance, Lift inspectorate, Central Electricity Authority etc.

8. The contractor has to prepare all the documents as required and submit directly to the local Statutory bodies. the contractor shall at his own cost collect field samples and carry out all Necessary tests required for submission of necessary applications. The contractor has to comply and, if necessary, resubmit applications which are required by the local bodies. If required the contractor has to appoint at his own cost consultants for obtaining local body approval. The statutory payments or fees shall be paid by the department.
9. 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. The contractor shall obtain completion certificate after completion of the project from statutory local bodies before handing over.
10. 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%

11. **ELIGIBILITY CRITERIA FOR ASSOCIATE AGENCY:** The Composite category contractor 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 Fire Fighting system:**

- (i) Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 69 Lacs**

OR

Two similar works each costing not less than **Rs. 103 Lacs**

OR

One similar works each costing not less than **Rs. 138 Lacs**

Similar work shall mean **SITC of Fire Fighting system , Wet Riser & Sprinkler System.**

b) Eligibility Criteria for DG set:

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 8 Lacs**

OR

Two similar works each costing not less than **Rs. 13 Lacs**

OR

One similar works each costing not less than **Rs. 17 Lacs**

Similar work shall mean “**Supplying, Installation, testing & commissioning of DG set/s with minimum 80% capacity of individual DG set proposed in NIT**”.

c) Eligibility Criteria for Solar PV generation:

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 5 Lacs**

OR

Two similar works each costing not less than **Rs. 8 Lacs**

OR

One similar works each costing not less than **Rs. 10 Lacs**

Similar work shall mean “**Solar PV generation plant**”.

d) Eligibility Criteria for Automatic Fire Alarm System:

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 16 Lacs**

OR

Two similar works each costing not less than **Rs. 24 Lacs**

OR

One similar works each costing not less than **Rs. 32 Lacs**
Similar work shall mean **“SITC of Automatic Fire Alarm System”**.

e) **Eligibility Criteria for Sub-Station Work :-**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 47 Lacs**

OR

Two similar works each costing not less than **Rs. 70 Lacs**

OR

One similar works each costing not less than **Rs. 93 Lacs**

Similar work shall mean **“Supplying, Installation, testing & commissioning of DG set/s with minimum 80% capacity of individual DG set proposed in NIT”**.

f) **Eligibility Criteria for LAN work:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 7 Lacs**

OR

Two similar works each costing not less than **Rs. 11 Lacs**

OR

One similar works each costing not less than **Rs. 14 Lacs**

Similar work shall mean **“LAN System”**.

g) **Eligibility Criteria for Lifts:**

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 24 Lacs**

OR

Two similar works each costing not less than **Rs. 36 Lacs**

OR

One similar works each costing not less than **Rs. 48 Lacs**
Similar work shall mean "**Lifts System**".

h) Eligibility Criteria for VRV/VRF system:-

Agency should have satisfactorily completed the similar works as mentioned below during the last 7 years ending on 30.11.2023.

Three similar works each costing not less than **Rs. 50 Lacs**

OR

Two similar works each costing not less than **Rs. 74 Lacs**

OR

One similar works each costing not less than **Rs. 99 Lacs**

Similar work shall mean "**Supplying, Installation, testing & commissioning of VRV/VRF system with minimum 80% capacity of Capacity proposed in NIT**".

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.

12. 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.
13. The contractor shall employ Supervisory staff as per NIT provision who will be constantly in touch with the department and will sign site order book.
14. 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.
15. The work shall be carried out according to instructions of the Engineer-in-Charge.
16. 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 about recovery shall be final & binding on the contractor.
17. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost to the satisfaction of the Engineer-in-Charge. The program of electrical works is to be coordinated in accordance with the civil work.

18. 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.
19. Cement for work is to be arranged and used by the contractor himself and nothing extra will be paid on this account.
20. 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.
21. The size of conduit and wiring shall be got approved from the Engineer-in-Charge before the execution of work.
22. 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.
23. 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.
24. No tax shall be separately paid by the department. The rates tendered should be inclusive all taxes and duties. Statutory deductions at source shall be made while releasing payment through running/final bills as applicable. A certificate specifying the rate and amount of deduction shall however be issued by the department. 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.
25. Notwithstanding the schedule of quantities, all items of interrelated works considered necessary to make the installation complete and operative are deemed to be included, shall be provided by the contractor at no extra cost.
26. 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.
27. Nothing extra shall be paid for inter connections with thimbles/Wires/Tapes strips etc. used on the work.
28. The contractor has to make his own arrangements for stores and watch and ward and no extra claim for this will be entertained.
29. The contractor shall make his own arrangements for electrical power supply for the construction activities. No extra payments for the same will be made.
30. 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.

31. The rupturing capacity of the MCB's shall be 10KA. The MCB's shall have ISI mark.
32. The insulated copper wire to be used on this work shall be FRLS type of multi stranded.
33. Make of MCB/MCCB shall be the same as the make of MCB DB.
34. 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.
35. 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.
36. 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.
37. 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.
38. 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.
39. The connection between incoming switch/isolator and bus bar shall be made with suitable size of thimble and cable at no extra cost.
40. Copper conductor of insulated cables of size 1.5 Sq.mm and above shall be stranded and terminals provided with crimped lugs.
41. 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.
42. All hardware items such as nuts/bolts/screws/washers etc. to be used in work shall be of zinc/cadmium plated iron.
43. While laying conduit, suitable size junction boxes shall be provided for pulling the wire as per the decision of the Engineer-in-charge.
44. 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.
45. Where switches / sockets / regulator / telephone / TV / internet outlets are to be provided, the same shall be of only one make. Modular accessories for UPS outlets shall be of distinguishable colour.

46. The materials used in the work shall be of approved make as per list of preferred makes. In the preferred makes of fitting model no. of one of the acceptable makes has been mentioned for guidance. However, the contractor is free to supply other makes mentioned therein, provided the parameters of the fittings match with the fitting model No. mentioned in NIT. The decision of Engineer-in-charge shall be final.
47. 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 and products from the manufacturer.
48. The contractor shall have to work as per the convenience of the concerned Department.
49. 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.
50. 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"**.
51. 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.
52. 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, CED-IV, CCU** 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.
53. 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.
54. 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.

55. 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.
56. 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 price of LED fittings for the remaining 4 years 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.
57. 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.
58. 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.
59. The contractor shall at his own cost submit samples of all materials sufficiently in advance and obtain approval of Engineer-in-Charge. The materials to be used in actual execution of the work shall strictly conform to the quality of samples approved by the Engineer-in-Charge and nothing extra shall be paid on this account. The acceptance of any sample or material on inspection shall not be a bar to its subsequent rejection, if found defective.
60. The contractor shall at his cost, make all arrangements and shall provide necessary facilities as the Engineer-in-Charge may require for collecting, preparing, packing, forwarding and transportation of the required number of samples for tests and for analysis at such time and to such places as directed by the Engineer-in-Charge. Nothing extra shall be paid for the above operations including the cost of materials required for tests and analysis. 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.

61. 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.
62. 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.
63. The contractor shall make his own arrangement of water required for execution of work and get the water tested at his own cost with regard to its suitability for use in the works and get written approval from the Engineer-in-Charge before he proceeds with the use of same for execution of work.
64. 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.
65. 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.
66. 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.
67. 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.
68. 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.
69. **Quality Assurance Manual (Quality Assurance Plan & Checklist for E &M Service).**
 - (a) Main contractor/Associate shall submit the required quantity of materials as sample for Testing from Govt. / 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 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 directly come to department.
70. 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.
71. Models of the fittings other than that mentioned in list of preferred make may be accepted provided the performance parameters are at par or higher than the model mentioned therein. Nothing extra shall be paid on this account.
72. 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.
73. **Inspection before Dispatch:** All routine tests shall be conducted before dispatch of equipment. No equipment shall be dispatched out from the manufactures premises before such tests are conducted and test result recorded. These test certificates shall be given along the supply of equipment. The Engineer- In-charge shall, if he so desires inspect and witness the pre-delivery tests. For this purpose, the agency shall give 15 days advance notice. Agency shall arrange for inspection of the department. Department shall bear expenses of its officials for inspection as far as travelling, boarding and / lodging is concerned. However, the inspection shall be done at the discretion of the department without any cost implication but **ROUTINE TEST & TYPE TEST Certificates** shall have to be submitted for all the equipment.
74. 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.
75. **APPROVAL OF MATERIALS, SHOP FLOOR DRAWINGS AND COMMENCEMENT OF WORK:** The contractor shall submit list of makes & Model numbers of all items of equipment and accessories for each Sub Head of work. Catalogues of the equipment to be supplied. Shop floor drawings of each packages/ Sub work shall be submitted separately for approval. It is the responsibility of the tenderer to get the makes, models and shop floor drawings approved by the department before placing of order.
76. **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.

- 77. 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.
- 78. 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.
- 79. Inspection and testing at Factory and site:** The department reserves the right to inspect the equipment and get it tested at factory itself for which the Contractor has to give 15 day's notice for inspection. The travelling cost of Officers will be borne by the Department. The installation shall be subject to necessary inspection during every stage of erection, by the Engineer In-charge or his authorized representative. The successful bidder shall provide all facilities and assistance for the purpose. The completed installation shall be inspected and tested by the Engineer-in charge in the manner as will be laid down by department. All instruments and facilities necessary for the tests shall be provided by the agency.
- 80.** All electrical & mechanical fittings / fixture / appliances, to be provided for the work, where BEE certification is available should have **5-star rating (of BEE)**.
- 81. 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.
- 82.** Storage and safe custody of all materials shall be the sole responsibility of the Contractor. Nothing extra shall be payable on this account. This shall include cost of painting of the entire installation. The major equipment's shall be factory final finish painted. The agency shall be required to do only touch up to the damages caused to the painting during transportation, handling & installation at site, if there is no major damage to the painting. However, hangers, supports etc. of bus trunking & cable tray etc. shall be painted with required shade including painting with two coats of anticorrosive primer paint or pressurized paint for touch up of powder coated equipment at site.
- 83.** 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.

- 84.** The Annual Maintenance work of DG set for item no. 3 of SH: - 10, shall be done by OEM/ his authorized service dealer only for which the main agency shall enter in MoU with OEM/ his authorized service dealer and submit to Engineer-in-charge for approval.
- 85.** The Annual Maintenance work of Lift for item no. 2 of SH- 14, shall be done by OEM only for which the main agency shall enter in MoU with OEM and submit to Engineer-in-charge for approval.
- 86. Interpreting Specifications:** In interpreting the specifications, the following order of decreasing importance shall be followed in case of contradictions:
- i) Nomenclature of items as per Schedule of Quantities
 - ii) Special/Additional Conditions
 - iii) Particular Specifications
 - iv) Architectural/Structural drawings
 - v) CPWD Specifications including upto date correction slips.
 - vi) CPWD General Conditions of Contract (2023) for Construction works including correction slips issued up to last date of submission of bid including extensions if any.
 - vii) Indian Standards Specifications of B.I.S.
 - viii) ASTM, BS, or other foreign origin code mentioned in tender document.
 - ix) Manufacturer's specifications and as decided by the Engineer-in-Charge.
 - x) Sound Engineering practices or well-established local construction practices

CONSENT LETTER FROM ELIGIBLE ASSOCIATE AGENCY OF MINOR COMPONENT OF WORK

Name of work: .

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

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

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

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

Date:

Signature with date of Major component Contractor
Address

Signature with date of Associate/Minor Component Contractor
Address

Witness with address
(From major component contractor side)

Witness with address
(From minor component contractor side)

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

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

SIGNATURE OF MAIN CONTRACTOR

Date:

Place:

SIGNATURE OF ASSOCIATED CONTRACTOR

Date :

Place:

Witness with address

(From major component contractor side)

Witness with address

(From minor component contractor side)

**UNDERTAKING LETTER FROM MANUFACTURERS 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

Acceptable makes of materials to be used in the work are enclosed. In case of non-availability of these makes, the Superintending Engineer, CCU may allow use of alternative makes on the recommendations of Engineer-in-charge. Only BIS marked materials in the list shall be used in the work. Non-BIS marked materials may be permitted by the Engineer-in-charge only when BIS marked materials are not manufactured. If approved make/brand of any material is not given in the list, the same will be approved by the Superintending Engineer, CCU on the recommendations of Engineer-in-charge.

<u>List of preferred makes</u>				
S. No	Broad category	S. No	Item	Makes
1	Electrical Installation	1	PVC insulated FRLS copper conductor single core cable	Polycab/Anchor/ KEI/ Havells
		2	MS Conduit and its Accessories	AKG/BEC / NIC
		3	PVC Conduit and its Accessories	BEC/ Precision/ Norpack
		4	G.I. Race way	Legrand/ MK (Honey well)/ OBO
		5	Modular Switch & Socket/ USB charger/ Telephone socket / TV socket / Fan Regulator	Legrand (Arteor)/ / Schneider (Unica pure) / MK -ORNA
		6		
		7	Anchor fastener	Hilti/ 3M/ Fischer
		8	Fan Box (with rod & hook assembly)	For concealed: Cast iron/GI Continuously welded / PVC same as pipe make For open: Anchor fastener with hook
		9	1.1 KV Grade XLPE Power Cable	Polycab/ Anchor/ KEI/ Havells
		10	1.1 KV Grade Fire survival cable	Polycab/ Anchor/ KEI/ Havells
		11	11 KV Grade XLPE Power Cable	Polycab/KEI/ Havells /Gloster
		12	Cable Lugs and Gland	Commet / Gripwel / Dowell/ Jainsons/ Raychem
		13	Cables (Control, Signal & communication, Coaxial system cable)	Polycab/ KEI/ Havells/ Grandlay

		14	Cat-6 UTP/CAT-6A,UTP/STP Cable, Fibre Optics cable	Legrand /PANDUIT/COMMOSCOPE
		15	GI Perforated Cable Tray	Slotco / Indiana / AKG/BEC
		16	Jointing Kit/ Termination	Raychem/ Densons/ Mahindra-3M / ABB
		17	UPVC/ HDPE Pipe/DWC	Duraline/ Rex/ Tirupati
2	DG Set	1	Diesel Engine	Cummins / /Caterpillar/ Perkins/ Kirloskar
		2	Alternator	Stamford/ Crompton/ Leroy somer
		3	Protection Relays & CT'S	As per main equipment Manufactures standard/AE/Crompton/ L&T/ Siemens/ Salzer
		4	Battery	Exide / Hitachi /Amaron
		5	Sound proof Enclosure	OEM of DG SET
3	Transformer	1	Dry Type Transformer (Cast resin dry type)	Crompton Greaves / Voltamp / Kirloskar
		2	LT BusTrunking and accessories	L&T / Schneider / Legrand / C&S
4	UPS	1	UPS	Schneider (APC) / Eaton/ Emerson (vertiv)
		1	HT Electrical Panels &VCB	Schneider Electric/ABB / Crompton Greaves / Kirloskar OEM factory-built panel. Panel shall be tested at manufacturer. HTVCB relay shall be of same OEM
		2	Air Circuit Breaker	L&T (U-Power Omega)/ABB-EMAX 2 / Siemens 3 WL/ Schneider Electric Master Pact NW/ Legrand (Dmx3)
		3	Contactors/ Starters/ Overload Relay / Timer	Siemens / Schneider/ ABB / L&T
		4	Protection Relays	GE / Schneider/ ABB / L&T
		5	Indicators/ Push Buttons	Vaishno / Schneider/ Siemens/ L&T
		6	Panel Meters/ other Accessories	Schneider/ Siemens/ L&T / AE

5	Elect Panel	7	Soft starters	Siemens/ Schneider/ ABB / Rockwell / L&T
		8	CT,PT	Advance / Kappa / AE / G&M
		9	Equipment Mounting Accessories for DG set/ Transformer	As per Equipment Manufacturer's Practice
		10	MCB , RCCB	Legrand (DX3) / L&T(Exora) / Siemens (Betagard) /Schneider (Acti-9)/ Havells
		11	MCCB	Siemens(3VA) Schneider NSX / L&T (D-Sine) / Legrand (DPX3)
		12	MCB DB	Legrand (Ekinox) / Hager / Siemens (Betagard) /Schneider (Acti-9)
		13	MV Electrical Panels	Tricolite / Advance Power Control Ltd. /Neptune/Precision System Control/Technoman Engineering Solutions

6	Electrical Fittings	14	Bus Bar aluminium	Hindalco / Nalco
		1	Ceiling fan / Exhaust fan / kitchen fresh air/ wall fan	Havells / Crompton/ Khaitan/Usha
		2	Exit Sign	Legrand/ Wipro/ Life guard
		3	LED Indoor Luminaires	Philips/ Trilux/ Regent/ Lighting technology
		4	LED Decorative light Luminaires	Philips/ Trilux/ Regent/ Lighting technology
		5	LED Street Light/ Outdoor Fittings	Philips/ Trilux/ Regent/ Lighting technology
		6	Octagonal GI Pole	Bajaj / Volmount /Transrail/ Hilite
7	Land scape bollards etc.	Philips/ Trilux/ Regent/ Lighting technology/ Hilite		

		8	Plastic IP 67 Junction Box with connector	Hensel / Cape Spelsberg/ OBO Bettermann
		9	Sensors for Light control	Philips /ABB /Honey Well / Schneider/ Siemens
		10	MS decorative Pole	Hilite/ Havells / Twinkle /Surya
7	EPABX	1	IP-PBX system / IP Phone	Cisco/ Polycom/ Mytel/ Avaya
		2	Server	Dell / HP/ IBM / Lenovo
		3	Rack	Panduit/ APW/ IBM/ HP
		4	Cat 6 A UTP Cable/UTP patch cord/CAT 6A/I/O/Jack panel/LIU/Face plate /Fiber cables	Belden / Panduit / Molex Note- All accessories shall be of same make
		5	Wi- Fi System	Cisco/ Juniper/ Arista / Netgear
8	Fire Alarm System	1	Addressable Fire Alarm Control Panel	Edwards / Notifier / Siemens/ TYCO
		2	Addressable Detectors, Graphic User Interface Software, Sounder Control Module /Monitoring Module, Response Indicators, Manual Call Boxes, Input /Output devices	Edwards / Notifier/ Siemens/TYCO
		3	Manual Fire Alarm	Agni, ASES Security, Siemens, Notifier
		4	Manual call point, hooter	Agni, ASES Security, Siemens, Notifier
		1	2-way/4-wayFBC,Air Release Valve, Double/single Headed Landing valve	Safex/ NewAge/ Life gaurd
		2	Diesel Engine (Fire-fighting)	Cummins/ Kirloskar/ Ashok Leyland/ Greaves / Cater Piller
		3	Diesel Engine Alternator	Siemens/ Kirloskar/ ABB/ Crompton
		4	Fire Extinguishers	Safex/ Ceasefire/ Minimax/ Life Guard

Fire Fighting system	5	Fire Hose	CRC/ NewAge / Minimax/ Lifeguard/Safex/
	6	Fire man Axe	CRC/ NewAge/ Minimax/ Lifeguard/ Safex
	7	First Aid Hose Reel and Drum	Firex /Lifeguard/ Safex/ Eversafe/ Newage
	8	Flexible Couplings	Life guard/ Victaulic/ Tyco/ Gridnell/ Rapid Drop
	9	Flexible Drop	Life guard/ Victaulic/ Tyco/ Gridnell/ Rapid Drop
	10	Hose Box (External) Stainless Steel	Manufacturers of Panels
	11	Installation Control Valve/ Deluge Valve	Safex/ Tyco/ HD/ Victaulic/ Lifeguard
	12	Sprinkler Heads	Tyco/HD/ Victaulic/Rapid Drop/ Life guard/ Vikng
	13	Sprinkler Panel, Curtain system Panel	Tyco/ Honeywell/ HD/ Victaulic/ Notifire
	14	Stainless Steel Brach Pipe	Safex/ Life guard / New wage
	15	Fire water Jockey/ Main pump set– Hydrant system, Sprinkler system, Water curtain system	Armstrong/ Grundfoss/ Kirloskar/ Wilo/ Mather Platt/ Xylem
	16	Electrical Motor	ABB, Bharat Bijlee/ Kirloskar Electric Co./ Siemens India Ltd/ Crompton Greaves Ltd
	17	Thermal insulation for exhaust pipe	UPTwiga/ Lloyd Insulation/ Owens Corning/ Kimmco
	18	M.S. Pipes	SAIL/ Tata/ Jindal Hissar
	19	M.S. Fittings	UNCO/ UNIK/ NEW/ HB/ Bharat Forge
	20	Anchor Fastener, Clamps, Pipe hangers support	Hilti/ Fisher/ Easyflex/ Hitech/ Diamond
	21	Welding Rods	Advani/ L&T/ ESAB/ Marglam
	22	Structural steel	Tata/ SAIL/ Jindal Hissar APL-Apollo

23	Sluice Valves	SANT/ Advance/ Audco/ Zoloto
24	Butterfly (manual, gear operated) Valves	Audco/ Advance/ Zoloto/ Sant/ Honeywell/ Kirloskar
25	Non Return Valves	Audco/ Advance/ Zoloto/ Sant/ Honeywell/ Kirloskar
26	Tamper switch for Butterfly Valve	Honeywell/ Potter/ Rapid Control/ System Sensor/ Pacific Fire
27	Ball Valves	Zoloto/ Sant/ Hawa/ Honeywell/ Castle
28	Globe Valve	Zoloto/ Sant/ Hawa/ Honeywell/ Castle

		29	Foot valve with strainer	Kirloskar/ Normex/ Castle/ Audco
		30	Air Release Valve	C Sant/ Leader/ Zoloto/ Castle/ Life guard
		31	Y-type Strainer	Zoloto/ Honeywell/ Emerald/ Sant/ Kartar/ Castle
		32	Air vessel	Nema/ Zenith/ As per CPWD specifications tested upto 25kg/sqrmtr /Life guard
		33	Pressure Release Valve	Newage (Mumbai)/ Cla-Val/ Tyco/ Viking/ H-Guru
		34	Pressure Switch	Danfoss/ Indfos/ Viking/ Delta Control
		35	Pressure Gauge	Feibig/ H. Guru/ Emerald/ Waaree
		36	Flow Test Meter	Viking/ Newage (Mumbai)/ Global Vision/ Eureka Forbes/ Fabri-Tek Equipments Pvt Ltd./ Gerand
		37	Hydrant Valve, Branch pipe with nozzle	Safex/ Minimax/ Eversafe/ AAAG / Life guard
		38	Hose Coupling	Safex/ Minimax/ Eversafe/ AAAG / Life guard
		39	Fire brigade connection	Newage (Mumbai)/ Eversafe/ Shah Bhogilal/ Newage (Surendranagar)/ Gtech/ safeguard
		40	Alarm Control Valve, Installation Control Valve	Tyco/ HD/ Newage (Mumbai)/ Newage (Surendranagar)/ Viking
		41	Zone Control Valve (ZCV)	Tyco/ Viking/ HD Fire/ Reliable
		42	Sprinkler flexible pipe (UL listed only)	HD Fire/ Tyco/ Safex/ Newage (Mumbai)/ Safex/ Minimax/ Eversafe/ AAAG / Life guard (Surendranagar)
		45	Sprinkler annunciation panel	Minilec/ Alan/ PCD Linovate Global/ Agni Fire/ ASES Security
		46	Power cables	As per make list of Electrical Installations
		47	Control cables -armoured, unarmoured, FRLS	As per make list of Electrical Installations

		49	Water flow switch	Honeywell /Johnson Controls / Siemens / System Sensor/ Plotter
		50	Paint, Primer	Asian Paint/ Nerolac / Berger,
		51	Anti-Vibrating Mounting pads, Expansion Joints	Dulop/ Resistoflex/ Easyflex/ Flexionics/ Vimpa
		53	Circuit integrity cables for fire alarm, voice evacuation, suppression, hssd;	Caliplast/ KEI/ Beldon
		54	Fire Fighting Panel	As Per Electrical Panel Make
		55	Local Starter Panel	As Per Electrical Panel Make
		56	Lugs & Glands	Comet, Dowell
		57	Anti Vibration Mounting	Dunlop/ Resistoflex/ Ewren
		58	Sealing Compound	HILTI/3M/ M-SEAL
9	HVAC	1	VRV/VRF System including Indoor units	Daikin/ Hitachi/ Mitusbishi/ O-General/ Toshiba
		2	Split Type AC	Daikin/ Hitachi/ Mitusbishi/ O-General/ Toshiba
		3	Refrigerant Piping	Mandev / Maxflow /RR SHRAMIK
		4	Closed cell Nitrile rubber insulation/ EPDM insulation	Armaflex /Aerocell / ALP
		5	PPR Pipe	Jindal / Astral /Fusion

		6	Centrifugal/ Axial/ Vane Axial/ In-line fans and their motors	Kruger / Greenheck/ Nicotra /with motor from their approved OEM
		7	Vibration isolator /Rubbed pad/Duct support Arrangement	Dunlop/ Resistoflex/ Gerb
		8	G.I. Sheet for Ducting etc	TATA/ SAIL / Jindal
		9	Grill/ Diffuser/ Fire Dampers/ Louvers/ Volume Control Damper	System Air/ Carryaire/ Cosmos/ Trox / Greenheck
		10	Flexible Grooved fittings/ Couplings	Victaulic/ Tycogrinnel/ Viking
		11	Pre Fabricated Duct & duct flange (With GI sheets of makes)	Zeco/ Rollastar/ Ductofab
		12	Variable Frequency Drive	Allen Bradley / Danfoss / ABB / Honeywell / Siemens / L&T
		13	Aluminum tape	Johnson/ Birla-3M/ Nippon industries
		14	FLRS Cables	As per Electrical section make list
		15	DX units and VRF	Daikin/ Hitachi/ Tohsiba/ Mitsubishi Electric
		16	Dry Scrubber	Trion/ RYD Air/ Humidin/ ESPAIR
		17	EC Fan	ziehl-abegg/ Rosenberg/ Ebm-papst
		18	Expansion Bellows/ Pipe Supports/ Vibration Isolators/ Duct Flexile Connections	Resistoflex/ Kanwal (Easiflex/ Cori/ Flexionics
		19	Fan coil Units	Edgetech/ JCI/ Diakin/ Trane/ Citizen/ Zeco/ Carrier
		20	Filters (Pre, Fine, Hepa)	Dyna Filters/ American Air Filter/ Camfil/ Thermodyne

		21	Flexible Duct	Twiga/ RuskinTitus/ Atco/ Kimmco/ Sevenstar
		22	Flow switch	Rapidcool/ Siemens/ Anergy/ Honeywell/ Danfoss
		23	FRP Material	Reichhold/ Equivalent
		24	Fibre glass insulation	Owens corning/ U. P. Twiga
		25	Fire Paint	Flamebar/ AMEETUFF/ 3M/ promat/ JAY / CO-ISCHEM
		26	GSS Factory Fabncated Ducts/ Duct Flanges	Rolastar/ Zeco/ Ductofab/ Waves
		27	Inline Fans	Systemairl Kruger/ Greenheck/ Humidin/ NicotraAir Flow / Wolter/Caryaire
		28	M.S. Pipes	(i)SAIL/ Tata/ Jindal(HISSAR) (below 350 mm dia) (ii) SAIL/ Tata/MSL(above 350 mm dia)
		29	M.S. Sheets	SAIL/ Tata/ Jindal
		30	Motorized Actuator ForValves& Damper	Belimo/ Honeywell/ Siemens/ Johnson Controls
		31	Induction Motors	ABB/ Siemens/ CGL/ Bharat Bijlee//Marathon/Havells
10	Lifts	1	Lift	Kone/ Mitsubishi/ Schindler/ Otis Elevator/ Thyssenkrupp
11	PUMPS	1	Water supply, STP ,Drainage, Submersible	Kirlosakar / Beacon/ KSB/ Grundfoss/ Wilo/ Xylem/ Armstrong
12		1	Network Switch /Media Convertor	Netgear/ Juniper/ Cisco/ Extreme/ Arista
		2	Port Managed PoE Ethernet switch	Cisco/ Juniper/ Netgear/ Extreme/ Arista
		1	Material for Structure	Tata/Jindal /Sail
		2	Power Conditioning Unit (PCU)	SMA(Germany)/Delta/Schneider Electric/ABB

13	Solar Power	3	Solar Pv Panel	Tata solar/ BHEL/ Waaree Energy		
		4	Inverter Panels for Solar Power System	Tricolite / Advance Power Control Ltd. / /Neptune		
		5	Solar Module	Tata solar/ BHEL/ Adani/ Waaree		
		6	Solar inverters	Delta/ SMA/ ABB/ Schneider		
		7	Data logger	Compatible to inverter		
		8	Industrial PC for data monitoring	HP/ Dell/ Lenovo/ IBM		
		9	ACDB	Tricolite / Advance Power Control Ltd. / Neptune		
		10	MCB	Schneider / Legrand / Siemens L&T / Hager/ Havells		
		11	MCCB	Schneider NSX / Siemens (3VA)/ L&T (D-Sine), Legrand (DPX3) , Hager		
		12	DCDB	Hensel / Honey well/ VNT / Sun garner		
		13	DC cable (modules to inverter)	Polycab/ Anchor/ KEI/ Havells		
		14	AC cable (inverter to MCCB)	Polycab/ Anchor/ KEI/ Havells		
		15	Module mounting structure (MMS) As per MNRE standards / specifications- Hot Dip GI 2-3mm thick	TATA / Jindal		
		16	MMS – Accessories SS (304 grade or above)	TATA / Jindal		
		14	STP	1	Air Blower	Everest / Beta / Akash /Ingersole
				2	Air Diffusers	Rehau / Welbrick / MM Aqua
3	Raw Sewerage Transfer Pump/ Sludge Recycle Pump/ Filter Feed Pump/ Non Clog Horizontal Centrifugal Pump/De watering pump			Armstrong/ Xylem/ Grundfos/ Kirloskar / Wilo		
4	Automatic Sprinkler System/ DRIP IRRIGATION SYSTEM/Sprinklers/ Pop Up Sprinklers			Jain Irrigation/ Aqua Irrigation/ Finolex/ KISAN		
5	Screw Pump			Roto / Technoflow / Rotomac		
6	Dosing Pump			Asia / LMI / Mini Dose / Minimax		
7	Filter Press			SachinFiltech / Pharmatech		

	8	Tube settler Media /MBBR Media	Welbrick / Pharmatech / MM Aqua
	9	M.S. Filter	Welbrick / Ion Exchange / Astha / Thermax
	10	Ozonator	Creative/ Ozonics/ Orapl
	11	Non Clogg Horizontal Screw Type Filter Press Pump	Roto/ Positive/ Rotamac/ Tushaco
	12	Centrifuge	Apollo / Welbrick / GWSPL / Pharmatech
	13	Pressure Gauge	H Guru / Feibig / Gluck
	14	Butterfly / Dual Plate Check Valves	Zoloto / Advance / Castle / Sant
	15	Pipe & Fitting UPVC	Astral / Supreme / Finolux
	16	GI / MS pipes	Jindal / Prakash Surya / Tata

Note:

1. The contractor shall submit samples & technical submittals of all material before procurement for approval & shall procure after approval directly from manufacturer and the Authorized dealers only.
2. Material not specified in attached list of acceptable makes shall be got approved from Engineer-in-charge & consultant before use on work. Decision of Engineer-in-charge & Consultant shall be final in this respect.
3. Either the model shall be got approved or Sample shall be submitted for approval by Engineer in Charge before confirming order to supplier.
4. Contractor shall normally not use more than two (except for Equipments: Lifts, DG Set, Transformer, HVAC Equipments, UPS, where only One make is allowed) out of the above preferred makes.
5. For any item not covered in the above list, the contractor shall get the samples and make approved from the Engineer-in-charge before the supply is made.
6. All items shall conform to e-waste management and handling rules 2011 issued by Min. of Environment and Forest, Government of India or ROHS (restrictions on use of Hazardous substances)/WEEE compliant as per EU norms or American norms. Certificate shall be submitted wherever applicable.
7. The material shall not be older by more than Six months from date of supply at site.
8. Proof of dispatch from factory/dealer shall always be submitted to Engineer-in-charge for verification.

SCHEDULE OF QUANTITY FOR ELECTRICAL WORK

SCHEDULE OF QUANTITY (E&M WORK)

Name of work: Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.

S.N O	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	SUB HEAD -1 (Wiring)				
1	Wiring for light point/ fan point/ exhaust fan point/ call bell points with 1.5 sq.mm FRLS 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 PVC insulated copper conductor single core cable etc. as required.				
a	Group C	Point	940	1960.00	1842400.00
2	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required.				
a	Group C	Point	695	1135.00	788825.00
3	Wiring for twin control light point with 1.5 sq.mm FRLS 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 PVC insulated copper conductor single core cable etc. as required.	Point	85	2104.00	178840.00
4	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 amps modular socket outlet and 5/6 amps modular switch, connection etc. as required.	Point	345	537.00	185265.00
5	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 2 Nos. 3 pin 5/6 A modular socket outlet and 2 Nos. 5/ 6 A modular switch, connections etc. as required.	Point	145	752.00	109040.00
6	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 amps modular socket outlet and 15/16 amps modular switch, connection etc. as required.	Point	159	652.00	103668.00

7	Supplying & fixing suitable size GI box with modular plate and cover in front on surface or in recess including providing and fixing 25 A modular socket outlet and 25 A modular SP MCB, "C" curve including connections, painting etc. as required.	Point	45	803.00	36135.00
8	Wiring for light/ power plug with 2X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit alongwith 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	Mtr	2250	420.00	945000.00
9	Wiring for light/ power plug with 4X4 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed steel conduit alongwith 2 Nos. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	Mtr	5850	608.00	3556800.00
10	Supplying and fixing call bell/ buzzer suitable for single phase, 230 V, complete as required.	Each	29	111.00	3219.00
11	Wiring for circuit/ submain wiring alongwith earth wire with the following sizes of FRLS 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	Metre	9500	339.00	3220500.00
b	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	Metre	500	375.00	187500.00
c	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	Mtr.	500	415.00	207500.00
d	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	Mtr.	360	569.00	204840.00
e	2 X 10sq. mm + 1 X 10 sq. mm earth wire	Mtr.	75	670.00	50250.00
f	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	Mtr.	300	844.00	253200.00
g	4 X 10 sq. mm + 2 X 10 sq. mm earth wire	Mtr.	250	1048.00	262000.00
h	4 X 16 sq. mm + 2 X 16 sq. mm earth wire	Mtr.	300	1483.00	444900.00
12	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	6 x 1.5 sq. mm	Metre	2500	142.00	355000.00
b	9 x 1.5 sq. mm	Metre	1250	231.00	288750.00
13	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
a	20mm dia	RM	500	250.00	125000.00
b	25mm dia	RM	1550	286.00	443300.00
c	32 mm dia	RM	1750	360.00	630000.00
14	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 (75mmX75mm)	Each	45	344.00	15480.00
15	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a	TV antenna socket outlet(i/c Crimping)	Each	45	165.00	7425.00
16	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.	RM	950	35.00	33250.00
	SUB HEAD 2 : (MCBs & MCB DBs)				
	<i>DISTRIBUTION BOARD</i>				
1	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	Each	28	2188.00	61264.00
b	12 way, Double door	Each	4	2514.00	10056.00
c	16 way, Double door	Each	3	2714.00	8142.00
2	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	Each	4	3226.00	12904.00
b	6 way (4 + 18), Double door	Each	16	3868.00	61888.00
c	8 way (4 + 24), Double door	Each	21	4661.00	97881.00
3	Supplying and fixing of following ways surface/ recess mounting, vertical type, 415 V, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs (but without MCBs and incomer) as required . (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)				
a	8 way (4 + 24), Double door	Each	3	10873.00	32619.00

4	upplying 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	6/32 A SP MCB 'C' series	Each	1145	254.00	290830.00
b	6/32 A DP MCB 'C' series	Each	4	573.00	2292.00
c	40 A DP	Each	4	854.00	3416.00
d	63A DP	Each	2	961.00	1922.00
5	Supplying and fixing following rating, four pole, 415 V, MCB in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	40 A TP	Each	24	1306.00	31344.00
b	40 A TPN	Each	20	1603.00	32060.00
c	63A TPN	Each	24	1676.00	40224.00
6	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	25A	Each	33	1867.00	61611.00
b	40A	Each	61	1882.00	114802.00
c	63A	Each	72	2547.00	183384.00
7	Supplying and fixing 30 A, 415 V, TPN Industrial type socket outlet, with 4 pole and earth, metal enclosed plug top alongwith 30 A "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	Each	4	4247.00	16988.00
8	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, etc. as required.				
a	100 A, 30 KA, 4P MCCB	Each	4	8248.00	32992.00
	SUB Head 3: (LIGHTING FIXTURES AND FAN)				
1	Supply, Installation, Testing and Commissioning of surface mounting LED Batten having minimum 2000 lumens output with system efficacy of 100 Lm/Watt or better, Aluminium/ CRCA housing prismatic/ PMMA difuser, SDCM ≤ 5, PF≥0.95, CRI>80, THD≤10%, Service life of 50,000 hrs @ L70, , 5700/6500K CCT with inbuilt	Each	50	1479.00	73950.00

	Driver, i/c connections etc complete as required at site. (With 5 Years warranty)				
2	Supply, Installation, Testing and Commissioning of Of Round surface recessed Type Downlighter having Aluminium/CRCA and PC diffuser with min. 1800 lumens output, Efficacy not less than 100 lm/watt, THD<10%, PF>0.95 , CRI>=80, 5700/6500K CCT and Min. service life of 50000 Hrs @ L70B50 complete etc as required at site.(With 5 Year Warranty.)	Each	802	2007.00	1609614.00
3	Supply, Installation, Testing and Commissioning of Round Surface /recessed Type Downlighter having Aluminium/CRCA and PC diffuser with min. 1200 lumens output, Efficacy not less than 100 lm/watt, THD<10%, PF>0.95 , CRI>=80, 5700/6500K CCT and Min. service life of 50000 Hrs @ L70B50 complete etc as required at site.(With 5 Year Warranty.)	Each	254	1726.00	438404.00
4	Supply, Installation, Testing and Commissioning of Round Surface Type LED Downlighter made of Aluminium die cast housing, prismatic/ PMMA difuser, SDCM ≤ 5 having min. 1500 lumens output with system efficacy of 100 Lm/Watt or better , PF≥0.95, CRI>80, THD≤10%, Service life of 50,000 hrs @ L70, 5700/6500K CCT with inbuilt Driver i/c connections etc complete as required at site. (With 5 Years warranty)	Each	130	1479.00	192270.00
5	Supply, Installation, Testing and Commissioning of Of recessed Type flat panel luminaire (2'X2') having Aluminium/CRCA and PC diffuser with min. 3600 lumens output, Efficacy not less than 100 lm/watt, THD<10%, PF>0.95 , CRI>=80, 5700/6500K CCT and Min. service life of 50000 Hrs @ L70B50 complete etc as required at site.(With 5 Year Warranty.)	Each	194	5529.00	1072626.00
6	Supply, Installation, Testing and Commissioning of 5M Flexxible LED strip complete with Electronic Driver , fixing arrangements and connections, earthing complete with all hardware, clamps, etc as per specification & as per architects approved colour temperature complete etc as required at site.(With 5 Year Warranty.)	Each	235	1655.00	388925.00
7	Supply, Installation, Testing and Commissioning of surface mounting LED Batten Mirror light having minimum 1000 lumens output with system efficacy of 100 Lm/Watt or better, Aluminium/ CRCA housing prismatic/ PMMA difuser, SDCM ≤ 5, PF≥0.95, CRI>80, THD≤10%, Service life	Each	109	648.00	70632.00

	of 50,000 hrs @ L70, , 5700/6500K CCT with inbuilt Driver, i/c connections etc complete as required at site. (With 5 Years warranty)				
8	Supply, Installation, Testing and Commissioning of bulkhead luminaire having minimum 1000 lumens output with system efficacy of 100 Lm/Watt or better, Aluminium/ CRCA housing prismatic/ PMMA difuser, SDCM ≤ 5, PF≥0.95, CRI>80, THD≤10%, Service life of 50,000 hrs @ L70, , 5700/6500K CCT with inbuilt Driver, i/c connections etc complete as required at site. (With 5 Years warranty)	Each	24.00	1374.00	32976.00
9	Supply, Installation, Testing and Commissioning of 80 W LED 6000K Environmental friendly, exclusive and specially designed heat sink for long life, vertical highbay/mediumbay LED luminaire. having minimum 8000 lumens output with system efficacy of 100 Lm/Watt or better, Aluminium/ CRCA housing prismatic/ PMMA difuser, SDCM ≤ 5, PF≥0.95, CRI>80, THD≤10%, Service life of 50,000 hrs @ L70, , 5700/6500K CCT with inbuilt Driver, i/c connections etc complete as required at site. (With 5 Years warranty)	Each	6	7994.00	47964.00
10	Supply, Installation, Testing and Commissioning of 20 watt LED type industrial light Energy saving, environmental friendly, long life, corrosion resistant, impact proof, surface mounting IP66 luminaire with PC housing & opal finish cover suitable for wet location. LEDs used as light source. having minimum 2000 lumens output with system efficacy of 100 Lm/Watt or better, Aluminium/ CRCA housing prismatic/ PMMA difuser, SDCM ≤ 5, PF≥0.95, CRI>80, THD≤10%, Service life of 50,000 hrs @ L70, , 5700/6500K CCT with inbuilt Driver, i/c connections etc complete as required at site. (With 5 Years warranty)	Each	37	1479.00	54723.00
11	Supplying, installation, testing and commissioning of Microwave technology based occupancy sensor having high performance, non regulating programmable type, suitable for connected load upto 10Amp , for mounting height up to 2.6 mtr and for 5m X 20m coverage area along with necessary fixing arrangements i/c programming at site etc. complete as required.	Each	39	7627.00	297453.00

12	Supply, Installation, Testing and Commissioning of 1200 mm sweep, BEE 5 star rated, ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, Power Factor not less than 0.9, Service Value (CM/M/W) minimum 6.00, Air delivery minimum 210 Cum/Min , 350 RPM (tolerance as per IS : 374-2019), THD less than 10%, remote or electronic regulator unit 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 Supply, earthing etc. complete as required.	Each	50	2923.00	146150.00
	<u>SUB HEAD 4 : SUBSTATION EQUIPMENTS (HT PANEL BOARD, TRANSFORMER & H.T. CABLE)</u>				
	11 KV HT Panel (3-switch HT Panel)				
1	Supplying/Receiving, Installation, testing and commissioning of HT Three panel board suitable for indoor installation for use on 11 KV, 50 C/S earthed system at 11 KV comprising VCB circuit breaker Panel shall be equipped with following accessories and as per specifications and schematic drawing. (Note; In case of VCB breaker Power pack of 200% of peak Trip current requirement shall be provided with each breaker)current requirement shall be provided with each breaker)				
	INCOMING PANELS - 1 Nos. & EACH SHALL COMPRISING OF:				
	1No. -Metal Clad housing with having 630A VCB breaker with Manual & Electric operated mechanism (spring charged motor - 230V AC)				
	1Set- Tripping coil & closing Coil 24V DC				
	1 - Set of isolating plug and receptacle				
	1 - Set of Automatic safety shutter				
	1- Set of breaker control switch (TNC)				
	1 -Set of dual core CT's as follows:				
	Core I -50/5-5A class 5P-10 (15 VA)				
	Core II -50/5-5A class -1 (15 VA)				
	1set of 11KV $\sqrt{3}$ / 110/ $\sqrt{3}$ 3 Volt, 100 VA burden & accuracy class 1, 3 nos. single phase				

	construction, dry type cast resin PT				
	1 - No. Ammeter(50A) with selector switch (Built-in)				
	1 - KW, KVA, KWH ,PF, HZ & KVAH Meter				
	1 - Set of ON/OFF/Trip/ Spring Charged & Trip circuit healthy and phase indicating lamps.				
	1 No.-H.T. Cable joint box suitable for 1R - 3C x 120 sq.mm aluminium conductor XLPE cable, 11 KV (E)				
	1-set of IDMTL relay with 3 elements of O/C protection(50%-200%), instantaneous O/C protection (200%-800%) & 1 element of E/F protection (10%-40%).				
	1 no. U/V & O/V relay				
	1 no. Anti Pumping Relay				
	1 no. Trip Circuit supervision relay.				
	1 no. Negative phase sequence protection relay.				
	1 no. Master Trip relay.				
	1 no. 12 window Annunciation system for alarm & Trip status of relays, HT Breakers complete with acknowledgement & Reset Button.				
	Bus Bar : - 1 Set of 630 amps TP air insulated Cu. bus bar & chamber.				
	OUTGOING PANELS:				
	2 Nos. & EACH SHALL COMPRISING OF:				
	1 -Metal clad housing with having 630A VCB circuit breaker Manual & Electric operated mechanism (spring charged motor 230VAC)				
	1 - Tripping coil & closing Coil 24V DC				
	1 - Set of isolating plug and receptacle				
	1 - Set of Automatic safety shutter				
	1- Set of breaker control switch (TNC)				
	1 -Set of dual core CT's with Ammeter as given below for outgoing feeders respectively:				
	Core I - 50 /5-5A class 5P-10 (15VA)				
	Core II - 50/5-5A class I (15VA)				
	1 - No. Ammeter(0-30A) with selector switch (Built-in)				
	1 - KW, KVA, KWH & KVAH Meter				
	1- Set ON/OFF, Trip & Trip ckt healthy indication lamp				
	1 No.-H.T. Cable joint box suitable for 1R - 3C x 120 sq.mm aluminium conductor XLPE cable,11 KV (E)				

	1-set of IDMTL relay with 3 element of O/C protection(50%-200%), Instantaneous Over Current protection(200%-800% and 1 element of E/F protection (10%-40%)				
	Restricted Earth Fault Relay with following rating PS class CT to be mounted on neutral of Transformers.(CT to be provided by HT panel Vendor)				
	For 630 KVA Trafo.-50/5A PS class - 2 nos.				
	1 - Aux. relay				
	1 - Trip circuit supervision relay				
	1 - no. Anti Pumping Relay				
	1 - Master Trip relay				
	Space Heater				
	Powerpack as Required 12/24 V Battery with charger				
	HT Panel as per specification & as described above	Set	1	1186563.00	1186563.00
	<u>TRANSFORMER</u>	-	-	-	
2	Supplying, installation, testing and commissioning of Cast Rasin Dry Type 630KVA 11kv/0.433 KV, 3 Phase, 50Hz, Dyn11 vector group,copper wound, class F insulation associated with winding temperature Indicator/controller actuated by means of resistance temperature detector embedded in LV windings, indoor type Transformer with approximately 5% impedance, tapping for ON load operation on HV side in steps of +5% to - 5%/-10% @ ±2.5% having cable end boxes on H.V.side and cable box on LV side brought out separately i/c supplying and laying of copper conductor multicore control cable from transformer to HT breaker for safety tripping, suitable mounted on M.S. channel i/c supplying grounding of suitable M.S. Channel with all accessories and confirming to IS 11171:1985 complete in all respects as required at site ((to be installed indoor).	SET	2	1626031.00	3252062
	<u>SUB HEAD 5 : MV and L.T. PANELS</u>	-	-	-	
1	<u>NORMAL LT PANEL</u>				

Design, Fabrication, Supply, Erection, Testing and commissioning of Powder coated in approved sheet Cubicle Type LT Panel fabricated in compartmentalized design out of 2.0mm CRCA sheet steel, free standing floor mounted, dust and vermin proof, with reinforcement of suitable size angle iron, channel, T-iron or flats as required. Cable gland plates shall be provided on top as well as bottom of the panels. Panels shall be treated with all anti-corrosive 9 Tank process before painting as per specification. having suitable amp capacity extensible type TPN aluminium alloy bus bars of high conductivity, DMC/SMC bus bar supports, with short circuit withstand capacity of 31 MVA for 1 Sec. Panels shall be suitable for 415V, 3-Phase, Four wire, 50 Hz supply complete with earth bus and lifting hooks as required in case of large panels. control wiring with 2.5 sq. mm. FRLS PVC insulated copper conductor with IP 54 Protection Approval shall be taken for each panel before fabrication. (All hardware like nuts and bolts used shall be Galvanized and Zinc passivated) As per Specification.				
NORMAL LT PANEL				
INCOMER FROM TRANSFORMERS(2Nos. 630 KVA Each)				
Incomer from each transformer shall be provided with the following:				
2 nos. 1000 A FP EDO ACB 50 KA having microprocessor based programmable & variable trip setting for releases with integral protection for the following:				
2 nos IDMTL Protection for S/C, O/C & E/f releases.				
2 nos U/V & O/V protection				
2 nos The ACB shall be complete with 3nos. 1000A/5A, 15VA, 5P10 CTs for protection.				
METERING & INDICATION				
2 set of phase indicating lamps				
2 set of Voltmeter (0-500V) with VSS with 3 nos. 2A SP MCBs each				
2 Nos. Load Analyser cum digital Multifunction Meter with 3 nos. 1000/5A, CL-1 CTs, as required.				
2 Set of Breaker ON-OFF-TRIP, Spring charged indication Lamps				
2 no. of 1000/5A, 15 VA, class-1 CTs for APFC relay sense				

	2 No. 400V AC/12V DC, 100VA SMPS (Rectifiers) with TP MCB of suitable rating & 2nos 6way terminal strip .				
	BUS BAR:-				
	4 strip aluminium bus bars of 1500 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 2 Set				
	BUS COUPLER:-				
	1 nos. 1000 A FP EDO ACB 50KA having microprocessor based programmable & variable trip setting for releases.				
	1 Set of Breaker ON-OFF indication Lamps with each Bus Coupler				
	INTERLOCKING.				
	Incomers from Transformer shall be electrically & mechanically interlocked.				
	OUTGOINGS				
	2 Nos 630 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	4 Nos.400 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	3 Nos.250 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	4 Nos. 160 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	3 Nos.100 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	4 Nos.63 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.	Set	1.00	1116424.00	1116424.00
2	ESSENSIAL LT PANEL				

Design, Fabrication, Supply, Erection, Testing and commissioning of Powder coated in approved sheet Cubicle Type LT Panel fabricated in compartmentalized design out of 2.0mm CRCA sheet steel, free standing floor mounted, dust and vermin proof, with reinforcement of suitable size angle iron, channel, T-iron or flats as required. Cable gland plates shall be provided on top as well as bottom of the panels. Panels shall be treated with all anti-corrosive 9 Tank process before painting as per specification. having suitable amp capacity extensible type TPN aluminium alloy bus bars of high conductivity, DMC/SMC bus bar supports, with short circuit withstand capacity of 31 MVA for 1 Sec. Panels shall be suitable for 415V, 3-Phase, Four wire, 50 Hz supply complete with earth bus and lifting hooks as required in case of large panels. control wiring with 2.5 sq. mm. FRLS PVC insulated copper conductor with IP 54 Protection Approval shall be taken for each panel before fabrication. (All hardwares like nuts and bolts used shall be Galvanized and Zinc passivated) As per Specification.				
Incoming				
1 Nos. 630A FP ATS WITH CONTROLLER				
1 NO 630 A FP MCCB 50 KA microprocessor release along with rotary handle : 1 No.				
Protection Instrument				
1 Nos. Load Analyser cum digital Multifunction Meter with 3 nos. 600/5A, CL-1 CTs, as required				
One (1) Set of Phase Indication & ON/OFF Lamp with 2A MCB.				
Busbar				
4 strip aluminium bus bars of 800 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				
OUTGOING				
2 Nos. 400 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
2 Nos. 250 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				

	4 Nos.160 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	7 Nos.100 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	3 Nos.63 Amps FP MCCB 36 KA microprocessor release along with rotary handle : 1 No. With ON-OFF LED indication Lamps.				
	6Nos.40 Amps FP MCB	Set	1	478581.00	478581.00
3	CAPACITOR PANEL 160 KVAR				
	Supplying , Installation , testing , & commissioning of factory built floor mounted auto-manual capacitor bank of total capacity of 160 KVAR having 3 phase MPP heavy duty type with ISI marked / conforming to IEC power capacitor & suitable steps APFC relay having capacitor of sizes (15+10+10+25+25+25+25+25) including 1 No 10 KVAR as static provided with Thyristor Electronic switching of suitable rating to suppress switching of inrush current to improve capacitor life.				
	The system shall have micro processor based APFC relay provided in the command module for target P. F setting with digital P. F. display. The Controller consists: all three powers, .i. e KVA, KW and KVAR phase wise .				
	The system shall be provided with required capacity master MCCB having protection for over load, short circuit, etc.The panel shall be made of 2mm thick CRCA Sheet including Suitable size of 4- strip aluminum bus bar powder coated painting provided with exhaust fans (with thermostat) and grills for proper ventilation, interconnections with suitable size conductor cables & lugs and accommodating the following switchgears & accessories:				
	INCOMER				
	400 A FP MCCB 50 KA microprocessor release along with rotary handle : 1 No.				
	Metering & Indication				
	1 set of phase indicating lamps				
	1 No. (0-500V) Digital Voltmeter with Built-in VSS with 3 nos. 6A SP MCB				
	1No. (0-400A) Digital Ammeter with ASS and 3 nos. 400/5A, CL 0.5,10VA CTs'				

	1 No. 8 step Dule Sence APFCR relay				
	1 No. Selector switch for auto-off-manual.				
	BUS-BAR				
	4 strip aluminium bus bars of 500 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				
	OUTGOINGS				
	5 Sets of 63 A TP+N MCCB 25 kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 70 A TP Power contactor (AC-3 duty)				
	3 Sets of 40 A TP+N MCCB 50kA With Thermal Magnetic Based Release (O/C,S/C) Protection with 40A TP Power contactor (AC-3 duty)				
	5 Nos. 25 KVAR capacitors MPP TYPE HEAVY DUTY				
	1 Nos. 15 KVAR capacitors MPP TYPE HEAVY DUTY				
	2 Nos. 10 KVAR capacitors MPP TYPE HEAVY DUTY				
	8 Sets self Illuminated Red-Green (ON-OFF) and push buttons.				
	Note- All MCCBs of 250A & above shall be Microprocessed release with O/L, S/C protection and below 250A shall be thermal magnetic relaease. All MCCB shall be with rotary handle and have Ics = 100 % Icu.	Sets	2	238206.00	476412.00
4	UMDB (UPS MAIN PANEL)				
	SITC of cubical type UPS Main Distribution Board made out of 2 mm thick sheet Steel , totally enclosed , IP54 protection , free standing / wall mounting dust and vermin proof , indoor type , copartmentalized, powder coated of approved shade after antirust treatment(with min. 7 tanks) suitable for operation on 3 phase and nutral 415V,, 50Hz, Ac supply system with Busbbar interconnection with suitable size of copper wire / solid Alluminium strips, control circuits, rotary operating handle for MCCBs & suitable spreader terminals for cable connections according to size, bottom base channel of MS section 50x50x5mm, fabrication shall be done in transportable section, entire panel shall have a common earth bus bar at rear with 2 nos. earth stud, cable alleys, cable gland plates in two half complete as required, as per Single Line Diagram.				

	Incoming				
	1 Nos. 100A FP ATS WITH BYPASS SWITCH				
	1 Nos. 100 Amps FP MCCB 25KA With thermal magenetic release for O/C,& S/C Protection.				
	Protection Istrument				
	1 set of R,Y,B phase indicating lamps				
	1 No. (0-500V) Voltmeter with Built-in VSS with 3 nos. 2A SP MCB				
	1 No. (0-100A) Ammeter with ASS with 3 nos. 100/5A CT's				
	Busbar				
	4 strip aluminium bus bars of 200 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				
	OUTGOING				
	2 Nos. 63 Amps DP MCB				
	4 Nos. 40 Amps DP MCB	Set	1	91878.00	91878.00
5	MDB VENTILATION				
	SITC of cubical type MDB VENTILATION Board made out of 2 mm thick sheet Steel , totally enclosed , IP54 protection , free standing / wall mounting dust and vermin proof , indoor type , copartmentalized, powder coated of approved shade after antirust treatment(with min. 7 tanks) suitable for operation on 3 phase and nutral 415V,, 50Hz, Ac supply system with Busbbar interconnection with suitable size of copper wire / solid Alluminium strips, control circuits, rotary operating handle for MCCBs & suitable spreader terminals for cable connections according to size, bottom base channel of MS section 50x50x5mm, fabrication shall be done in transportable section, entire panel shall have a common earth bus bar at rear with 2 nos. earth stud, cable alleys, cable gland plates in two half complete as required, as per Single Line Diagram.				
	Incoming				
	1 Nos. 160 Amps FP MCCB With thermal magenetic release for O/C,& S/C Protection.				
	Protection Istrument				
	1 set of R,Y,B phase indicating lamps				
	1 No. (0-500V) Voltmeter with Built-in VSS with 3 nos. 2A SP MCB				

	1 No. (0-160A) Ammeter with ASS with 3 nos. 160/5A CT's				
	Busbar				
	4 strip aluminium bus bars of 200 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				
	OUTGOING				
	5 Nos.63 Amps TP MCB				
	3 Nos.40 Amps TP MCB				
	4 Nos.32 Amps DP MCB	Set	1	69421.00	69421.00
6	NORMAL MDB -1 (GUEST HOUSE BLOCK)				
	SITC of cubical type NORMAL MDB -1 (GUEST HOUSE BLOCK) Board made out of 2 mm thick sheet Steel , totally enclosed , IP54 protection , free standing / wall mounting dust and vermin proof , indoor type , copartmentalized, powder coated of approved shade after antirust treatment(with min. 7 tanks) suitable for operation on 3 phase and nutral 415V., 50Hz, Ac supply system with Busbbar interconnection with suitable size of copper wire / solid Alluminium strips, control circuits, rotary operating handle for MCCBs & suitable spreader terminals for cable connections according to size, bottom base channel of MS section 50x50x5mm, fabrication shall be done in transportable section, entire panel shall have a common earth bus bar at rear with 2 nos. earth stud, cable alleys, cable gland plates in two half complete as required, as per Single Line Diagram.				
	Incoming				
	1 NO 250 A FP MCCB 50 KA microprocessor release along with rotary handle : 1 No.				
	Protection Istrument				
	1 Nos. Load Analyser cum digital Multifunction Meter with 3 nos. 250/5A, CL-1 CTs, as required				
	One (1) Set of Phase Indication & ON/OFF Lamp with 2A MCB.				
	Busbar				
	4 strip aluminium bus bars of 300 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				

	OUTGOING				
	18 3 Nos. 63 Amps FP MCB	Set	1	91468.00	91468.00
7	NORMAL MDB -2 (TRAINING CENTER)				
	SITC of cubical type NORMAL MDB -2 (TRAINING CENTER) Board made out of 2 mm thick sheet Steel , totally enclosed , IP54 protection , free standing / wall mounting dust and vermin proof , indoor type , copartmentalized, powder coated of approved shade after antirust treatment(with min. 7 tanks) suitable for operation on 3 phase and nutral 415V,, 50Hz, Ac supply system with Busbbar interconnection with suitable size of copper wire / solid Alluminium strips, control circuits, rotary operating handle for MCCBs & suitable spreader terminals for cable connections according to size, bottom base channel of MS section 50x50x5mm, fabrication shall be done in transportable section, entire panel shall have a common earth bus bar at rear with 2 nos. earth stud, cable alleys, cable gland plates in two half complete as required, as per Single Line Diagram.				
	Incoming				
	1 Nos. 160 Amps FP MCCB With thermal magenetic release for O/C,& S/C Protection.				
	Protection Istrument				
	1 Nos. Load Analyser cum digital Multifunction Meter with 3 nos. 160/5A, CL-1 CTs, as required				
	One (1) Set of Phase Indication & ON/OFF Lamp with 2A MCB.				
	Busbar				
	4 strip aluminium bus bars of 200 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				
	OUTGOING				
	11 3 Nos. 63 Amps FP MCB	Set	1	68088.00	68088.00
8	NORMAL MDB -3 (OFFICE BLOCK)				

SITC of cubical type NORMAL MDB -3 (OFFICE BLOCK) Board made out of 2 mm thick sheet Steel , totally enclosed , IP54 protection , free standing / wall mounting dust and vermin proof , indoor type , copartmentalized, powder coated of approved shade after antirust treatment(with min. 7 tanks) suitable for operation on 3 phase and nutral 415V,, 50Hz, Ac supply system with Busbbar interconnection with suitable size of copper wire / solid Alluminium strips, control circuits, rotary operating handle for MCCBs & suitable spreader terminals for cable connections according to size, bottom base channel of MS section 50x50x5mm, fabrication shall be done in transportable section, entire panel shall have a common earth bus bar at rear with 2 nos. earth stud, cable alleys, cable gland plates in two half complete as required, as per Single Line Diagram.				
Incoming				
1 Nos. 160 Amps FP MCCB With thermal magenetic release for O/C,& S/C Protection.				
Protection Istrument				
1 Nos. Load Analyser cum digital Multifunction Meter with 3 nos. 160/5A, CL-1 CTs, as required				
One (1) Set of Phase Indication & ON/OFF Lamp with 2A MCB.				
Busbar				
4 strip aluminium bus bars of 200 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				
OUTGOING				
11 Nos. 63 Amps FP MCB	Set	1	68088.00	68088.00
Notes :				
Note: The vendor shall submit GA drawing for approval to consultant/clint.				
Note- All MCCBs of 250A & above shall be Microprocessed release with O/L, S/C protection and below 250A shall be thermal magnetic relaese. All MCCB shall be with rotary handle and have Ics = 100 % Icu.				

9	Supplying, installation, including suspension, testing and commissioning of following capacity bus trunking with aluminium bus bars having current density of 130 A/ sq cm at nominal current rating in 1.6mm thick IP 42 sheet steel enclosure in convenient sections for use on, 3 phase, 4 wire, 415 V, 50 Hz, A.C. supply including jointing of sections, flexible joints, expansion joints, bends and earthing with 2 runs of galvanised iron strips, suspenders, angle iron bracket, steel fasteners, connecting to earthing system etc. as required.				
a	1000 A	RM	32	17620.00	563840.00
	HT Power Cable				
10	Supplying of one number Earthed armoured Aluminium conductor XLPE power cable of 11 KV grade conforming to IS:7098 (Part-II)1985 as amended up to date.				
a	3 x120 Sq.mm HT CABLE	RM	125	1528.00	191000.00
11	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/DWC pipe as required.				
a	Above 95 sq. mm and upto 185 sq. mm	RM	100	92.00	9200.00
12	Laying of one number PVC insulated and PVC sheathed XLPE power cable of 11 KV grade of following size in the existing masonry open duct as required.				
a	Above 95 sq. mm and upto 185 sq. mm	RM	25	76.00	1900.00
13	supplying 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 11 KV grade as required				
a	3 x120 Sq.mm	Each	6	3041.00	18246.00
14	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc..direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.				
a	160 mm dia (OD-160 mm & ID-135 mm nominal)	RM	125	535.00	66875.00
	LT CABLES & CABLE TRAY				
15	Supplying of following size Al. conductor XLPE insulated and PVC sheathed armoured power cable of 1.1 KV grade as required as per IS:7098 (Part-I)1988 as amended up to date				

a	3.5 Core 300Sqmm	Mtr	405	2176.00	881280.00
b	3.5 Core 185 Sqmm	Mtr	200	1387.00	277400.00
c	3.5 Core 150 Sqmm	Mtr	60	1097.00	65820.00
d	3.5 Core 95 Sqmm	Mtr	400	761.00	304400.00
e	3.5 Core 70 Sqmm	Mtr	65	608.00	39520.00
f	3.5 Core 35 Sqmm	Mtr	400	337.00	134800.00
g	4 Core 25 Sqmm	Mtr	530	130.00	68900.00
h	4 core 16 Sqmm	Mtr	835	235.00	196225.00
i	4 core 10 Sqmm	Mtr	1000	197.00	197000.00
16	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	3.5 Core 300Sqmm	NOS	6	1326.00	7956.00
b	3.5 Core 185 Sqmm	NOS	14	985.00	13790.00
c	3.5 Core 150 Sqmm	NOS	2	785.00	1570.00
d	3.5 Core 95 Sqmm	NOS	6	669.00	4014.00
e	3.5 Core 70 Sqmm	NOS	4	531.00	2124.00
f	3.5 Core 35 Sqmm	NOS	6	425.00	2550.00
g	4 Core 25 Sqmm	NOS	10	362.00	3620.00
h	4 core 16 Sqmm	NOS	16	356.00	5696.00
i	4 core 10 Sqmm	NOS	8	314.00	2512.00
17	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	RM	1000	44.00	44000.00
b	Above 35 sq. mm and upto 95 sq. mm	RM	400	68.00	27200.00
c	Above 95 sq. mm and upto 185 sq. mm	RM	50	92.00	4600.00
d	Above 185 sq. mm and upto 400 sq. mm	RM	400	162.00	64800.00
18	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
a	Upto 35 sq. mm (clamped with 1mm thick saddle)	RM	805	63.00	50715.00
b	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	RM	65	148.00	9620.00
c	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	RM	10	175.00	1750.00
d	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	RM	100	262.00	26200.00
19	Providing, laying and fixing following dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc. as required.				

a	100 mm dia	RM	50	754.00	37700.00
b	150 mm dia	RM	25	826.00	20650.00
c	300 mm dia	RM	25	1248.00	31200.00
20	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc.direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning				
a	63 mm dia (OD-63 mm & ID-51 mm nominal)	RM	1800	284.00	511200.00
b	90 mm dia (OD-90 mm & ID-76 mm nominal)	RM	465	331.00	153915.00
c	200 mm dia (OD-200 mm & ID-175 mm nominal)	RM	560	734.00	411040.00
	Perforated Cable Trays				
21	Supplying and installing following size of perforated pre-painted M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required.				
a	150 mm width X 50 mm depth X 1.6 mm thickness	Mtr	230	677.00	155710.00
b	300 mm width X 62.5 mm depth X 2.0 mm thickness	Mtr	100	1021.00	102100.00
c	450 mm width X 62.5 mm depth X 2.0 mm thickness	Mtr	10	1345.00	13450.00
	SUB Head-6 : Earthing System				
1	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.	Set	32	8288.00	265216.00
2	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.	RM	300	761.00	228300.00
3	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required	RM	550	280.00	154000.00
4	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	Set	6	15057.00	90342.00

	charcoal/ coke and salt as required.				
5	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.	RM	50	1660.00	83000.00
6	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	RM	200	1255.00	251000.00
7	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing along with existing surface/ recessed conduit/ submain wiring/ cable as required.	RM	500	49.00	24500.00
	SUB Head- 7 : LIGHTNING PROTECTION SYSTEM				
1	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required.	Each	6	593.00	3558.00
2	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or on surface of wall for lightning conductor complete as required. (For Horizontal run)	Metres	300	145.00	43500.00
3	Providing and fixing G.I. tape 20 mm X 3 mm thick on parapet or on surface of wall for lightning conductor complete as required. (For vertical run)	Metres	150	230.00	34500.00
3	Jointing copper / G.I. tape (with another copper/ G I tape, base of the finial or any other metallic object) by riveting / nut bolting/ sweating and soldering etc as required.	Each	113	133.00	15029.00
4	Providing and fixing testing joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.	Each	4	137.00	548.00
5	Providing and laying G.I. tape 32 mm X 6 mm from earth electrode directly in ground as required.	Metres	300	218.00	65400.00
	SUB Head-8 : EXTERNAL LIGHTING WORK				
1	FEEDER PILLAR-1				

	Design, manufacture,Supply, installation, testing & commissioning at works of Double door panel fabricated with minimum 2mm thick MS sheet, , tapered drip proof top, having 600 mm long 50 mm X 50 mm X 6 mm angle iron legs, Conform to IS Specification, with IP-56 enclosure protection, as per IS-2137(Revised), floor mounting free standing on a suitable massanory pedestal outdoor type panel,provided with hinged detachable and lockable outer opening doors with the following incoming/outgong MCCB/ MCBs mounted therein including making connections/ interconnections, earthing, painting etc. as required.The panel shall have canopy arrangement on the top.All MCB to be C curve .				
	(Note : The fault withstanding capacity shall be 10 KA for one sec. Earth bus shall be part of the panel. All MCB to be 10 KA breaking capacity.				
	Feeder Pillar-1				
	INCOMER				
	1 No. 63.amps FP MCCB(25 KA) with thermal Magnetic release (PRMB-3) with Class-C transient voltage surge suppression device suitable for 3 phases as per specifications.				
	Protection Istrument				
	One (1) Nos. (0-500V) 96 x 96 Sq.mm voltmeter with control Fuse & selector switch.				
	1 Set of (0-60 Amps) 96 x 96mm CT operated Ammeter with 3 way selector switch and 60 /5A, CL-1, 10VA CT.				
	One (1) Set of Phase Indication & ON/OFF Lamp with 2A MCB				
	1 Nos.TIMER suitable for 24Hrs. Setting with Auto/Manual Selector switch				
	1 No.70A TP CONTRACTOR				
	BUS-BAR				
	4 strip aluminium bus bars of 100 Amps capacity with heat shrinkable coloured sleeves and including DMC/ SMC bus bars supports at required intervals -- 1 Set				
	OUTGOINGS				
	8 No. 32A DP MCB With ON Lamp with 2A MCB				
	Feeder pillar-1 as described above	No.	1	36622.00	36622.00
	Lighting pole				

2	<p>Supplying, Installation, Testing and Commissioning of 3 Mtr. height Galvanised MS decorative type steel tubular pole, duly primed and painted/coated. The pole shall be have Min. 114 mm(Approx.) Dia Upto 1 Mtr(Approx.) From Bottom and Min. 75 mm(Approx.) Dia For Rest height. It should have cast rings for aesthetics. The cloumn shall be provided with inbuilt loop box, earth stud with 4 way 25 Amp heavy duty connector, 1 No. SP MCB and shall have matching flush door, fabricated & painted complete & making cement concrete foundation in 1:2:4 grade of size 500mm x 500mm x 800mm depth complete with S/F M16 x 450mm long foundation bolts, plastering the same with fine sand and having horizontal top surface without any slope including two coats of trump exterior paint complete etc. as reqd.</p>	EACH	20	13092.00	261840.00
3	<p>Supplying of 6 mtr long hot dip Galvanized octagonal Pole with Single arm bracket 1 mtr. long, top of the pole 70 mm dia (A/F) and bottom of the pole 130 mm dia (A/F) made out of 3mm sheet with MS base plate of size 200mm (NS) x 200mm (NS) x 16mm (NS) on precast RCC foundation complete with suitable size opening inside the pole with flush weather proof door with locking facility preferably with LN key having proper arrangement with Accommodating of 1 Nos. 6Amp.,10 KA MCB & neutral link 4 way connector suitable for 25 sqmm cable complete with electrically safe including inside cable teMeterination with thimbles i/c wiring from pole box to fitting with 3x1.5 sq.mm. FRLS PVC insulated copper conductor wire, earthconnection, din channel, earth stud and other accessories pertaining to this pole (But without street light fitting) etc as reqd. including providing & laying in position suitable RCC foundation of size 40 x 40 x 100 cm as required for 6 mtr. octagonal hot dip GalvanizedPole as per Manufacturers drawing with 1:2:4 concrete (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including excavation of all kind of earth such as all type of soil/soft rock or hard rock etc. as per existing site condition i/c providing, cutting, bending and placing reinforcement & J type 4 Nos steel foundation bolts & nuts of minimum 13mm dia x 450mm long including providing 40mm dia B class GI pipe sleeve 1.00 mtr. length, anchor plate and templates in position as per</p>	EACH	23	11118.00	255714.

	manufacturer standard and providing PVC pipe for cable entry and exits including disposal of surplus malba / softrock / hardrock stone etc. as required.				
	Light Fixture				
4	Supplying, Installation, Testing and Commissioning of Min. 40 Watt stylish, LED decorative post top lantern fitting having Aluminum die Cast Housing and Polycarbonate diffuser, CRI ≥ 70, CCT 3000/4000/5700/6500K (as per direction of Engineer in Charge), IP65/66 protection, to be mounted on existing pole including connections with 3 x 1.5 sq.mm. PVC insulated PVC sheathed copper conductor cable from looping box to post top lantern etc. complete as reqd. (Make:- Philips TownGlow/Wipro Vista/Panasonic FANAL) (With 5 Year Warranty.)	EACH	24	14283.00	342792.00
5	Supplying, Installation, Testing and Commissioning of 40-45 Watt stylish LED Street light fitting having Min. Efficacy not less than 110LPW, CRI ≥ 70, PF ≥ 0.95, Min. service life 50000 Hrs @ L70B50, IP65/66 Ingress protection, Min. 4KV Surge Protection to be mounted on existing 4 Mtr Street light pole including connections with 3 x 1.5 sq.mm. PVC insulated PVC sheathed copper conductor cable from looping box to post top lantern etc. complete as reqd. (With 5 Year Warranty.)	EACH	25	6592.00	164800.00
6	Supplying Installation Testing & Commissioning of 9-10 Watt LED spike light fitting with CRCA/Aluminum powder coated housing and IP65 protection in complete with driver i/c making CC foundation (1:3:6) of size 0.4 x 0.4 x 0.5 mtr deep and grouting 2 Nos. hot dip galvanized 'L' type Anchor rag bolts of 10 mm dia and 150 mm long with check nut & washer i/c plastering the same with fine sand and having horizontal top surface without any slope including two coats of trump exterior paint complete etc as required at site (With 5 Year Warranty.)	EACH	30	2417.00	72510.00
	CABLE				
7	Supplying of following size Al. conductor XLPE insulated and PVC sheathed armoured power cable of 1.1 KV grade as required as per IS:7098 (Part-I)1988 as amended up to date				
a	3 Core 10Sqmm	RM	950	173.00	164350.00

	Cable termination :				
8	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	3X 10 sq. mm (19mm)	Nos.	96	300.00	28800.00
9	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing masonry open duct as required.				
a	Upto 35 sq. mm	RM	950	34.00	32300.00
10	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. in the existing trench, complete as required.				
a	63 mm dia (OD-63 mm & ID-51 mm nominal)	RM	850	137.00	116450.00
	EARTHING SYSTEM				
11	Earthing with G.I. earth pipe 4.5 metre long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required	Set	2	7601.00	15202.00
12	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.	RM	20	761.00	15220.00
	SUB Head 9: UPS				
1	40 KVA UPS THREE PHASE				
	UPS :- Supply, installation, testing & commissioning of fully Microprocessor Based UPS System suitable for Three phase, AC 50 Hz. input supply comprising of following features. High Frequency PWM Inverter using IGBT Technology Manual by pass switch LCD display SMF VRLA Batteries with 30 minutes back up time for full load including interconnecting cables Battery Rack Weather proof enclosure for the complete system				
a	40 KVA True On Line (Three Phase input/Three phase output) UPS	Set	1	583309.00	583309.00
	Note: The vendor shall submit dimensional GA drawing of complete UPS system, battery rack with batteries, Service bypass Panel and Battery bank calculations.				
	SUB Head 10: DG SET				

	DG SET (SILENT TYPE)				
1	Providing, Installing, Testing and Commissioning of 'Silent Type' Diesel Generating set with CPCBIV+ norms alongwith Standard AMF Panel(as per OEM) having Prime Power Rating of 250.0 KVA, 415 volts at 1500 RPM, 0.8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0.85 Load Factor, and consisting of the followings: (With two year on site waranty)				
	Diesel Engine:				
	Diesel engine 4 stroke liquid cooled, electric start, of suitable BHP at 1500 RPM suitable for above output of alternator at 40 Degree C, 50% RH & at 1000 Meter MSL and conforming to BS 5514, BS 649, IS 10000, capable of taking 10% over loading for one hour after 12 hours of continuous operation. The engine will be fitted complete with all the required accessories.				
	Engine mounted Instrument Panel fitted with and having digital display for following:				
	(i)Start-stop switch with finger touch				
	(iii)Lubrication oil pressure indication				
	(iv)Lubrication oil temperature indication				
	(v)Battery charging indication				
	(vi) RPM indication				
	(vii)Over speed indication				
	(viii)Low lub. Oil trip indication				
	(ix)Engine Hours indication				
	Alternator :				
	Synchronous alternator rated at 250.0 KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0.8 lagging power factor at 40 Degree C, 50% RH & a 1000 Meter MSL. The alternator shall be having SPDP enclosure, brushless, continuous duty, selfexcited and self-regulated through AVR conforming to IS: 4722/BS 2613 suitable for tropical conditions and with class-F/H insulation.				
	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.				

	Fuel Tank :				
	Daily service fuel tank of capacity as per manufacturer standard fabricated with suitable gauge of 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.				
	Exhaust System :				
	As per CPCB - IV+ norms				
	Starting System :				
	12V/24V DC starting system comprising of starter motors : voltage regulator and arrangement for initial excitation complete with suitable nos. of batteries (suitable capacity) as required as per specifications.				
	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 as per specifications.	Set	1	2025778.00	2025778.00
2	Supplying and fixing exhaust gas piping of 150 mm dia 'C' Class black steel pipe conforming to IS:1239 I cut to required lengths and weld with necessary bends, supports and clamps, antivibration mountings, insulation of exhaust system with mineral wool/rockwool 50mm thick, wiremesh & aluminium cladding of 22 SWG etc. as required along the building or in the existing steel supported structure of item no. 3 below completed as required.	Meter	40	2092.00	83680.00
3	Comprehensive annual and preventive maintenance and upkeep of all electrical and mechanical services and equipments of DG Set i/c replacement of all damaged parts attending the complaint within 12 Hours. etc on all days in a month i/c sunday and holidays to the satisfaction of the engineer in charge.				
	Note:- The date of commencement of above job will be after completion of defect liability period of two years as per Terms of the Contract.				
a	1st Year	Job	1	68396.00	68396.00
b	2nd Year	Job	1	71132.00	71132.00
c	3rd Year	Job	1	73977.00	73977.00
	<u>SUB HEAD 11 : LAN AND TELEPHONE SYSTEM</u>				
1	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 (75mmX75mm)	Each	221	344.00	76024.00
2	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a	Telephone socket outlet(i/c Crimping)	Each	106	165.00	17490.00
b	RJ 45 Data Socket(i/c Crimping)	Each	115	576.00	66240.00
3	Supplying and drawing of UTP 4 pair CAT 6 LAN Cable in the existing surface/ recessed Steel/ PVC conduit as required				
a	1 run of cable	RM	1500	52.00	78000.00
b	2 run of cable	RM	1800	81.00	145800.00
c	3 run of cable	RM	1050	110.00	115500.00
4	SITC of 24-Ports Managed (Layer 2) Gigabit PoE Switch having Network Interface: 24x 10/100/1000 Mbps gigabit ethernet ports, 4x1G SFP Ports, min. 195 watts available PoE+ complete etc. as required at site.	EACH	13	46998.00	610974.00
5	SITC of 6U wall mount network rack having steel frame, toughened glass, ventilation fan, cable manager, Power Distribution Unit etc complete as required at site.	EACH	13	5086.00	66118.00
6	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	1 Pair	RM	300	29.00	8700.00
b	2 Pair	RM	1100	34.00	37400.00
c	4 Pair	RM	500	43.00	21500.00
7	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
a	25 mm dia	RM	1600	286.00	457600.00
b	32 mm dia	RM	250	360.00	90000.00
	SUB Head- 14 : LIFT WORK				
1	Supplying, Installation and Commissioning of 13 passenger (884Kg) lifts without machine room less and gearless having control speed of 1 Meter per second serving different floor in he lift shaft as per detailed specification enclosed and as under :-				
(i)	Speed of lift 1.5 MPS				

(ii)	Floor- 6				
(iii)	Travel 22.5 meter (Approx)				
(iv)	stop and opening- 6 Stop and 6 Opening				
(v)	Controller type AC variable ,Voltage and variabel frequency MRL				
(vi)	AC VVVF Drive (Closed Loop)				
(vii)	Automatic rescue device complete with dry maintenance free batteries as required				
(viii)	Operation: Microprocessor based single automatic push button/touch control simplex selective collective with/ without attendant.				
(ix)	Power- 415V, 3 Phase, 50Hz, 4 wires system				
(x)	Type of Door- (Fire Rated Doors For 120 Minutes)				
(a)	Car: Power oprated, centre opening horizontal sliding in stainless steel hairline finish with texture.				
(b)	Landing dorrs: Power operated, centre opening horizontal sliding in stainless steel hairline finish with texture				
(xi)	A hand rail not less than 600mm long at 900mm above floor level on all three sides or as per requirement of engineer-in-charge.				
(xii)	Voice announcement system in the car to announe the possition of the elevator in the hoistway as the car passes or stops at a floor served by the elevator				
(xiii)	Car Position Indicator- Monochrome LCD- Blue background & white font dor matrix (LED) scrolling display				
(xiv)	Hall fixture Face Plate- Stainless steel 441(Hairline)				
(xv)	Hall Button Arrangement- LCD Monochrome type				
(xvi)	Standard Features:-				
(a)	Anti-nuisance car call protection				
(b)	Simplex collective controll				
(c)	Overload Device				
(d)	Door Nudging				
(e)	Emergency Car Light Unit				
(f)	Infrared curtain door protection				
(g)	Door time protection				
(h)	Emergency Alarm Button				
(i)	Extra Door time of Lobby & Parking				
(j)	Door Open/ Close Buton				
(k)	Manual Rescue Operation				
(l)	Belt Inspection Drive				
(m)	Auto Fan Cut Off				
(n)	Provision of IP based CCTV camera inside car along with 30 days backup complete with				

	NVR.				
(o)	Fireman control				
(p)	Fireman emergency return	4	Each	1489155.00	5956620.00
2	Comprehensive annual and preventive maintenance and upkeep of all electrical and mechanical services and equipments of Lift i/c replacement of all damaged parts attending the complaint within 12 Hours. etc on all days in a month i/c sunday and holidays to the satisfaction of the engineer in charge.				
	Note:- The date of commencement of above job will be after completion of defect liability period of two years as per Terms of the Contract.				
a	1st Year	1	Job	51797.00	51797.00
b	2nd Year	1	Job	53868.00	53868.00
c	3rd Year	1	Job	56023.00	56023.00
	SUB Head-14 : ADDRESSABLE TYPE FIRE DETECTION SYSTEM				
1	Supplying, installation, testing and commissioning of micro processor based intelligent addressable main fire alarm panel, central processing unit with the following loop modules and capable of supporting not less than 240 devices (including detectors) and minimum 120 detectors per loop and loop length up to 2 km, network communication card, minimum 320 character graphics/ LCD display with touch screen or other keypad and minimum 4000 events history log in the non volatile memory (EPROM), power supply unit (230 ± 5% V, 50 hz), 48 hrs back-up with 24 volt sealed maintenance free batteries with automatic charger. The panel shall have facility to connect printer to printout log and facility to have seamless integration with analog/digital voice evacuation system (which is part of the schedule of work under SH: PA System) and shall be complete with all accessories . The panel shall be compatible for IBMS system with open protocol BACnet/ Modbus over IP complete as per specifications.				
a	Ten Loop Panel.	Nos	1	484921.00	484921.00
2	Supplying, installation, testing & commissioning of central graphical fire alarm management system to centrally monitor and operate the fire alarm system complete as required.	Nos	1	213709.00	213709.00

3	Supplying, installation, testing & commissioning of intelligent addressable thermal detector with rate of rise cum fixed temperature thermistor complete with base as required. (Heat Detector)	Nos	30	2910.00	87300.00
4	Supplying, installation, testing & commissioning of intelligent analog addressable photothermal detector complete with mounting base complete as required. (Smoke Detector)	Nos	385	3050.00	1174250.00
5	Supplying, installation, testing & commissioning of addressable fire control module complete as required.	Nos	35	3204.00	112140.00
6	Supplying, installation, testing & commissioning of addressable manual call point complete as required.	Nos	33	4127.00	136191.00
7	Supplying, installation, testing & commissioning of addressable horn cum strobe complete as required.	Nos	33	3739.00	123387.00
8	Supplying, installation, testing & commissioning of addressable beam detector with short circuit isolator (inbuilt or separate) complete with emitter and receiver including connections with remote test features etc complete as required.	Nos	3	79819.00	239457.00
9	Supplying, installation, testing & commissioning of fire fighter telephone handset complete as required.	Nos	33	6114.00	201762.00
10	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	2 X 1.5 sq. mm	Mtr	2700	59.00	159300.00
b	4 X 1.5 sq. mm	Mtr	850	95.00	80750.00
11	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
a	25 mm dia	Mtr	3450	286.00	986700.00
	SUB HEAD-15:- SOLAR PV SYSTEM				
1	Supply,Installation,Testing and Commissioning of on grid Solar Photovoltaic Power Plant conforming to MNRE specifications as amended,consisting of Mono/PolyCrystalline silicon solar cells,Metmetering facility, necessary protections, earthing, mounted on Aluminium/GI structure of suitable strength with following components complete as required:-a)Solar Photo voltaic Module of	KWP	20	64926.00	1298520.00

	<p>capacity 330W porabove, manufactured in India,conforming to IS 286/IEC61215,IS/IEC61730-Part-1,IS/IEC61730-Part-2.Solar Photo voltaic Module conversion efficiency shall not be less than 16.5%.PV modulesuse in solar power plants/systems must be warranted for their output peak watt capacity,which should not be less than 90% attheend of 10 years and 80% attheend of 25 years. b) Power Conditioning Unit (PCU)of 350-800 V DC Input voltage range and 400VAC, three phase, 4wire,50Hz+/-2.5Hz, output voltage suitable to generate A</p> <p>Power with efficiency not less than 97%,total harmonic distortion less than 3%and suitable for ambient temperature from 0 to 50 degree C. The PCU shall adjustthev oltage and frequency level to suit the Grid Voltage Frequency.c) Data Monitoring System complete with accessories. d) Fixing of Array junction box& Main junction box with IP65 protection and termination arrangement for incoming and outgoing cablealongwithglands,lugsand other accessories etc. as required.e) Lightning and surge voltage protection. f) Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1kV gade armoured power and control cables between solar modules,main power cable to grid supply PCU unit along with supplying & fixing of necessary channel/conduit lugs and other accessories etc. as required.</p>				
	SUB HEAD :- 16 (Pumps)				
A	Water Supply, Drainage Pumps & Water Treatment Equipments				
1	<p>Supply, installation, testing & commissioning of vertical inline multistage pumping set with Stainless steel-304 body, Stainless steel-304 impeller, Stainless steel-304 casing, Stainless steel-316 shaft and C.I. base & head with mechanical seal, connected to a TEFC induction motor suitable for 415+/- 10% volts, 3 phase 50 cycles A.C. supply with 150 mm dia pressure gauge with gunmetal isolation cock, vibration eliminating pads under foundations, 80x40 mm I section base plate bolted to cement concrete foundations complete including CC foundation of suitable size with angle iron lining.Vendor to submit performance curves and technical catalogue of</p>				

	the proposed model for review and information.				
a	Filter Feed Pump (Domestic Water) in Water Supply Pump Room				
	Set of Two Pumps (1 Working + 1 Standby)				
	Capacity 2 LPS				
	Head 25 M.				
	HP 1.0 HP Approx.	Set	1	111115.00	111115.00
b	Raw Water Pumps from UGT to STP .				
	Set of Two Pumps (1 Working+ 1 Standby)				
	Capacity 2 LPS				
	Head 35 M.				
	HP 1 HP Approx.	Set	1	122030.00	122030.00
2	Supply, installing, testing and commissioning of submersible dewatering single stage single entry pumps with C.I.body and C.I. two vane enclosed type impeller, SS-304 shaft connected to TEFC submersible motor for 415 ± 10% volts, 3 phase, 50 cycles A.C. power supply with mechanical seal, pump connector unit with rubber diaphragm and bend, vertical discharge pipe, guide pipe and chain in built level controller, sequence running controller, arrangement for both pumps running together in case of emenegency, audible hooter for failure or flooding, dry running Protection complete in all respects.				
	(Pumps shall be installed in a set of two pumps One working and One standby)				
a	Pump Room Drainage Pumps				
	(Pumps to be suitable to handle solids upto 30 mm size)				
	Capacity - 2.5 LPS (Each)				
	Head - 15 M				
	H.P. - 1.5 HP Approx.	Set	1	114758.00	114758.00
b	Sewage Sump Pumps				
	(Pumps to be suitable to handle solids upto 40 mm size)				
	Capacity - 2.5 LPS (Each)				
	Head - 15 M				
	H.P. - 1.5 HP Approx.	Set	1	114758.00	114758.00

3	Providing, installing, testing and commissioning of variable speed (VSPS) hydropneumatic system mounted on a common base plate under cement concrete foundation with angle iron lining comprising of vertical centrifugal pumping set with Stainless steel-304 body, Stainless steel-304 impeller, Stainless steel-304 casing, Stainless steel-316 shaft and mechanical seal, shaft directly coupled to a TEFC induction motor suitable for 400/440 volts, 3 phase, 50 cycles AC supply with 150 mm dia pressure gauge with gunmetal isolation cock, vibration eliminating pads under foundation, one No. microprocessor based controller, dedicated variable frequency drive for each pump, one No. remote sensors, pressure transducers, sequence running controller, dry running Protection, motor control centre, necessary power and control cabling from MCC to pumps including required rating of MCB, one No. 100 litre capacity M.S diaphragm tank with interchangeable butyl rubber membrane or as per manufacturer calculation, complete in all respects including CC foundation of suitable size, including stainless steel grade 316 pipe suction and delivery headers and isolation/ control valves(ball valves/butterfly valves/ Non return valves/ vibration eliminators etc as required) , power box, equipped with fuses/ isolators/circuit breakers as required.				
	The entire Hydropneumatic system shall be factory fitted.				
a	Hydropneumatic System for Domestic Water Supply in Water Supply Pump Room				
	Set of Two Pumps (1 Working + 1 Standby)				
	Capacity 2.0 LPS				
	Head 50 M.				
	HP 2 HP Approx.	Set	1	386060.00	386060.00
b	Hydropneumatic System for Flushing Water Supply in STP Pump Room				
	Set of Two Pumps				
	Capacity 1.5 LPS				
	Head 50 M.				
	HP 2.0 HP Approx.	Set	1	348651.00	348651.00
c	Hydropneumatic System for Irrigation Water Supply at STP Pump Room				
	Set of Two Pumps (1 Working + 1 Standby)				
	Capacity 1.5LPS				
	Head 40 M.				
	HP 2 HP Approx.	Set	1	350963.00	350963.00

4	Supply Installation,Testing & Commissioning of vertical self supporting Filter fabricated from MS sheet as per IS: 2825, (minimum thickness of shall 6 mm and dished end 8 mm)) pressure gauges, sample cock, GI class 'C' face piping, CI butterfly valves and all accessories , with initial charge of filter media including anthracite, painting inside with epoxy paint and outside with two coat of red oxide primer and two or more coat of synthetic enamel paint, testing and commissioning complete including CC foundation of suitable size.				
a	Dual Media Filter For Domestic Water Supply				
	Capacity- 5000 LPH				
	Filtration rate- 14000 LPH/Sqm.				
	Filter dia approx. - 1000 MM				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4.5 Kg/sq cm	Each	1	115993.00	115993.00
b	Activated Carbon Filter For Domestic Water Supply				
	Capacity- 5000 LPH				
	Filtration rate- 14000 LPH/Sqm.				
	Filter dia approx. - 1000 MM				
	Working pressure: 3.0 Kg/sq cm.				
	Test pressure : 4.5 Kg/sq cm	Each	1	137297.00	137297.00
5	Supply Installation,Testing & Commissioning of Water Softener fabricated from MS plate as per IS: 2825 (minimum thickness of shall 6 mm and dished end 8 mm) complete with initial charge of resins , GI class 'C' face piping, CI butterfly valves, pressure gauge, hydraulic brine injector, accessories, painting inside with epoxy paint, including 200 liters capacity PVC / HDPE brine tank suitable for 2 regeneration capacity, testing and commissioning complete with resins of approved quality and make complete in all respects including CC foundation of suitable size.800 litre resin.				
a	For Cooling Tower Water Supply in STP Room & UG Tank Pump Room				
	Hardness-				
	Inlet- 500-600 PPM				
	Outlet- Less than 30 PPM				
	Capacity- 3600 LPH				
	Regeneration period 12 hrs.				
	Quantity of soft water				
	between two regenerations = 43200 lit				
	Working pressure: 3.0 Kg/sq cm.				

	Test pressure : 4.5 Kg/sq cm	Each	2	164602.00	329204.00
6	Supply Installation,Testing & Commissioning of metering pump type chemical doser with 200 lits. HDPE chemical grade solution tank,injection fitting assembly,suction and delivery hose upto the point of injection, capacity 0-12 lph, complete in all respects.				
a	Chlorination of Domestic Water	Each	1	20707.00	20707.00
7	Design, manufacture, supplying, fixing in position, testing and commissioning of the following front operated cubicle type, front access 2mm thick mild steel sheet, free standing, dust and vermin proof, switchboard with IP42 protection with hinged and lockable doors complete with interconnections, tinned copper crimping lugs, bonding to earth and painting, suitable for use at 415 volts, 3 phase 4 wire 50 Hz system and suitable for a fault level of 25 MVA symmetrical at 415 volts.				
	All switchboards shall have provision for entry of cables from the top or bottom as required.				
	All live accessible parts shall be shrouded and all equipment shall be finger touch proof. The busbars insulation shall be with heat shrinkable sleeves. SMC/DMC shrouds and busbar supports shall be used. Padlocking facility shall be provided on all outgoing feeders doors and switch handles shall be lockable in OFF position.				
a	Electric Panel For Water Supply Pumps at Water Supply Pump Room.				
	INCOMING				
	1 No. 150 amps TP + NL MCCB with the following accessories:				
	1 No. square flush mounting 0-500 volts scaled voltmeter with three way and OFF switch.				
	Three phase indicating lights.				
	Electrolytic high conductivity three phase and neutral tinned alluminium bus bar rated at 200 amps having a current density of 1 amp per Sqmm suitable to with stand symmetrical fault level of 25 MVA at 415 volts. The neutral bus bar is to be of 100% capacity.				
	OUTGOING UNITS				
	4 Nos 25 Amp. TPN MCB of breaking capacity 10KA				
	2 Nos 32 Amp. TPN MCB of breaking capacity 10KA				
	1 No. TPN MCB of 63 A with 10 KA service breaking capacity for domestic water hydropneumatic pumps. (Only connection to				

	inbuilt panel of domestic water hydropneumatic system)				
	6 Nos. fully automatic DOL starters with push buttons and ON/OFF indicating lights and overload relays for 2.0 to 5.0 HP pumps.				
	6 Nos. selector switch for selecting mode of operation i.e. auto/manual/off.				
	6 Nos.cyclic relay for automatic duty changeover of pumps.				
	6 No. single phase preventors.				
	6 Nos. square flush mounting 0-30 amps scaled ammeters with three way and OFF selector switch.				
	Space for 3 Nos. Level Controllers.				
	Switchgear shall be suitable for the HP of various motors.				
	2 No.25 Amp. TPN MCB Spare.				
	2 No. 32 Amp. TPN MCB Spare.				
	The motor control panel shall be prewired with colour coded wires with identification labels complete in all respects as required.	Set	1	141982.00	141982.00
b	Electric Panel For Water Supply Pumps at STP Pump Room				
	INCOMING				
	1 No. 200 amps TP + NL MCCB with the following accessories:				
	1 No. square flush mounting 0-500 volts scaled voltmeter with three way and OFF switch.				
	Three phase indicating lights.				
	Electrolytic high conductivity three phase and neutral tinned alluminium bus bar rated at 300 amps having a current density of 1 amp per Sqmm suitable to with stand symmetrical fault level of 25 MVA at 415 volts. The neutral bus bar is to be of 100% capacity.				
	OUTGOING UNITS				
	6 Nos 25 Amp. TPN MCB of breaking capacity 10KA				
	2 Nos. TPN MCB of 63 A with 10 KA service breaking capacity for domestic water hydropneumatic pumps. (Only connection to inbuilt panel of flushing & irrigation water hydropneumatic system)				
	6 Nos. fully automatic DOL starters with push buttons and ON/OFF indicating lights and overload relays for 2.0 to 5.0 HP pumps.				
	6 Nos. selector switch for selecting mode of operation i.e. auto/manual/off.				
	6 Nos.cyclic relay for automatic duty changeover of pumps.				

	6 No. single phase preventors.				
	6 Nos. square flush mounting 0-30 amps scaled ammeters with three way and OFF selector switch.				
	Space for 3 Nos. Level Controllers.				
	Switchgear shall be suitable for the HP of various motors.				
	2 No.25 Amp. TPN MCB Spare.				
	2 No. 32 Amp. TPN MCB Spare.				
	The motor control panel shall be prewired with colour coded wires with identification labels complete in all respects as required.	Set	1	59664.00	59664.00
c	Electric Panel For Drainage Sump Pump				
	One incoming main MCCB unit of 63 amps rating.				
	Alluminium bus bar is separate chamber fully taped of 100 amps capacity.				
	Two MCB units of 25 amps				
	Two fully automatic DOL starters with push buttons and on/off indicating lights.				
	One rotary duty selector switch				
	Two manual/auto/off switches.				
	Two single phasing presenters.				
	One panel type voltmeter with rotary selector switch for reading voltage between phases.				
	Two ampere meters one for each motor.				
	Three neon phase indicating lights on the incoming mains.				
	Space for one liquid level controllers.				
	All internal wiring colour coded from incoming mains to various switchgear, starters, meters, indicating lamps and bus bar with a changeover facility to run each pump alternatively with an alarm bell in case of both pump's running at one time. Switchgear offered must be compatible with the HP of the motors offered.				
	Motor control centre as described above	Set	1	38606.00	38606.00
8	Supplying, installing, testing and commissioning controllers with low voltage relays, stainless steel probes and PVC shroud wiring from tank top to probes.				
a	For Water Supply Pump:				
9	To start pump when water level is low in Domestic Water U.G. tank and shut off pump when Domestic Water U.G. tank is full. Also to stop when water level is low in raw water underground tank.	Each	5	9827.00	49135.00
	For Sump Pumps:				

10	To start pump when water level is high in sump and shut off pump when sump is empty. Both pumps are start when sump is over flowing.	Each	1	9827.00	9827.00
11	Providing, laying, testing & commissioning of 'B' class medium duty G.I. pipe conforming to IS 1239 including welding, fittings like elbows, tees, flanges, tapers, nuts, bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :				
a	40mm dia	Metre	55	945.00	51975.00
b	50 mm dia	Metre	8	1047.00	8376.00
c	65 mm dia	Metre	4	1308.00	5232.00
d	80 mm dia	Metre	15	1495.00	22425.00
12	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	40 mm dia	Each	15	3892.00	58380.00
b	50 mm dia	Each	2	4125.00	8250.00
c	65 mm dia	Each	2	4711.00	9422.00
13	Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS: 5312 complete with rubber gasket, GI bolts, nuts, washers etc.as required :				
a	40 mm dia	Each	2	6287.00	12574.00
b	65 mm dia	Each	2	6955.00	13910.00
14	Providing and fixing resilient rubber neoprene lined style arch vibration eliminators suitable for raw water upto 45 deg.C. Temperature working pressure upto 25 Kg/Sqcm.				
a	40mm dia	Each	8	2553.00	20424.00
b	50 mm dia	Each	4	3080.00	12320.00
c	65 mm dia	Each	2	3359.00	6718.00
15	Providing and fixing heavy duty armoured cables 1.1 KVA grade including necessary support clamps at ceiling level and connection lugs complete in all respects.				
a	Power cable Copper 3 core 10 sq.mm	Metre	10	620.00	6200.00
b	Power cable 3 core 6 sqmm	Metre	8	386.00	3088.00
c	Power cable Copper 3 core 4 sq.mm	Metre	6	279.00	1674.00
d	Control cable copper 2 core 1.5 sq.mm	Metre	10	112.00	1120.00
16	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	80 mm dia.	Each	1	5121.00	5121.00
	SUB HEAD :- 17 (Fire Fighting System)				
1	Supplying, installation, testing and commissioning of Electric driven Main Fire Pump suitable for automatic operation and consisting of following, complete in all respects, as required :				
	Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal conforming to IS 1520.				
	Suitable HP Squirrel cage induction motor, TEFC, synchronous speed 1500 RPM, suitable for operation on 415 volts, 3 phase 50 Hz, AC supply with IP 55 protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325.				
	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
	Suitable cement concrete foundation duly plastered with anti vibration pads.				
a	2280 LPM at 88 m Head	Set	2	430640.00	861280.00
2	Supplying, installation, testing and commissioning of diesel engine driven main fire pump suitable for automatic operation and consisting of following, complete in all respects, as required : (Diesel Driven Pump)				
	Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal conforming to IS 1520.				
	Suitable HP, 1500 RPM water cooled with radiator, diesel engine conforming to relevant IS standard complete with auto starting mechanism, 12 /24 volts electric starting equipment, diesel tank, exhaust pipe extended upto 10 m outside pump house duly insulated with 50 mm thick glass wool with 1.0 mm thick aluminium sheet cladding, residential silencer, instruments and protection as per standard specification, stop solenoid for auto stop in the event of fault with audio indications, painted with post office red colour etc. as required.				
	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
	Suitable cement concrete foundation duly				

	plastered with anti vibration pads.				
a	2280 LPM at 88 m Head	Set	1	677756.00	677756.00
3	Supplying, installation, testing and commissioning of electric driven pressurisation pump suitable for automatic operation and consisting of following, complete in all respects, as required : (Jockey Pump)				
	Horizontal type, multistage, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal conforming to IS : 1520.				
	Suitable HP Squirrel cage induction motor, TEFC, synchronous speed 2900 RPM, suitable for operation on 415 volts, 3 phase 50 Hz, AC supply with IP 55 protection for enclosure, horizontal foot mounted type with Class-'F' insulation, conforming to IS-325.				
	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
	Suitable cement concrete foundation duly plastered with anti vibration pads.				
a	180 LPM at 88 m Head	Set	2	136022.00	272044.00
4	Fabrication, supply, Insallation testing & commissioning of Electrical control panel of cubical construction, floor mounted type, fabricated out of 2mm thick CRCA sheet, compartmentalised with hinged lockable doors, dust and vermin proof, powder coated of approved shade after 7 tank treatment process, cable alley, interconnection with suitable size copper conductor cable/solid copper strip, having switchgears and accessories, mountings and internal wiring, earth terminals, numbering etc. complete in all respect, suitable for main fire pump, pressurisation pump & diesel pump set complete as per CPWD pecification with following in coming and Outgoings, suitable for operation on 415V, 3 phase, 50Hz Ac Supply with enclosure protection class IP 42 as required :				
	Incomings				
	800A, 50kA 4 Pole MCCB, Ics=100% Icu Rating Digital Voltmeter 0-500V with selector switch Ammeter (0-800 A) with selector swtich & CTs etc.LED type RYB phase indicating lamps, ON, OFF, trip indicating lamps Set of Copper Bus Bar 1000Amps				
	Outgoings				

	(Note : All outgoing feeders for pumps should have digital Ammeter with selector switches, and LED type ON, OFF, trip indicating lamps)				
	Main Fire Pumps				
	250 Amp, 50kA TPN MCCB, Ics=100% Icu, with fullyautomatic Star/Delta starter suitable for 100 hp pumpwith overload protection, current sensing type singlephase preventor complete with all accessories andinternal wiring required for automatic operation,selector switch for local/remote, auto/manual/OFFoperation. - 2 sets				
	Jockey Pump				
	125 Amp, 50kA TPN MCCB, Ics=100% Icu, with Suitable HP fully automatic Star/Delta starter with overload protection, current sensing type single phase preventor complete with all accessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation. - 2 sets				
	Diesel Engine Control				
	Control for diesel engine comprising - Automatic/Manual selector switch & 3 starting attempts starting device, timers and relays as required, push buttons, start/stop in manual modeIndicating lamp for high/ Low Lub. Oil pressure, High Water Temp and Engine on indication Battery charger suitable for 12V/24 V DC with boost and trickle selector switch, 0-30 V DC volt meter, and 0-20 A DC Ammeter				
	All standard relays and accessories for automatic operation of diesel engine System Controller				
a	Designing, Supply, Installation, Testing and commissioning of system controller to control operation of main electric fire pump, diesel pump, Pressurization pump, Terrace pump in sequence as per specification consisting of relays, timers. Sensors, annunciation window for fault indication, complete as per specification(Set	1	343405.00	343405.00

5	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	80 mm. Dia	Metre	6	1131.00	6786.00
b	100 mm dia.	Metre	20	1454.00	29080.00
c	150 mm dia.	Metre	520	4706.00	2447120.00
6	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	25 mm dia	Metre	2836	838.00	2376568.00
b	32 mm dia	Metre	130	959.00	124670.00
c	40 mm dia	Metre	530	1160.00	614800.00
d	50 mm dia	Metre	388	1424.00	552512.00
e	65 mm dia	Metre	265	1791.00	474615.00
f	80 mm dia	Metre	395	2079.00	821205.00
g	100 mm dia	Metre	458	2799.00	1281942.00
h	150 mm dia	Metre	210	3896.00	818160.00
i	200 mm dia (wall thickness 6.3 mm)	Metre	15	5918.00	88770.00
j	250 mm dia (wall thickness 6.3 mm)	Metre	15	7190.00	107850.00
7	Supplying and fixing single headed internal hydrant valve with instantaneous Gunmetal/Stainless Steel coupling of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required :				
a	Single headed Stainless steel	Set	17	6665.00	113305.00
8	Supplying and fixing Single headed external yard hydrant valve with 1 No. 63 mm dia instantaneous FM Gunmetal/Stainless Steel coupling and cast iron wheel, ISI marked, conforming to IS 5290 (type A) with blank Gunmetal/Stainless Steel cap and chain as required :				
a	Single headed Stainless steel	Set	9	6665.00	59985.00
9	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	80 mm dia	Set	45	5424.00	244080.00
b	100 mm dia	Set	5	7282.00	36410.00
c	150 mm dia	Set	26	9764.00	253864.00
10	Supplying and fixing orifice plate made out of 6 mm thick stainless steel (Grade 304) with orifice of required size to be fitted between flange & landing valve of external and internal hydrants to reduce pressure at the outlet to the level of 3.5 kg/cm ² complete as required.	Each	26	1432.00	37232.00
11	Providing, installation, testing and commissioning of non-return valve of following sizes confirming to IS:5312 complete with rubber gasket, GI bolts, nuts, washers etc.as required :				
a	80 mm dia	Set	2	8316.00	16632.00
b	100 mm dia	Set	2	11943.00	23886.00
c	150 mm dia	Set	6	17110.00	102660.00
d	200 mm dia	Set	1	19100.00	19100.00
12	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	Each	2	11766.00	23532.00
13	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female couplings duly bound with GI wire, rivets etc. conforming to IS 636 (type-A) as required :				
a	Stainless Steel (Grade 304)	Set	52	4742.00	246584.00
14	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	40 m	Set	17	11136.00	189312.00
15	Supplying & fixing 63 mm dia gun metal short branch pipe with 20 mm nominal internal diameter size nozzle conforming to IS				

	903 suitable for instantaneous connection to interconnect hose pipe coupling as required :				
a	Stainless Steel (Grade 304)	Set	26	1780.00	46280.00
16	Supplying and fixing of fire brigade connection of cast iron body with gun metal male instantaneous inlet couplings complete with cap and chain as reqd. for suitable dia MS pipe connection conforming to IS 904 as required :				
a	2 way - 100 mm dia M.S. Pipe	Set	1	7306.00	7306.00
b	4 way - 150 mm dia M.S. Pipe	Set	1	14996.00	14996.00
17	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.	Set	5	19612.00	98060.00
18	Providing, fixing, testing & commissioning of 15mm dia quartzoid bulb type sprinklers of rating 68 degree centigrade with required accessories :				
a	Pendent Sprinkler	Each	860	589.00	506540.00
b	Upright Sprinkler	Each	1030	589.00	606670.00
c	Horizontal side wall sprinkler	Each	102	691.00	70482.00
19	Providing & fixing of pressure switch in M.S. pipe line including connection etc. as required.	Each	12	1678.00	20136.00
20	Providing & fixing flow switch in following sizes M.S. pipe including connection etc as required.				
a	150mm dia	Each	12	9730.00	116760.00
21	Providing, fixing, testing & commissioning of installation control valve of cast iron body, brass/bronze working parts comprising of water motor alarm, bronze seat clapper, clapper arm and hydraulically driven mechanical gong bell to sound continuous alarm when the wet riser/sprinkler system activates, pressure gauges, emergency releases, strainer, pressure switch, cock valve complete with drain valve and bypass, test control box, ball valves, MS pipe of required size, flanges, orifice plate, gasket etc of following sizes as required :				
a	150mm dia	Each	2	51528.00	103056.00

22	Supplying, installation, testing & commissioning of sprinkler flexible pipe (UL Listed) of stainless steel complete with 15 NPT on reducer thread with maximum working pressure of 175 PSI test pressure of 875 PSI (Burst) with branch line (Inlet) 25mm NPT male thread to sprinkler head (Outlet) 15mm NPT female thread with reducer, nipple, 2 side brackets, center bracket, stockbar of following sizes complete as required.				
a	700 mm	Set	300	1501.00	450300.00
b	1000 mm	Set	400	1712.00	684800.00
c	1200 mm	Set	100	1810.00	181000.00
d	1500 mm	Set	60	1983.00	118980.00
23	Providing, installation, testing & commissioning of adjustable rosette plate for 15mm dia in white finish UL Listed or FM approved complete as required.	Each	860	257.00	221020.00
24	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
a	25 mm	Metre	10	285.00	2850.00
25	Supplying and installing following size of perforated pre-painted M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required.				
a	150 mm width x 50mm depth x 1.6 mm thickness.	Metre	20	670.00	13400.00
26	Providing and fixing of Weather proof hose cabinets fabricated from 14 g M.S. Sheet with full glass door and mortise locking arrangement, suitable to accommodate one Hydrant landing valve, 2 nos. 15 M long hose and 1 No branch pipe. The cabinet shall be painted with one coat of primer and finished stove enamelled "Fire Red", "Fire Hose" written on front including suitably mounted on a raised masonry platform as required. (Approx 0.75mx0.6 m x 0.25 m).	Each	9	4303.00	38727.00

27	Providing and fixing MS partly glazed single/double hung lockable shutter fabricated from MS section as required with 5 mm thick glass for fire station complete including stove enamelled painting of door and frame and words "Fire Hydrant" written on glass, suitable to accommodate 2 Hydrant landing valves, 1 fire hose reel, 2 nos.15m long 63 mm dia hose,1-branch pipe, 1no. fire man's axe, fire extinguishers 2 nos, including suitably mounted on a raised masonry platform as required. (Approx.size 0.90 m x 2.1m)	Each	17	7958.00	135286.00
28	Providing and fixing in position the industrial type pressure gauges with gun metal / brass valves complete as required	Each	26	1492.00	38792.00
29	Providing and fixing resilient rubber neoprene lined single arch vibration eliminators with unit control suitable for raw water upto 450C temperature working pressure 25 kg and test pressure 37.5 kg/cm ² .				
a	80 mm dia.	Each	4	3898.00	15592.00
b	100 mm dia	Each	4	5552.00	22208.00
c	150 mm dia	Each	6	6768.00	40608.00
30	Providing and fixing heavy duty PVC insulated, PVC armoured conductor cables 1100 V grade including necessary support clamps and connection lugs complete in all respects.				
a	Power cable 3.5 core 150 sq mm aluminium conductor armoured cable	Metre	15	1093.00	16395.00
b	Power cable 3 core 16 sq mm aluminium conductor armoured cable.	Metre	35	179.00	6265.00
c	Control cable copper 2 core 1.5 sq.mm	Metre	75	112.00	8400.00
31	Supply, Installation, Testing & Commissioning of double flanged vertical air vessel fabricated shell from 10 mm thick & dished ends 12 mm thick M.S.plate, suitable for working pressure of 18 kg/cm ² and test pressure of 27 kg/cm ² , 450 mm dia and 2.00 m high for fire pumps complete with four nos dual setting pressure switches to operate jockey and main pumps at drop of pressure as given in the specifications.	Each	2	41189.00	82378.00
32	Providing & fixing 150 mm diameter MS Class 'C' for diesel engine exhaust pipe (including all fittings, clamps, steel support) of suitable dia for the diesel engine. The pipe shall be provided insulation with fibre glass wool and wrapped with 24g. aluminium sheet complete with all respect.	Metre	40	1778.00	71120.00

33	Providing and fixing of gun metal fire Brigade Suction Hose coupling (Draw-out Connection) with nut for female coupling as per IS:902- 1974 complete with 100 mm dia. G.I. Suction pipe and 100 mm dia. 1No. C.I. Foot valve flanged (to be connected to static water tank).	Each	1	15141.00	15141.00
34	Providing and fixing carbon-di-oxide type fire extinguishers consisting of pressure tested single cast cylinder with rotary discharge valve and high pressure discharge tube of minimum 1 m length, discharge horn, suspension bracket conforming to IS:15683 finished externally with red enamel paint and fixed to wall with brackets complete with internal charge (Halon Free Gas)				
a	Capacity 4.5 Kg.	Each	20	5050.00	101000.00
35	Providing and fixing carbon-di-oxide fire extinguishers trolley mounted with all accessories internal discharge tube,high pressure discharge hose,discharge nozzle, ISI marked as per IS:2878 finished externally with red enamel paint. (Halon Free Gas)				
a	Capacity 22.5 kg.	Each	1	12575.00	12575.00
36	Providing and fixing ABC Powder type fire extinguishers consisting of welded M.S. cylindrical body, squeeze lever discharge valve fitted with pressure indicating guage internal discharge tube 30 cms long high pressure discharge hose, discharge nozzle, suspension bracket conforming to IS:15683 finished externally with red enamel paint and fixed to wall with brackets complete with internal charge. (Halon Free Gas)				
a	Capacity 6.0 Kg.	Each	20	1804.00	36080.00
37	Providing and fixing 25 mm dia inspecting & testing assembly with drain valve built in bye pass arrangement and connection to drain line. (Giocomini)	Each	12	3006.00	36072.00
	SUB HEAD :- 17 (HVAC WORKS)				
1	OUTDOOR UNIT				

	Supply Installation, Testing & Commissioning of modular type Variable Refrigerant Flow/Variable Refrigerant Volume aircooled Outdoor units suitable for cooling and heating, having all hermetically sealed inverter type Scroll Compressor(s), minimum two compressor for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R410 A Refrigerant, vibration isolators, with suitable foundation etc. complete as required. The unit shall deliver the rated capacity at AHRI Conditions and work even at 50°C ambient temperature without tripping. The unit shall be suitable to work on 400V±10%, 3Phase, 50Hz AC power supply. The unit shall be filled with first charge of the refrigerant and ready for use as required. The COP at AHRI conditions shall not be less than 3.1 and IEER not less than 6.5 .				
		per HP	174.0 0	19532.00	3398568.00
2	VRV/VRF INDOOR UNITS:				
2	Supply, installation, testing and commissioning of following minimum capacity and external static pressure VRF/VRV ceiling mounted ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration isolators, drainpan, other necessary supports etc., suitable for operation on single phase AC supply 230V±10%, 50 Hz complete as required. The unit shall have automatic force shut down provision in case of fire on receiving signal from BMS System. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature.				
a)	8.0 TR Ductable unit H.S	Nos.	3	75823.00	227469.00
2	Supply, installation, testing and commissioning of following minimum capacity 4-way flow VRV/VRF Cassette Type Indoor ceiling mounted unit equipped with synthetic washable media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX Copper coil, electronic expansion valve, outer cabinet, drain pump, grill, necessary supports, vibration isolation, cord less remote control etc., suitable for operation on single phase 230 V ± 10%, 50Hz AC supply, complete, as				

	required. The unit shall have automatic force shut down provision in case of fire on receiving signal from BMS System. The cooling capacity of indoor unit will be at air inlet conditions of 27 Degree C DB and 19 Degree C WB temperature.				
a)	1.0 TR Cassette unit with drain pump	Nos.	2	29758.00	59516.00
b)	1.2/1.3 TR Cassette unit with drain pump	Nos.	9	30922.00	278298.00
c)	1.6 TR Cassette unit with drain pump	Nos.	6	31124.00	186744.00
d)	2.0 TR Cassette unit with drain pump	Nos.	26	32175.00	836550.00
e)	2.8/2.6 TR Cassette unit with drain pump	Nos.	10	34188.00	341880.00
f)	3.2 TR Cassette unit with drain pump	Nos.	5	36090.00	180450.00
3	Y-JOINTS:				
	Supply Installation, testing, commissioning of supply & return Y-joints sets of required size for refrigerant piping as per manufacturer standards.				
a)	Y- Joints set	Set	47	3905.00	183535.00
4	REFRIGERANT PIPING:				
	Supply, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastometric nitrile rubber tubular sleeves sections of specified thickness as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :				
a)	6.4 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	45	177.00	7965.00
b)	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	285	268.00	76380.00
c)	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	170	357.00	60690.00
d)	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	340	538.00	182920.00
e)	19 mm dia (OD) (hard drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	280	579.00	162120.00

f)	22.2 mm dia (OD) (hard drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	175	659.00	115325.00
g)	25.4 mm dia (OD) (hard drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	5	823.00	4115.00
h)	28.58 mm dia (OD) (hard drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	135	1028.00	138780.00
i)	31.8 mm dia (OD) (hard drawn) with tube thickness 1.62 mm with 19mm thick insulation	Rmt	190	1259.00	239210.00
j)	34.9 mm dia (OD) (hard drawn) with tube thickness 1.62 mm with 19mm thick insulation	Rmt	65	1500.00	97500.00
k)	38.1 mm dia (OD) (hard drawn) with tube thickness 1.62 mm with 19mm thick insulation	Rmt	55	1769.00	97295.00
5	DRAIN PIPING :				
	Providing and fixing of uPVC drain pipe of 6 Kg /cm ² pressure rating complete with 6mm thick closed cell nitrile rubber insulation, fittings, supports, valves as per specifications & drawings.				
a)	25 mm dia	Rmt	650	264.00	171600.00
b)	32 mm dia	Rmt	150	398.00	59700.00
6	AIR COOLED INVERTER TYPE SPLIT AC:				
	Supply, installation, testing and commissioning of inverter type Split Cooling units as per specifications and complete as required. Outdoor units with rotary/scroll compressor air-cooled condenser coil with fan, casing, MS-stand, cabling and earthing as required. Indoor units shall consist of centrifugal fan with motor, dx-cooling coil of copper tubes and aluminium fins, casing, filter, full charge of CFC free gas and oil, control wiring, Standard 3m interconnecting refrigerant piping between indoor and outdoor unit, cooling thermostate control wiring & corded remote control.				
	Note : Aluminium Fins and copper tubes of Air Cooled Condenser along with copper tubing / piping with all joints and U-Bends exposed to coastal areas corrosive atmosphere / aggressive ambient, shall be painted with special corrosion prevention coating either in factory or at site.				
a)	1.0 TR Hi wall unit with drain pump 5Star	Nos.	12	32365.00	388380.00
b)	1.5 TR Hi wall unit with drain pump 5Star	Nos.	26	38098.00	990548.00
c)	2.0 TR Hiwall unit with drain pump 5Star	Nos.	5	51784.00	258920.00

7	Supply, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for SPLIT AC system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastometric nitrile rubber tubular sleeves sections of specified thickness as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :				
a)	6.4 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	150	177.00	26550.00
b)	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	20	268.00	5360.00
c)	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	150	357.00	53550.00
d)	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm with 19mm thick insulation	Rmt	20	538.00	10760.00
8	Sheet Metal Duct:				
8	Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.				
a)	Thickness 0.63 mm sheet (24 G)	Sqm	100	1055.00	105500.00
b)	Thickness 0.80 mm sheet (22 G)	Sqm	40	1135.00	45400.00
8	Supply, installation, balancing and commissioning of fabricated at site GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.				
a)	Thickness 0.63 mm sheet (24 G)	Sqm	20	1084.00	21680.00
b)	Thickness 0.80 mm sheet (22 G)	Sqm	10	1243.00	12430.00
9	Supplying, fixing, testing commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc, in accordance with approved shop drawings and specifications complete as required.	Sqm	1.1	6738.00	7411.80
10	Supplying & fixing of powder coated extruded aluminium Supply Air Grills with	Sqm	4.8	8589.00	41227.20

	aluminium volume control dampers as per specifications.				
11	Supplying & fixing of powder coated extruded aluminium Return Air Grills without volume control dampers complete as required.	Sqm	4.8	4701.00	22564.80
12	Supply and fixing of Acoustic lining of supply air duct and plenum with 25 mm thick resin bonded glass wool having density of 32 kg/m ³ , with 25 mm X 25 mm GI section of 1.25 mm thick, at 600 mm centre to centre covered with Reinforced Plastic tissue paper and 0.5 mm thick perforated aluminum sheet fixed to inside surface of ducts with cadmium plated nuts, bolts, stick pins, CPRX compound etc. complete as required and as per specifications.	Sqm	35	766.00	26810.00
13	Supplying and fixing of following thickness duly laminated aluminum foil of mat finish closed cell Nitrile rubber (class "O") insulation on existing duct after applying two coats of cold setting adhesive (CPR X compound). The joints shall sealed with 50 mm wide and 3 mm thick self adhesive nitrile rubber tape insulation complete as per specifications and as required.				
a)	19 mm	Sqm	170	801.00	136170.00
14	Supply, installation and balancing of extruded aluminium powder coated air louvers complete with aluminium wire mesh bird screen as per specifications.	Sqm	0.1	6997.00	699.70
15	Supplying, fabricating, installing and testing of fire retardent double Canvas Flexible Connection 150mm wide for constructed of standard material as per the drawings/specifications.	Sqm	2	2986.00	5972.00
16	AXIALS FANS				
	Supply, Installation, Testing and commissioning of AMCA certified for sound and air performance (FEG) Tube Axial fan complete with tube casing in MS standard construction powder coated, aluminium impeller with adjustable blade angles,vibration isolator and directly coupled TEFC to Sq.cage induction motor, suitable for 415V±10%, 50 Hz. 3 phase electric supply complete with required hardware etc.				
a)	Air Qty. = 7000 CFM				
	Static Pressure = 30mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	4	38879.00	155516.00
b)	Air Qty. = 6500 CFM				
	Static Pressure = 20mm Wg				

	Fan Speed = Not exceeding 1450 rpm	Nos.	1	33056.00	33056.00
c)	Air Qty. = 6000 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	1	33056.00	33056.00
c)	Air Qty. = 2000 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	1	26606.00	26606.00
17	Supply, Installation, Testing and commissioning of AMCA certified for sound and air performance (FEG) Tube Axial fan complete with tube casing in MS standard construction powder coated, aluminium impeller with adjustable blade angles, vibration isolator and directly coupled TEFC to Sq.cage induction motor, suitable for 415V±10%, 50 Hz. 3 phase electric supply complete with required hardware etc. The complete fan assembly shall be BSEN-1210-3-2002/UL listed for 250 Deg C 2 hours in accordance with power ventilator for smoke control systems and as per specification complete as required.				
a)	Air Qty. = 1500 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	2	25263.00	50526.00
b)	Air Qty. = 3500 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	8	29831.00	238648.00
c)	Air Qty. = 3750 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	3	31713.00	95139.00
d)	Air Qty. = 4500 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	3	31713.00	95139.00
e)	Air Qty. = 5500 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	6	33146.00	198876.00
f)	Air Qty. = 6500 CFM				
	Static Pressure = 20mm Wg				
	Fan Speed = Not exceeding 1450 rpm	Nos.	2	34759.00	69518.00
18	INLINE TYPE FAN				

	Supply, installation, testing and commissioning of ducted Inline Fans of GSS construction (rectangular box type above 900cfm for upto 25 mm WG S.P and circular type for 10 mm WG SP upto 850cfm) with centrifugal blower and motor encased in sheet metal casing, canvas connection etc. The Fan motor shall be suitable for operation on 220 V± 10%, 50 Hz, 1 phase AC supply upto 2500cfm and above 400 V 3phase. noise level not more than 65dBA from 1 m The Fan assembly shall conform to specifications and in accordance with requirements of drawings and Schedule of Quantities.				
a)	200-300 cfm capacity with 10 mm static pressure	Nos.	15	4569.00	68535.00
b)	350-450 cfm capacity with 10 mm static pressure	Nos.	12	5196.00	62352.00
19	PROPELLER FANS				
	Supply, Installation, Testing and commissioning of wall mounted GSS/MS propeller type exhaust fans of Axial Flow type with light weight type MS / aluminium impellers with aerofoil contours for high efficiency and low noise. The fan shall be supplied complete with and gravity louvers with a suitable Squirrel cage induction motor.				
a)	225 mm dia 900RPM	Nos.	57	1541.00	87837.00
b)	300 mm dia 1400RPM	Nos.	2	3549.00	7098.00
c)	450 mm dia 1400RPM	Nos.	3	5053.00	15159.00
20	DRY SCRUBBER				
	Supply, Installation, Testing and Commissioning of dry type Ceiling/Floor mounted Scrubber comprising electrostatic section multi cell type with 16 G powder coated galvanised steel sheet housing of 16 G (1.4 mm) thick system, bottom drain and metallic mesh filter. The electronic air cleaner shall be the two- stage dual voltage plate type cells and efficiency of 90% as per ASHRAE test Standard for dry particulate. Ionizing-collecting cell of one-piece construction. Power supply shall be 100% solid state. on 200 to 240 VAC, 50HZ, 1Phase input with an LED light indicating the performance status as per specification etc complete as required.				
a)	2500 cfm capacity for kitchen	Nos.	1	85105.00	85105.00
21	SISW KITCHEN EXHAUST FAN FOR SCRUBBER				
	Supply, installation, testing and commissioning of Suitable SISW Backward Curved Kitchen Exhaust Air Fan in double skin construction complete with TEFC				

	Induction Motor, Drive Assembly, Base Frame, Vibration Isolators and other accessories etc as per specification complete as required.				
a)	Capacity - 2500 CFM (static pressure-35mm)	Nos.	1	54198.00	54198.00
22	Sheet Metal Duct:				
22	Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.				
a)	Thickness 0.63 mm sheet (24 G)	Sqm	320	1055.00	337600.00
b)	Thickness 0.80 mm sheet (22 G)	Sqm	255	1135.00	289425.00
c)	Thickness 1.0 mm sheet (20 G)	Sqm	100	1248.00	124800.00
23	Supply, installation, balancing and commissioning of fabricated at site GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers, supports etc. as per approved drawings and specifications of following sheet thickness complete as required.				
a)	Thickness 0.63 mm sheet (24 G)	Sqm	20	977.00	19540.00
b)	Thickness 0.80 mm sheet (22 G)	Sqm	15	1104.00	16560.00
c)	Thickness 1.0 mm sheet (20 G)	Sqm	10	1229.00	12290.00
24	Supply, installation, balancing and commissioning of 16 gauge MS duct work welded construction . Duct shall have fire rated coating compound. Fire rated coating compound used for construction of fire rated duct work shall be protected with minimum 0.7mm to 1mm nominal thickness tested to properties as per the requirements of BS 476: 6 & amp; 7, including non-combustibility Class O and fire propagation - Class 1 surface spread of flame & amp; materials in accordance with building regulations.	Sqm	45	1850.00	83250.00
25	Supplying, installing and testing of extruded aluminium louvers with bird screen in accordance with approved shop drawings and specifications complete as required.	Sqm	17	6930.00	117810.00
26	Supplying, fixing, testing commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc, in accordance with approved shop drawings and specifications complete as required.	Sqm	0.1	6738.00	673.80

27	Supplying & fixing of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers as per specifications.	Sqm	16	8589.00	137424.00
28	Supplying & fixing of powder coated extruded aluminium Return Air Grills without volume control dampers complete as required.	Sqm	17	4701.00	79917.00
29	Supplying, fabricating, installing and testing of fire retardant double Canvas Flexible Connection 150mm wide for constructed of standard material as per the drawings/specifications.	Sqm	15	2986.00	44790.00
30	HVAC PANEL WORKS				
	Design, fabrication, supply, installation, testing and commissioning of panels fabricated out of 2mm thick for structural members and 1.6mm thick for door and covers CRCA sheet in cubicle compartmentalize free standing floor mounted/ wall mounted powder coated with reinforcement wherever necessary. Cable gland plates shall be provided on top and bottom. Panels have 2 Nos. earthing terminals. Panels shall be suitable for 415V, 3-phase, 4-wire, 50Hz supply system lifting hooks shall also be provided in case of large panels. Degree of ingress protection shall be IP42.				
30	ODU PANEL (TERRACE)				
	Incomer (1 No.):				
	400 A, TPN MCCB (35 KA) with adjustable O/L fix short circuit				
	Metering:				
	0-500 Volts, digital Voltmeter with S/S and shall be protected by 2 Amps MCBs.				
	0-400 Amps digital Ammeter and 400/5A, 10VA, CL-1 CTs and selector switch.				
	Phase indicating lamps and shall be protected by 2 Amps MCBs.				
	Bus Bars:				
	500 Amps TPN Aluminium busbars, colour coded with heat shrinkable insulation sleeves,				
	Out Goings				
	(2) Nos. 4 pole 100A RCBO				
	(5) Nos. 4 pole 63A RCBO				
	(1) Nos. 4 pole 40A RCBO				
	(1) Nos. 4 pole 32A RCBO				
	(2) Nos. 4 pole 32A MCB (Spare)	Set	1	92570.00	92570.00
30	Fan Starter Panel terrace				
	Incomer (1 No.):				

	40A, TPN MCCB (10 KA) with adjustable O/L fix short circuit				
	Metering:				
	0-500 Volts, digital Voltmeter with S/S and shall be protected by 2 Amps MCBs.				
	0-40 Amps digital Ammeter and 40/5A, 10VA, CL-1 CTs and selector switch.				
	Phase indicating lamps and shall be protected by 2 Amps MCBs.				
	Bus Bars:				
	63Amps TPN Aluminium busbars, colour coded with heat shrinkable insulation sleeves,				
	Outgoing:				
	2 Nos. TPN MPCB with DOL starter with contactor, O/L relay with single phase preventor suitable for 2.2 KW with ON/OFF/Trip indication lamps and push buttons potential free contacts for remote operation in each feeder as required including auxiliary contacts for smoke signal.	Set	2	34975.00	69950.00
30	Fan Starter Panel Corridor GF to 4th				
	Incomer (1 No.):				
	63A, TPN MCCB (10 KA) with adjustable O/L fix short circuit				
	Metering:				
	0-500 Volts, digital Voltmeter with S/S and shall be protected by 2 Amps MCBs.				
	0-63 Amps digital Ammeter and 63/5A, 10VA, CL-1 CTs and selector switch.				
	Phase indicating lamps and shall be protected by 2 Amps MCBs.				
	Bus Bars:				
	100Amps TPN Aluminium busbars, colour coded with heat shrinkable insulation sleeves,				
	Outgoing:				
	3Nos. TPN MPCB with DOL starter with contactor, O/L relay with single phase preventor suitable for 1.5 KW with ON/OFF/Trip indication lamps and push buttons potential free contacts for remote operation in each feeder as required including auxiliary contacts for smoke signal.				
	2 Nos. TPN MPCB with DOL starter with contactor, O/L relay with single phase preventor suitable for 2.2 KW with ON/OFF/Trip indication lamps and push buttons potential free contacts for remote operation in each feeder as required including auxiliary contacts for smoke signal.	Set	4	51309.00	205236.00

30	Fan Starter Panel Corridor 5th				
	Incomer (1 No.):				
	32A, TPN MCCB (10 KA) with adjustable O/L fix short circuit				
	Metering:				
	0-500 Volts, digital Voltmeter with S/S and shall be protected by 2 Amps MCBs.				
	0-32 Amps digital Ammeter and 32/5A, 10VA, CL-1 CTs and selector switch.				
	Phase indicating lamps and shall be protected by 2 Amps MCBs.				
	Bus Bars:				
	40Amps TPN Aluminium busbars, colour coded with heat shrinkable insulation sleeves,				
	Outgoing:				
	2 Nos. TPN MPCB with DOL starter with contactor, O/L relay with single phase preventor suitable for 1.5 KW with ON/OFF/Trip indication lamps and push buttons potential free contacts for remote operation in each feeder as required including auxiliary contacts for smoke signal.	Set	1	34975.00	34975.00
31	Fan Starter Panel Corridor 5th Hostel				
	Incomer (1 No.):				
	25A, TPN MCCB (10 KA) with adjustable O/L fix short circuit				
	Metering:				
	0-500 Volts, digital Voltmeter with S/S and shall be protected by 2 Amps MCBs.				
	0-25 Amps digital Ammeter and 25/5A, 10VA, CL-1 CTs and selector switch.				
	Phase indicating lamps and shall be protected by 2 Amps MCBs.				
	Bus Bars:				
	40Amps TPN Aluminium busbars, colour coded with heat shrinkable insulation sleeves,				
	Outgoing:				
	2 Nos. TPN MPCB with DOL starter with contactor, O/L relay with single phase preventor suitable for 1.1 KW with ON/OFF/Trip indication lamps and push buttons potential free contacts for remote operation in each feeder as required including auxiliary contacts for smoke signal.	Set	1	34975.00	34975.00
31	Fan Starter Panel Kitchen Vent				
	Incomer (1 No.):				
	32A, TPN MCCB (10 KA) with adjustable O/L fix short circuit				
	Metering:				

	0-500 Volts, digital Voltmeter with S/S and shall be protected by 2 Amps MCBs.				
	0-32 Amps digital Ammeter and 32/5A, 10VA, CL-1 CTs and selector switch.				
	Phase indicating lamps and shall be protected by 2 Amps MCBs.				
	Bus Bars:				
	40Amps TPN Aluminium busbars, colour coded with heat shrinkable insulation sleeves,				
	Outgoing:				
	2 Nos. TPN MPCB with DOL starter with contactor, O/L relay with single phase preventor suitable for 1.5 KW with ON/OFF/Trip indication lamps and push buttons potential free contacts for remote operation in each feeder as required including auxiliary contacts for smoke signal.1no Toggle	Set	1	34975.00	34975.00
31	Fan Starter Panel Pump & LT Panel				
	1Nos. TPN MPCB with DOL starter with contactor, O/L relay with single phase preventor suitable for 2.2 KW with ON/OFF/Trip indication lamps and push buttons potential free contacts for remote operation in each feeder as required including auxiliary contacts for smoke signal.	Set	2	10795.00	21590.00
	TOTAL				82808909.30
	SAY				82808909.00

CIVIL CONSTRUCTION UNIT					
NIT No: 9/2023-24/CE/CCU/CED-IV/Howrah Recall1					
Name of work : Construction of Headquarters office building, hostel, auditorium and guest house for BSI at Andul Road, Howrah.					
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 Works	39,61,81,538.00	*	*	*
2	Furniture Works	3,24,90,397.00	*	*	*
2	Electrical Works	8,28,08,909.00	*	*	*
	Total	51,14,80,844.00			

:*- 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) place 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