Notice Inviting Tender

NIT No.	123/IITD/EE(CD-1)/2025-26
Name of Work	Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.
Estimated cost	Civil Work Rs.77,14,79,987/- Electrical Work Rs.21,77,94,709/- **Total** **Rs.98,92,74,696/-**
Earnest Money	Rs.1,08,92,747/- (in favour of Registrar, IIT Delhi) To be returned after receiving Performance Guarantee.
Performance Guarantee	5% of Tendered value
Security Deposit	2.5% of Tendered Value
Period for completion	18 Months
Date & Time of Pre-Bid Meeting	29/12/2025, Room No. AD-215, Committee Room, Office of Dean (Infra), IIT Delhi at 11:00 AM.
Last date & time for submission of bids	15/01/2026 up to 1500 Hrs.
Date & Time of opening of Technical Bids	16/01/2026 at 1500 Hrs.
Date & Time of opening of Financial Bids	The time and date of opening of financial bid will be communicated to the eligible bidders, who qualify in Technical Bid, at a later date.

It is certified that this document contains three parts, i.e., Part A, Part B & Part C containing page no. **1 - 221.**

Junior Engineer (E) **Assistant Engineer (C)**

Executive Engineer (ED-I) **Executive Engineer (CD-I)**

NIT approved for Rs.98,92,74,696/- (Rupees Ninety-Eight Crore Ninety-Two Lakh Seventy-Four Thousand Six Hundred Ninety-Six Only)

Institute Engineer

INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI-110016
INDEX

Name of work : Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.

Executive Engineer (CD-I)
IIT Delhi

PART-A

General Information

INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI-110016
IITD/WORKS(SP-5208)/2025

Notice Inviting e -Tender

The Executive Engineer (CD-I), IIT Delhi, Hauz Khas, New Delhi - 110016 (Phone No 011-26596851) on behalf of the Board of Governors invites online **Percentage Rate composite bids** from Firms / Contractors Registered in appropriate class and category with CPWD / MES / BSNL / Railways for Civil work / Building works / Building & Roads /Composite works or **specialized agencies** meeting the eligibility criteria as mentioned in the NIT for the following work:

NIT No.	123/IITD/EE(CD-1)/2025-26
Name of Work	Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.
Estimated cost	Civil Work Rs.77,14,79,987/- Electrical Work Rs.21,77,94,709/- **Total** **Rs.98,92,74,696/-**
Earnest Money	Rs.1,08,92,747/- (in favour of Registrar, IIT Delhi) To be returned after receiving Performance Guarantee.
Performance Guarantee	5% of Tendered value
Security Deposit	2.5% of Tendered Value
Period for completion	18 Months
Warranty	2 Year for Civil and Electrical Works 05 Years for LED lighting fixtures and ceiling Fans.
Date & Time of Pre-Bid Meeting	29/12/2025, Room No. AD-215, Committee Room, Office of Dean (Infra), IIT Delhi at 11:00 AM.
Last date & time for submission of bids	15/01/2026 up to 1500 Hrs.
Date & Time of opening of Technical Bids	16/01/2026 at 1500 Hrs.
Date & Time of opening of Financial Bids	The time and date of opening of financial bid will be communicated to the eligible bidders, who qualify in Technical Bid, at a later date.

The bid forms and other details can be obtained from the website **www.iitd.ac.in** or **eprocure.gov.in** free of cost**.** For more clarification you may visit the above website.

Executive Engineer (CD-I)
For & on Behalf of BOG, IIT Delhi

Copy to: -

1. Institute Engineer
2. Executive Engineer (ED-I), for information.
3. A.R. (Works Accounts)
4. J.R. (A/Cs) – for opening of uploaded documents at **3:00 PM on 16/01/2026** in the office of D.R. Store
5. Notice Boards.
6. Office Copy
7. Web site Administrator, IITD

z

C—NIL I----NIL O--- NIL EE (CD-I) EE (ED-I) JE(E) AE(C)

INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI – 110016
IITD/WORKS (SP- 5208)/2025

INFORMATION AND INSTRUCTIONS FOR BIDDERS FOR E-TENDERING
(Tender Notice)

The Executive Engineer (CD-I), IIT Delhi, Hauz Khas, New Delhi - 110016 (Phone No 011-26596851) on behalf of the Board of Governors invite online **Percentage Rate composite bids** from Firms / Contractors Registered in appropriate class and category with CPWD / MES / BSNL / Railways for Civil work / Building works / Building & Roads /Composite works or **specialized agencies** meeting the eligibility criteria as mentioned in the NIT for the following work:

SL. No.	NIT No.	Name of Work	Estimated Cost (Rs.)	Earnest Money (Rs.)	Time for Completion
1	123/IITD/EE (CD-I)/2025-26	**Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.**	**98,92,74,696/-**	**1,08,92,747/-**	**18 Months**

Last date and time of submission of financial & Technical bid : 15/01/2026 up to 3:00 pm (online)

Date and time of opening of technical bid : 16/01/2026 at 3.00 pm (office of D.R Store) Price bids of eligible bidders as per NIT shall be opened at a later date after scrutiny of technical bids.

1. The contractor submitting the tender should read the schedule of quantities, additional conditions, additional specifications, particular specifications, IITD- 6 and other terms and conditions given in the NIT and drawings carefully. The bidder should also read the General Conditions of Contract for CPWD Works 2023 for Construction works with up-to-date correction slips, which is available as Government of India Publications; however, provisions included in the tender document shall prevail over the provisions contained in the standard form. The set of drawings and NIT shall be available in the office of Executive Engineer (CD-I), IIT Delhi, New Delhi (Telephone-011-26596851/ email ID: eeplg@iitd.ac.in). The contractor should also visit the site of work and acquaint himself with the site conditions before tendering. He should only submit his tender if he considers himself eligible and he is in possession of all the required documents.

The following conditions, which already form part of the tender conditions, are specially brought to his notice for compliance while submitting the tender online. They are requested to comply with the following instructions:

a) Tenders with any condition including that of conditional rebates shall be rejected forthwith.
b) The successful bidder shall be required to submit a Performance Guarantee of 05% (Five Percent) of the tendered amount as defined in Schedule F.
c) **GST, Labour-Cess etc. as applicable shall be borne by the contractor himself. The contractor shall quote his rates considering all such taxes and hence their quoted rates should be inclusive of all the tax components.**
d) It will be obligatory on part of the contractor/ bidder to tender for and sign the tender documents for all the component parts. The department reserves right to accept tender in full or in part without assigning any reasons.

2. The contractor shall submit an irrevocable Performance Guarantee at specified percentage of the tendered amount as mentioned in the NIT, in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule 'F' from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in- Charge up to a maximum period as specified in schedule 'F' on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. 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 Scheduled Commercial Banks. In case a fixed deposit receipt of any Bank is furnished by the contractor to the Government as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the Government to make good the deficit. **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 Performance Guarantee shall be submitted by the contractor on format as per GCC and shall be initially valid up to the stipulated date of completion plus minimum **6 months** beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of Performance Guarantee extended to cover such enlarged time for completion of work. After recording of the completion certificate for the work by the competent authority, the performance guarantee shall be returned to the contractor, without any interest. However, in case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance Guarantee shall be retained as Security Deposit. The same shall be returned year wise proportionately.

Eligibility Criteria

3. Contractors who fulfill the following requirements shall be eligible to apply. **Joint ventures / Consortium / Special Purpose Vehicles are not accepted.**

i. The bidder 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.

One similar work of value not less than **Rs.79,14,20,000/-**
or
Two similar works each of value not less than **Rs.59,35,65,000/-**
or
Three similar works each of value not less than **Rs.39,57,10,000/-**

Similar work to be defined as:

Similar work shall mean works of "Construction of Building(s) with Composite Steel Structure (Structural Steel and RCC) having minimum one 8 storey building comprising of all required Civil and E&M Services and at least one basement carried out under a single contract. For this purpose, each basement, stilt constructed in the building shall be considered as a storey.

OR

Completing balance construction work of one building (i/c structural work) with Composite Steel Structure (Structural Steel and RCC) minimum up to 8 storey building comprising of all required Civil and E&M Services and at least one basement carried out under a single contract. For this purpose, each basement, stilt constructed in the building shall be considered as a storey.

Note:

a. For the purpose of similar works, works executed in India only shall be considered.

b. The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple interest rate of 07% per annum, calculated from the date of completion to previous day of last date of submission of bid.

ii. **Earnest money of Rs. 1,08,92,747/- in** the form of Payment through online mode (NEFT / RTGS with UTR details) or Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (for balance amount as prescribed) from any of the Scheduled Commercial Banks drawn in favor of **Registrar, IIT Delhi** shall be scanned and uploaded on the e-tendering website within the period of bids submission. No relaxation in EMD will be allowed for MSMEs and MSEs as per the CPWD Manual. A part of earnest money is acceptable in the form of Bank Guarantee including e- Bank Guarantee also. In such cases 50% of earnest money or Rs. 20 lakh whichever is less, will have to be deposited in shape prescribed above and balance can be accepted in form of Bank Guarantee issued by a Scheduled Commercial Bank having validity for a period of 180 days or more from the last date of receipt of bids which is also to be scanned and uploaded by the intending bidders.

iii. **The bidder should have had an Average Annual Financial Turnover of 30% of the ECPT i.e., Rs.29.68 Crores on construction works during the last three years ending 31st March 2025. (Scanned copy of the certificate from CA with UDIN to be uploaded)**. The value of annual turnover figures shall be brought to the current value by enhancing the actual turnover figures at a simple rate of 7% per annum. At the time of submission of bid contractor may upload Certificate from CA mentioning Financial Turnover and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet. **(FORM – A)**

iv. **The bidder should have a Banker's Certificate of 40% of the Estimated Cost i.e., for Rs.39.57 Crores from a Scheduled Commercial Bank (FORM – B).** The certificate should be issued in the current financial year or **net worth certificate of a minimum of Rs. 9.89 Crores, issued by a certified Chartered Accountant with UDIN (FORM B-1).**

v. The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last five consecutive balance sheets (standalone financial statement), duly certified and audited by the Chartered Accountant to be uploaded **(FORM – A)**.

vi. The bidder 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: The bidder should submit bidding capacity as per **FORM C-3**.
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 of ongoing works during the period of execution of work for which bids have been invited.

vii. The bidder must not be backlisted / debarred / put on holiday list from any government department during the last seven years ending on last day of submission of bid. **FORM-G.**

4. The intending bidder must read the terms and conditions of IITD-6 carefully. He should only submit his bid if he considers himself eligible and he is in possession of all the documents required.

5. Information and Instructions for bidders posted on website shall form part of bid document.

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 can be seen and downloaded from website http://eprocure.gov.in/eprocure/app.in free of cost.

7. Completion certificates issued by an officer not below the rank of Executive Engineer of the

similar works completed by the Agency.

8. **Work means, only work done under Government/ Central Public Sector Undertaking / State Public Sector Undertaking / Central Autonomous bodies / State Autonomous bodies / City Development Authority / Municipal Cooperation of City formed under any act by Central / State Government and published in Central / State Gazette.**

9. IITD is committed to follow the principle of transparency, equity, and competitiveness in public procurement. Before submission of bid each bidder should sign an integrity pact at respective places and submit the bid, if a duly signed integrity pact is not submitted by the bidder such bid shall not be considered.

10. Those contractors not registered on the website mentioned above are required to get registered beforehand. If needed they can be imparted training on online bidding process as per details available on the website

11. The intending bidder must have a valid class-III digital signature to submit the bid.

12. On opening date, the contractor can log in and see the bid opening process. After opening the bids, he will receive the competitor bid sheets.

13. The contractor can upload documents in the form of JPG format and PDF format.

14. Contractor must ensure to quote percentage above / below, 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 bidder does not quote any percentage above/below on the total amount of the tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.**

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

16. In e-Tendering intending bidder can quote his rates in figures only. The rates in words for each item and total are generated automatically. Therefore, the rate quoted by the bidder in figures will be taken as final.

17. The bid can only be submitted after uploading the mandatory scanned documents such as Demand Draft or Pay order or Banker`s Cheque or Deposit at call Receipt or Fixed Deposit Receipts and towards cost of EMD in favor of **Registrar IIT Delhi** to be deposited with http://eprocure.gov.in/eprocure/app / NEFT facility.

18. The physical EMD of the scanned copy of EMD uploaded shall be deposited by the lowest tenderer within a week after opening of financial bid failing which the tender shall be rejected.

19. The following undertaking in this regard shall be up-loaded by the intending bidders on the letter head of their company: **"the physical EMD shall be deposited by me / us with the Authority inviting the tender, in case I / we become the lowest tenderer, within a week of the opening of financial bid, otherwise, department may reject the tender and also take action to debar me / us from tendering in any form in IIT Delhi."**

20. **Copy of enlistment / Registration order and certificate of work experience and other documents as specified in the Press Notice / web notice shall be scanned and up-loaded to the e-Tendering website within the period of bid submission. However, certified / original copy of all the scanned and up-loaded documents as specified in press notice web / notice shall have to be submitted by the lowest bidder only along with physical EMD of the scanned copy of EMD uploaded within a week physically in the office of e-tendering authority and it shall be sole responsibility of lowest bidder.**

21. **Online bid documents submitted by intending bidders shall be opened only to those bidders, who have deposited EMD, and other documents scanned and uploaded are found in order.**

22. When bids are invited in two /three stages systems and if it is desired to submit a revised financial bid it shall be mandatory to submit a revised financial bid. If not submitted, then the bid submitted earlier shall become invalid – Not applicable.

23. The bid submitted shall become invalid if:

a) The bidder is found ineligible.

b) The bidder does not upload scanned copies of all the documents stipulated in the bid document.

c) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of tender opening authority.

d) 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 / subhead in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

e) The lowest bidder does not deposit physical EMD within a week of opening of tender.

24. Bid validity shall be **75 days** from the last date of submission of bid.

25. The rate of bidders shall be considered inclusive of GST.

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

1. Demand Draft / Pay order or Banker`s Cheque / Deposit at Call Receipt / FDR of any Scheduled Commercial Bank or through RTGS/ NEFT with UTR details, against EMD
2. Enlistment / Registration order of contractor, if applicable in this tender, as per NIT Form 6 Tender notice.
3. Certificate of Registration for GST and acknowledgement of up to date filed return of GST.
4. Certificate of Financial Turnover from Chartered Accountant (Form - A)
5. Banker's Certificate (Form – B) or Net Worth Certificate (Form – B1)
6. Certificates of Work Experience (Form – C, Form – C1 & Form - D)
7. Bidding Capacity (Form – C3)
8. Structure & Organization details of the bidder (Form – E)
9. Undertaking on structural stability and soundness of already completed buildings and infrastructure projects (Form "F").
10. Proforma of Affidavit for Non-Blacklisting – (Form "G").
11. Declaration about Site inspection - (Form "H").
12. Affidavit regarding non execution of work on back-to-back basis - (Form "I").
13. Signed copy of Letter of Transmittal.
14. Acceptance to execute Integrity Pact.
15. Undertaking as per 'Sl. No. 19 on page No. 8 on firm's letter head.
16. ESI & EPF registration certificates.
17. In the case of a Partnership firm, if all the tender papers are not signed by all the partners, a power of attorney authorizing the person who has signed the tender paper must be uploaded with the tender documents.
18. Annexure-I (duly filled & signed by the bidders)
19. Annexure-II (duly filled & signed by the bidders)
20. Any other documents as specified in the NIT.
21. **Valid Electrical License of the Contractor or the associate agency.**
22. **OEM authorization of the Specialized E&M component as below: -**
    a. **HT / LT Substation Equipment / DG sets**
    b. **Passenger Lifts / Basement Ventilation.**
    c. **FA & PA system, Fire Fighting System /**
    d. **CCTV / LAN / IPABX system / Solar PV**
    e. **Any other specialized item (s) as per the direction of the Engineer in Charge.**

Note: 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. If any discrepancy is noticed between the documents as uploaded at the time of submission of bid

and the hard copies as submitted physically by the lowest bidder in the office of bid opening authority, the bid submitted shall become invalid.

Executive Engineer (CD-I),
For & on Behalf of BOG, IIT Delhi
Hauz Khas, New Delhi-110016

Copy to: -

1. **Institute Engineer, for information**
2. **Executive Engineer (ED-1), for information.**
3. **A.R. (Works Accounts)**
4. **J.R. (A/Cs) – for opening of tenders on 16/01/2026 at 3:00 PM in the office of D.R. Store**
5. **Notice Boards.**
6. **Office Copy**
7. **Web site Administrator, IITD**
8. **NIT: - Publicity on Website on Institute as well as on CPP portal http://eprocure.gov.in may be ensured as per instruction issued.**
9. **E-tendering Web.** http://eprocure.gov.in/eprocure/app or wwww.iitd.ac.in

INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI – 110016

Indian Institute of Technology Delhi is in the process of purchasing following item(s) as per details as given as under.

Details of the item/work	**As per Tender Notice**
Earnest Money Deposit to be submitted	**Rs. 1,08,92,747/-**
Warranty	**As per Tender Notice, NIT & IITD form 7**
Performance security	**As per Tender Notice, NIT & IITD form 7**

Tender Documents may be downloaded from Central Public Procurement Portal http://eprocure.gov.in/eprocure/app.Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website http://eprocure.gov.in/eprocure/app . The portal enrolment is free of charge. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission.

Tenderers can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type 'IIT'. Thereafter, click on "GO" button to view all IIT Delhi tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website http://eprocure.gov.in/eprocure/app as per the schedule given in the next page.

No manual bids will be accepted. All quotes (both Technical and Financial should be submitted in the E-procurement portal).

Schedule

Name of Organization		Indian Institute of Technology, Delhi
Tender Type (Open/Limited/EOI/Auction/Single)		Open
Tender Category (Services/Goods/works)		Works
Type/Form of Contract (Work/Supply/ Auction/Service/Buy/Empanelment/ Sell)		Works
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems)		Civil & Electrical Works
Source of Fund (Institute/Project)		Institute
Is Multi Currency Allowed		No
Date of Issue/Publishing		18/12/2025 (16.00 Hrs)
Document Download/Sale Start Date		18/12/2025 (16.00 Hrs)
Document Download/Sale End Date		15/01/2026 (15.00 Hrs)
Date for Pre-Bid Conference		29/12/2025 (11.00 Hrs)
Venue of Pre-Bid Conference		Room No. AD-215, Committee Room, Office of Dean (Infra), IIT Delhi at 11:00 AM.
Last Date and Time for Uploading of Bids		15/01/2026 (15.00 Hrs)
Date and Time of Opening of Technical Bids		16/01/2026 (15.00 Hrs)
Tender Fee	**NIL**	(To be paid through RTGS/NEFT or OFFLINE MODE in favor of Registrar IIT Delhi.) Name of the Bank A/C: Registrar IIT Delhi SBI A/C No. 10773572622 Name of the Bank : State Bank of India, IIT Delhi, Hauz Khas, New Delhi-110016 IFSC Code : SBIN0001077 MICR Code :110002156 Swift No. : SBININBB547 (This is mandatory that UTR Number is provided in the on-line quotation / bid. Kindly refer to the UTR Column of the Declaration Sheet at Annexure-II) **or as per NIT/ Tender notice**
EMD	**Rs. 1,08,92,747/-**	
No. of Covers (1/2/3/4)		**02**
Bid Validity days (30/75)		**75 days (From the last date of Submission of bid)**
Address for Communication		**Office of the Executive Engineer (Civil Division-I), Room No- AD-117, Main Building, IIT Delhi, Hauz Khas, New Delhi-110016**
Contact No.		**011-26596851, 011-26548437, 011-26597339**
Fax No.		**Nil**
Email Address		**eeplg@iitd.ac.in, aashish@admin.iitd.ac.in a26926@admin.iitd.ac.in**

z

C—NIL I----NIL O--- NIL EE (CD-I) EE (ED-I) JE(E) AE(C)

Instructions for Online Bid Submission

As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal (URL:http://eprocure.gov.in/eprocure/app). The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: http://eprocure.gov.in/eprocure/app

REGISTRATION

1. Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL:http://eprocure.gov.in/eprocure/app) by clicking on the link "Click here to Enroll". Enrolment on the CPP Portal is free of charge.
2. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
3. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
4. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.), with their profile.
5. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
6. The bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken.

SEARCHING FOR TENDER DOCUMENTS

1. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal.
2. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
3. The bidder should make a note of the unique Tender ID assigned to each tender; in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the documents that need to be submitted. Any deviations from these may lead to rejection of the bid.
3. The bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF formats. Bid documents may be scanned with 100 dpi with black and white option.
4. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g., PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid and need not be uploaded again and again. This will lead to a reduction in the time required for the bid submission process.

SUBMISSION OF BIDS

1. Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e.,

on or before the bid submission time. Bidder will be responsible for any delay due to other issues.

2. The bidder must digitally sign and upload the required bid documents one by one as indicated in the tender document.
3. Bidder has to select the payment option as "on-line" to pay the tender fee / EMD as applicable and enter details of the instrument. Whenever, EMD / Tender fees is sought, bidders need to pay the tender fee and EMD separately on-line through RTGS (Refer to Schedule, Page No.12).
4. A standard BoQ format has been provided with the tender document to be filled in by all the bidders. Bidders are requested to note that they should submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
   OR
   In some cases, Financial Bids can be submitted in PDF format as well (in lieu of BOQ).
5. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
6. All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128-bit encryption technology. Data storage encryption of sensitive fields is done.
7. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
8. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
9. Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.

ASSISTANCE TO BIDDERS

1. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
2. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 233 7315.

General Instructions to the Bidders

1. The tenders will be received online through portal http://eprocure.gov.in/eprocure/app . In the Technical Bids, the bidders are required to upload all the documents in .pdf format.
2. Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through http://eprocure.gov.in/eprocure/app. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site https://eprocure.gov.in/eprocure/app under the link "Information about DSC".
3. Tenderer are advised to follow the instructions provided in the 'Instructions to the Tenderer for the e-submission of the bids online through the Central Public Procurement Portal for e-Procurement at https://eprocure.gov.in/eprocure/app.

Terms & Conditions Details

S.No.	Specification
1.	**Due date**: The tender has to be submitted on-line before the due date. The offers received after the due date and time will not be considered. No manual bids will be considered.
2.	**Preparation of Bids**: The offer/bid should be submitted in two bid systems (i.e.) Technical bid and financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. Financial bid should indicate percentage above or below for the items mentioned in the Schedule of Quantity in the NIT in the given format i.e BOQ_XXXX. OR Financial Bids to be submitted in Excel. The Technical bid and the financial bid should be submitted Online.
3.	**EMD (if applicable)**: **As per NIT**
4.	**Refund of EMD: - As per NIT**
5.	**Opening of the tender**: **As per Tender Notice, NIT & IITD form 7**
6.	**Acceptance/ Rejection of bids:** The competent authority of IIT Delhi reserves the right to reject any or all offers without assigning any reason.
7.	**Pre-qualification criteria: - Mentioned in Tender notice**
8.	**Performance Security**: **-Mentioned in Tender notice**
9.	**Force Majeure: - As per IITD form 7**
10.	**Risk & Cost Clause: As per IITD form 7**
11.	**Delivery and Documents: As per Tender Notice & NIT & IITD form 7**
12.	**Delayed delivery: As per Tender Notice & NIT & IITD form 7**
13.	**Prices**: **As per Tender Notice & NIT & IITD form 7**
14.	**Progress of Work: As per Tender Notice & NIT & IITD form 7**
15.	**Inspection and Tests: As per Tender Notice & NIT & IITD form 7**
16.	**Resolution of Disputes**: **As per Tender Notice & NIT & IITD form 7**
17.	**Applicable Law: As per Tender Notice & NIT & IITD form 7**
18.	**Supplier Integrity: As per Tender Notice & NIT & IITD form 7**
19.	**Training: As per Tender Notice & NIT & IITD form 7**
20.	**Installation & Demonstration: As per Tender Notice & NIT & IITD form 7**
21.	**Incidental services: As per Tender Notice & NIT & IITD form 7**
22.	**Defect liability Period: As per Tender Notice & NIT & IITD form 7**
23.	**Governing Language: As per Tender Notice & NIT & IITD form 7**
24.	**Applicable Law: As per Tender Notice & NIT & IITD form 7**
25.	**Notices: As per Tender Notice & NIT & IITD form 7**
26.	**Taxes: As per Tender Notice & NIT & IITD form 7**
27.	**Termination for Default: As per Tender Notice & NIT & IITD form 7**
28.	**Disputes and Jurisdiction**: **As per Tender Notice & NIT & IITD form 7**
29.	**Completion certificate**: **As per Tender Notice & NIT & IITD form 7**

INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI – 110016
IITD-6 FOR E-TENDERING

1. **Online Percentage Rate composite bids are invited from Firms / Contractors Registered in appropriate class and category with CPWD / MES / BSNL / Railways for Civil work / Building works / Building & Roads / Composite works or Specialized Agencies meeting the eligibility criteria as mentioned in the NIT.**
   The enlistment / Registration of the contractors should be valid on the last date of submission of tenders. In case the last date of submission of tender is extended, the enlistment of contractor should be valid on the original date of submission of tenders.

   1.1 The work is estimated to cost **Rs.98,92,74,696/-.** This estimate, however, is given merely as a rough guide.

   1.1.1 The authority competent to approve NIT for the combined cost and belonging to the major discipline will consolidate NITs for calling the bids. He will also nominate Division which will deal with all matters relating to the invitation of bids. For composite bid, besides indicating the combined estimated cost put to bid, should clearly indicate the estimated cost of each component separately. The eligibility of bidders will correspond to the combined estimated cost of different components put to bid.

   1.2 Intending bidder 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 Details of criteria of eligibility for submission of bid documents as Indicated in "INFORMATION AND INSTRUCTIONS FOR CONTRACTORS FOR E-TENDERING FORMING PART OF NIT AND TO BE POSTED ON WEBSITE"

   1.2.2 To become eligible for issue of tender, the tenderer shall have to furnish an affidavit as per **FORM – I.**

2. Agreement shall be drawn with the successful bidders on prescribed Form No. IITD – 7 (or other Standard Form as mentioned) which is available as a Govt. of India Publication. 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 **as per tender notice** 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 tender documents.
4. **The site for the work is available. In case of anything serviceable found it will be property of the government unless specified otherwise.**
5. 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 from the web Site http://eprocure.gov.in/eprocure/appor iitd.ac.in or e-procure.gov **free** of cost.
6. After submission of the bid the contractor can re-submit a revised bid any number of times but before the last time and date of submission of tender as notified.
7. While submitting the revised bid, the 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 tender as notified.
8. If it is desired to submit a revised financial bid, then it shall be mandatory to submit a revised financial bid. If not submitted, then the tender submitted earlier shall become invalid.
9. Earnest money in the form of Payment through online mode (NEFT / RTGS with UTR details) or Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (for balance amount as prescribed) from any of the Scheduled Commercial Banks drawn in favor of **Registrar, IIT Delhi** shall be scanned and uploaded on the e-tendering website within the period of bids submission. No relaxation in EMD will be allowed for MSMEs and MSEs as per the CPWD Manual. A part of earnest money is acceptable in the form of Bank Guarantee including e- Bank Guarantee also. In such cases 50% of earnest money or Rs.20 lakh whichever is less, will have to be deposited in the shape prescribed above and balance can be accepted in the form of Bank Guarantee issued by a Scheduled Commercial Bank having validity for a period of 180 days or more from the last date of receipt of bids which is also to be scanned and uploaded by the intending

bidders. The original EMD should be deposited by lowest bidder within a week after the opening of financial bid in office of **Executive Engineer (CD-I), IIT Delhi, Hauz Khas, New Delhi.**

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

Copy of Enlistment Order and certificate of work experience and other documents as specified in the 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 **Executive Engineer (CD-I), IIT Delhi, Hauz Khas, New Delhi (**tender opening authority). Online bid documents submitted by intending bidders shall be opened only of those bidders, who has uploaded the proof of EMD (as specified in the NIT) and other documents scanned and uploaded are found in order.

10. The bid submitted shall become invalid if:
    a. The bidder is found ineligible.
    b. The bidder does not upload scanned copies of all the documents stipulated in the bid document.
    c. If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest bidder in the office of tender opening authority.
    d. If a bidder does not quote any percentage above/below on the total amount of the tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.
    e. The lowest bidder does not deposit physical EMD within a week of opening of tender.
11. The time & date of opening of financial bid of contractors qualifying the **criteria as per Tender Notice** shall be communicated to them at a later date.
12. The contractor whose bid is accepted will be required to furnish Performance Guarantee at specified percentage of the tendered amount as mentioned in the NIT, in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule 'F' from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in- Charge up to a maximum period as specified in schedule 'F' on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. 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 Scheduled Commercial Banks. In case a fixed deposit receipt of any Bank is furnished by the contractor to the Government as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the Government to make good the deficit. **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.**
13. Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

Intending Bidders are advised to get familiarized with the local body rules, firefighting rule, tree cutting authorities, environment clearances, orders passed by any court on the environment issues, any other issue related to obtaining commencement certificate & occupancy certificate and satisfy themselves before submitting their bids as to the status, nature of the rules and regulations and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. Bidder shall be deemed to have full knowledge of such rules and regulations whether he has read it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. **In case scope of work is reduced on any account no additional payment for opportunity loss shall be made. Payment shall be made only for the work actually done and nothing extra.** Submission of a bid by the bidder implies that he has read this notice and all other **documents and has made himself aware of the Local Body Bye laws and other factors having a bearing on the execution of the work**

14. The competent authority, on behalf of the Board of Governors, 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 conditions are not fulfilled or any condition including that of conditional rebate is put forth by the bidders shall be summarily rejected.
15. Canvassing, whether directly or indirectly, in connection with tenderers is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
16. The competent authority, on behalf of the Board of Governors, reserves himself the right to accept the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
17. GST or any other tax applicable in respect of inputs procured by the contractor for this contract shall be payable by the Contractor and Government will not entertain any claim whatsoever in respect of the same.
18. The contractor shall not be permitted to tender for works in the IITD 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 people who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in the Central Public Works Department or in the Ministry of Urban Development. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this Department.
19. 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 previous 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 afore said before submission of the tender or engagement in the contractor's service.
20. The bids for the work shall remain open for acceptance for a period of **75 (Seventy-Five)** 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
21. This notice inviting Tender shall form a part of the contract document. The successful tenderer / contractor, on acceptance of his tender 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 Tender, all the documents including additional conditions, specifications and drawings, if any, forming part of the tender as uploaded at the time of invitation of tender and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

b) Standard IITD Form - 7 or other Standard IITD Form as mentioned.

22. **For Composite Bids**

21.1.1 The Executive Engineer in charge of the major component will call the bids for the composite work. The cost of bid document and Earnest Money will be fixed with respect to the combined estimate cost put to tender for the composite bid.

21.1.2 The bid document will include the following three components: -

PART A : IITD-6, and General Information.

PART B : Tender Form (IITD-7) including schedule A to F for the work, General Conditions of contract, Additional & Special Conditions, Particular Specification etc. applicable to Civil, E&M Works

PART C : Schedule of Quantity

21.1.3 The bidder must associate himself with experienced agencies of the appropriate class eligible of bid for each of the minor components individually.

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

21.1.5 After acceptance of the bid by competent authority, the EE in charge of major component of the work shall issue letter of award on behalf of the BoG, IIT Delhi. After the work is awarded, the main contractor will have to enter into one agreement with EE (CD-1) in charge of major component and has also to sign two or more copies of agreement depending upon number of EE (ED-1) in charge of minor components. One such signed set of agreement shall be handed over to EE(ED-1) in charge of minor component(s). EE(CD-1) of major component will operate Part A and major component part of Part B of the agreement. EE(ED-1) in charge of minor component(s) shall operate minor component of Part - B along with Part A of the agreement.

21.1.6 Entire work under the scope of composite bid including major and all minor components shall be executed under one agreement.

21.1.7 Security Deposit will be worked out separately for each component corresponding to the estimated cost of the respective component of works.

21.1.8 The main contractor has to associate agencies for specialized / Minor component(s) conforming to eligibility criteria as defined in the bid document and has to submit details of such agency(s) to Engineer-in-Charge of relevant component(s) within prescribed time. The name of the agency(s) to be associated shall be approved by the Engineer-in-Charge of relevant component(s).

21.1.9 In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in Charge of relevant specialized component(s). The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case the 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.

21.1.10 The main contractor must enter into MoU with agency(s) associated by him for execution of the specialized component(s), in case the main contractor does not have the capability to execute the Specialized / Minor components of the work. Copy of such MoU shall be submitted to EE in charge of each relevant component as well as to EE-in-charge of major component. In case of change of associate contractor, the main agency(s) has to enter into MoU/agreement with the new contractor associated by him.

21.1.11 Running payment for the major component shall be made by EE of major discipline to the main contractor. Running payment for minor components shall be made by the Engineer-in-Charge of the discipline of minor component directly to the main contractor. The CMB shall be maintained independently by Engineer-in Charge of major and minor components.

21.1.12

A. The composite work shall be treated as completed when all the components of the work

are complete. The completion certificate of the composite work shall be recorded by Engineer-in-charge of major component after record of completion certificate of all other components.

B. The final bill of the whole work shall be finalized and paid by the EE of major component. EE's in charge of minor component(s) will prepare and pass the final bill for their respective component of work and pass on the same to the EE of the major component for including in the final bill for composite contract.

23. Integrity Pact: The contractor shall download the Integrity Pact, which is a part of tender documents, affix his signature in the presence of a witness, and upload the same while submitting online bids. In the event of his failure to sign and upload the Integrity Pact along with other bid documents, his bid shall be rejected.
24. 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.
25. **For specialized components** of civil and E&M work (Components of work for particular specialized work shall only be considered while calculating the cost of specialized work). The specialized agency should have satisfactorily completed the said specialized work of amount as mentioned during the last 7 (seven) years. The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 07% per annum, calculated from the date of completion: The bidder should either himself meet the eligibility conditions as mentioned in the NIT or otherwise he will have to associate with an agency meeting the eligibility requirements for specialized work. The bidder shall submit details of such agency(s) as given below to the Executive Engineer of concerned component within 60 days of award of work.
    i. Name of Firm.
    ii. List of works as given in table at page no. 56 & 57 of this NIT.
    iii. Performance certificate from the Client.
    iv. Availability of manpower and machineries.

    Names of the agency(s) to be associated shall be approved by the Engineer-in-Charge of concerned components.

Executive Engineer (CD-I)
IIT Delhi, Hauz Khas
New Delhi – 110016

SECTION-I
BRIEF PARTICULARS OF THE WORK

1. The proposed site is situated at IITD Extension Campus in Sector-3, R.K.Puram, New Delhi. The proposed residential building is to be constructed in available land as given in the Site layout plan provided herein this bid document. The entire development is designed adhering to the local body norms / NBC 2016, UBBL along with compliance with ECBC 2017, relevant BIS codes etc.
2. The present tender is for construction of 80nos. 2BHK and 69nos. 1 BHK (Total 149 units) using **composite steel construction**. The approximate built-up area of the building including basements is 16580 sqm. **Due to the influence zone of the metro tunnel beneath the proposed building, the structure will be divided into two parts/towers. The first tower will be G+3 while the second tower will be 3B+G+11.**
3. The execution will be done on the basis of design, planning, drawings and details of works, prepared by the consultant appointed by the Department. The complete structural drawings shall be provided by the department and the work shall be executed at site by the contractor as per the issued GFC drawings. However, the shop drawings shall be prepared by the contractor, wherever required before the execution the work as per the direction of Engineer-in-charge. The execution of the project shall be as per CPWD specifications, relevant IS code, National Building Code-2016 and other standard specifications as applicable, except otherwise mentioned in the bidding document.
4. If any functional/live services encountered during excavation, the necessary assistance to the concerned agency shall be provided by the contractor for relocating the same. The charges for reallocation of services shall be borne by the department. However, nothing shall be paid extra to contractor for assistance.
5. The site is situated in reasonably populated locality of Delhi with significant flow of traffic on the roads leading to site where limited space is available for stacking the materials and establishment of support infrastructure during construction. The bidders shall fully understand restrictions before participating in the tender. Nothing extra shall be paid on this account. No delay or claims of any kind shall be entertained from the contractor on this account. Due to space constraint, no damages or compensation shall be payable.
6. The Contractor shall obtain all service connections like Water Supply, Sewerage, Drainage, Electric Supply, associate in applying for LAN/WAN, Telephone Lines etc. from the main lines of the respective authorities/service providers and this shall be deemed to be included in the quoted price. The cost of obtaining these service connections to be paid by contractor. The temporary connections for construction work shall be obtained by the contractor on his own expenses.
7. Testing, commissioning of all services, fittings and fixtures, equipment's after obtaining local body approval as applicable and handing over is included in the scope of work. Nothing extra shall be payable on these accounts.
8. Detailed architectural and Structural drawings (GFC's) prepared by the consultant appointed by IITD and IITD will provide the drawings to contractor after award of work as specified in IITD-6 of the NIT.
9. The defects and deficiencies found during **the defect liability period** shall be made good by the contractor at his own cost after getting instructions/notice from the Engineer-in-Charge within the time specified in such instructions/notice.
10. The scope of work shall include all activities/work starting from the given concept to completion.
11. **The contractor shall prepare and submit all "As Built Drawings" of buildings & services and other related documents both in hard copy and the soft copy in four sets duly stamped by authorized person within one month after completion. Any observation pointed out by fire department at the time of grant of fire clearance of the building, due to the poor workmanship, shall be made correct by the contractor at his own cost. An amount of Rs. 2 Crores shall be withheld from the final bill till the fire NOC is not obtained. The withheld amount shall be released only after obtaining fire NOC from the concern fire department. The contractor shall extend all cooperation and assistance to the consultant/architect appointed by IITD in obtaining Fire clearance, Occupation Certificate etc. from local body and hand over the completed project in habitable state from all perspective to the client department.**

12. The following provisions have been made in this work:

Civil Work

1. Framework built up of composite steel constructions E350 grade steel.
2. 1mm thick deck sheeting.
3. High strength friction bolts.
4. Vermiculite fireproofing paint.
5. Intumescent fire paint on exposed steel work.
6. Diaphragm wall thickness is 600mm as per drawing. Depth is assumed +3.5 M below the raft bottom.
7. 60T capacity ground anchors.
8. Deck slab is assumed for basement + Stilt roof and upwards.
9. Earthwork in excavation for foundation and basement.
10. Excavating trenches for pipe and cables.
11. Filling available excavated earth.
12. Credit of surplus excavated earth.
13. Supplying and filling sand under floors.
14. Cement concrete M-10 under raft and basement.
15. 50mm thick plinth protection
16. Centering and shuttering for foundations, pedestals, retaining walls, floors, kitchen counters, stairs, ramps etc.
17. RCC M-30 grade concrete in slabs and columns.
18. RCC M-60 grade concrete in shear walls, ramp walls, lift walls and UGT.
19. Required TMT bars for RCC work.
20. Expansion joints
21. RCC diaphragm wall.
22. Fly ash brick work
23. Granite stone on kitchen counter slab.
24. Granite sill and jamb in all windows.
25. 35mm thick, both side laminate flush door shutters, along with required fittings and fixtures.
26. Modular kitchen with necessary fittings and fixtures.
27. SS Kitchen sink with drain board.
28. Steel work in built up sections for service shaft platforms
29. SS railing in staircases.
30. Kota stone flooring in stilt floor and ramp area
31. Anti-skid floor tiles and Wall tiles in toilets and kitchen
32. Vitrified floor tiles 600x600mm in bedrooms & drawing room.
33. Granite stone flooring in entrance lobby, staircase and lift lobby.
34. Tactile on the ground floor.
35. Precast terrazzo tiles in basements.
36. UPVC rainwater pipes with necessary fittings.
37. False Ceiling - Gypsum board in Rooms & calcium Silicate + Metal Tile in Corridors.
38. 12mm and 15mm thick cement plaster on walls.
39. Acrylic emulsion paint on internal walls over cement putty.
40. Textured paint on external walls.
41. Powder coated aluminum work for door & window frames
42. Aluminum window shutters with SS fly proof mesh on internal shutters.
43. Aluminum grill on windows.
44. Structural glazing work with hermetically sealed glass panels in entrance lobby.
45. Kota stone water proofing for raft and lift wells in two layers.
46. Cementitious water proofing of sunken portion of toilets.
47. Brick bat coba on terrace.
48. 80mm thick paver blocks along with kerb stones on peripheral road.
49. Retro reflective overhead signage boards
50. Hubless centrifugally cast (spun) iron pipes for soil & waste pipe along with necessary fittings.
51. CPVC pipe for internal and external water supply.
52. Sanitary fittings and fixtures.
53. RCC NP-2 pipe for rainwater disposal.
54. Rainwater harvesting work.

55. Granite work on lift façade.
56. GRC jali on external façade.
57. SS curtain rods.
58. Wooden fire rated doors along with metal fire rated frame.
59. Noise Barrier on front boundary wall side.
60. 10mtr high temporary barricading.
61. Accessible toilet at ground floor.
62. Necessary signage and artwork for statutory approvals.
63. Aluminum and Terracotta Louvers on façade.
64. **STP SBR technology 50KL capacity and package type STP.**
65. **UGT-160 KL, OHT-45 KL and Fire tank-75KL.**
66. **Artwork for statutory approvals.**

Electrical Work:

1. Supplying and laying different sizes of copper wires in steel conduit complete as required.
2. Supplying, installation, testing and commissioning of electrical panels and distribution board of various capacities complete as required.
3. Supplying, installation, testing and commissioning of rising mains, bus trunking and cables of various sizes as complete as required.
4. Supplying, installation, testing and commissioning of earthing and lightning system for the protection of building complete as required.
5. Supplying, installation, testing and commissioning of LED light fixtures, fan etc. all complete as required.
6. Supplying, installation, testing and commissioning of 10 kVA online UPS complete as required.
7. Supplying, installation, testing and commissioning of ACTIVE and PASSIVE LAN system complete as required.
8. Supplying, installation, testing and commissioning of IPBAX system complete as required.
9. Supplying and installation and testing of Fire detection and alarm system with PA system all complete and testing and commissioning as required.
10. Supplying and installation of CCTV system complete, testing and commissioning as required.
11. Supplying, installation, testing and commissioning of 15 passenger / stretcher lift and 13 passengers gearless without machine room (MRL) all complete as required.
12. Supplying, installation, testing and commissioning of Substation equipment like 11 KV VCB HT switchboard and RMU type VCB panel with 2X1250 KVA Transformer and LT normal and emergency panel with hybrid APFC panel 400 KVAR all complete as required.
13. Supplying, installation, testing and commissioning of 125 KVA DG set with complete accessories and AMF panel as per CPCB- IV or better norm as complete as required.
14. Supplying, installation, testing and commissioning of External lighting with complete pole and fixtures all complete as required.
15. Supplying, installation, testing and commissioning of ONGRID Solar Photo voltaic power plant with mono Crystalline silicon solar cells of 100 KWp all complete as required.
16. Supplying and installation of Firefighting system all complete testing and commissioning as required.
17. Supplying and installation of Water supply system and drainage pump all complete testing and commissioning as required.
18. Comprehensive maintenance of various services and activities like Substation, DG set, Lifts, CCTV system, FAS and PA system, IPBAX system etc. repair and replacement complete as required as per terms and conditions after DLP period for 02 years.
19. Supplying and installing basement ventilation and pressurization system all complete testing and commissioning as required.

Executive Engineer (CD-I)
IIT Delhi

SECTION-II
INFORMATION & INSTRUCTION FOR BIDDERS

1. General

1.1 **Letter of transmittal and forms for deciding eligibility are given in Section III.**

1.2 All information called for in the enclosed forms should be furnished against the relevant columns in the forms. If for any reason, information is furnished on a separate sheet, this fact should be mentioned against the relevant column. Even if no information is to be provided in a column, a "nil" or "no such case" entry should be made in that column. If any particulars/query is not applicable in case of the bidder, it should be stated as "not applicable". The bidders are cautioned that not giving complete information called for in the application forms or not giving it in clear terms or making any change in the prescribed forms or deliberately suppressing the information may result in the bid being summarily disqualified. Bids made by telegram or e-mailed or telex and those received late will not be entertained.

1.3 References, information and certificates from the respective clients certifying suitability, technical knowledge or capability of the bidder should be signed by an officer not below the rank of Executive Engineer or equivalent.

1.4 The bidder may furnish any additional information which he thinks is necessary to establish his capabilities to successfully complete the envisaged work. He is, however, advised not to furnish superfluous information. No information shall be entertained after submission of eligibility criteria document unless it is called for by the Employer.

2. Definitions

2.1 In this document the following words and expressions have the meaning hereby assigned to them.

2.2 Employer: Means the BOG, IIT Delhi, acting through the Executive Engineer (CD-I), IIT Delhi.

2.3 Bidder: Means the individual, proprietary firm, firm in partnership, limited company private or public or corporation.

2.4 "Year" means "Financial Year" unless stated otherwise.

2.5 USER/CLIENT/OWNER Means Indian Institute of Technology Delhi represented by its authorized persons.

3. Method of application:

3.1 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 typewritten 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.

4. Final decision-making authority.

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

5. Particulars provisional

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

6. Site visit

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

7. Initial Criteria for Eligibility

7.1 The Bidder should have satisfactorily completed similar works during the last Seven years ending last date of the month previous to the one in which tenders are invited. For this purpose, cost of work shall mean gross value the completed work including cost of material 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.

One similar work of value not less than **Rs.79,14,20,000/-**

or

Two similar works each of value not less than **Rs.59,35,65,000/-**

or

Three similar works each of value not less than **Rs.39,57,10,000/-**

Similar work to be defined as:

Similar work shall mean works of "Construction of Building(s) with Composite Steel Structure (Structural Steel and RCC) having minimum one 8 storey building comprising of all required Civil and E&M Services and at least one basement carried out under a single contract. For this purpose, each basement, stilt constructed in the building shall be considered as a storey.

OR

Completing balance construction work of one building (i/c structural work) with Composite Steel Structure (Structural Steel and RCC) minimum up to 8 storey building comprising of all required Civil and E&M Services and at least one basement carried out under a single contract. For this purpose, each basement, stilt constructed in the building shall be considered as a storey.

Note:

a. For the purpose of similar works, works executed in India only shall be considered.

b. The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple interest rate of 07% per annum, calculated from the date of completion to previous day of last date of submission of tenders.

7.2 **The bidder should have had an Average Annual Financial Turnover of 30% of the ECPT i.e., Rs.29.68 Crores on construction works during the last three years ending 31st March 2025. (Scanned copy of the certificate from CA with UDIN to be uploaded)**. The value of annual turnover figures shall be brought to the current value by enhancing the actual turnover figures at a simple rate of 7% per annum. At the time of submission of bid contractor may upload Certificate from CA mentioning Financial Turnover and further details if required may be asked from the contractor after opening of technical bids. There is no need to upload entire voluminous balance sheet.

7.3 **The bidder should have a Banker's Certificate of 40% of the Estimated Cost i.e., for Rs.39.57 Crores from a Scheduled Commercial Bank.** The certificate should be issued in the current financial year or **net worth certificate of a minimum of Rs.9.89 Crores, issued by a certified Chartered Accountant with UDIN.**

7.4 The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last five consecutive balance sheets (standalone financial statement), duly certified and audited by the Chartered Accountant to be uploaded.

7.5 The bidder 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: The bidder should submit bidding capacity as per **FORM C-3**.

7.6 The bidder must not be backlisted / debarred / put on holiday list from any government department during the last seven years ending on last day of submission of bid. **FORM-G.**

8. Financial information

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

9. Experience of similar works

Bidder should furnish the List of eligible similar nature of works successfully completed during the

last seven years in (Form "C") and ongoing works as well (Form C-1).

10. Organization information

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

11. Letter of transmittal

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

12. Evaluation Criteria

12.1 The detailed submitted by the bidders will be evaluated in the following manner:

12.1.1 The initial criteria prescribed in para 7.0 above in respect of experience of eligible similar works completed, loss, Banker's certificate and financial turnover will first be scrutinized and the bidder's eligibility for the work be determined.

12.1.2 The bidders will be evaluated for Initial Eligibility Criteria laid in Para 7 and those who qualify these criteria, will be shortlisted for opening of Financial Bid.

13. Opening of Financial bid:

After technical evaluation of applications, a list of technically qualified 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. **The bidder who quotes the lowest rates will be designate as the L-1 bidder.**

14. Award Criteria

14.1 The work shall be awarded to the L-1 bidder. However, the employer reserves the right, without being liable for any damages or obligation to inform the bidder, to:

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

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

Executive Engineer (CD-I)
IIT Delhi

SECTION-III
PROFORMA FOR INFORMATION REGARDING ELIGIBILITY

LETTER OF TRANSMITTAL

From:

To
The Executive Engineer (CD-I)
IIT Delhi, Hauz Khas,
New Delhi - 110016

Subject: **Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.**

Sir,

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

1. I/we hereby certify that all the statement made and information supplied in the enclosed forms "A" to "I" and accompanying statements are true and correct.

2. I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.

3. I/we submit the requisite certified Banker's or Net worth Certificate. I/we authorize Executive Engineer (CD-I), IIT Delhi to approach the bank issuing the Banker's certificate to confirm the correctness thereof. I/we also authorize Executive Engineer (CD-I), IIT Delhi to approach the 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:

Name of Work	Certificate From

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

Certificate: It is certified that the information given in the 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 is found to be incorrect.

Enclosures: Seal of Bidder
Date of Submission Signature(s) of Bidder(s)

FINANCIAL INFORMATION (FORM 'A')

1. 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				
		2020-21	2021-22	2023-23	2023-24	2024-25
1	**Gross Annual Turnover** on Construction Works					
2	**Profit / Loss** (Standalone Financial Statement)					

2. Financial arrangements for carrying out the proposed work.

Signature of Chartered Accountant with Seal Seal & Signature of Bidder(S)

FORM "B"

BANKER'S CERTIFICATE FROM A SCHEDULED COMMERCIAL BANK

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

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

(Signature) For the Bank

FORM "B-1"

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

NOTE:

1. Banker's or Net Worth Certificates should be on letter head of the Bank, addressed to tendering authority.
2. In case of Partnership firm, certificate should include names of all partners as recorded with the bank.

FORM 'C'

DETAILS OF ELIGIBLE SIMILAR NATURE OF WORKS COMPLETED DURING THE LAST SEVEN YEARS ENDING PREVIOUS DAY OF LAST DAY OF SUBMISSION OF TENDERS

S. No.	Name of Work 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 the 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 Arbitrator / Arbitration Tribunal.

Signature of Bidder(s)

FORM 'C-1'

DETAILS OF PROJECTS UNDER EXECUTION / ONGOING WORKS

S. No.	Name of Work 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 work	Slow progress if any and reason thereof	Name and address / telephone number of the officer to whom reference may be made	Remarks
1	2	3	4	5	6	7	8	9	10

Signature of Bidder(s)

FORM 'C-3'

CALCULATION OF BIDDING CAPACITY

DETAILS OFEXISTING COMMITMENTS AND ONGOING WORKS

S. No.	Name of Work / Project and Location	Owner or sponsoring organization	Contract Value in crore of rupees	Date of commencement as per contract	Stipulated date of completion	Up to date percentage progress of work	Remaining work in percentage (100-column 7)	Existing commitment Column 4 x Column 8 / 100	Name and address / telephone number of the 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) = ……

Bidding 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 THE WORKS REFERRED IN FORM-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	
(i)	Whether case of levy of compensation for delay has been decided or not	
(ii)	If decided, amount of compensation levied for delayed completion, if any	
8.	Amount of Reduced Rate Items, if any	
9.	Performance Report:	
(i)	Quality of Work	Outstanding /Very Good/Good/Poor
(ii)	Financial Soundness	Outstanding /Very Good/Good/Poor
(iii)	Technical Proficiency	Outstanding /Very Good/Good/Poor
(iv)	Resourcefulness	Outstanding /Very Good/Good/Poor
(v)	General Behavior	Outstanding /Very Good/Good/Poor
10.	Details of Types of Structure / construction Technology / No. of Stories / Basement etc.	
11.	Details of E&M Services Executed.	
12.	Remarks (if any) :	

Dated: **Executive Engineer or Equivalent with Stamp**

FORM 'E'
STRUCURE & ORGANISATION

1. Name & Address of the bidder
2. Telephone no./ Telex no./ Fax no.
3. Legal status of the bidder (attach 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 photocopy)

Organization / Pace of registration	Registration No.

5. Name 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, ever been convicted by court of law? If so, give details.
8. Has the bidder or any constituent partner in case of partnership firm / limited company, ever been debarred / blacklisted for tendering in any organization at any time? If so, give details.
9. In which field of Civil Engineering construction the bidder has specialization and interest?
10. Any other information considered necessary but not included above.

Signature of Bidder(S)

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

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

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

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

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

Signature of notary with seal

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

Note: The above undertaking to be furnished on an affidavit on a 'non-judicial' stamp paper of Rs.100/-.(Scanned copy of the notarized affidavit to be uploaded at the time of submission of bid. The stamp paper shall be purchased/ notarized between date of publishing and last date of submission of bids beside this NIT/Tender ID and name of work must be mentioned on the affidavit).

FORM 'G'
PROFORMA OF AFFIDAVIT FOR NON - BLACK LISTING

I/we undertake and confirm that our firm / partnership firm / company 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 IITD 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)

Signature of notary with seal

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

Note: The above undertaking to be furnished on an affidavit on a 'non-judicial' stamp paper of Rs.100/-.(Scanned copy of the notarized affidavit to be uploaded at the time of submission of bid. The stamp paper shall be purchased/ notarized between date of publishing and last date of submission of bids beside this NIT/Tender ID and name of work must be mentioned on the affidavit).

FORM 'H'
DECLARATTION ABOUT SITE INSPECTION

To
The Executive Engineer (CD-I)
IIT Delhi, Hauz Khas,
New Delhi - 110016

Subject: Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.

Dear Sir,

It is hereby declared that as per IITD-6 of NIT, "I/we the bidder inspected and examined the subject site and its surroundings and satisfy myself/ourselves before submitting my/our 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 I/ we may require and in general shall myself/ ourselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect my/our bid. I/we the bidder shall have full knowledge of the site and no extra c harges consequent upon any misunderstanding or otherwise shall be claimed at later date. I/we the bidder shall be responsible for arranging and maintaining at own cost all materials, tools & plants, water, electricity, access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by me/us implies that I/we has read this notice and all other contract documents and has made myself/ourselves aware of the scope and specifications of the work to be done and of local conditions and other factors having a bearing on cost on the execution of the work.

Seal of Bidder
Signature(s) of Bidder(s)

Note: The above declaration to be furnished on the letter head of the bidder.

FORM 'I'
AFFIDAVIT FOR NON-EXECUTION OF WORK ON BACK-TO-BACK BASIS

Subject: **Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.**

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 IITD or if it is found that any information has been concealed, then I/we shall be debarred for tendering in IITD 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.

Signature of notary with seal

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

Note: The above undertaking to be furnished on an affidavit on a 'non-judicial' stamp paper of Rs.100/-.(Scanned copy of the notarized affidavit to be uploaded at the time of submission of bid. The stamp paper shall be purchased/ notarized between date of publishing and last date of submission of bids beside this NIT/Tender ID and name of work must be mentioned on the affidavit).

PART-B

Tender Form, Schedules A to F, General Conditions of Contract, Special & Additional Conditions of Contract, Associated Specialized Agencies

INDIAN INSTITUTE OF TECHNOLOGY DELHI
HAUZ KHAS, NEW DELHI – 110016

Percentage Rate Tender & Contract for Composite Work (IITD FORM-7)

Tender for the work of: **As per NIT Form-6 Tender Notice**

1. To be submitted **as per tender notice**
2. To be opened in presence of bidders who may be present at **as per tender notice** in the office of **D.R. (Store).**

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, Additional 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 Board of Governors, IIT Delhi, Hauz Khas, New Delhi - 16 within the time specified in Schedule 'F' viz., schedule of quantities and in accordance in all respect with the specifications, designs, drawing and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

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

A copy of Earnest Money deposit of prescribed amount deposited in the form of Online payment, Insurance Surety Bonds, Account Payee Demand Draft, Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee (as prescribed) issued by a Scheduled Commercial Bank, is scanned and uploaded *(strike out as the case may be)*. If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said the Board of Governors, IIT Delhi, Hauz Khas, New Delhi - 16 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 Board of Governors, IIT Delhi, Hauz Khas, New Delhi - 16 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 of the tender form.

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

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

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

Dated: Signature of Contractor

Witness: Postal Address

Address:

Occupation:

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for an on behalf of The Board of Governors, IIT Delhi, Hauz Khas, New Delhi - 16 for a sum of (Rupees……..).

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

a) …….
b) ……
c) ……

Dated:

(For & on behalf of Board of Governors, IIT Delhi)

Signature……..……
Designation……..……

INTEGRITY PACT E-TENDERING	IITD

To,

……..,

……..,
……..

NIT No. : ……/IITD/EE (CD-I)/2025-26
Name of Work: Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.

Dear Sir,

It is hereby declared that IITD is committed to follow the principle of transparency, equity, and competitiveness in public procurement.

The subject Notice Inviting Tender (NIT) is an invitation to offer made on the condition that the Bidder will sign the integrity Agreement, which is an integral part of tender/bid documents, failing which the tenderer / bidder will stand disqualified from the tendering process and the bid of the bidder would be summarily rejected.

This declaration shall form part and parcel of the Integrity Agreement and signing of the same shall be deemed as acceptance and signing of the Integrity Agreement on behalf of the IITD

Yours faithfully

Executive Engineer (CD-I)

z

C—NIL I----NIL O--- NIL EE (CD-I) EE (ED-I) JE(E) AE(C)

ACCEPTANCE TO EXECUTE INTEGRITY PACT	IITD

(To be signed by bidder and upload the scanned copy)

To,
Executive Engineer (CD- I)
IIT Delhi, Hauz Khas,
New Delhi – 110016

Subject : Submission of Bid for "Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.

Dear Sir,

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

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

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

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

Yours faithfully

(Duly authorized signatory of the Bidder)

INTEGRITY PACT E-TENDERING	IITD

To be signed by the bidder and same signatory competent / authorized to sign the relevant contract on behalf of IITD

INTEGRITY PACT

This Integrity Pact is made at ..... on this ..... day of..... 20.....

BETWEEN

The Board of Governors, IIT Delhi, Hauz Khas, New Delhi - 16 represented through Executive Engineer (CD-1) IIT Delhi. (hereinafter referred to as the Principal/Owner, which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assignees)

AND

.....

(Name and Address of the Bidder)

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

PREAMBLE

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

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

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

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

Article 1: Commitment of the Principal/Owner

1. The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:
   a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
   b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
   c) The Principal/Owner shall endeavour to exclude from the Tender process any person

whose conduct in the past has been of biased nature.

2. If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

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

1. It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of fraud or corruption or Coercion or Collusion of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
2. The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
   a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
   b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
   c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contract(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
   d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly, Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
   e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
3. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
4. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.
5. The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (which shall include the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly,

where potential or actual injury may befall upon a person, his/ her reputation or property) to influence their participation in the tendering process.

Article 3: Consequences of Breach

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

1. If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days' notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and determined by the Principal/Owner. Such exclusion may be forever or for a limited period as decided by the Principal/Owner.
2. **Forfeiture of EMD/Performance Guarantee/Security Deposit**: If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.
3. **Criminal Liability**: If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.

Article 4: Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
2. If the Bidder makes an incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
3. If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

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

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

Article 6- Duration of the Pact

This Integrity Pact begins when both the parties have legally signed it. It expires for the

Contractor 12 months after the completion of work under the contract or expiry of defect liability period or last payment made under the contract, whichever is later and for all other bidders, 6 months after the Contract has been awarded. If any claim is made/lodged during this time, the same shall be binding and continue to be valid despite the lapse of this Integrity Pact as specified above, unless it is discharged/determined by the competent authority of IIT Delhi.

Article 7- Other Provisions

1. This Pact is subject to Indian Law, place of performance and jurisdiction is the Headquarters of the Division of the Principal/Owner, who has floated the Tender.
2. Changes and supplements need to be made in writing. Side agreements have not been made.
3. If the Contractor is a partnership or a consortium, this Pact must be signed by all the partners or by one or more partner holding power of attorney signed by all partners and consortium members. In the case of a Company, the Pact must be signed by a representative duly authorized by board resolution.
4. Should one or several provisions of this Pact turn out to be invalid, the remainder of this Pact remains valid. In this case, the parties will strive to come to an agreement to their original intensions.
5. It is agreed terms and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Pact, any action taken by the Owner/Principal in accordance with this Integrity Pact or interpretation thereof shall not be subject to arbitration.
6. In view of the nature of integrity pact, the Integrity Pact is irrevocable and shall remain valid even if the main tender/contract is terminated till the currency of the integrity pact.

Article 8- LEGAL AND PRIOR RIGHTS

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

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

…….....
(For and on behalf of Principal / Owner)

.....
(For and on behalf of Bidder/Contractor)

WITNESSES:

1. .....
   (signature, name and address)

2. .....
   (signature, name and address)

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

On non- Judicial stamp paper of minimum Rs.100/-
(Guarantee offered by Bank to IIT Delhi in connection with the execution of contracts)

FORM OF BANK GUARANTEE FOR EARNEST MONEY DEPOSIT / PERFORMANCE GUARANTEE / SECURITY DEPOSIT / MOBILISATION ADVANCE.
Ref. _____ No. _____

Bank Guarantee No. _____

Dated: _____

To
The Registrar
Indian Institute of Technology Delhi
Hauz Khas, New Delhi – 110 016

Dear Sir,

1. Whereas the Executive Engineer (name of division) IIT Delhi on behalf of the Board of Governors, IIT Delhi (hereinafter called "The Government") has invited bids under……(NIT number) dated…… for ……. (Name of Work) …… The Government has further agreed to accept an irrevocable Bank Guarantee for Rs. ..... (Rupees only) valid up to ..... (date)*..... as ***Earnest Money Deposit*** from …… (name and address of the contractor) (herein 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) ……., IIT Delhi on behalf of the Board of Governors, IIT Delhi (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 up to ..... (date) as ***Performance Guarantee / Security Deposit / Mobilization Advance*** from the said Contractor for compliance of his obligations in accordance with the terms and conditions of the agreement

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

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

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

5. We, ... (indicate the name of the Bank) ..... , further agree that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation here under to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability

by reason of any such variation or extension being granted to the said Contractor or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

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

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

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

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

(Signature)
Full Name:
Designation:
Name & Address of Bank (in legible letters):

Stamps of Attorney as per Power of Attorney No.:

Dated: _____

Witness: 1

Signature

Full Name and Address

Witness: 2

Signature

Full Name and Address

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

PROFORMA OF SCHEDULES	IITD

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

SCHEDULE 'A' Schedule of quantities (as per PWD-3)		As attached with the NIT
SCHEDULE 'D' Extra schedule for specific requirements/document for the work, if any		Nil
SCHEDULE 'E' Reference to General Conditions of contract		CPWD GCC for Construction Works 2023 along with correction on slips / amendments issued up to the last date of submission of bid.
Name of Work		Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.
Estimated Cost of Work		Rs.98,92,74,696/-
Earnest Money		Rs.1,08,92,747/- (To be returned after receiving Performance Guarantee.)
Performance Guarantee		**5% of Tender value**
Security Deposit		2.5% of Tender Value
SCHEDULE 'F' **GENERAL RULES & DIRECTIONS**		
1. Officer inviting tender		Executive Engineer (CD-I), IIT Delhi.
2. 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
Definitions		
Engineer-in-Charge		Executive Engineer (CD-I), IIT Delhi for Major Component i.e., Civil Works. Executive Engineer (ED-I), IIT Delhi for Minor Components i.e., E & M Works.
Accepting Authority		Director, IIT Delhi
Percentage on cost of materials and labour to cover all overheads and profits.		15% (7.5% OH + 7.5% CP)
Standard Schedule of Rates		**Civil Work:** DSR 2023 with up-to-date correction slip + 0.973 GST correction Factor + 3% Cost Index on DSR Items + Market Rate Items. **E&M Work:** DSR 2025 with up-to-date correction slip + Market Rate items.
Department		Works Department, IIT Delhi
Standard IITD contract Form		CPWD General Conditions of Contract for Construction Works 2023 with amendments up to last date of submission of bid.
Clause 1		15 (Fifteen) days

i. Time allowed for submission of Performance Guarantee, Programme chart (time and progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance.		
ii. Maximum allowable extension with late fee at 0.1% per day of performance guarantee amount beyond the period provided in (i) above.		7 (Seven) days
Clause 2 Authority for fixing compensation under clause 2.		Director, IIT Delhi
Clause 5 Number of days from the date of issue of letter of acceptance for reckoning date of start.		10 (Ten) days

MILESTONE(S)

S.No.	Description of milestone (Physical)	Period for completion from date of start in days/months	Amount to be withheld in case of non-achievement of milestone.
1.	Mobilization of materials, T&P and testing laboratory including its equipment's, erection of barricading, approval of design mix, water & electrical arrangements, Site office of 100 sqm. as per the approved plan, etc. all site establishment works including site barricading, approval of agency for specialized work (civil & MEP work), Excavation work, PCC work in Foundation and retaining wall.	2 Months	0.25% of the Tender Amount
2.	Completion of Steel/RCC works up to Plinth level i/c diaphragm wall. Submission and approval of Technical Datasheet of items related to Civil & MEP works.	5 Months	0.50% of the Tender Amount
3.	Completion of all Steel/RCC work up to 2nd floor level and approval of the Material for all items of civil and Preparation of sample toilet and sample room, complete brick work up to first floor. Placement of order for transformers, DG set, panels, lift, UPS, VRV/VRF related items, Solar plant, hydraulic car parking system, Pumps, shop drawings for STP work.	7 Months	0.25% of the Tender Amount

4.	Completion of Steel/RCC work up to 6th Floor level, complete brick work up to 4th floor. Delivery of door & windows. Factory inspection of various major MEP related items and delivery of rising mains, MDBs for power and lights.	9 Months	0.25% of the Tender Amount
5.	Completion of Steel/RCC work up to 11th floor level, complete brick work up to 9th floor, entire plaster and flooring up to 5th floor including plumbing work. Fixing of door & window up to 3rd floor and supply of light fixtures and fans, wires & cables, indoor and outdoor unit of VRV, HT Panel, CSS, LAN items, IP PBX items, Hydraulic Car Parking system, Baggage Scanner, DFMD, Boom Barrier, UPS, Solar PV Panels with GI Structure.	12 Months	0.25% of the Tender Amount
6.	Completion of all Steel / RCC work including mumty i/c waterproofing, entire brick work, plastering, flooring and plumbing up to terrace level, fixing of door windows at all floors, finishing work up to terrace and, electrical conduiting, fire alarm conduiting, wiring of all electrical services and delivery of all solar PV panels.	14 Months	0.25% of the Tender Amount
7.	Completion of Plumbing, Flooring, False Ceiling, Railing work in staircases, all finishing up to 6th floor. Exterior plaster, façade work and completion of wiring, cabling for all sub-works and fixing of distribution boards, rising mains, wet riser & sprinkler header, etc. up to top level.	16 Months	0.25% of the Tender Amount
8.	Completion of service connection of water, sewerage, drainage, fixing of signage, blinds and curtains rod, Artwork, external façade, glass canopy. And Completion of Access control, LAN system, IP based EPABX system, lift license and CEA approval. Testing of all services. Completion of DG exhaust structure.	17 Months	0.125% of the Tender Amount
9.	Completion of all balance activities, testing & commissioning of both Civil and E&M works (Internal & External), defect rectification, cleaning work & site clearance in all respect, submission of as built drawings & handing over of the building.	18 Months	0.375% of the Tender Amount

Time allowed for execution of work		18 Months
Authority to decide:		
Extension of time		Director, IIT Delhi
Rescheduling of milestones		Director, IIT Delhi

Shifting of date of start in case of delay in handing over of site		Institute Engineer
Clause 6		Applicable, (CMB)
Clause 7 Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment.		For Civil works Minimum Rs. 250 Lakhs up to first Three RA Bills and for rest RA Bills 500 Lakhs except Final Bill. For Electrical works Minimum Rs. 150 Lakhs up to first Three RA Bills and for rest RA Bills 200 Lakhs, except Final Bill. However, Engineer-in-Charge at his discretion may release monthly payment even at a lesser amount subjected to availability of funds. But the contractor cannot claim it as a matter of right and no interest payment as per clause 7 is permitted.
Clause 7A Whether clause 7A shall be applicable		Applicable, as per institute policy.
Clause 10B		Applicable
Clause 10C Component of labour expressed as a percentage of value of work.		Applicable 25% for Civil Work 15% for Electrical Work
Clause 10CC		Not Applicable
Clause 11 Specifications to be followed for execution of work		**Civil Work**: 1. CPWD Specifications 2019, Volume- I and II and PAR- 2025 as amended up to last date of submission of bid. 2. CPWD Green Rating Manual 2019 as amended up to last date of submission of bid. 3. CPWD Handbook on Safety, Health and Environment as amended up to last date of submission of bid. 4. Harmonized Guidelines & Standards for Universal Accessibility in India - 2021 as amended up to last date of submission of bid. **Electrical Work:** CPWD General Specifications for Electrical Works (Part I for Internal) 2023, (Part II for External) - 2023, (Part III for Lift & Escalators) - 2003, (Part IV for Sub Station) - 2013, (Part V for Wet Riser & Sprinkler System) - 2020, (Part VI for Fire Detection & Alarm System) 2018, (Part VII for DG Sets) - 2013, (Part VIII for Gas Based Fire Extinguishing System) - 2013 and CPWD General Specifications for HVAC Works –

		2024 or latest version of above specifications as issued / amended up to last date of tender submission. **Others:** ECBC 2017, NBC 2016 and relevant BIS codes, ASHRAE Guidelines modified and corrected up to last date of submission of bids.
Clause 12 **Type of work**		New / Original Work
12.2 & 12.3 Deviation limit beyond which clauses 12.2 & 12.3 shall apply for building work.		100%
12.4(i) Deviation Limit beyond which clauses 12.2 & 12.3 shall applicable for foundation work (Except items mentioned in earthwork subhead of DSR and related items)		100%
12.4(ii) Deviation Limit for Items in earth work subhead of DSR and related items		100%
Clause 16 Competent Authority for deciding reduced rates		Institute Engineer
Clause 17 Contractor liable for damages, defects during defect liability period		Defect liability period shall be **24 months** after completion of the work.
Clause 18 List of mandatory machinery, tools & plants to be deployed by the contractor at site.		As per requirement.
Clause 19 Authority to decide penalty for each default.		Engineer-in-Charge. (Major / Minor Component of work)
Clause 25		Applicable. The Dispute Resolution Committee shall be constituted by the competent authority of the Institute, if required.

Clause 32: Requirement of Technical Staff(s) & Recovery Rate

Cost of Work (Rs. In Crores)	Requirement of Technical Staff		Minimum experience (Years)	Designation of the Technical Staff	Rate at which recovery shall be made from contractor in the event of not fulfilling the provision of clause 32
	Qualification	Number (of Major + Minor Component)			
More than 50 to 100	Graduate Engineer	1	20 (and having experience of one similar nature of work)	Project Manager	Rs.60,000/- per month
	Graduate Engineer	1+1	12 (and having experience of one similar nature of work)	Deputy Project Manager	Rs.40,000/- per month per person
	Graduate Engineer or Diploma Engineer	1+1	5 or 10 respectively	Project / Site Engineer	Rs.25,000/- per month per person
	Graduate Engineer	1+1	8	Quality Engineer	Rs.25,000/- per month
	Diploma Engineer	1	8	Surveyor	Rs.15,000/- per month
	Graduate Engineer	1+1	6	Project Planning /Billing Engineer	Rs.20,000/- per month per person

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

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

Clause 38

i)	Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2023 with up-to-date correction printed by C.P.W.D.	
ii)	Variations permissible on theoretical quantities	
a)	Cement:	
	For works with estimated cost put to tender not more than Rs.25 lakh.	3% plus/minus.
	For works with estimated cost put to tender more than Rs.25 lakh	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 (Two percent)
d)	All other materials	Nil

ESTABLISHING SITE LABORATORY AND TESTING MATERIAL

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

S.No.	Equipment	Numbers
1	150MT compression testing machine, electrical-cum-digital	1
2	Slump cone, steel plate, tamping rod, steel scale, scoop	2
3	Vicat Apparatus with Desk pot	1
4	Megger & Earth Resistance Tester	1
5	Pumps and pressure gauges for hydraulic testing of pressure	1
6	Weighing scale platform type 100 Kg	1
7	Graduated glass measuring cylinder of various capacity	As per requirement
8	Sets of sieves of 450mm internal dia for coarse aggregate [100mm, 80mm, 40mm, 2mm, 12.5mm]	1 sets
9	Sets of sieves of 200mm internal dia for fine aggregate [4.75mm; 2.36mm; 1.18mm; 600microns; 300 microns & 150 micron, with lid and pan]	1 sets
10	Sieve Brushes and sieve shaker capable of 200mm and 300mm dia sieves, manually operated with timing switch assembly	1
11	Cube moulds size 70mmx70mmx70mm	12
12	Cube moulds size 150mmx150mmx150mm	36
13	Ultrasonic Test Equipment (For concrete)	1
14	Hot air oven- temp. Range 50°C to 300°C-sensitivity 1 degree	1
15	Electronic balance 600gx0.1g., 10kg	2
16	Physical balance weight up to 5 kg	2
17	Digital thermometer up to 150oC	3
18	Air Content of concrete testing machine	1
19	Measuring jars 100ml, 200ml, 500ml	5 Nos each size
20	Gauging trowels 100mm & 200mm with wooden Spatula 100mm & 200mm with long blade wooden handle	5 5
21	Vernier calipers 12" & 6" size	3 each
22	Digital pH meter- least count 0.01mm	2 each
23	Digital Micrometer- least count. 0.01mm	2 each
24	Digital paint thickness meter- for steel 500 microns	2
25	GI tray 600x450x50mm, 450x300x40mm, 300x250x40mm	3 Nos each
26	Electric Motor mixer 0.25 cum capacity	1
27	Rebound hammer- test digital rebound hammer	1
28	Screw gauge 0.1mm-10mm, least count 0.05	2
29	Water testing kit	1
30	Motorized sieve shaker	1
31	Pruning Rods 2 Kg weight length 40 cm and ramming face 25 mm2	2
32	Extra Bottom plates for 15 cm cube mould	12
33	Standard Vibration Table for gauging the Cubes	1

34	Pocket concrete penetrometer 0 to 50kg/sq.cm	3
35	Concrete temperature measuring thermometer with Brass protections heath0- 100 degree centigrade.	2
36	Mortar Cube vibrator	1
37	Dial type spring balance preferably with zero correction knob capacity 100 kgs. Reading to ½ kg.	2
38	Counter scale capacity 1 kg and 10 kg	2
39	Iron Weight of 5 kg, 2 kg, 1 kg, 500 gm, 20 gm, 100 gm	2 each
40	Brass Weight of 50 gm, 2 gm, 10 gm, 5 gm, 2 gm, 1 gm	2 each
41	Measuring cylinder TPX or Poly propylene capacity 100 ml, 500 ml, 250 ml, 100 ml	3 each
42	Pyrex, corning or Borosil beakers with cover capacity 500 ml, 20 ml, 50ml.	3 each
43	Wash Bottles capacity 500 ml	3
44	Thermometers 1-100 degree centigrade / max. and Min/ Dry and wet with table	3
45	Set of box spanner ratchet	2
46	Hammer 1lb & 2lb	3 each
47	Distance metre (of 100 metre)	5
48	Hacksaw with 6 blades	4
49	Measuring tape (5 metre)	5
50	Depth gauge 2 cm	5
51	Shovels & Spade	4
52	Steel plates 5 mm thick 75x75 cm	4
53	Plastic or G.I. Buckets 15 ltr, 10 ltr, 5 ltr	2 each
54	Wheelbarrow	3
55	Floor Brushes, hair dusters, scrappers, wire brush, paint brushes, shutter steel plat oil, kerosene with stove etc.	3 each
56	Concrete Core cutter Machine	2
57	Moisture Meter	2
58	Any other equipment for site tests as outlined in BIS codes and as directed by the Engineer-in-charge.	As per requirement
	List of Machineries, Tools & Plants at site	
59	Builders hoist	1
60	Centralized concrete batch mix plant of minimum capacity 30 cum per hour (fully automatic with computer control)	As per requirement
61	Excavator cum loader (JCB 3D model or equivalent).	1 or more
62	Compressor machine minimum 20 CFM with rock Breaker.	As per requirement
63	DG set of minimum capacity 62.5 KVA.	1
64	Transit mixers.	As per requirement
65	Concrete pump/ boom pump	1
66	Needle Vibrators	15
67	Screed leveler	3
68	Plate Vibrator	3
69	Dumper/Tipper	As per requirement
70	Reinforcement bending machine.	2
71	Reinforcement cutting machine.	2
72	Power driven earth rammer (Soil compactor).	2

73	Total station	1
74	Water tanker (Minimum capacity of 5000 liters)	1
75	Welding machine 400 Ampere	2
76	Screener for coarse sand and fine sand	2
77	Centrifugal mono block water pump minimum capacity 2 HP	2
78	Road roller / Vibratory roller 8 to 10 tons.	As per requirement
79	Drilling machine	1 Nos.
80	Air compressor	1 Nos.
81	Floor grinding/polishing machines	2 Nos.
82	Granite cutting machine	2 Nos.
83	Ceramic tile cutting machine	2 Nos.
84	Granite hand polishing machine	2 Nos.
85	Mobile/ Fixed tower crane	1 Nos.
86	Any other machinery required for completion of the work as per decision of Engineer-in-charge.	As per Actual Requirement

1. The above list is only indicative and not exhaustive. The bidder may be required to deploy more T&P as per requirement of work. Nothing extra on account of additional deployment shall be payable.
2. All the above plants & equipment's are to be deployed as and when required or directed by Engineer-in-Charge.
3. No claim shall be entertained regarding idling of machineries/ manpower/ tools/ plants etc. during the currency of work.
4. The site laboratory with the equipment's as specified above shall be established, made functional and maintained within two months from the commencement date without any extra cost to the department. In case of non-compliance / delay in compliance in this, a recovery @ Rs.5,000/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor. Decision of Engineer-in-charge shall be final and binding in this regard.

ASSOCIATE SPECIALIZED AGENCY

1. The following Specialized works shall be carried out by specialized agencies / agency on their own if they have experience of
   a) 3 similar works of 40 % value of specialized work component of tendered amount.
   b) 2 similar works of 60 % value of specialized work component of tendered amount.
   c) 1 similar work of 80 % value of specialized work component of tendered amount.
2. **Specialized work / Associate Works:**

   The bidder should either meet the eligibility conditions for the work as above or otherwise he will have to associate with an agency meeting the eligibility requirements as mentioned in the table for specialized works after award of work and has to submit details of such agency(s) conforming eligibility conditions as defined in the bid document to the Engineer in charge before taking up specific component. The names of the agency(s) to be associated shall be approved by the Engineer-In-Charge of that component. The contractor of the appropriate class shall have to associate other agency(s) for execution of each of the work(s), which fulfils the eligibility criteria as defined after taking prior approval. The Composite Contractor and the associated specialized agencies shall give the required affidavit to confirm their association. The Engineer-In-Charge may approve change of sub agency in case it is required during the currency of contract. However, the composite category contractor shall also be eligible to carry out himself any or all these works without associating any specialized agency provided: -

A. He fulfills the prescribed eligibility criteria respectively for these work(s).

OR

B. He directly procures the equipment of approved make from manufacturers and gets it installed from OEM / authorized agency / service provider of the manufacturer or specialized agency as per criteria mentioned.

3. The main contractor, if does not fulfil the criteria himself, shall have to associate with specialized agency fulfilling the following eligibility criteria having successfully completed during last seven years ending up to previous day of last date of submission of tender as given below with completion certificate issued by an officer not below the rank of Executive Engineer or Equivalent duly attested. The Completion certificate should contain the name of the contractor with address, Name of work and location, date of start of work, actual date of completion, amount of work done, satisfactory performance etc.
4. 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 / MOU 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. 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.
5. The main contractor shall submit the credential of specialized agency well in advance but not later than 60 days from date of start of work or 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 with eligibility criteria as

mentioned above.

6. The main contractor cannot work as a specialized Agency unless his name is approved as specialized agency by Engineer-in-charge in accordance with Sr. No.2 above.

The following works are considered as specialized work.

S. No.	Specialized work(s) / item of work(s)	Value of Specialized component (the cost is approximately rounded off and for eligibility of specialized agencies.)	Definition of Similar works	Eligibility criteria of associate agencies
1	Water proofing treatment work	96 Lakhs	Water proofing treatment work	The associate agency should have successfully completed works, as mentioned under, during the last 7 years ending previous day of last date of submission of tender. (i) Three similar work each costing not less than 40% of value of corresponding specialized item. or (ii)Two similar works each costing not less than 40% of value of corresponding specialized item. or (iii) One similar work costing not less than 80% of value of corresponding specialized item. The value of executed similar work shall be brought to the current costing level by enhancing the actual value of work at a simple rate of 7% per annum calculated from the date of completion to the previous day of last day of submission of bids. Similar work means, the works done under Government / Central Public Sector
2	Diaphragm Walls	271 Lakhs	Construction of Diaphragm walls.	
3	Expansion Joints	25 Lakhs	Providing and fixing of expansion joint system	
4	Vermiculite Fireproofing	163 Lakhs	Providing and Applying Vermiculite Fire Proofing protection for composite steel structure.	
5	Intumescent Fire Paint	131 Lakhs	Providing & applying intumescent fire retarding coating	
6	Artwork	8.50 Lakhs	Artwork	
7	ETP	29 Lakhs	S/I/T/C of common Effluent Treatment Plant of min. capacity of 25 cum per day.	
8	LAN	503 Lakhs	S/I/T/C of Passive & Active LAN system	
9	Fire Detection & Alarm System and PA System	42 Lakhs	S/I/T/C of Fire Detection & Alarm System and PA System	
10	CCTV	108 Lakhs	S/I/T/C of CCTV System	

11	LIFTS	53 Lakhs	S/I/T/C of Passenger Lifts	Undertaking / State Public Sector Undertaking / Central Autonomous bodies / State Autonomous bodies / City Development Authority / Municipal Cooperation of City formed under any act by Central / State Government and published in Central / State Gazette.
12	SUBSTATION EQUIPMENTS	278 Lakhs	S/I/T/C of Substation Equipments	
13	DG SET	09 Lakhs	S/I/T/C of DG Sets of atleast 80% capacity of the DG set mentioned in SOQ.	
14	Solar Power Generation System	278 Lakhs	S/I/T/C of Solar Power Generation System	
15	Fire Fighting System	93 Lakhs	S/I/T/C of Fire Fighting System	
16	Basement Ventilation & Pressurization	111 Lakhs	S/I/T/C of Basement Ventilation & Pressurization	
17	Water Supply and Drainage Pump	9 Lakhs	S/I/T/C of Water Supply and Drainage Pump	

GENERAL CONDITIONS OF CONTRACT - 2023

1. Latest edition of "General Conditions of Contract for Construction Work - 2023 " unless specified in the NIT as amended / modified up to the last date of submission of Tenders, which is available in market as CPWD publication and also available on CPWD official website at https://cpwd.gov.in/Documents/cpwd_ publication.aspx shall be deemed to be part of the Tender document and Agreement.
2. The GCC is amended from time to time through issue of OMs under series DG/CON which are available on CPWD official website at http://www.cpwd.gov.in/Documents/Official Circulars/ DG CON. These amendments/modifications issued after publication of above GCC and up to last date of submission of Tenders shall be deemed to be part of the Tender document and Agreement.
3. The GCC and its amendments as mentioned above, though not attached with this tender document, shall be deemed to be part of the Tender document and Agreement to be signed with the successful bidder.

SPECIFICATIONS FOR STEEL CONSTRUCTION

SUPPLY, FABRICATION, TRANSPORTATION, ERECTION AND PAINTING SPECIFICATIONS OF STRUCTURAL STEEL PLATE GIRDER AND OTHER STRUCTURAL ELEMENTS

1. STRUCTURAL STEELWORK SPECIFICATIONS- GENERAL

1.1. Scope of Specification

This specification covers the scope of work of structural steel works, submittals by the Contractor, applicable codes of practice for structural steel work and the specifications for the materials to be used, including steel, bolts & nuts, washers etc. and the storage thereof.

1.2. Scope of Work

The scope of work for the contractor in respect of structural steel work shall cover, but shall not be limited to the following:

i. Preparation of complete detailed shop fabrication drawings by using latest software like Tekla or any superior, based on the design drawings for approvals required for all the permanent structures.
ii. Submission of revised design, with calculations and detailed fabrication drawings, in case any substitution of the designed sections is required.
iii. Submission and getting approval of shuttering, staging and scaffolding details for erection of "Steel structure".
iv. Procurement and testing of all raw structural steel materials in lots for fabrication taking into account wastage margin etc., sand blasting as per specifications including storage and upkeep of the materials.
v. Providing all materials, labour, tools & plant and equipments and all types of consumables required for fabrication using submerged arc welding or as mentioned in approved fabrication drawing including all necessary bolts, nuts, washers with wastage margins.
vi. Fabrication of the steel works in accordance with the approved fabrication drawings, including all shop assembling, matching and marking. Design, manufacture/fabrication and provision of all jigs, fixings, manipulators etc. required for the fabrication are to be included in item.
vii. Provision of shop painting including all primers etc. to all fabricated steelwork, as per requirements of the related specification of the painting.
viii. Suitably marking, bundling and packing for transport of all fabricated materials.
ix. Preparing and furnishing detailed bill of materials, drawing Office dispatch lists, Bolts Lists and any other lists of bought out items required in connection with the fabrication of the structural steelwork.
x. Loading and transporting all fabricated steelwork and field connection materials including site unloading and erection of structure in final position with all HSFG bolts, nuts, bearing etc.
xi. To submit erection plan showing a methodology & procedure for erection compatible with the details of fabrication. Also, complete drawings & phase wise instructions for all the activities required to erect steel structure in final position, shall be submitted.
xii. The contractor shall provide general assistance during complete erection for solving any problem related to fabrication or site assembling of the structural steelwork. The contractor shall ensure the presence of the qualified and experienced Erection Engineer during complete erection work at site.
xiii. All major/ minor modifications of the fabricated steel structures, as directed by the Engineer-in-charge, including but not limited to the following:
    a. Removal of bends, kinks, twists etc. for parts damaged during transportation and handling.
    b. Cutting, chipping, filling, grinding etc. if required or preparation and finishing of site connections.
    c. Reaming of holes for use of higher size bolt if required.
    d. Re-fabrication of parts damaged beyond repair during transport and handling or re-fabrication of parts which are incorrectly fabricated.
    e. Fabrication of parts omitted during fabrications by error or subsequently found necessary.
    f. Drilling of holes which are either not drilled at all or are drilled in incorrect location during fabrication.

g. Carry out tests in accordance with the related Specification which will be inspected by Engineer-in-charge.
h. Site touch up for the paints damaged during transportation & handling and final finish coat on the structure as per specification.
i. Details of erection equipment machinery including capacity & specifications, tools, tackles etc. to be used for erection purpose.
j. Necessary formwork & staging required for erection of structural steel Plate girder including design of formwork for all the anticipated loads.
k. All procedures and tests on welds as per specifications and welded parts to ensure the strength requirements of joints.

1.3. Submittals

Before commencement of the work pertaining to steel structure, the Contractor shall submit the following in four sets:

i. Prior to the technical submittals, the contractor shall submit detailed baseline program & methodology indicating the proposed overall schedule for documentation such as calculations, material procurement schedule based on availability with approved suppliers, shop/working drawings, plan/ procedures and records. Submission of samples, inspection by Engineer-in-Charge, process of fabrication/ delivery to site storage yard/ erection site for the approval of the Engineer-in-charge.
ii. Complete fabrication drawings, Bill of materials, cutting lists, bolt lists, welding schedules and Quality Assurance schedules, based on the design drawing furnished to him and in accordance with the approved schedule. It is highlighted that structural steel member dimensions indicated in tender drawings are tentative only, and may be modified during final design stage.
iii. Results of any tests, as and when conducted and as required by the Engineer-in-charge.
iv. Manufacturers mill tests reports/certificates in respect of steel materials, bolts, nuts and electrodes, wires as may be applicable.
v. A detailed list of all constructional Plant & Equipment, such as cranes, derricks, winches, welding sets, pugmill, all consumables, grinding and hole drilling machine etc. their make, model, present condition and location, available to the contractor and the ones he will employ on the job to maintain the progress of work in accordance with the contract.
vi. The total number of experienced personnel of each category, like fitters, welders, riggers etc., which he intends to deploy on the project.
vii. Complete scheme with drawings for the erection of steel structures.
viii. The contractor shall submit complete design calculations for any alternative sections proposed by him, for approval of the Engineer-in-charge. Use of any alternative section shall be subject to approval of the Engineer-in-charge. However, no extra payment will be entertained on this account.

1.4. Furnishing of information

i. Design drawings shall be furnished to the contractor and all such drawings shall form part of these Specifications. The availability of structural member mentioned in design drawings may be checked and if not available may be brought under notice of Engineer in charge.
ii. The Engineer-in-charge reserves the right to make changes in the design drawings even after release for preparation of shop drawings to reflect addition, omission & modifications in data/details and requirements. Contractor shall consider such changes as part of these Specifications and the contract, and no extra claims shall be entertained on this account.
iii. Design drawings will show as appropriate the salient dimensions, design loads, sizes of members and welding location of openings at various levels and other necessary information required for the preparation of fabrication drawings, designs and erection details.
iv. It shall be clearly understood that the drawings submitted to the contractor will be design drawings. The typical details of connection, cuts, gusset plate shapes notches, bends, etc. were shown in the design drawings are only for general guidance of the contractor. The contractor shall develop all such details based on the design drawings.
v. In case of variations in design drawings and specifications, the decision of the Engineer-in-charge shall be final. If the contractor, find any discrepancy in the information furnished to him, same shall be immediately brought to the notice of Engineer-in-charge for resolution. The contractor shall obtain clarifications on discrepancies from Engineer-in-charge before proceeding with the work.

vi. No detailed shop drawings will be accepted for examination by the Engineer-in-charge unless these have first been completely checked by the contractor's qualified structural engineer. The contractor shall check and ensure that detailing of connections is carefully planned to obtain ease in erection of structures, including field bolting or field connection of temporary structure to permanent structure. Any temporary structure which is used for erection or launching purpose and required to be welded to permanent structural works shall be accounted for in fabrication drawings. Permission shall be obtained before welding or holing is done in permanent structures other than as shown in design drawings or approved fabrication drawings. In case of field bolted connection between temporary structure and permanent structural works, all necessary hole's provision shall be left during fabrication in shop. No filed welding is allowed on permanent part of structure to be erected.

vii. No fabrication work shall be started by the contractor without approval of Engineer-in-charge on the relevant drawings. Approval by the Engineer-in-charge of any of the drawings shall not relive the contractor of his responsibility of workmanship, fit of parts, details, materials and errors or omissions of any work.

viii. The contractor shall furnish four prints of shop drawings as advance drawing (for approval) and eight prints of all approved final shop drawings along with soft copy on CD for field use and record purpose.

ix. The Contractor shall get approval of workshop from Engineer-in-Charge where he intends to get the fabrication work carried out or whether he has his own setup and will establish the fabrication shop at site. The fabrication shop shall consist of at least sub-merged arc welding machine, shearing machine, pug mill, flame cutting machine, grinders, sand blasting equipments etc.

x. The drawings prepared by the Contractor, and all subsequent revisions thereof shall be at the cost of the Contractor, and no separate payments shall be made for the same. Revisions shall incorporate all modifications, field changes, substitutions etc. effected. The rates/prices quoted for steel work item shall be deemed to include the cost of such drawing work.

xi. The Contractor shall give due consideration to the need of trial assemblage at shop, weight and size limitation of elements for transportation from shop to site storage yard/Erection site, temperature variation of 25 degree centigrade between the fabrication shop and site, site measurements of as-built dimensions and position of pockets etc. for bolts and avoidance of site welding except for fixtures. All the drawings shall be prepared in metric units. The drawings should preferably be of A-1 standard size, and the details shown therein shall be clear and legible. These drawings shall include but shall not be limited to the following:

a. Assembly drawings, giving exact sizes of the sections to be used and identification marks of the various sections members.
b. Dimensional drawings of base plans, anchorages details of bearing bolts location etc.
c. Complete Bills of Materials and detailed drawings of all sections including their billing weights.
d. Detailed shop drawings for proper co-ordination with the concrete components to which the steel members shall be connected, as required.
e. Any other drawings or calculations that may be required for proper completion of the works and clarification of the works or substituted parts thereof.
f. All 'as-built' drawings in 4 prints and 1 plot on Garware film or equivalent and on CD.

1.5. Applicable Codes of Practice.

The following specifications, standards and codes of practice are included as part of this Specification. All Standards, specifications, codes of practice including all correction slips/ amendments current on the date of signing of agreement and referred to herein shall be applicable. In case of discrepancy between this Specification and those referred to herein, this specification shall govern. In case of discrepancy between Contract drawings and this specification, the Contract drawings shall govern. All relevant codes as listed shall be of latest revision including all amendments & corrections.

IS:226	Structural Steel (Standard Quality)
IS-800:2007	General Construction in Steel - Code of Practice
IS-456:2000	Plain and Reinforced Concrete (Code of practice)
IS-11384:2022	Composite construction in structural steel and concrete-code of practice
IS-875:1987/2015 (Part 1, 2 and 3)	Code and Practice for Design Loads (Other than earthquake) for Building and Structures like Dead, Imposed, Wind and

	other Loads
IS-875 (Part 5):1987	Code of Practice for design loads (other than Earthquake) for buildings and structures – Special loads and combinations
IS-13920:2016	Ductile detailing of reinforced concrete structure subjected to seismic forces
IS-7205:1974	Safety Code for Erection of Structural Steelwork
IS-7215:1974	Tolerances for Fabrication of Steel Structures
IS-1904:2021	General requirements for design and construction of foundation in soils – Code of practice
IS-1786:2008	Specification for high strength deformed steel bars and wires for concrete reinforcement
SP-38	Handbook of typified Designs for structures with steel roof trusses
IS-2062:2011	Hot Rolled medium and high tensile structural Steel - Specification
IS-801:1975(2021)	Code of Practice for Use of Cold-Formed Light Gauge Steel Structural Members in General Building Construction
IS-806:1968(2017)	Code of Practice for Use of Steel Tubes in General Building Construction
IS-808:2021	Dimensions for Hot rolled steel beam, channel and angle sections
IS-1730:1989(2019)	Steel Plates, Sheets, strips and Flats for Structural and General Engineering Purposes - Dimensions
IS-1367:(2023,2019)	Technical supply conditions for threaded steel fastener's part 14, 16 & 17.
IS-816:1969(2019)	Code of practice for use of metal arc welding for general construction in mild steel.
IS-822:1970(2019)	Code of procedure for inspection of welds.
SP-16	Design aids for Reinforced concrete Structure
SP-34	Handbook on Concrete Reinforcement and Detailing
IS-15988:2013	Seismic Evaluation and Strengthening of Existing Reinforced Concrete
IS-3370:2021	Concrete Structures for Storage of Liquids- Code of Practice
IS-1893:2016 (Part-1)	Criteria for Earthquake resistant deign of Structures
IS-18168:2023	Earthquake resistance Design and Detailing of Steel Buildings-- Code of Practice.
IS-1080:1985(2021)	Code of Practice for Design and Construction of Shallow Foundations in Soil (Other than raft, ring and shell)
IS-12070:1987(2020)	Code of Practice for Design and Construction of Shallow Foundations on rocks
IS-8009:1976(2023)	Code of Practice for Calculations of Settlement of Foundations
IS-10262:2019	Concrete Mix Proportioning Guidelines.
IS-4000:1992(2017)	High strength Bolts in Steel Structures Code of Practice
IS-16172:2023	Reinforcement couplers for Mechanical Splices of Bars in Concrete--Specifications.
IS-3067:1988(2020)	Code of Practice for General Design Details for Preparatory Work for Damp Proofing and Water Proofing of Building
SP-7	National Building code of India 2016 (NBC-2016)
IS-4923:2017(2023)	Hollow Steel Sections for Structural Use - Specifications

2. Products.

2.1. Materials

All materials to be supplied by the Contractor shall conform to relevant Indian Standards as approved by the Engineer-in-charge.

Steel materials required for the work shall be free from imperfections, mill scales, slag intrusions, laminations, pitting, rusts etc. that may impair strength, durability and appearance. All materials shall be of tested quality only. Test Certificates in respect of each consignment shall be submitted to Engineer-in-charge before use in work. Whenever the materials are permitted for procurement from identified stocks, a random sample shall be tested at an approved laboratory, as directed by the Engineer-in-charge.

2.2. Structural Steel

Structural steel conforming to IS:2062 : E 350-BR (minimum grade) **E350 MPA Grade** irrespective of anything other grade specified in structural drawings, shall be used for all members of dome structures including bracings, gussets plates etc.

2.3. Bolt & Nut

For splicing of any structural member wherever required **HSFG 8.8 Grade UNO** bolts and nuts of property class-8.8 conforming to IS:3757 and IS:6623 (1985) respectively shall be used. Unless specified otherwise, the bolts shall be hexagonal. All the HSFG bolts are tightened up to the proof load as per IS: 4000 (1992).

All anchor bolts shall be of property class of 8.8 shall conform to IS:1363 (1992), IS:1364 (1992) and IS:1367, as applicable, and unless specified otherwise, shall be hexagonal. All nuts shall conform to property class compatible with the property class of the bolt used.

2.4. Washers

For HSFG bolts , washer shall be conforming to IS:6649 (1985).

Plain washers shall be conforming to IS:5369 (1975), unless otherwise specified. One washer shall be supplied with each bolt and, in case of special types of bolts, more than one washer as needed for the purpose shall be supplied. An additional double coil helical spring washer, conforming to IS:6755 (1980), shall be provided for bolts carrying dynamic or fluctuating loads and those in direct tension.

3. Storage of Materials

3.1. General

i. All materials shall be so stored as to prevent deterioration, and to ensure the preservation of their quality and fitness for the work. If required by the Engineer-in-charge, the materials shall be stored under cover and suitably painted for the protection against weather condition. Any material, which has deteriorated or has been damaged shall be removed from site and replaced by new members, as directed by the Engineer-in-charge at no extra cost and time.

ii. The steel to be used in fabrication shall be stored in a separate stack clear of the ground section wise and lengthwise.

iii. The storage area shall be kept clean and properly drained. Structural steel shall be so stored and handled in such a manner that members are not subjected to excessive stresses and damage. Girders and beams shall be placed in upright position. Long members shall be supported on closely spaced skids to avoid unacceptable deflection.

iv. The Contractor shall have a suitable shop storage yard at his own premises for storing the fabricated steel structures and other materials. The yard shall have proper facilities such as drainage and lighting including access for cranes, trailers and other heavy equipment's.

v. All Shop / field connection materials, shop paints etc. shall be stored on racks and platforms, off the ground in a properly covered building by the contractor.

vi. The contractor shall have proper arrangement for sand blasting of steel sections so that these sand blasted material may be used for fabrication wherever required.

4. Structural Steelwork Specification for welded structure

i. This Specification covers the supply, fabrication transportation and erection at Site of welded structural steelwork, including the supply of approved consumables, electrodes, wires and other materials required for fabrication and field connections of all structural steelwork covered under the scope of the Specification. The shear connectors studs as specified in the drawing shall also be welded in the shop.

ii. All workmanship shall be in accordance with the best practices in modern structural shops. Greatest accuracy shall be maintained in the manufacture of every part of the work and similar parts shall be strictly interchangeable. The contractor shall not proceed with any welding until the Engineer-in-charge

has approved his welding plan, which shall include.

a. All information's on welding procedures, equipment, additives and preheating during welding operation.
b. Details of non destructive testing methods
c. Precautions with regard to welding shrinkage
d. Possible treatment of completed welds by grinding
e. Procedure and programme of welding sequence

iii. During Design & Detailing of component lengths, care has been taken to avoid butt weld in built up members. Therefore it is essential to use only nearest size and length of section that have been procured to scheduled sizes and lengths by proper planning by contractor. No butt weld shall be carried out without approval of Engineer-in-charge.

iv. **Templates**

Templates used throughout the work shall be of steel. In cases where actual materials have been used as templates for drilling similar pieces, the Engineer-in-charge shall decide whether such materials are fit to be used as parts of the finished structure.

v. **Straightening**

All materials shall be straight and free from twists, and if necessary, before being worked, shall be straightened and/or flattened by pressure, unless required to be of curvilinear form.

vi. **Clearance**

The clearance between fraying surface of bolted connections shall not be greater than 1mm at each end. If separation is between 1 to 3mm, the surface should be tapered to eliminate the separation. Separation of 3mm or more shall be filled with filler plates / washers. Such situations may be avoided and if situations are more , the correction may be carried out by the contractor as per the direction of the Engineer-in -charge.

vii. **Shearing, Cutting and Planning**

Cutting shall be done automatically. Cutting by shearing machine may be used for plates not exceeding 10 mm in thickness provided that the plate edges be fully enclosed in a weld. For Plates above 10mm, Oxygen cutting/flame cutting may be used provided a smooth and regular surface free from cracks and notches is secured.

a. Chipping of edges of plates, wherever necessary, shall be done without damaging the parent metal. Chipped edges shall be ground to a neat finish and sharp corners and hammered rough faces shall be rounded off.
b. The edges and ends of all cut/sheared plates shall be plained/ground. Edge preparation for welding may be done by machine controlled flame cutting, with edges free from burrs should be clean and straight.
c. The butting surfaces at all joints of girders shall be planed so as to butt in close contact throughout the finished joint.

viii. **Assembly**

a. All parts assembled for welding shall be in as close contact as practicable over the whole surface.
b. The component parts shall be so assembled that they are neither twisted nor otherwise damaged. Specified cambers, if any, shall be provided.
c. All parts of bolted and welded members shall be held firmly in position by means of jigs or clamps while bolting or welding. No drifting of holes shall be permitted, except to draw the parts together and no drift used shall be larger than the nominal diameter of the bolt. Drifting done during assembling shall not distort the metal or enlarge the holes.
d. Trial assemblies shall be carried out at the fabrication stage to ensure trial assemblies. accuracy of workmanship. These checks shall be witnessed by the Engineer-in-charge and such trial assemblies shall be at the cost of the Contractor. Nothing extra is to be paid for.

ix. **Welding**

a. The welding shall conform to code, IS:816 (1969) and IS:9595 (1980) and other applicable codes and standards, unless otherwise specified. As much work as possible shall be welded in shops and the layout and sequence of operations shall be so arranged as to eliminate distortion and shrinkage stresses. **Submerged arc welding and Gas Metal arc welding (MIG) shall only be done in the shop. No welding is permitted at site except tack welding for temporary structure.**
b. **Electrodes / Wires / Flux:** All electrodes/ wires / flux shall be kept under dry conditions. Any electrode / wires /flux damaged by moisture shall not be used unless it is guaranteed by the manufacturer that, when it is properly dried, there will be no detrimental effect. Any electrode, which has part of its flux coating broken away or is otherwise damaged, shall be rejected. Any

electrode /wires/ flux older than six (6) months from the date of manufacture shall not be used. Batch certificates for electrodes/ wires /flux shall be submitted by the Contractor.

c. **Preparation of Joints**

- The edges shall be prepared, with an automatically controlled flame cutting torch, correctly to the shape, size and dimensions of the groove, prescribed in the design and fabrication drawings. In case of U-groove joints, the edges shall be prepared with an automatic false cutting torch in two phases, following a bevel out with a gouging pass, or by machining.
- The welding surfaces shall be smooth, uniform and free from fins, tears, notches or any other defects, which may adversely affect welding, and shall be free of loose scale, slag, rust, grease, paint, moisture or any other foreign material.

d. **Welding Procedure**

1. All welding procedures shall be submitted to the Engineer-in-charge for approval, well before starting fabrication.
2. The welding procedures shall be arranged by the Contractor to suit the details of the joints, as indicated in the drawings, and the position at which welding has to be carried out. Welding procedure shall cover the following:
    - Type and size of electrodes.
    - Current and (for automatic submerged arc welding) arc voltage
    - Length of run per electrode; or (for automatic welding) speed of travel
    - Number and arrangement of runs in multi run welds
    - Position of welding
    - Preparation and set-up of parts
    - Welding sequence
    - Pre or post heating
    - Any other relevant information.
3. The welding procedures shall be so arranged that distortion and shrinkage stresses are reduced to the minimum.
4. Any weld found defective shall be removed, by using either chipping hammer or gouging torch, in such a manner that parent material is not injured in any way.
5. Welding shall not be carried out when temperature is below 10 degrees Celsius or surface is wet or during periods of strong winds unless the work and the welder is adequately protected.
6. **At least 10% of the weld done at site shall be tested by dye-penetration tests in the presence of representative of client.**

e. **Fusion Faces and Surrounding Surfaces**

1. Fusion faces and the surrounding surfaces within 50mm of the welds shall be free from all mill scale and free from oil, paint or any substance which might affect the quality of the welds or impede the quality/progress of welding. These shall be free from irregularities, which would interfere with the deposition of the specified size of weld or be the cause of defects.
2. All mill scale within 50mm of welds shall be removed prior to welding, either by pickling followed by thorough power wire brushing, or by other approved methods.
3. If preparation or cutting of the fusion faces is necessary, the same shall be carried out by shearing, chipping, gas cutting or flame gouging.
4. Where hand gas cutting or hand gouging is employed, the blowpipe or gouging blowpipe shall be properly guided.

f. **Assembly for Welding**

Parts to be welded shall be properly assembled and held firmly in position by means of jigs and clamps prior to and during welding.

g. **Plate Construction**

Automatic submerged arc welding shall be employed for fabrication of all members. Metal inert gas welding (CO_2) may be done for short length where access to the location of the weld does not permit submerged arc welding subject to approval of Engineer-in-charge.

h. **Accuracy of Fit-Up**

Parts to be fillet welded shall be brought into as close contact as practicable, and the gap due to faulty workmanship or incorrect fit-up shall not exceed 1.5mm. If greater separation occurs at any

position, the size of fillet weld shall be increased at such positions by the amount of the gap.

i. **Jigs and Manipulators**
Jigs and manipulators shall be used, where practicable, and shall be designed to facilitate welding and to ensure that all welds are easily accessible to the operators.

j. **Ends of Butt-Welded Joints**
The ends of butt joints shall be welded so as to provide full throat thickness. This may be done by the use of extension pieces, cross-runs or other approved means.

k. **Weld Face and Reinforcement of Butt welds**
The weld face shall, at all places, be deposited projecting the surface of the parent metal. Where a flush surface is required, the surplus metal shall be dressed off.

l. **Testing of Butt Welds**
Butt-welded joints are to be 15% radio graphically tested by the Contractor at his own cost. If such tests indicate the joints to be defective, the cost of rectification of defective welds shall also be borne by the Contractor. The agency for testing of welds shall be specified for approval by engineer-in-charge.

m. **Minimum Leg Length & Throat Thickness in Fillet Welds**
The minimum leg length of a fillet weld as deposited shall be not less than the specified size as per codal provisions. In no case shall a concave weld be deposited, unless specifically permitted. Where permitted, the leg length shall be increased above that specified length, so that the resultant throat thickness is as great as would have been obtained by the deposition of a flat-faced weld of the specified leg length.

n. **Dislodging**
After making each run of welding, all slag shall be thoroughly removed and the surface cleaned.

o. **Quality of Welds**
The weld metal, as deposited (including tack welds), shall be free from-cracks, slag inclusions, porosity, cavities and other deposition faults. The weld metal shall be properly fused with the parent metal without under cutting or overlapping at the toes of the weld. The surface of the weld shall have a uniform consistent contour and regular appearance.

p. **Weather Conditions**
Welding shall not be done under weather conditions, which might adversely affect the efficiency of welding.

q. **Qualification and Testing of Welders**
The Contractor shall satisfy the Engineer-in-charge that the welders are suitable for the work for which they will be employed, and shall produce evidence to the effect that welders, have satisfactorily completed appropriate tests, as described in IS:817 Part I (1992). The Engineer-in-charge may, at his own discretion, order periodic tests of the welders and/or of the welds produced by them. Such tests shall be at the expense of the Contractor.

r. **Supervision**
The Contractor shall employ competent welding supervisors to ensure that the standard of workmanship and the quality of the materials comply with the requirements laid down in this document.

s. **Machining of Butts and Bases**
Splices and butt joints of compression members, depending on contact for stress transmission, shall be accurately machined over the whole section. In column bases, the ends of shafts together with the attached gussets, angles. channels etc., after bolting and/or welding together as the case may be, shall be accurately machined so that the parts connected butt over the entire surface of contact. Care shall be taken that connecting angles or channels are fixed with such accuracy that they are not reduced in thickness by machining by more than 0.8mm.

t. **Requirement of Welded Joints**
Apart from the requirements of welding specified under the above sub clauses, sections above, the Contractor shall ensure the following requirements in the welded joints.

- Strength-quality with parent metal.
- Absence of defects
- Corrosion resistance of the weld shall not be less than that of parent material in an aggressive

environment.

u. **Studs**

Studs may be used at interface of in-situ wherever required to transfer the longitudinal shear. The material used shall have characteristic yield strength of 385 MPa, minimum elongation of 18% and characteristic tensile strength of 495 Mpa.

v. **Welding of stud shear connectors**

- The stud shear connectors shall be fusion welded to the plate girder using stud welding machine as per the manufacturer's instructions. No other type of welding shall be permitted.
- The stud and the surface to which studs are welded shall be free from scale, moisture, rust and other foreign material. The stud base shall not be painted, galvanised or cadmium plated prior to welding. Welding shall not be carried out when temperature is below 10 degrees Celsius or surface is wet or during periods of strong winds unless the work and the welder is adequately protected.
- The welds shall be visually free from cracks and shall be capable of developing at least the nominal ultimate strength of studs.
- The procedural trial for welding the stud shall be carried out when specified by the Engineer-in-charge.

w. **Shop Assembly**

- The steelwork shall be temporarily shop assembled, as necessary, so that the accuracy of fit may be checked before dispatch. The parts shall be shop assembled with a sufficient number of parallel drifts to bring and keep the parts in place
- Since parts drilled or punched, with templates having steel bushes shall be similar and, as such, interchangeable, such steelwork may be shop erected in part only, as agreed by the Engineer-in-charge.

x. **Erection Marking**

- Each fabricated member, whether assembled prior to dispatch or not so assembled, shall bear an erection mark, which will help to identify the member and its position in respect of the whole structure, to facilitate re-erection at site.
- These erection marks shall be suitably incorporated in the shop detail and erection drawings.

y. **Field Inspections**

Field inspections shall be done as per clause 1905.6 of MORTH Specification- 2013 and CPWD specification 2019.

5. Structural Steel Specification for Painting Work

i. **Scope of Specification**

This Specification covers the scope of painting, methods for the surface preparation, application of paints and precautions to be taken for the painting of structural steel work. It covers the supply and delivery of all necessary materials, labour, scaffolding, tools, equipment and everything that is necessary for the job completion on schedule.

ii. **Applicable Codes**

The following Specifications, Standards and Codes are included as part of this Specification. All standards and codes of practice referred to herein shall be the current editions during the currency of project including all applicable official amendments and revisions.

In case of discrepancy between this Specification and those referred to herein, this specification shall govern. In case of discrepancy between Contract drawings and this specification, the Contract drawings shall govern

a) IS: 102 (1962) : Ready Mixed Paint, Brushing, Red lead, Non Setting, Priming.

b) IS: 159 (1981) : Ready Mixed Paint, Brushing, Acid Resisting for Protection against Acid Fumes, Colour as Required.

c) IS: 384 (1979) : Brushes, Paints and Varnishes, Flat.

d) IS: 487 (1985) : Brush, Paint and Varnish i) Oval Ferrule Bound ii) Round Ferrule

Bound.

e) IS: 958 (1975) : Temporary Corrosion Preventive Grease, Soft Film, Cold Application.

f) IS: 1153(1975) : Temporary Corrosion Preventive, Fluid, Hard Film, Solvent Deposited.

g) IS: 1477(1971) : Code of Practice for Painting of Ferrous Metals in Building.
Part I -Pretreatment
Part II -Painting

h) IS: 1674(1960) : Temporary Corrosion Preventive Fluid, Soft Film, Solvent Deposited.

i) IS: 2074(1992) : Ready Mixed Paints, Red Oxide -Zinc Chromate.

iii. **Products**

Paint

- All paint delivered to the fabrication shop shall be ready mixed, in original sealed containers, as packed by the paint manufacturers, and no thinners shall be permitted.
- Paint shall be stirred frequently to keep the pigment in suspension.

Storage of Paints

- All paints shall be stored strictly in accordance with the requirements laid down by the paint manufacturers. The storage area shall be well ventilated and protected from sparks, flame, direct exposure to sun or excessive heat, preferably located in an isolated room or in a separate building.
- All paint containers shall be clearly labelled to show paint identification, date of manufacture, batch number, order number and special instructions in legible form. The containers shall be opened only at the time of use. Paints which have liveried, gelled or otherwise deteriorated during storage, shall not be used. Paints for which the shelf life specified by the supplier has expired shall not be used without inspection and approval by the Engineer-in-charge

iv. **Execution**

Paint System (High Performance Polysiloxane System)

Sand blasting shall be carried out in accordance with IS:1477. Painting work shall be carried out as follows:

Surface Treatment	Abrasive Blast to SA 2.5(ISO 8501-1:1988). If oxidation occurs between blasting and application of paint, the surface shall be re blasted to the specified standard.
1st Coat	Providing & applying amine cure epoxy primer (low VOC) compatible to Fire intumescent paint, with additional anti-corrosive protection having minimum VS of 73% of approved make applied over abrasive blasted surface and surface preparation up to a standard of Sa2.5 (ISO 8501-1:1988) or SSPC-SP6. The primer can be like Pen guard HSP ZP of Jotun paint or approved equivalent brand. DFT-100 microns The primer shall be applied by Conventional/Airless Spray only in Shop.
Finish Paint	Supplying and applying water-based Fire intumescent paint fire tested in accordance with BS 476 Parts 20-22 of approved make @ DFT dependent on HP/a ratio of structural steel. Polyurethane finish paint Hard top XP or approved equivalent having volume solid of minimum 63% @ 50 micron of the required shade over Structural Steel Works at all levels including storage, surface preparation by Abrasive blasting, degreasing, cleaning, drying, providing temporary staging, scaffolding, testing etc., all complete with all respect as desired and as per manufacturer specification and direction of Engineer in charge. Application to be carried out by authorized manufacturer applicator or any other trained applicator as approved by the manufacturer and direction of Engineer in charge. (Two hrs fire rating)

The following precautions must be taken:

a. After abrasive blast cleaning, the first undercoat (primer coat) should be applied well before surface deterioration.

b. Over coating intervals, application parameters shall conform to manufacturer's instruction manual.
c. The DFT (Dry film thickness) shall be measured after completion of each coat.

v. **Surface Preparation**

All surfaces shall be cleaned of loose substances and foreign materials. e.g. dirt, rust, scale, oil, grease, welding flux etc so that the primer coat adheres to the original metal surface. The work shall be carried out in accordance with IS: 1477 (1971) (Part I). Any oil, grease, dust or foreign matter deposited on the surface after preparation shall be removed and care shall be taken to ensure that the surface is not contaminated with acids, alkalis or other corrosive chemicals. The primer coat shall be applied immediately after the surface preparation is completed.

Before the application of any paint the surfaces to be treated shall be thoroughly cleaned freed from all scale, loose paint, rust and other deleterious matters. Oil and grease shall be removed from the surface by washing with solvents or with a detergent solution before blast cleaning operation of metal polish with metal pellets. If any traces of oil or grease remain after blasting they shall be removed by solvent cleaning and the area will be re-blasted thereafter.

All welding areas shall be given special attention for removal of weld flux slag, weld metal splatter weld head oxides, weld flux fumes silvers and other foreign objects before blasting. If deemed necessary by the Engineer in Charge, acid washing and subsequent washing with clean water shall be used.

Any rough seams will have to be ground and must be inspected and approved by the Engineer-in-charge before application of the coatings.

All structural steel to be painted shall be cleaned using blast cleaning in accordance with SA 2 1/2 Near-White Blast cleaning (equivalent Swedish Standard SIS 055900). For SA 2 1/2 the profile should be in the range of 40-70 microns and shall be measured with comparator. Mill scale, rust and foreign matter shall be removed to the extent that the only traces remaining are light stains in the form of spots or stripes. Finally the surface shall be cleaned with a vacuum cleaner or clean dry compressed air.

The blast cleaning shall produce a surface roughness complying with the one specified by the paint manufacturer for the primer concerned. If, cleaned surfaces are rusted or are contaminated with foreign material before painting is accomplished they shall be re-cleaned by the Contractor at his own expenses. Nothing extra shall be paid on this account.

vi. **Mixing of paint**

All ingredients in a paint container shall be thoroughly mixed to break-up lumps and disperse pigments, before use and during application, to maintain homogeneity. All pigmented paints shall be strained after mixing to remove skins and other undesirable matters.

1. Dry pigments, pastes, tinting pastes and colours shall be mixed and/or made into paint so that all dry powders get wetted by vehicles and lumps and particles are uniformly dispersed.
2. Additives that are received separate such as curing agents, catalysts, hardeners etc. shall be added to the paint as per the manufacturer's instructions. These shall be promptly used within the pot life specified by the manufacturers and unused paint thereafter shall be discarded.
3. Thinners shall not be used unless essential for proper application of the paint. Where thinners are used, they shall be added during the mixing process and the type and quantity of thinner shall be in accordance with the instructions of paint manufacturer.

vii. **Paint Application**

General

1. Paint shall be applied in accordance with the manufacturer recommendations, as supplemented by these Specifications. The work shall generally follow IS:1477 (1971) (Part II). Prior approval of the Engineer-in-charge shall be taken in respect of all primers and/or paints, before their use in the works.
2. Paint shall generally be applied by brushing except that spraying may be used for finish coats only when brushing may damage the prime coats. Roller coat or other method of paint application shall not be used unless specifically authorized.
3. Paint shall not be applied when the ambient temperature is 10°C and below. For paints which dry by chemical reaction the temperature requirements specified by the manufacturer shall be met with. Also, paint shall not be applied in rain, wind, fog or at relative humidity of 80% and above or when

the surface temperature is below dew point, resulting in condensation of moisture. Any wet paint exposed to damaging weather conditions shall be inspected after drying and the damaged area repainted after removal of the paint.

4. Each coat of paint shall be continuous, free of pores and of even film thickness without thin spots. The film thickness shall not be so great as to detrimentally affect either the appearance or the service life of the paint.
5. Each coat of paint shall be allowed to dry sufficiently before application of the next coat, to avoid damages such as lifting or loss of adhesion. Undercoats having glossy surface shall be roughened by mild sand papering to improve adhesion of subsequent coats. Successive coats of same colour shall be tinted. Whenever practical, to produce contrasts and help in identifying the progress of the work.

Brush Application

1. Proper brushes shall be selected for a specific work piece. Round or oval brushes which conform to IS:487(1985) are better suited for irregular surfaces, whereas flat brushes which conform to IS:384(1979) are convenient for large flat areas. The width of flat brushes shall not generally exceed 1.25mm.
2. Paint shall be applied in short strokes depositing a uniform amount of paint in each stroke followed by brushing the paint into all surface irregularities, crevices and corners and finally smoothening or leveling the paint film with long and light strokes at about right angles to the first short strokes. All runs and sags shall be brushed out. The brush marks left in the applied paint shall be as few as practicable.

Spray Application

1. The spraying equipments shall be compatible with the paint material and provided with necessary gauges and controls. The equipment shall be cleaned of dirt, dried paint, foreign matter and solvent before use.
2. The paint shall be applied by holding the gun perpendicular to the surface at a suitable distance and moved in a pattern so as to ensure deposition of a uniform wet layer of paint. All runs and sags shall be brushed out immediately. Areas not accessible to spray shall be painted by brush or dauber.
3. Water trap acceptable to Engineer-in-charge shall he furnished and installed on all equipment used in spray painting.

Shop Painting

1. The painting system specified in Table shall be followed. Surfaces, which will be inaccessible after field assembly, shall receive the full-specified protective treatment before assembly.
2. Surfaces in contact during shop assembly shall not be painted. Surfaces which can not be painted but require protection shall be given a rust inhibitive grease conforming to IS:958-1975 or solvent deposited compound conforming to IS: 1153 (1975) or IS: 1674 (1960) or treated as specified in the drawing.
3. The shop coats shall be continuous over all edges, including ends meant for jointing at site by bolting, except where the paint could be detrimental to bolting. In such cases, no paint shall be applied within 50mm, and the unprotected surface shall be given a coat of corrosion inhibitive compound.
4. The unpainted area shall be cleaned prior to welding. The welded joint shall be cleaned and DE slagged, and immediately after covered by the same paint as has been used for the remaining surface.

Painting at Site

1. Surfaces which will be inaccessible after site assembly shall receive the full specified protective treatment before assembly. Surfaces which will be in contact after site assembly shall receive a coat of paint (in addition to any shop priming) and shall be brought together while the paint is still wet.
2. Damaged or deteriorated paint surfaces shall be first made good with the same type of coat as the shop coat. Where steel has received a metal coating in the shop, this coating shall be completed on site so as to be continuous over any welds, bolts and site rivets. Specified protective treatment shall be completed after erection.

Protection of Paintwork

1. The Contractor shall provide measures as necessary to prevent damage to the work and to other property or persons from all cleaning and painting operations. Paint or paint stains which result in other unsightly appearance on surfaces not designated to be painted shall be removed or obliterated by the contractor at his cost.

2. All painted surfaces that in the opinion of the Engineer-in-charge are damaged in anyway, shall be repaired by the contractor at his cost with materials and to a condition equal to that of the requirements specified in these specifications.
3. Upon painted surfaces that in the opinion of any other work that would cause dust, grease or foreign materials to be deposited upon the painted surfaces, the painted surfaces shall be thoroughly cleaned.
4. The areas for high-strength bolts shall be protected by masking tape against undercoat application at the fabrication shop. Immediately prior to erection any rust in the paint area shall be removed by power wire brushing to a standard equivalent to SA3.

6. Structural Steel Work – Quality Control & Testing Requirements.

Scope of Specification

The scope of work of these specifications is to establish the norms for ensuring the required Quality Control through established testing norms of the welded structural steelwork by Engineer-in-charge.

Codes / Standards

- The materials shall be tested in accordance with relevant IS specifications and necessary test certificates shall be furnished. Additional tests if required shall be got carried out by the Contractor at his own cost from the approved testing laboratory.
- The fabrication, furnishing, erecting and painting of structural steel work shall be in accordance with these specifications and shall be checked and accepted by the Engineer in charge.

Submittals

The Contractor shall submit the following:

- Proposed overall schedule for documentation of shop drawings, plan/procedures and records, procurement of materials from approved suppliers, submission of procedure of fabrication and erection.
- The contractor shall himself inspect all materials and shop work to satisfy the specified tolerance limits and Quality norms before the same are inspected by Engineer-in-charge or his authorized representative.

Field Inspection

- All materials, equipment and work of erection shall be subject to the inspection of the Engineer in charge who shall be provided with all facilities including labour and tools required at all reasonable times. Any work found defective is liable to be rejected.
- No protective treatment shall be applied to the work until the appropriate inspection and testing has been carried out. The stage inspection shall be carried out for all operations so as to ensure the correctness of fabrication and good quality. Plate Girder dimensions and camber, if any, shall not be finally checked until all welding and heating operations are completed and the member has cooled to a uniform temperature.

Testing of material

- Structural steel shall be tested for mechanical and chemical properties as per various IS codes as may be applicable and shall conform to requirements specified in IS:226, IS:2062, IS:11587, IS:1977, IS:8500 and IS:961 etc.
- Rivets, bolts, nuts, washers, welding consumables, steel forging, casting and stainless steel shall be tested for mechanical and chemical properties in the appropriate IS Code.
- Rolling and cutting tolerance shall be as per IS: 1852. The thickness check measurements for the plate and rolled sections shall be taken at not less than 15 mm from edge.
- For plates thicker than 25mm, check for laminations in plates shall be carried out by ultra-sonic testing or any other specified methods.
- Steelwork shall be inspected for surface defects and exposed edge laminations during fabrication and blast cleaning. Significant edge laminations found shall be reported to the Engineer in charge for his decision.
- Chipping, grinding, machining or ultrasonic testing shall be used to determine depth of imperfection.

Bolted connections

Bolts and bolted connection joints with high strength friction grip bolts shall be inspected and tested according to IS:4000. The alignment of plates at all bolted splice joints and welded butt joints shall be checked for compliance with codal requirements.

Welding and welding consumables:

- Welding procedure, welded connection and testing shall be in compliance with codal requirements. All facilities necessary for stage inspection during welding and on completion shall be provided to the Engineer in Charge or his authorized representatives.
- Adequate means of identification either by identification mark or other record shall be provided to enable each weld to be traced to the welder(s) by whom it was carried out.

Quality Control

- Steel shall comply in all respects with the requirements of approved drawings and relevant codes and specifications and shall be procured from approved manufacturers only. It may be noted that quality of raw steel used for fabrication shall be essence of the contract & shall be strictly conforming to specified standard. Steel sections to be supplied by the manufacturers shall be tested as per codal provisions at the manufacturer's premises before dispatch. The contractor on receipt of supply in his fabrication shop shall carry out necessary control tests including ultrasonic testing as per codal requirements and verify them with the list received from manufacturers. The rejected lot shall not be used and rejected lot shall be immediately removed from fabrication shop. Only steel passed in all tests shall be used for fabrication.
- The contractor shall supply information in the technical package regarding source / manufacturers from where procurement of steel is proposed.
- In order to exercise proper control of the quality of the welding, Contractor shall enforce methods of control as tabulated below:

Purpose	Control subjects	Methods of control
1	2	3
Control of welding materials and basic metal quality	Quality control of electrodes, welding wire, flux and protective gases Checking quality and Weldability of the basic metal and welded members	Weldability test to determine the technological properties of materials. Mechanical test of weld metal Metallographically investigations of welds macro-structure and microstructure Checking of weld metal resistance for intercrystallite corrosion. Study if weld metal solidity by physical control methods.
Checking of welders qualifications	Welding of specimens for quality determination	Mechanical tests, metallographically investigation & checking of welded joints by physical control methods
Control of welded joint quality	Control of assembly accuracy and technological welding process	Checking of assembly quality & centering of welded members Checking of welding equipment conditions. Checking correctness of welding procedure. Visual examination of welds

Tests & Testing Procedures

Fabricator agency shall have in house facilities for all testing of weld.

Visual Examination

The contractor shall conduct visual examination and measurement of the external dimensions of the weld for all joints. Before examining the welded joints, areas close to it on both sides of the weld for a width not less than 20 mm shall be cleaned of slag and other impurities. Examination shall be done by a magnifying glass which has a magnification power of ten (10) and measuring instrument which has an accuracy of $\pm$ 0.1 mm or by weld gauges. Welded joints shall be examined from both sides. The contractor shall examine the following during the visual checks.

i) Correctness and shape of the welded joints
ii) Incomplete penetration of weld metal.
iii) Influx
iv) Burns
v) Unwelded craters
vi) Undercuts
vii) Cracks in welded spots and heat affected zones
viii) Porosity in welds and spot welds
ix) Compression in welded joints as a result of electrode impact while carrying out contact welding
x) Displacement of welded element

The contractor shall, document all data as per sound practices.

Mechanical Test

- The Contractor shall carry out various mechanical tests to determine weldability, metal alloy ability, nature of break, correct size and type of electrodes, degree of pre-heat and post-heat treatment. The type, scope and sample of various mechanical tests shall be determined in agreement with the purchaser.
- The number of tests conducted shall depend on the result obtained to satisfy the Engineer-in-charge that the correct type and size of electrode, degree of pre-heating and post-heating and weldability of metal are being followed.

Dye Penetration Test

All welds shall be tested by "Dye Penetration test" as per current practices.

Radiography Test

- Radiography test shall be conducted by the contractor to determine gas inclusion (blow holes, hollows) slag inclusion, shallow welds and cracks for 15% lengths all butt joints.
- Before conducting the examination the welded joints shall be cleaned of slag and scales and visually examined. The welds shall be marked into separate portions depending on the length of photograph. The length of photograph shall be such as to ensure that there are no distortions and shall reveal the defect correctly. The length shall not be more than 0.75 of the focal distance and the width of the photograph would depend on the width of the welded joint plus 20 mm on either side of the weld. The cassette with film shall be protected by sheet of lead or equivalent of proper thickness against incidental, diffused and secondary radiation.
- The direction of the ray with relation to the film shall be as specified hereunder.
- Welds of butt joints without edge slopes with edge processing shall be examined by central ray directed at right angles to the weld.
- In special cases examination of welds with inclined rays directed along edge slopes may be permitted by the Engineer-in-charge.
- Lap joints shall be examined by directing rays at 45 degree to the bottom plate. Welds in T-joints without any edge preparation shall be examined by rays directed at 45 degree to the weld. Angle welds in lap and tee-joints shall be examiner by the rays in opposite direction i.e. the film will be on the side of the weld. Weld in angle joints shall be checked by directing ray along the bisector of the angle between the welded elements. Opposite direction of the ray and location of the film may also be permitted by the Employer.

Ultrasonic Test

Ultrasonic test shall be conducted by the contractor to detect gas inclusion (pores), slag inclusion, shallow welds, cracks, lamination and friability etc. Prior to starting of ultrasonic test the welded joint shall be thoroughly cleaned of slag and other material. Surface of the basic metal adjacent to welded

joint on both sides shall be mechanically cleaned by the grinder or a metal brush to provide the contact of the whole ultrasonic probe surface with surface of basic metal. The width of the clean surface shall be as directed by the Engineer-in-charge. The welded joint then shall be covered with a thin coat of transformer oil, turbine or machine oil to ensure acoustic contact. The joints so treated shall be marked and the marks shall be entered into the documentation, subsequent to this, ultrasonic test shall be carried out as directed by the Engineer-in-charge. At least 50% of weld shall be tested by ultrasonic testing.

7. Erection of Steel Structures.

The scope of work of these specifications is to establish the norms for ensuring the required safety procedures methods etc. for erection of steel structures.

Submittals

The methodology shall be submitted by contractor for approval by Engineer-in-charge well before the arrival of material for erection.

Erection

The Contractor shall erect the structural steel, remove the temporary construction, and do all the work required to complete the, construction included in the contract in accordance with the drawings and the specifications and to the entire satisfaction of the Engineer.

Organization and Equipment

a. The Contractor shall submit erection plans prepared by the fabricator, showing a method and procedure of erection, compatible with the details of fabrication.
b. A detailed scheme must be prepared showing stage-wise activities, with complete drawings and working phase-wise instructions. This should be based on detailed stagewise calculation and take into account specifications and capacity of erection machinery, tools, tackles to be used and temporary working loads as per Codal provisions.
c. The scheme should be based on site conditions e.g. hydrology, rainfall intensity, soil and sub-soil conditions, temperature and climatic conditions and available working space, etc.
d. The scheme should indicate precisely the type of temporary fastener to be used as also the minimum percentage of permanent fasteners to be fitted during the stage erection. The working drawings should give clearly the temporary jigs, fixtures, clamps, spacer support, etc.
e. The contractor shall supply and erect all necessary false work and staging and shall supply all labour, tools, erection plant and other materials necessary to carry out the work complete in all respects.
f. The Contractor shall supply all bolts, nuts, washers, etc. required to complete erection at site with an allowance for wastage, etc., of 10% or a minimum of five number of each item.
g. Prior to actual commencement of erection all equipment, machinery, tools, tackles, ropes, etc. need to be tested to ensure their efficient working. Frequent visual inspection is essential in vulnerable areas to detect displacements, distress, drainages, etc.
h. Deflection and vibratory tests shall be conducted in respect of supporting structures, launching truss, cranes etc. as also the structure under erection and unusual observations reviewed, looseness of fittings are to be noted.
i. For welded structures, welders' qualifications and skill are to be checked as per standard norms. Non-destructive tests of joints as per designer's directives are to be carried out.
j. Precision non-destructive testing instruments available in the market should be used for noting various important parameters of the structures frequently and systematic record is to be kept.
k. Safety requirements should conform to IS:7205, IS:7273 and IS:7269 as applicable and should be a consideration of safety, economy and rapidity.
l. Erection work should start with complete resources mobilized as per latest approved drawings and after a thorough survey of foundations and other related structural work. In case of work of magnitude, maximum mechanization is to be adopted.
m. The structure should be divided into erectable modules as per the scheme. This should be pre-assembled in a suitable yard/platform and its matching with members of the adjacent module checked by trial assembly before erection.
n. The structure shall be set out to the required lines and levels. The stocks and masses are to be carefully preserved. The steelwork should be erected, adjusted and completed in the required position to the specified line and levels with sufficient drifts and bolts. Packing materials are to be available to maintain this condition. Organized “Quality Surveillance” checks need to be exercised frequently.
o. Before starting work, the Contractor shall obtain necessary approval of the Engineer as to the method adopted for erection, the number and character of tools and plants. The approval of the

Engineer shall not relieve the Contractor of his responsibility for the safety of his method or equipment or from carrying out the work fully in accordance with the drawings and specifications.

p. During the progress of work, the Contractor shall have a competent Engineer or foreman in charge of the work, who shall be adequately experienced in steel erection and acceptable to the Engineer in Charge.

Handling and Storing of Materials

- Suitable area for storage of structures and components shall be located near the site of work. The access road should be free from water logging during the working period and the storage area should be on levelled and firm ground.
- The store should be provided with adequate handling equipment e.g. road mobile cranes, gantries, derricks, chain pulley blocks, winch of capacity as required. Stacking area should be planned and have racks, stands sleeper, access tracks, etc., and properly lighted.
- Storage should be planned to suit erection work sequence and avoid damage or distortion. Excessively rusted, bent of damaged steel shall be rejected. Methods of storage and handling steel, whether fabricated or not shall be subject to the approval of the Engineer in charge.
- Fabricated materials are to be stored with erection marks visible, such as not to come into contact with earth surface or water and should be accessible to handling equipment.
- Small fitting hand tools are to be kept in containers in covered stores.
- All materials, consumables, including raw steel or fabricated material shall be stored specification-wise and size-wise above the ground upon platforms, skids or other supports. It shall be kept free from dirt and other foreign matter and shall be protected as far as possible from corrosion and distortion. The electrodes shall be stored specification-wise and shall be kept in dry warm condition in properly designed racks. The bolts, nuts, washers and other fasteners shall be stored on racks above the ground with protective oil coating in gunny bags. The paint shall be stored under cover in air-tight containers.
- IS:7293 and IS:7969 dealing with handling of materials and equipments for safe working should be followed. Safety nuts and bolts as directed are to be used while working. The Contractor shall be held responsible for loss or damage to any material provided by the Department while in his care or for any damage to such material resulting from his work.

Formwork

The formwork shall be properly designed, substantially built and maintained for all anticipated loads. The Contractor, if required, shall submit plans for approval to the Engineer in Charge. Approval of the plans, however, shall not relieve the Contractor of his responsibility. Nothing shall be paid extra.

Straightening Bent Material

The straightening of plates, angles and other shapes shall be done by methods not likely to produce fracture or any injury. The metal shall not be heated unless permitted by the Engineer for special cases, when the heating shall not be to a temperature higher than that producing a dark “cherry red” colour, followed by as slow cooling as possible. Following the straightening of a bend or buckle the surface shall be carefully investigated for evidence of fracture. Sharp kinks and bends may be the cause for rejection of material.

Assembling Steel

- The parts shall be accurately assembled as shown on the drawings and match marks shall be followed. The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged.
- Hammering which will injure or distort the members shall not be done. Bearing surface or surfaces to be in permanent contact shall be cleaned, before the members are assembled. The truss spans shall be erected on blocking, so placed as to give the proper camber. The blocking shall be left in place until the tendon chord splices are fully riveted and all other truss connections pinned and bolted. Bolts in splices of butt joints of compression members and bolts in railings shall not be driven until the span has been swung.

- All joint surface for bolted connections including bolts, nuts, washers shall be free from scale, dirt, burrs, other foreign materials and defects that would prevent solid seating of parts. The slope of surface of bolted parts in contact with bolt head and nut shall not exceed 1 in 20, plane normal to bolt axis, otherwise suitable tapered washer shall be used.
- All fasteners shall have a washer under nut or bolt head whichever is turned in tightening.
- Any connection to be bolted shall be secured in close contact with service bolts or with a sufficient number of permanent bolts before the rivets are driven or before the connections are finally bolted. Joints shall normally be made by filling not less than 50 percent of holes with service bolts and barrel drifts in the ratio 4:1. The service bolts are to be fully tightened up as soon as the joint is assembled. Connections to be made by close tolerance bolts shall be completed as soon as practicable after assembly.

Transportation & Handling

- Before the shop assembling is dismantled, all members and sections shall be appropriately marked with paint or grooved with their identification numbers as detailed in shop drawings.
- The Contractor shall transport the fabricated structural steel materials to work site, with all necessary field connection materials, in such sequence as will permit the most efficient and economical performance of the erection work. As per scheduled programme, the Engineer-in-charge may, at his discretion prescribe or control the sequence of delivery of materials.
- Fabricated parts shall be handled in such a way-that no damage is caused to the components. Measures shall be taken to minimize damage to the protective treatment on the steelwork. All work shall be protected from damage in transit. Particular care shall be taken to stiffen free ends, prevent permanent distortion and adequately protect all machined surfaces. All bolts, nuts, washers, screws, small plates and articles generally shall be suitably packed and identified.

Field Bolts

a. Field bolts nuts and washers shall be furnished by the Contractor in excess of the nominal numbers required. He shall supply the full number of bolts, nuts and washers and other necessary fittings required completing the work, together with the additional bolts, nuts and washers totaling to 10% of the requirement subject to minimum of 10 Nos. Only HSFG bolts of class 10.9 shall be used.
b. At the time of assembly, the surfaces in contact shall be free of paint or any other applied finish, oil, dirt, loose rust, loose scale, burrs and other defects which would prevent solid seating of the parts or would interfere with the development of friction between them.
c. If any other surface condition, including a machined surface, is specified, it shall be the responsibility of the Contractor to work within the slip factor specified for the particular case.
d. Each bolt and nut shall be assembled with washers of appropriate shape, quality and number in cases where plane parallel surfaces are involved. Such washers shall be placed under the bolt head or the nut, whichever is to be rotated during the tightening operation. The rotated nut or bolt head shall be tightened against a surface normal to the bolt axis, and the appropriate tapered washer shall be, used when the surfaces are not parallel. The angle between the bolt axis and the surface under the non-rotating component (i.e. the bolt head or the nut) shall be 90 + 3 degree. For angles outside these limits, a tapered washer shall be placed under the non-rotating component. Tapered washers shall be correctly positioned.
e. No gasket or other flexible material shall be placed between the holes. The holes in parts to be joined shall be sufficiently well aligned to permit bolts to be freely placed in position. Driving of bolts is not permitted. The nuts shall be placed so that the identification marks are clearly visible after tightening. Nut and bolts shall always be tightened in a staggered pattern and where there are more than four bolts in any one joint, they shall be tightened from the centre of the joint outwards.
f. If, after final tightening, a nut or bolt is slackened off for any reason, the bolt, nut and washer or washers shall be discarded and not used again.

Tightening of bolts

a. Bolted connection joints with high strength friction grip bolts shall be inspected for compliance of codal requirements.
b. The Engineer shall observe the installation and tightening of bolts to ensure that correct tightening procedure is used and shall determine that all bolts are tightened. Regardless of tightening method used, tightening of bolts in a joint should commence at the most rigidly fixed

or stiffest point and progress towards the free edges, both in initial snugging and in final tightening.

c. The tightness of bolts in connection shall be checked by inspection wrench, which can be torque wrench, power wrench or calibrated wrench. Tightness of 10 per cent bolts, but not less than two bolts, selected at random in each connection shall be checked by applying inspection torque. If no nut or bolt head is turned by this application, connection can be accepted as properly tightened, but if any nut or head has turned all bolts shall be checked and, if necessary, re-tightened.

Painting at Site

Surfaces which will be inaccessible after site assembly shall receive the full specified protective treatment before assembly. Surfaces which will be in contact after site assembly shall receive a coat of paint (in addition to any shop primer) and shall be brought together while the paint is still wet. Damaged or deteriorated paint surfaces shall be first made good with the same type of coat as the shop coat. Where steel has received a metal coating in the shop, this coating shall be completed on site so as to be continuous over any welds, bolts and site rivets. Specified protective final painting treatment shall be completed after erection.

RATE

The unit rate shall include following but not limited to:

a. Preparation and getting approval of complete detailed fabrication drawings based on the design drawings, required for all permanent structures including incorporating the connection details of temporary structure. Preparation of details for alternative sections/ any modifications in design drawings. Furnishing required numbers of sets of drawings as an advance (for approval) and final execution drawings.

b. Procurement of all raw steel materials including plates & other sections, HSFG bolts nuts, washer, shear connector, electrodes / wires /flux including its testing, allowance for all types of wastages, temporary works, shuttering, staging, temporary bolts etc. and all incidentals required to complete the job as per drawings and specifications and as per instructions of Engineer-in-Charge. All rolling tolerances shall be within the specified limits as per codal provisions. Any material with less than specified weight will not be acceptable. No payment will be made for overweight materials.

c. Complete fabrication and its testing including shop assembling.

d. Surface preparation for application of primers and procurement and application of all coats of shop primers and internal and external paints as specified.

e. Loading, transportation and unloading of fabricated parts and field connection materials etc to site storage yard or erection site.

f. Erection and installation in final position including all site splicing, bolting, etc. including all tools, machinery, equipments required to complete the job.

8. MATERIALS AND ITS PARAMETERS

8.1. Cement

a. The 43-grade ordinary Portland cement (OPC) conforming to IS 8112 / Portland Pozzolana Cement (PPC) conforming to IS: 1489 (Part-I) as required in the work, from reputed manufacturers of cement as stated in preferred list of makes should be used.

b. Supply of cement shall be made 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. The cement for such testing purpose shall be supplied by the contractor free of charge. In case test results indicate that the cement arranged by the contractor does not conform to the relevant BIS Codes, the same shall stand rejected and shall be removed from the site by the contractor at his own cost within a week's time of written order from the Engineer-in-Charge to do so. **The cost of tests shall be borne by the contractor.**

c. Cement shall be brought at site in bulk supply of approximately 10 tonnes or as decided by the Engineer-in-Charge.

d. OPC & PPC bags shall be stored in separate godowns. Separate godowns for tested cement and fresh cement (under testing) to be constructed by the contractor at his own cost as per sketches given in C.P.W.D Specifications having weather-proof roofs and walls. The size of the cement godown is indicated in the sketches for guidance. The actual size of godown shall be as per site requirements and nothing extra shall be paid for the same. Each godown shall be provided with a single door with two locks. The keys of one lock shall remain with Engineer-

in Charge or his authorized representative of the work and that of other lock with the authorized agent of the contractor at the site of work so that the cement is issued from godown according to the daily requirement with the knowledge of both parties. The account of daily receipt and issue of cement shall be maintained in a register in the prescribed proforma and signed daily by the contractor or his authorized agent and Engineer-in-Charge or his authorized representative in token of its correctness. The day-to-day receipt and issue accounts of different grade/brand of cement shall be maintained separately in the standard proforma by the contractor or his authorized representative which shall be duly signed by the authorized representative of the Engineer-in-Charge before issue to the work on day-to-day basis.

e. Required number of cement godowns each having capacity as decided by the Engineer-in Charge shall be constructed by the contractor at site of work for which no extra payment shall be made. The contractor shall be responsible for the watch and ward and safety of the cement go-downs. The contractor shall facilitate the inspection of the cement go-downs by the Engineer-in-Charge at any time.
f. The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in the contract.
g. Cement brought to site and cement remaining unused after completion of work shall not be removed from site without written permission of the Engineer-in-Charge.
h. Damaged cement shall be removed from site immediately by the contractor on receipt of notice in writing from the Engineer-in-charge. If he does not do so within three days of receipt of such notice, the Engineer-in-charge shall get it removed at the cost of the contractor.
i. In case the contractor brings surplus quantity of cement the same shall be removed from the site after completion of work by the contractor at his own cost after approval of the Engineer-in-Charge.
j. Cement, which is not used within 90 days from its date of manufacture, shall be retested at approved laboratory. Until the results of such tests are found satisfactory, it shall not be used on the work.

8.2. Concrete

As per clause 6.2.3, 6.2.5, 6.2.6, 7.1, and 8.2.2 of IS:456 in case of Plain and Reinforced Concrete structures. The minimum grade of concrete and PCC for building construction shall be M30 grade and M15 grade respectively unless noted otherwise (u.n.o) / as required. The concrete with maximum 25% cement replacement is allowed with cementitious material GGBS/Flyash/Silica-fume as per the mix design prescribed as per IS-10262:2019.

8.3. Reinforcement Steel (Rebar)

a. Thermo-Mechanically Treated (TMT) reinforcement bars of Fe-550D grade, confirming to IS-1786:2008 to be used for the structures.
b. For reinforced cement concrete or pre-stressed concrete works, the TMT reinforcement bars shall be conforming to IS:1786 - 2008 (Indian Standard Specification for high strength deformed steel bars and wires for reinforcement) of the following grades: Fe 500D or more as per specification/nomenclature of the item.
c. The contractor shall obtain manufacturer's certificate stating the process of manufacture, chemical composition and test sheet giving result of each mechanical test applicable to the material purchased and submit it to the Engineer-in-charge. Each test certificate shall indicate the number of the cast to which it applies corresponding to the number or identification mark to be found on the material.
d. The Engineer-in-charge shall get each consignment tested for both chemical composition and physical properties (including bend and re-bend test) as specified in IS: 1786 from approved labs. In case the test results indicate that the 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 on written orders from the Engineer-in-charge to do so. Else the department shall remove it and recover double the cost of removal from the contractor.
e. The steel reinforcement bars shall be brought to the site in bulk supply of 10 tonnes or more, or as decided by the Engineer-in-charge. In no case secondary reinforcement steel will be allowed to use at site.
f. 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.

g. 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 100 tones
Under 10mm dia bars	One sample for each 25 tones or par thereof.
10mm to 16mm dia bars	One sample for each 45 tones or part thereof.
Over 16mm dia bars	One sample for each 50 tones or part thereof.

h. The contractor shall supply free of charge the steel required for testing including its transportation to testing laboratories. **The cost of tests shall be borne by the contractor.**

i. The steel brought to site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge. Steel bars brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use.

j. The contractor shall submit original vouchers from the manufacturer for the total quantity of steel supplied under each consignment to be incorporated 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 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 test certificates shall be verified by the Site staff and kept on record in the site office.

k. The standard sectional weights referred to as in Table 5.4 in para 5.3.4 in CPWD Specifications will be considered for conversion of length of various sizes of M.S. Bars, Steel Bars and T.M.T. bars into Standard Weight.

l. Records of actual Sectional weights shall also be kept dia-wise 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.

Young's modulus	E	=	200000	MPa
Yield stress	f_y	=	550	MPa
Density	γ_s	=	78.5	kN/m^3
Tensile strength	f_u	=	> 600	MPa
Minimum % elongation		=	14.5%	Table-3, IS 11384:2022

8.4. Structural Steel

Structural steel conforming to IS-2062:2011(2021) and Table-8, IS-11384:2022 shall be adopted for the structural requirements.

- Bend test not required for thickness > 25 mm for grades E300 to E650. 't' is the thickness of the test piece.
- Chemical composition of structural steel used for the construction to be as per Table-1, IS-2062:2011.
- The quality of structural steel used for the fabrication and construction in the proposed buildings to be mentioned in the proposal submitted by the contractor with due regard to the Indian standards and local climatic conditions.
- The NABL approved laboratory test reports to be submitted by the contractor/consultant for the steel raw materials used in the construction of buildings for the required physical and chemical tests.
- The structural steel must have the mechanical properties for the grades of structural steel mentioned as below.

Grade	Tensile Strength	Yield Stress (MPa)			Elongation
	Ultimate (MPa)	t < 20mm	t = 20-40mm	t > 40mm	%
E450	570	450	430	420	20
E350	490	350	330	320	22
E250	410	250	240	230	23

- Structural steel section classification for composite elements to be as per the Table 4 of IS 11384:2022. Material should be checked as per Annex E of IS 11384:2022.

Table 4 Encased I Section Classification

[*Clause* 6.1.2 (c)]

Sl No.	Section	Flange Overhang to Thickness Ratio (b/t_f)		
		Class 1 Plastic	Class 2 Compact	Class 3 Semi-compact
(1)	(2)	(3)	(4)	(5)
i)	Rolled Section	9.4 ε	10.5 ε	15.7 ε
ii)	Welded Section	8.4 ε	9.4 ε	13.6 ε

- The structural steel classification for the regular steel members shall be as per Table-1, IS-800:2007.
- Beam and column (flanges) shall be either plastic or semi-compact as per IS-800:2007.
- All the structural sections used for the members to be hot rolled prefabricated (welded) as per the approved makes (SAIL, JINDAL, TATA, RINL-VIZAG) and the ready-made sections as per approved makes (Jindal, Tata, Apl Apollo) as per IS-808:2021 / IS-4923.
- No structural member shall have thickness of less than 8 mm to meet the durability considerations.

8.5. Connection Bolts

The connection bolts used for the super-structure jointing must be hot-dip galvanized of minimum Grade-8.8 conforming to requirements of IS-800:2007 and IS 1400:1992(2017). The connection design calculations to be shared for approval along with the detailing drawing showing the grade and number of bolts required to form the efficient connections. The connection bolts with double washers and check nuts to be provided to ascertain the safety of the connections under the given loading and vibrations.

- Rigid connections : Beam – Column
- Simple connections : Secondary elements at required locations.
- The combined strength for shear and tension must be evaluated as per the requirements of IS- 800:2007.
- The connections shall be designed for at-least 20% higher design forces (working/actual loads) coming from the connected elements.

8.6. Anchor Bolts

The anchor bolts shall confirm to the requirements of IS-5624:2021 of Grade-4.6 (u.n.o) confirming to the requirements of the diameter, depth of embedment, full length, type, numbers and supplied with adequate number of templates for construction (minimum two per site).

- The strength of the base connections to be at-least 20% higher than the member design forces (working/actual) being connected at the base.
- The high-strength grout (M40) to be used to fill the gap between the pedestal and base plates. The length of the bolt must be decided considering the embedment depth and extension required to adequately tighten the bolts.
- The cover and reinforcement detailing shall be provided to the pedestals to create ease for constructing the cast-in-situ anchor bolts.
- The adequate protection coating on the anchor bolts must be prescribed.

8.7. Non-Structural walls/ Façade

The non-structural walls of Red Burnt bricks / Fly Ash Bricks / Solid Concrete Blocks / AAC blocks to be considered. The use of concrete pre-cast exterior walls for fast construction may be employed with submission of adequate technical and construction & supplier details with the required grade of concrete, reinforcement and connection with the main frame elements. The joints of the non-structural walls with the frame elements or same elements to be addressed as the design requirement and solution to be submitted for the approval of IIT Delhi.

- The all-interior walls except for staircase, RCC core, lifts wells / lobbies and toilets will be Fly Ash Bricks / AAC block wall partition.
- The exterior wall thickness to be considered as 200mm Fly Ash Bricks / AAC block finished with AHPL /Terracotta tile cladding.

8.8. Concrete mix-design

The guidelines to be followed for the proportioning of the concrete mixes to be as per IS-10262:2019. The aspects covered in IS-456:2000 for the concrete requirements must also be adhered to maintain the quality of concrete.

8.9. Cover to reinforcement - Durability & Fire protection

The durability requirements for concrete (Cl.8, IS-456:2000) and steel elements (Sec-15, IS-800:2007) to be employed along with the fire requirements (Table-16, IS-456:2000, Sec-16, IS-800:2007)

Column / Structural Wall	:	40mm
Beams	:	35mm
Slabs	:	30mm
Raft/Grade Slab	:	50mm
Footing top	:	50mm
Footing (bottom, side)	:	75mm

Exposure conditions		**Classification**
Member in contact of ground	:	Very severe
Member in interior environment	:	Moderate
Members in above-ground exterior environment	:	Severe

The buildings should have good drainage system to not allow for stagnation of water and moisture protection for elements that are hard to access. The fire protection paints (intumescent / vermiculite) and corrosion resistant coating (self-priming, low VOC, approved shade, synthetic enamel / acrylic emulsion) to be provided as per the required thickness on the steel elements on surface (for pre-fabricated) as per the finishing requirements. The cathodic protection for corrosion resistance to be suggested at required locations if applicable. The painting scheme as per the CPWD for the ready-made sections to be followed (u.n.o)

9. LOADS TO BE CONSIDERED (GRAVITY & LATERAL LOADS)

Following are the various loads to be taken into consideration for analysis and design of structures as prescribed in IS-875 (Part-1,2,3,5), IS-1893:2016, IS-800:2007, IS-11384:2022 and IS-456:2000

9.1. Dead load shall be based on the actual cross section area and unit weight of materials and shall include the weight of the materials that are structural components which are permanent or semi-permanent in nature.

The dead loads calculated shall confirm to the unit weights of material given in IS 875 (Part 1). Unit weights of various elements are given below:

Materials		**Density**
Concrete	:	25 kN/m^3
Steel	:	78.5$_{kN/m^3}$
Saturated soil	:	20 kN/m^3
Water	:	10 kN/m^3

Glass	:	27.2 kN/m^3
Aluminium	:	27 kN/m3
Aerated light weight blocks mm	:	10 kN/m^3
Dry wall partitions (102mm thk.)	:	7 kN/m^3 / As actual
Solid block masonry (SBM)	:	22 kN/m^3
Brickwall with 20mm plaster	:	20 kN/m^3
Floor finish	:	24 KN/m^3
Façade	:	As actual
Light weight Partitions wall	:	7 kN/m^3
Soil dry	:	18 kN/m^3
Soil wet	:	20 kN/m^3
Screed / Lean concrete	:	24 kN/m^3
Red brick filling material	:	18 kN/m^3

9.2. Super Imposed Dead Load

Super imposed dead loads include all the weights of materials on the structures that are not structural elements but are permanent. It includes weight of brick work, parapet, floor finish, solar panels, etc.

- Floor finish loading
  - Parking, Driveway, Storage area : 2 kN/m^2
  - Electric, Meter, IT, Panel Room, Lift lobby, Passage, Corridor, Entrance lobby, Dining, Café, Service room, Toilets, W/C, Balcony, Solar panel area, Laboratory : 1.5 kN/m^2
- MEP services, Ceiling : 0.5 kN/m^2
- Waterproofing load (brick bat coba)
  - OHT top & bottom : 3 kN/m^2 (150mm thk.)
  - Lift Machine (LMR top) : 3 kN/m^2 (150mm thk.)
  - Toilet, W/C, Washrooms (under slung sunk) : 2 kN/m^2, 3 kN/m^2 (100, 150mm thk.)
  - Balcony (sunk) : 3kN/m^2, 4kN/m^2 (150,200mm thk.)
  - Terrace : 3kN/m^2, 4kN/m^2 (150,200mm thk.)
- Lift Machine Room (LMR bottom) : 15 KN/m^2
- OHT water loading : As per Design /Drawings
- Staircase area (with Granite Stone) : 3.8 kN/m^2
- Fire tender : 10 KN/m^2

NOTE:

- The floor finish type and thickness to be referred from the Architectural drawings.
- The location of solar panels to be referred from the Architectural drawings.
- The sunk areas to be referred from the Architectural drawings.
- The size of the water tanks to be referred from the Architectural / MEP drawings and DBR.
- The areas with light weight filling shall be marked and loading to be estimated based on the sunk thickness.
- Non-Structural wall partitions details to be referred from the Architectural drawings

- The details of the external façade to be referred from the Architectural drawings / DBR for load estimation.
- Parapet loading (1.2m height) to be considered and Architectural drawings to be referred for details.

9.3. Live Loads / Imposed Loads

Live loads on the entire floor shall comprise all loads other than dead loads. The minimum live loads on different occupancies to be considered as per IS: 875 (Part 2).

Concentrated loads from specific machinery	:	as per actual equipment specs
Parking, Driveway, Storage	:	5 kN/m^2
Electrical, IT, Meter, Panel room	:	4 kN/m^2
Toilet and bathrooms	:	2 kN/m^2
Corridor, Lobby and Staircase	:	3 kN/m^2
Terrace & Balcony area	:	3 kN/m^2
Service, Storage area	:	5 kN/m^2
Equipment rooms	:	10 kN/m^2
OHT top/LMR top/Staircase top	:	0.75 kN/m^2
Loads for filling	:	As per Architectural drawings
Dining, Cafeteria	:	4 kN/m^2
Bedroom Room / living Room / Kitchen	:	4 kN/m^2
Machine/Equipment rooms	:	10kN/m^2

9.4. Erection Loads

All loads required to be carried by the structure or the part of it due to storage or positioning of construction material and erection equipment, including all loads due to operation of such equipment shall be considered as erection loads. The stability of the building and parts or joints or floors shall be ensured as part of the design (refer. pg.16, Cl.3.3, IS-800:2007).

9.5. Loads due to construction sequencing.

The linear elastic method is valid for the analysis of the structure after considering load history, sequence of concrete casting and development of composite strength. In the case of propped construction, most of the initial dead load is resisted through the beam-prop system and the steel beam remains basically unstressed at this stage. In the case of un-propped construction, the steel beam alone have to carry the initial dead load and construction loads. Consequently, stresses and deflections at this stage shall not exceed specified design limits (refer pg.14, Cl.7.1, IS-11384:2022).

- For the design of steel components and concrete decks reference of IS-800:2007 and IS-456:2000 must be done.
- The sequence of construction shall be considered as an integral part of the design process unless until it is affecting the stability of local components or the overall building as a system.
- The sequence and method of construction shall be marked in the Drawings.
- The positions of construction and expansion joints must be shown in the initial scheme and drawings submitted to IIT Delhi.
- The construction sequencing shall be aligned to suit the requirements of construction, safety, strength of partly matured components, cambering, concrete strength, etc.

SPECIAL CONDITIONS TO COMPLY DIRECTIVES OF HON'BLE NATIONAL GREEN TRIBUNAL AND EIA GUIDANCE MANUAL

1. The contractor shall not store/dump construction material or debris on metaled road.
2. The contractor shall get prior approval from Engineer-in-charge for the area where the construction material traffic/inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.
3. 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.
4. 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 unrouted their destination, the dust, sand or any other particles are not released in air/contaminate air.
5. The contractor shall provide Safety Helmet & mask to every worker working on the construction site and involved in loading, uploading and carriage of construction material and construction debris to prevent inhalation of dust particles and risk of injuries.
6. The contractor shall provide all medical help, investigation and treatment to the workers involved in the construction of building and carry of construction material and debris relatable to dust emission.
7. 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.
8. The contractor shall make compulsory use of wet jet in grinding and stone cutting.
9. The contractor shall comply with all the preventive and protective environment steps as stated in the MoEF guidelines 2010.
10. The contractor shall carry out on-Road-inspection for black smoke generating machinery. The contractor shall use cleaner fuel.
11. The contractor shall ensure that all DG sets comply with emissions norms notified by MoEF.
12. 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 case where speed reduction cannot effectively reduce fugitive dust, the contractor shall divert traffic to nearby paved areas.
13. The contractor shall ensure that the construction material is covered by tarpaulin. The contractor shall take all other precautions to ensure that no dust particles are permitted to pollute air quality as a result of such storage.
14. The paving of the path for plying of vehicle carrying construction material is more permanent solution to dust control and suitable for longer duration projects. The NIT approving authority shall carry out cost benefit ratio analysis of the same.
15. Nothing extra shall be paid for fulfilling the above conditions.

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

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS (All Water - Proofing Items).

The agreement made this.....day of ..... (Two Thousand ……only).....between S/o .....(hereinafter called the GUARANTOR of the one part) and the BoG IIT Delhi (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 render the building and structures in the said contract recited completely water and leak-proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said structures will remain water/leak proof for **(10) Ten years** to be reckoned from the date after the expiry of maintenance period prescribed in the Contract.

NOW THE GUARANTOR hereby guarantees that work executed by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be **(10) Ten years** to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

The decision of the Engineer-in-charge with regard to nature and cause of defect shall be final and binding on Guarantor.

During this period of guarantee, the guarantor shall make good all defects and in case of any defect being found render the building water proof to the satisfaction of the 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 cost and risk. 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 execute the water proofing or commits breach there under, then the guarantor will indemnify the principal 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 BoG, IIT Delhi 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 BoG IIT DELHI
BY

.....

in the presence of :-

1. ..... 2. .....

SPECIAL & ADDITIONAL CONDITIONS OF CONTRACT

General

1.1. 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, labour etc. constraints put by local regulations, if any, weather conditions at site, general ground / subsoil conditions etc. or any other circumstances which may affect or influence their tenders. The site is available for work.

1.2. The contractor shall carry out survey of the work area, at his own cost, setting out the layout and fixing of alignment of the building as per GFC architectural and Structural drawings in consultation with the Engineer-in-Charge and proceed further ensuring full structural continuity and integrated and monolithic construction. Any discrepancy between the architectural drawings and actual layout at site shall be brought to the notice of the Engineer-in-charge.

1.3. The Contractor shall, before submission of the tender, study the Architectural and Structural drawings and NIT document carefully as the work is to be executed on percentage / item rate basis. The Department shall not bear any responsibility for the lack of knowledge and also the consequences, thereof to the Contractor. 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. No claim, whatsoever, shall be entertained from the Contractor, if the data or information furnished in tender document is different from the actual site conditions. 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.

1.4. 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, or several incidental works, which are not mentioned in the specifications, drawings etc. but will be necessary to complete the item in all respects. All these incidental works / costs which are not mentioned in the specifications, drawings etc but are necessary to complete the item shall be deemed to have been included in the items. No additional payment shall be made for any variation in quantum of incidental works due to variation / change in actual working drawings. Also, no extra payment 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 is 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.

1.5. 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. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night.

1.6. The Contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards, day and night. In case of any accident of labours / contractual staff, entire responsibility will rest on the part of the contractor and any compensation under such circumstances, if becomes payable, shall be entirely borne by the contractor.

1.7. The work shall generally be carried out in accordance with "CPWD Specifications 2019 Vol. I & II" with up to date correction slips, GFC, Architectural & Structural drawings, MEP services drawings, External Development works drawings, Schedule of Finishing & Technical specifications, items to be executed with reference to Technical specifications & GFC drawings and as per instructions of Engineer-in-Charge. Any additional item of the work, if taken up subsequently, shall also conform to relevant CPWD specifications as mentioned above. Items not covered under CPWD specifications, shall be executed as per provisions of IS codes, if any or as per manufacturer's specifications or as directed by the Engineer – in – Charge.

1.8. Several documents forming part the tender are to be taken as mutually complementary to one another. Detailed drawings shall be followed in preference to small scale drawings and figured dimensions in preference to scaled 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. In case of any ambiguity due to mutually conflicting provisions or lack of clarity in tender document, decision of Engineer-in-charge shall be final and binding.

1.9. The work shall be carried out in accordance with the Architectural 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. 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.

1.10. If there is any difference or discrepancy between the description of items as given in the particular specifications for individual items of work, special conditions and I.S. Codes, drawings etc., the following order of preference shall be observed.

i. Schedule of quantities with specifications.
ii. Special & Additional Conditions.
iii. Particular specifications.
iv. Architectural drawings / Structural drawings and Technical specifications / Schedule of finishing.
v. Other conditions and specifications mentioned in the NIT
vi. CPWD Specifications including correction slips issued up to the last date of uploading/submission of tender.
vii. CPWD General Conditions of Contract for construction 2023 including correction slips issued up to the last date of submission of bid including extensions if any.
viii. Indian Standards Specifications of B.I.S.
ix. ASTM, BS, or other foreign origin code mentioned in tender document.
x. Manufacturer's specifications and as decided by the Engineer-in-Charge.
xi. Sound Engineering practices or well-established local construction practices subjected to approval by the Engineer-In-Charge.

1.11. 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 on the contractor and in case the contractor has any doubt and the same should be got clarified immediately from the Engineer-in-charge and no claim of the contractor shall be entertained thereafter. Moreover, the agency is not allowed to take benefit out of any clerical/ grammatical mistake in the standard clauses/Specifications etc. being used in the agreement.

1.12. A reference made to any Indian Standard Specifications in these documents, shall imply to the latest version of that standard, including such revisions / amendments as issued by the Bureau of Indian Standards up to last date of submission of tenders. The Contractor shall keep at his own cost all such publications of relevant Indian Standards applicable to the work at site, with correction slips up to last date of submission of bids.

1.13. The works to be governed by this contract shall cover delivery and transportation up to destination, safe custody at site, insurance, erection, testing and commissioning of the entire works.

1.14. The works to be undertaken by the contractor shall inter-alia include the following:

i. Preparation of detailed SHOP drawings of all applicable services, Fabrication Drawing of Steel Structure, Steel Connection Detail, All Services coordinated drawings on BIM /Revit Model in LOD 400 or other software as approved by the Institute and AS-BUILT drawings of all services.
ii. Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
iii. Contractor shall be responsible for assisting the architect / consultant appointed by IITD in obtaining of Occupancy Certificates from Statutory Bodies like Delhi Fire Services (DFS), Municipal Corporation of Delhi (IIT DELHI), DG operation, Lift(s), DUAC, DMRC, Forest Department, Delhi Jal Board, GRIHA Compliance & GRIHA Certificate, State Electricity Board etc. at completion stage.
iv. Warranty obligation for the equipment and / or fittings/fixtures supplied by the contractor. Contractor shall provide all the shop drawings or layout drawings for all the coordinated services before starting any work or placing any order of any of the services etc. These shop drawings/layout drawings shall be got approved from Engineer-in-charge before

implementation and this shall be binding on the contractor. The contractor shall submit material submittals along with material sample for approval of Engineer-in-Charge prior to delivery of material at site.

v. All As-Built Drawings of all External and internal services shall be submitted by Contractor on BIM/Revit Model in LOD 400 or other software as approved by the Institute.

vi. Contractor shall submit the detailed X- ray Report for Fire Retardant Paint/ Vermiculite of prime junctions, Beam, Slab or any other component of steel structure as per direction of Engineer in charge without any additional cost.

vii. Contractor Shall submit guarantee against Leakage / Seepage for 10-years as per the direction of Engineer in charge.

1.15. The Contractor shall take instructions from the Engineer-in-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed. The stacking shall take place as per stacking plan. However, if any change is required, the same shall be done with the approval of Engineer-in-Charge.

1.16. The Contractor shall bear all incidental charges for cartage, storage and safe custody of materials, if any, issued by department as well as to materials arranged by the contractor.

1.17. The contractor shall carry out performance test of the entire installation(s) as per the specifications in the presence of the Engineer-in-charge or his authorized representative before the work is finally accepted and nothing extra what-so-ever shall be payable to the contractor for such test and submit the performance report with technical data sheet.

1.18. 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.

1.19. Water tanks, taps, sanitary, water supply & drainage pipes, fittings & accessories should conform to relevant IS Standards, where CPWD specifications are not available. The Contractor should engage approved, licensed plumbers for the work and get the materials (fixtures/fittings) tested, by the municipal Body/ Corporation authorities wherever required at his own cost. The Contractor shall submit for the approval of the Engineer-in-Charge, the name of the plumbing agency (along with their working experience in recent past) proposed to be engaged by him.

1.20. The contractor shall make his own arrangements for water and for obtaining electric connections and make necessary payments directly to the State Govt. departments concerned. Contractor shall get the water tested from laboratory approved by the Engineer-in-charge at regular interval as per the CPWD Specifications 2019. All expenses towards collection of samples, packing, transportation etc. shall be borne by the contractor.

PREVENTION OF NUISANCE AND POLLUTION CONTROL

1.21. The contractor shall take all necessary precautions to prevent any nuisance or inconvenience to the owners, tenants or occupiers of adjacent properties and to the public in general and to prevent any damage to such properties from pollutants like smoke, dust, noise. The contractor shall use such methodology and equipment so as to cause minimum environmental pollution of any kind during and minimum hindrance to road users and to occupants of the adjacent properties or other services running adjacent/near vicinity. The contractor shall make good at his cost and to the 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. All waste or superfluous materials shall be carried away by the contractor, without any reservation, entirely to the satisfaction of the Engineer-in-Charge.

1.22. All the vehicles leaving the site shall be loaded in such a manner that the excavated materials, mud or debris will not be deposited on roads. All such loads shall be covered or protected to prevent dust being emitted. The wheels of all vehicles shall be washed properly before leaving the site to avoid the deposition of mud and debris on the roads. The contractor shall provide a wash pit and a wheel washing facility with high pressure water jets for this purpose. Also, the contractor shall make necessary arrangements for sweeping and removal of mud and other spillages from roads being used by it in university premises if it is deposited even after

washing of wheels of vehicles leaving site. Nothing extra shall be paid for providing and maintaining this site premises and its surroundings in good condition.

1.23. Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the nearby occupants/users of building(s), if any. Compliance of relevant rules and regulations are required to be made.

1.24. ANTI SMOG GUN

i. The agency shall provide trolly mounted or truck mounted semi-automatic antismog guns in sufficient number of suitable throws upto 100 meters. The ASG may be rotated vertically by an angle of -5 degrees to 45 degrees. The canon may rotate by 320 degrees (manually or by remote control).

ii. Care shall be taken that there will be minimum noise and emission into air during operation of ASG. Hence, conventional electric supply must be used for operation. Alternatively, use of CNG, PNG operated Gensets must be encouraged.

iii. Energy meter should be installed at ASG for checking/monitoring use of ASG at site.

iv. Best quality nozzles (with droplet size from 10-50 micrometer) and optimum hydraulic pressure be used to generate atomized water droplets. The size of droplets is crucial for dust control so nozzle must be certified by Original Equipment Manufacturer for droplet size.

v. Source of water: - Municipal supply water or class A and class B water without conventional treatment but only after disinfection so as to make water free from coliforms, viruses and bacteria (details of class A and B are presented in "Designated Best Use Water Quality Criteria" developed by CPCB).

vi. Use of treated sewage water be avoided.

vii. Time span for use: - Normally for 30 minutes as a continuous operation every 2-3 hours. However, operation shall depend upon site conditions, types of construction activities going on at the site and local environmental conditions to ensure there is no windblown dust.

SECURITY & TRAFFIC ARRANGEMENTS

1.25. In the event of any restrictions being imposed by the Security agency, IIT DELHI, Traffic or any other authority having jurisdiction in the area on the working or movement of labour /material, the contractor shall strictly follow such restrictions and nothing extra shall be payable to the contractor on such accounts. The loss of time on these accounts, if any, shall have to be made up by augmenting additional resources whatever required.

1.26. Before tendering, the bidder must visit the site and assess the manner in which he is able to arrange the accommodation facilities for labours. If as per local Municipal regulations or if space is not available at site, huts for labourers are not to be erected at the site of work, the contractor shall be required to provide such accommodation at a place outside the campus as is acceptable to the local body and nothing extra shall be paid on this account. The contractor cannot be permitted to have labour huts on the site as there is acute shortage of space. 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.

1.28. The contractor shall construct suitable godowns, yard at the site of work for storing all other materials so as to be safe against damage by sun, rain, damages, fire, theft etc. at his own cost and also employ necessary watch and ward establishment for the purpose at his cost.

1.29. All materials obtained from contractor shall be got checked by the representative of Engineer-in-Charge on receipt of the same at site before use.

1.30. Royalty at the prevalent rates shall have to be paid by the contractor on all the boulders, metals, shingle, sand and bajri etc. collected by him for the execution of the work, direct to the Revenue authority or authorized agent of the State Government concerned or Central Government if necessary.

1.31. The contractor shall be responsible for the watch and ward/guard of the buildings, safety of all fittings and fixtures including all equipment, services provided by him against pilferage and breakage during the period of Installations and thereafter till the building is physically handed over to the Client Department. No extra payment shall be made on this account, and no claim

shall be admissible on this account.

1.32. The Contractor shall keep himself fully informed of all acts and laws of the Central & State Governments, all orders, decrees of statutory bodies, tribunals having any jurisdiction or authority, which in any manner may affect those engaged or employed and anything related to carrying out the work. All the rules & regulations and bye-laws laid down by Collector and any other statutory bodies shall be adhered to, by the contractor, during the execution of work. The Contractor shall also adhere to all traffic restrictions notified by the local authorities.

1.33. The extra sewerage charges (one time charges for commencement of work) required to be paid to the Municipal Corporation/ other statutory bodies shall be paid by the department and need not be considered by the contractor. All statutory taxes, levies, charges (including water and sewerage charges, charges for temporary service connections and / or any other charges) payable to such authorities for carrying out the work, shall be borne by the Contractor.

1.34. The water charges (for municipal water connection as well as tanker water) shall be borne by the contractor. Also, if the contractor obtains water connection for drinking purposes from the municipal authorities or any other statutory body, the consequent sewerage charges shall be borne by the contractor. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and shall pay to such authority all the fees that is required to be paid for the execution of work.

1.35. The contractor shall protect and indemnify the Department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts. 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.

1.36. For works below ground level the contractor shall keep that area free from water. If dewatering or bailing out of water is required the contractor shall do the same at his own cost and nothing extra shall be paid.

1.37. The Contractor shall make all necessary arrangements for protecting from rains, fog or likewise extreme weather conditions, the work already executed and for carrying out further work, during monsoon including providing and fixing temporary shelters, protections etc. Nothing extra shall be payable on this account and also no claims for hindrance shall be entertained on this account.

1.38. In case of flooding of site on account of rain or any other cause and any consequent damage, whatsoever, no claim financially or otherwise shall be entertained notwithstanding any other provisions elsewhere in the contract agreement. Also, the Contractor shall make good, at his own cost, the damages caused, if any. Further, no claims for hindrance shall be entertained on this account.

1.39. The contractor will take reasonable precautions to prevent his workman and employees from removing and damaging any flora (plant/vegetation) from the project area.

1.40. 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. But contractor will take lead and initiative to extend all help and cooperation and coordinate with consultant in this matter. Nothing extra shall be paid on this account.

1.41. 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 and 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 with the levels shown in the layout plan. 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 and have the same resolved. 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. Nothing extra shall be payable on this account.

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 benchmarks maintained for the said purpose. Nothing extra shall be payable on this account.

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.

viii. The Percentage rate quoted by the Contractor are deemed to be inclusive of site clearance, setting out work (including marking of reference points, center lines of buildings), construction and maintenance of reference bench mark(s), taking spot levels, construction of all safety and protection devices, barriers, barricading, signage, labour safety, labour welfare and labour training measures, preparatory works, working during monsoon, working at all depths, height and location etc, compliance of environmental conditions and any other incidental works required to complete this work. Nothing extra shall be payable on this account.

ix. A site laboratory with the minimum equipment as specified in CPWD specifications & in this agreement as per Annexure enclosed shall be established, made functional and maintained within one month from the award of work without any extra cost to the department. In case of non-compliance / delay in compliance in this, a recovery @ Rs. 5000/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

1.42. INTEGRATED SERVICE DRAWINGS: Before taking up the work, the contractor shall provide integrated and coordinated drawings for various services showing details of layout plan including sectional elevations and contractor shall plan and mobilize his resources as per the Integrated drawings and as per the site conditions to facilitate convenient execution, installation as well as maintenance of these services. **Contractor is also required to give the fabrication drawing and BIM model(s) for individual and combined and superimposed services after ensuring clash free detection**. Nothing extra shall be payable on this account.

1.43. TOOLS AND PLANTS: The bidder should have own constructions equipment required for the proper and timely execution of the work. Nothing extra shall be paid on this account. 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.

1.44. SCAFFOLDING: Wherever required for the execution of work, all the scaffolding shall be provided and suitably fixed, by the Contractor. It shall be provided strictly with steel double scaffolding system, suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection. Single scaffolding system is strictly prohibited and shall invite necessary action. It shall be designed to take all incidental loads. The design is the responsibility of the contractor. It should cater to the safety features for workmen. Nothing extra shall be payable on this account. It shall be ensured that no damage is caused to any structure due to the scaffolding.

1.45. The Contractor shall do proper sequencing of the various activities by suitably staggering the activities within various pockets in the plot so as to achieve early completion. The agency to 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 constructional 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.

1.46. Slab cycle requirements: The contractor shall plan at various stages of work commensurate to the slab cycle requirement through submitted shuttering plan/design, which shall be the sole responsibility of the contractor and this shall not absolve him of his responsibility despite approvals accorded by EIC. The quoted rate shall be deemed to include the cost of the above.

1.47. The Contractor shall maintain all the work in good condition till the completion of entire work. The Contractor shall be responsible for and shall make good, all damages and repairs, rendered necessary due to fire, rain, traffic, floods or any other causes. 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 any other of his representatives, in his employment during the execution of the work. The compensation, if any, shall be paid directly to the Department / authority / persons concerned, by the Contractor at his own cost.

1.48. **PRESERVATION AND CONSERVATION MEASURES**: 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. 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.

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.

1.49. **RESPONSIBILITY:** The contractor shall protect and indemnify the IIT Delhi and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts.

1.50. The Contractor shall assume all liability, financial or otherwise in connection with this contract and shall protect and indemnify the Department from any and all damages and claims that may arise on any account. 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.

1.51. **CO-OPERATION WITH OTHER CONTRACTORS/SPECIALIZED AGENCIES/ SUB-CONTRACTORS**

1.52. The Contractor shall take all precautions to abide by the environmental related restrictions imposed by any statutory body having jurisdiction in NCT Delhi as well as prevent any pollution

of streams, ravines, river bed and waterways. All waste or superfluous materials shall be transported by the Contractor, entirely to the satisfaction of the Engineer- in-Charge and disposed at designated places only. Utmost care shall be taken to keep the noise level to the barest minimum so that no disturbance as far as possible is caused to the occupants / users of adjoining buildings. No claim whatsoever on account of site constraints mentioned above or any other site constraints, lack of public transport, inadequate availability of skilled, semi-skilled or unskilled workers in the near vicinity, non-availability of construction machinery spare parts and 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.

1.53. 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 IIT Delhi against any claim(s) arising out of such disputes. The Contractor shall:

i. Allow use of scaffolding, toilets, sheds etc.
ii. Properly co-ordinate their work with the work of other Contractors.
iii. Provide control lines and benchmarks to his Sub-Contractors and the other Contractors.
iv. Provide electricity and water at mutually agreed rates.
v. Provide hoist and crane facilities for lifting material at mutually agreed rates.
vi. Co-ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.
vii. Adjust work schedule and site activities in consultation with the Engineer-in- Charge and other Contractors to suit the overall schedule completion.
viii. Resolve the disputes with other Contractors/ sub-contractors amicably and the Engineer-in-Charge shall not be made intermediary or arbitrator.
ix. The work should be planned in a systematic manner so as to ensure proper co-ordination of various disciplines viz. sanitary & water supply, drainage, rain water harvesting, electrical, fire fighting, information technology, communication & electronics and any other services.
x. Other agencies will also simultaneously execute and install the works of sub-station / generating sets, air-conditioning, lifts etc. for the work and 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 (for which inserts, sleeves, brackets, conduits, base plates, clamps etc. shall be supplied by the contractor himself and the same shall be fixed at time of casting of concrete, stone work and brick work, if required, and nothing extra shall be payable on this account.
xi. The contractor shall conduct his work, so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-In-Charge and shall as far as possible arrange his work and shall place and dispose of the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and in a proper co –ordination manner and shall perform it in proper sequence to the complete satisfaction of others.

1.54. SPECIALIZED AGENCIES

i. The main contractor shall submit the credential of two specialized agency for each discipline 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 quantum of credentials will be broadly in line with NIT floated by IIT Delhi. 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.

ii. 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.

1.55. FOUNDATION SYSTEM AND SOIL INVESTIGATION.

The existing site is nearly flat and Care shall be taken to ensure to support the footings on firm strata ensuring minimum SBC specified in structural drawings. Subsurface conditions encountered during construction may vary somewhat from the conditions encountered during site investigation. There is likelihood of different types of formation in sub-soil. Therefore, it is essential to examine the founding levels very carefully during excavation and plan the foundations till firm strata is ensured prior to laying of PCC for foundation. It should be ensured that at foundation level, no voids are there, if voids are observed the same shall be grouted or treated like firm strata. The decision of Engineer-in charge shall be final and binding. If necessary, soil stabilization measures shall be implemented by the contractor, without any extra cost, to achieve the bearing capacity as specified in structural drawings. If required suitable soil test may have to be carried out by the contractor to get the desired SBC to the satisfaction of Engineer-in-charge and nothing shall be paid extra. Any deviation in earth work, concrete work, RCC work, or any other items of works will be ignored and nothing shall be paid on account of varying foundation level (in order to ensure supporting of foundation on firm strata and at minimum SBC specified in structural drawings). The contractor shall quote the rate accordingly.

1.56. RATES

i. The rates quoted by the Contractor are deemed to be inclusive of site clearance, setting out work, profile, setting lay out on ground, establishment of reference bench mark(s), installing various signage, taking spot levels, survey with total station/ GS, 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, construction of clean, hygienic and well-ventilated workers housings in sufficient numbers as per drawing supplied by Engineer in charge, working during monsoon or odd season, working beyond normal hours, working at all depths, height, lead, lift, levels and location, implementation of green building norms to achieve desired GRIHA rating 4 etc. compliance of environmental conditions / guidelines and any other unforeseen but essential incidental works required to complete this work. Nothing extra shall be payable on this account and no extension of time for completion of work shall be granted on these accounts.

ii. **The rates quoted by the tenderer, shall be firm and inclusive of all taxes and levies (including GST, Seigniorage charges and construction labour welfare cess etc.).**

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 camp, stores, fabrication yard, offices for Contractor, watch and ward, temporary ramp required to be made for working at the basement level, 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, for the project. 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, not with-standing the fact that the Contractor may have to pay extra amounts for any reason, to the laborers and other staff engaged directly or indirectly on the work according to the provisions of the labour and other statutory bodies regulations and the agreement entered upon by the Contractor with them.

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.

1.57. 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 etc. shall be provided and displayed during daytime by the Contractor, wherever required and as directed by the Engineer-in-Charge. 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. The contractor shall also ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. This signage shall be dismantled & taken away by the Contractor after the completion of work, only after approval of the Engineer – in – Charge. Nothing extra shall be payable on this account.

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 10 days from issue of award letter. Nothing extra shall be payable on this account. In case of non compliance/delay in compliance in this, a non-refundable recovery @ Rs.5000/- per day will be made which will be recovered from the immediate next R/A Bill of the Contractor.

iii. Necessary protective and safety equipment's such as helmet, safety shoes, gloves etc shall be provided to the Site Engineer, Supervisory staff, labour and technical staff of the contractor by the Contractor at his own cost and to be used at site. Similarly, the same shall be provided to all IIT Delhi Engineers, Visiting Representatives, TPQA staff, Consultants and other visitors also by the contractor.

iv. 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.

v. Skilling of Construction workers and Safety Management in Projects shall be followed as per CPWD works procedure and Publications.

1.58. TPQA: Third Party Quality Assurance

The contractor/ associated agency shall extend full cooperation to TPQA agencies engaged by the department for the Project during their field visits for arranging the necessary quality assurance tests for materials and the construction works

1.59. QUALITY ASSURANCE:

i. The proposed building 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, Polysulphide sealant and backer rod fixing in structural glazing works and windows, 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 for arranging the necessary quality assurance tests for materials and the construction works.

iv. In addition to the supervision of work by Engineer- in-charge or his representatives, the Consultants deployed by the CPWD shall also be carrying out 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, these are also to 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 doors and windows, thinnest joints in stone/ tiling / cladding work, non hollowness in floor and dado tiles work, protection of scratches over flooring by impounding layer of plaster of Paris, water tight pipe linings, absence of hollow vertical joints in brick masonry, proper compaction of filled up earth etc. to achieve an Institution of International standards and up keeping of quality assurance shall be of paramount importance, as such.

v. The Contractor shall submit immediately after the award of work 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.

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 material is not specified in the particular specifications; the contractor shall submit the sample of premium make as per list of preferred makes 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 and 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. This is, however, subject to documentary evidence produced by the contactor for nonavailability of the brand specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, the decision of Engineer-in-Charge as regards equivalent make of the material shall be final and binding on the Contractor. No claim, whatsoever, of any kind shall be entertained from the Contractor on this account. Nothing extra shall be payable on this account. Also, the material shall be procured only after written approval of the Engineer-in-Charge.

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 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. No claim of payment or claim of any other kind, whatsoever, shall be entertained from the Contractor.

xiii. 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 and as per CPWD specification before covering.

xiv. 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. Nothing extra shall be paid on this account.

xv. The contractor shall give performance test of the entire installation(s) as per the standing specifications before the work is finally accepted and nothing extra whatsoever shall be payable to the contractor for the test.

xvi. The Contractor shall arrange electricity at his own cost for testing of the various electrical installations as directed by Engineer-in-Charge and for the consumption by the contractor for executing the work. Also, all the water required for testing various electrical installations, fire pumps, wet riser / fire fighting equipment'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. Nothing extra shall be payable on this account.

xvii. The Contractor shall scrupulously preserve all the documents related to work and make available, on request from the Department, the copies of challan, GST paid vouchers and invoices, 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-today account of receipt of such material shall be maintained at site of work.

xviii. 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. The decision of Engineer-in-charge shall be final and binding.

xix. 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.

1.60. SUBMISSION AND DOCUMENTATION

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 at site 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 four (04) sets of completed Building Drawings, "As Built Drawings" along with literatures, 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 all drawings of internal and external services i.e. Water Supply, Sanitary line and Drainage lines. This shall be the prerequisite for payment of final bill. These drawings shall have the following information:
   a. Data of Run off for all piping and their diameters including soil, waste pipes and vertical stacks.
   b. Ground and invert level of all drainage pipes together with locations of all manholes and connections, up to outfall.
   c. Run off for all water supply lines with diameters location of control valves, access panels etc.

iv. To avoid delay, contractor should submit all samples well in advance so as to give timely orders for procurement.

1.61. PROJECT PROGRAM CHART

i. The Contractor shall prepare the integrated program chart within 10 days of issue of award letter including civil as well as E & M / MEP activities for the execution of work, **taking into account the observation from presentation/ client** Showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfillment of the program within the stipulated period and submit the same for approval of the Engineer-In-Charge within 10 days of the award of the work. These shall be submitted by the contractor through electronic media besides forwarding hard copies of the same. The integrated program chart so submitted should not have any discrepancy with the physical milestones attached in the contract agreement. The program chart should include the following:-
   a. Descriptive note explaining sequence of various activities.
   b. Construction Program prepared on Building information modelling (BIM) Software /Revit Model in LOD 400 / or other software as approved by the Institute, which will indicate resources in financial terms, manpower and specialized equipment for every important stage.
   c. Program for procurement of materials by the contractor.
   d. Program for arranging and deployment of manpower both skilled and unskilled so as to achieve targeted progress.
   e. 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.
   f. Program for achieving fortnightly micro milestones and periodic milestones.

ii. In case of non-compliance/delay in compliance in this, a penalty @ Rs.5000/- per day will be imposed which will be recovered from the immediate next R/A Bill of the Contractor.

iii. 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.

iv. The submission for approval by the Engineer-In-Charge of such program or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of Engineer-In-Charge to take action against the contractor as per terms and conditions of the agreement.

v. Contractor shall submit the Material Store Certification and Tower, Mobile crane location, Its Foundation detail and layout to Engineer-in-Charge for Proof checking/vetting of crane design for handling required load.

1.62. SUBMISSION OF PROGRESS REPORTS

i. 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, apart from whatever else may be required as specified above:
   a. Construction schedule of the various components of the work through a bar chart for the next two fortnights (or as may be specified), showing the micro-milestone/milestones, targeted tasks (including material and labour requirement) and up to date progress. At least 10 digital photographs showing all the parts of construction site of executions of different items in soft copy has to be submitted in every fortnightly progress report.

b. Progress chart of the various components of the work that are planned and achieved, for the fortnight as well as cumulative up to the fortnight under reckoning, with reason for deviations, if any in a tabular format.
c. 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 i.e. blocks.
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 18cheque payment received, extra/substituted/deviation items if any, etc.
f. In case of non-compliance / delay in compliance in submission of fortnightly, a non-refundable recovery @ Rs.5000/- per fortnightly report per day will be made which will be recovered from the immediate next R/A Bill of the Contractor.

1.63. PROJECT REVIEW MEETINGS

The contractor, immediately on award of work shall submit details of his key personnel to be engaged for the work at site. In addition, he shall furnish the Engineer-in-charge detailed program involved with the work.
The contractor shall present the programme with Power Point Presentation (PPT) and Hard copies about the status at various review meetings as required.
Weekly Review Meetings shall be attended by Local Team headed by Project-in-charge along with IIT Delhi team and client representative.

Agenda	a) Weekly programme v/s actual achieved in the past week and programme for next week. b) Remedial actions and hold up analysis. c) Any decision on quarries raised either by contractor/IIT DELHI. d) Fortnightly pictorial report of site progress e) GRIHA Compliances

Monthly Review Meetings: Shall be attended by Project – in – charge and the Management Representative who can take independent decisions along with IIT DELHI team and client's representatives.

Agenda	a) Progress Status/Statistics. b) Completion Outlook. c) Major hold ups/slippages. d) Assistance required. e) Critical issues. f) Any decision on queries raised either by contractor / IIT DELHI. g) Anticipated cash flow requirement for next two months.

1.64. TEMPORARY WATER/ ELECTRICITY/ TELEPHONE CONNECTION

i. Arrangement of temporary telephone connection, internet/wifi, water and electricity required by Contractor, shall be made by him 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 and 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. Nothing extra shall be payable on this account.
ii. The Contractor shall be responsible for maintenance and watch and ward of the complete installation and water / electricity meter and 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. Nothing extra shall be payable on this account.
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.

No claim of delay or any other kind, whatsoever, on this account shall be entertained from the Contractor. 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 any kind whatsoever shall be entertained on this account from the Contractor. Nothing extra shall be payable on this account.

1.65. 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 as directed by the Engineer-in-Charge, 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. Nothing extra shall be payable on this account. 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 agreement.

ii. The contractor shall take instructions from the Engineer-In-Charge regarding collection and stacking of materials at any place. No excavated earth or building rubbish shall be stacked on areas where other buildings, roads, services and compound walls are to be constructed.

iii. The site of work shall be always 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 waste water, slush etc. shall not be allowed to be collected at site. It may be directly pumped into the creek with prior approval of the concerned authorities. For discharge into public drainage system, necessary permission shall be obtained 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. Nothing extra shall be payable on this account.

1.66. INSPECTION OF WORK

i. In addition to the provisions of relevant clauses of the contract, the work shall also be open to inspection by representative (s) of IIT DELHI & 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.

ii. **Inspection of the work by the Consultant appointed by IIT DELHI.** The consultant appointed by IIT DELHI , shall be inspecting the works to ensure that the works are in general being executed according to the design, drawings and specifications laid down in the contract. His observations shall be communicated by IIT DELHI engineering staff and compliance is to be reported to IIT DELHI.

iii. Representative(s) of IIT DELHI, 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 details.

   a. Display Board showing detail of work, weekly progress achieved with respect to targets, reason of shortfall, status of manpower, wages being paid for different categories of workers.
   b. Entrance and area surrounding to be kept cleaned.
   c. Display layout plan key plan, Building drawings including plans, elevations and sections.
   d. Up to date displays of Bar chart, CPM and PERT etc.
   e. Keep details of quantities executed, balance quantities, deviations, possible Extra item, substituted Item etc.
   f. Keep plastic / cloth mounted one sets of building drawings.

g. Set of Helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.

1.67. FINAL TESTING OF THE INSTALLATION

The Contractor shall demonstrate trouble free functioning of all the Civil and E & M installations and services. The Engineer-in-Charge or his authorized representatives shall carry out final inspection of the various Civil and E & M services and installations. Any defect(s) noticed during demonstration shall be rectified by the Contractor at his own cost to the entire satisfaction of the Engineer-in-Charge. Nothing extra shall be payable on this account.

1.68. SUBMISSION OF AS BUILT DRAWINGS AND OBTAINING OCCUPATION CERTIFICATE

The contractor shall coordinate and facilitate the consultant / architect appointed by IITD for obtaining occupation certificate / completion certificate from local bodies including getting the required site visits conducted by such authorities with a view to obtain the same. Liasoning with Local body(ies) shall be in the scope of the contractor. Nothing shall be paid extra to the contractor in this regard.

1.69. DEFECT LIABILITY PERIOD (REFUND OF SECURITY DEPOSIT)

Refer clause 17, General Condition of Contract.

1.70. 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 materials 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, APP (Atactic Polypropylene Polymer, Poly urethane compounds), all exterior and interior paints, polish etc.) shall be procured in convenient packs say 20 litres/Kgs.} capacity packing only or 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.

iv. 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.

v. All filled containers shall be handled in safe manner and in a way to avoid breaking container seals.

vi. 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.

vii. All arrangements for measuring, dosing and mixing of material / chemicals at site have to be made by the contractor.

viii. Contractor shall suitably advise his site Engineer and all the workers as regards safe handling of chemicals. Necessary protective and safety equipment in form of hand gloves, goggles etc. shall be provided by the contractor and be also used at site.

ix. All incidental charges of any kind including cartage, storage and wastage and safe custody of material etc. shall be borne by the contractor and no claim, whatsoever, shall be entertained on this account.

x. The chemicals shall be tested in an independent laboratory as approved by the Engineer-in-charge at the frequency as specified. If required, more samples may have to be tested as per the directions of the Engineer-in-Charge. Nothing extra shall be payable on this account.

1.71. 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 no extra cost. 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-bye to attend to repair of pumps etc. and disruption of power / fuel supply. Nothing extra shall be payable on this account.

ii. In trenches where surface water is likely to get into cut / trench during monsoons, a ring bund of puddle clay or by any other means shall be formed outside, to the required height, and maintained by the Contractor. Also, suitable steps shall be taken by the Contractor to prevent back flow of pumped water into the trench. Nothing extra shall be payable on this account.

1.72. 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 equivalent to contract value 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 7 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.

1.73. PRESERVE AND PROTECT LANDSCAPE DURING CONSTRUCTION

i. The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.

ii. The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.

iii. Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by Engineer in Charge.

iv. The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.

v. The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.

1.74. PREPARATION OF SAMPLE (MOCK UP)

The contractor shall prepare one sample/Mock-Up for typical units (e.g. Room / Lobby/ Sample Flat / Corridor of minimum 10m length/ complete male, female, Handicap toilet unit etc.) with. samples of representative units, well in advance before taking up the mass execution at the appropriate time as per milestones. The contractor shall invariably prepare the samples units of 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 items only after getting the samples of these items approved in writing from Engineer-in-charge. The preparation of sample (mock up) shall be done before 8 months after award of work, else the recovery of Rs. 5000/- per week of delay shall be imposed and recovered from next RA bill.

1.75. APPLICABLE PERMITS

i. The contractor(s) shall give to the Municipality, police and any 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. He shall make good any damage to the adjoining property whether public or private and shall supply and maintain lights either for illumination or for cautioning the public at night.

ii. The contractor shall ensure that applicable permits mandated by the local bodies and in case warranted for this work are obtained as required under the Applicable Laws. An indicative but not exhaustive list of some of the applicable permits are mentioned below for the guidance of the Contractor.

iii. Consequences on account of failure to obtain the mandatory permits shall be the sole responsibility of the contractor and no claim whatsoever shall be entertained by the EIC. Any liability incurred by EIC on account of such failure shall be recovered from the amounts/payments due to the contractor.

a. Permission of the State Government for extraction of boulders from quarry.
b. Permission of Pollution Control Board for installation of crushers.
c. Licence for use of explosives.
d. Permission of the State Government for drawing water from river/reservoir.
e. Licence from Inspector of factories or other competent authority for setting of Batching Plant.
f. Clearance of Pollution Control Board for setting up Batching Plant.
g. Clearance of Pollution Control Board for Asphalt Plant.
h. Clearance of Pollution Control Board for installation of diesel generator sets.
i. Fire safety clearance from fire authorities.
j. Licence from Lift Inspector, Department of Labour.
k. Permission of State Government for cutting of trees; if any.
l. Permit for employing unskilled/semi skilled labour during day/night.
m. Permit for disposal of solid waste/excess material or soil.
n. Permissions from the public utilities for diversion of utilities including reinstatement/reconstruction to original specifications.
o. Electrical Licence form CEA, Electrical Inspector, approvals for electric supply/distributions.
p. Any other permits or clearance required under the Applicable laws.

1.76. Procurement of Centering and Shuttering

The marine ply centering and shuttering and other connected materials required for shuttering an area of 30000 sqm ± 10% shall be made available within 45 days of date of start of work, failing which recovery will be made at the rate of Rs. 5000/- per day till the materials are made available at site upto the satisfaction of Engineering-in-charge. The recovery will be effected in the next running account bill itself. The material so brought shall not be removed from the site of work, unless all connected works are completed and approval of Engineer-in-charge is obtained. The decision of the Engineer-in-charge in this regard shall be final and binding upon the contractor.

1.77. The bidder shall mobilize construction equipment to site of work as per Table within the time schedule as mentioned in the table.

1.78. Sample Room and Sample toilet for residential building, sample unit for residential building incorporating all relevant items including, painting, water supply and sanitary installations, electrical installations and services is to be completed to demonstrate their functioning within 240 days from the stipulated date of start.

1.79. The recovery, if any, towards late procurement of centering and shuttering, delay in submission of construction programs, progress reports, non construction of Lab building are non refundable.

1.80. 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 22 chapters and corresponding provisions of NBC 2016 while incorporating such features in the building. Nothing extra shall be payable on this account.

1.81. **All efforts will be made to make the running account bills payment within 21 days of submission of the bill in correct shape and form. However, due to any reason if the running account bills payment could not be made, the contractor cannot claim any interest on the amount claimed in the running bills and hindrance on account of delay in payment.**

1.82. **Samples of all materials being used in the work and sample of work of all items shall be got approved from the Engineer-in-charge well in advance before execution.**

1.83. The sample rooms two nos each not less than 1 unit shall be constructed with the provisions as directed by Engineer-in-charge for keeping approved samples till completion of the work.

1.84. 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. The available excavated earth suitable for filling shall be used by the contractor. Excess earth required if any shall be procured from outside the campus for which nothing extra shall be paid. Surplus excavated earth after filling as per site conditions to be disposed outside the campus by taking required permission from concerned Government authority. No extra payment will be made for the above.

1.85. In case of reduction in scope of work no claim on account of reduction in value of work, loss of expected profit, consequential overheads etc. shall be entertained.

1.86. GST or any other tax applicable in respect of inputs procured by the contractor for this contract shall be payable by the contractor and Govt. will not entertain any claim whatsoever in respect of the same.

1.87. If any information furnished by the bidder is found to be incorrect at a later stage, he shall be liable to be debarred from tendering/taking up of works in IIT DELHI. The department reserves the right to verify the particulars furnished by the applicant independently.

1.88. **The testing charges of all materials including steel, cement, bricks, tiles, doors, aluminium, wood works items etc shall be borne by the contractor including all incidental charges like cost of materials, packing and transportation etc. This condition will supersede if anywhere in this document it is mentioned that the testing charges shall be paid by the department.**

1.89. In order to maintain uniformity of the shade/colour of the exposed RCC, the source of materials like aggregate and sand used in RCC works shall be consistent and the cement shall be procured from a single manufacturer as far as possible.

1.90. **ADDITIONAL CONDITIONS AND PARTICULAR SPECIFICATION FOR ALUMINIUM WORK.**

i. The material for the work shall be procured from the approved manufacturer as per the list attached with the tender documents. 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 aluminium 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.

ii. The Contractor shall prepare the shop drawings for the aluminium windows giving details of the various aluminium sections, microwave cured EPDM gaskets, cleats, anchor fasteners, hardware, sealants, glass etc. and submit the same for the approval of Engineer-in-Charge.

iii. Only after the approval of the samples and the shop drawings by the Engineer-in-Charge, the Contractor shall procure the material for the work. All materials brought to the site by the Contractor, for use in the work, as well as fabricated components shall be subject to inspection and approval by Engineer-in-Charge. The Contractor shall produce manufacturers test certificates for any material or particular batch of materials supplied by him.

iv. The Contractor shall prepare a finished sample of the aluminium window along with glazing panel and fittings etc. for approval of workmanship and material. Nothing extra shall be payable on this account.

v. Aluminium sections to be used for various works shall be appropriate to meet technical, structural, functional and aesthetic considerations. The polyester powder coating shall be carried out in an approved factory /workshop as specified in the tender documents

FABRICATION

vi. All joints shall be accurately fabricated and be hairline in appearance. The finished surface shall be free from visible defects. All the aluminium windows/ventilators/doors shall be factory made and shall be only brought to site for assembly and fixing.

vii. All hardware used shall conform to the relevant specifications and as per samples approved by the Engineer- in-Charge of reputed makes. Design, quality, type, number and fixing of hardware shall be generally in accordance with architectural drawings and as approved by the Engineer-in-Charge before use.

viii. All doors, windows, ventilators and glazing etc. shall be made watertight with microwave cured EPDM gaskets and weather silicone sealants to the satisfaction of the Engineer-in-Charge, for which nothing extra shall be payable.

ix. The frames shall be strictly as per Architectural drawings, 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 aluminium cleats, stainless steel screws etc. shall not to cause any bi-metallic reaction by providing separators, wherever required. Vertical members of the aluminum framework shall be embedded in the floors, wherever required, by cutting and making good of the floor.

FIXING OF ALUMINIUM FRAME WORK

x. All kind of aluminium frame work (door, window, ventilator etc.) shall be fixed on non-anodized aluminium base frame (must be in line and level) which must be fixed before plaster or granite lining work.

xi. The screws used for fixing fixed aluminium frames of the aluminium windows to Granite Cill or Jamb , masonry walls / RCC members and aluminium members to other aluminium members shall be of heavy guage 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.

xii. For the aluminium windows, the contractor is to ensure no gap between the aluminium frames and the R.C.C / Masonry. and also any gaps in the various sections All joints 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. Nothing extra shall be payable for the above.

xiii. Fixing of glass panes shall be designed in such a way that replacing damaged /broken glass panes is easily possible without having to remove or damage any members or interior finishing materials.

xiv. Stainless steel adjustable heavy duty friction hinges and the aluminum handles for the openable side hung windows shall be of "Earl Bihari" Ebco, make or equivalent as approved by the Engineer-in-Charge. 2 nos. friction hinges shall be provided per shutter.

PROTECTIONS AND CLEANING:

xv. All glass panes 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:

xvi. 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 Low ‘E’– Heat strengthened 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.

1.91. SPECIAL CONDITIONS FOR GREEN BUILDING

i. The work is aimed for minimum GRIHA LD 4 star rating. To obtain minimum GRIHA LD 4 star rating the contractor shall ensure to execute the work in a befitting manner to obtain the targeted GRIHA rating. In case of non-compliance of the following conditions, a recovery will be imposed which will be recovered from the immediate next R/A Bill of the Contractor. The recovery amount shall be decided by the Engineer-in-Charge and shall be binding on the contractor.

ii. Special conditions for GRIHA rating:-

iii. The contractor shall prepare scheme for the approval of Engineer-in-charge for obtaining GRIHA LD 4 rating in the criteria relevant to the execution of work.
iv. The contractor shall plan and execute the work in a manner to preserve and protect the landscape during construction and shall arrange the materials/equipment and follow the procedure as per GRIHA LD rating requirement as applicable.
v. All the mandatory criteria of GRIHA LD 4 and additional conditions for Green Building practices are to be necessarily followed.
vi. The contractor shall comply with NBC- 2016 norms on construction safety, health and sanitation as per GRIHA LD rating system.
vii. The construction activity shall be done in a befitting manner, and the contractor shall adopt measures to prevent air pollution at site in compliance with GRIHA LD rating as applicable.
viii. The contractor shall comply with all the instructions and schemes for execution of Green building.
ix. Nothing shall be paid extra for fulfilling of all the above conditions.

1.92. WATER POLLUTION

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

1.93. 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 confirm that emission levels comply with environmental emission standards/norms.
iii. For controlling the noise from Vehicles, Plants and Equipment, the Contractor shall confirm the following:
iv. All vehicles and equipment used in construction will be fitted with exhaust silencers.
v. Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced.
vi. Noise emission from compactors (rollers) front loaders, concrete mixers, cranes (movable), vibrators and saws should be less than 75 dB(A).
vii. As per the standards/guidelines for control of Noise Pollution from Stationary Diesel Generator (DG) sets, noise emission in dB(A) from DG Set (15-500 KVA) should be less than 94+10 log 10 (KVA). The standards also suggest construction of acoustic enclosure around the DG Set and provision of proper exhaust muffler with insertion loss of minimum 25 dB(A) as mandatory.

1.94. PERSONAL SAFETY MEASURES FOR LABOUR

i. Contractor shall provide the following items for safety of workers employed by contractor associate agencies:
ii. Protective footwear / helmet and gloves to all workers employed for the work on mixing, cement, lime mortars, concrete etc. and openings in water pipeline/sewer line.
iii. Welder"s protective eye-shields to workers who are engaged in welding works.
iv. Safety helmet and Safety harness/ belt 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 or machinery.
v. All the workers should be wearing helmet and shoes all the time on site.
vi. Masks and gloves should be worn whenever and wherever required.
vii. Adequate drinking water facility should be provided at site, adequate number of decentralized latrines and urinals to be provided for construction workers.
viii. Full time workers (if any with the approval of Engineer-in-Charge) residing on site should be provided with clean and adequate temporary hutment. The hutment must have minimum clear height of 2400mm and adequate provision for daylight and ventilation. The hutment should also not have any sharp edges on the doors, openings etc to prevent any accidental hurt to labour.
ix. First aid facility should also be provided.
x. Overhead lifting of heavy materials should be avoided. Barrow wheel and hand-lift boxes should be used to transport materials onsite.
xi. Tobacco and cigarette smoking should be prohibited on site.

xii. All dangerous parts of machinery are well guarded and all precautions for working on machinery are taken.

xiii. 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.

xiv. Use of durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.

xv. Ensure that walking surfaces or boards at height are of sound construction and are provided with safety rails and belts. Provide protective equipments such as helmets.

xvi. Provide measure to prevent fire. Fire extinguisher and buckets of sand to be provided in fire-prone area and elsewhere.

xvii. Provide sufficient and suitable light for working during night.

xviii. Ensure that measures to protect workers from materials of construction, transportation, storage and other dangers and health hazards are taken.

xix. Ensure that the construction firm/division/company have sound safety policies.

xx. Comply with the safety procedure, norms and guidelines (as applicable) as outlined in NBC 2016 (BIS 2005c).

xxi. Adopt additional best practices and prescribed norms as in NBC 2016 (BIS2005)

1.95. Site office Requirement for IIT Delhi

The Contractor shall provide, construct and maintain the site office at all times during execution and till completion of the work, a temporary site office with adequate electrical light fittings, A.C., fans, internet, electric/ power points, switches etc. at his cost for exclusive use of the Engineer in charge and his authorized representatives, Program Management Consultants and Architects. Area of such office shall be approximately 100 sqm and shall have required partitions, doors, windows, locking arrangement etc. with a conference hall for 10 to15 persons with conference table, chairs etc. all as per direction of Engineer-in-charge. Adequate toilet facilities connected to a temporary septic tank /soak pit, drinking water with water purifier & cooler etc. shall also be provided in the site office. All the water and electricity charges for the site office shall be borne by the Contractor.

The Contractor shall at all reasonable times provide access to the Engineer-in-Charge or his authorized representative to his workshops, factories and any other places where materials are stored, for inspection collection of samples. Nothing extra shall be payable on this account.

1.96. Inspection and Witness testing at Factory

List of Equipment(s) which to be inspected at factory shall be submitted by the contractor for approval of Engineer-in-Charge. Factory visit shall be arranged by the contractor for the Engineer-in-Charge or IIT Delhi's representative (maximum 3 people) and shall include complete boarding and lodging and transportation cost. The contractor shall provide 15-day notice of factory visits to the Engineer in Charge for approval of the planned schedule.

The Following items of equipment(s) (but not limited to) require factory inspection, witnessing and testing prior to approval of equipment

i. Chillers / HVAC Equipment/ Ventilation Equipment
ii. HVAC Pumps, Plumbing Pumps, Fire Fighting Pumps
iii. Cooling Tower
iv. Transformers
v. Pipe / pre insulated pipes
vi. Electrical Panels (all types of electrical panels)
vii. Diesel Generator Set (DG)
viii. Lift / Elevators
ix. Structural steel
x. Any other Items as directed by Engineer in charge.

1.97. Since the site has limited access, no concrete plant/ batch mix plant/ ready mix plant shall be allowed inside the site. Nothing extra shall be paid on this account.

1.98. Contractor shall be responsible to establish the Closed-Circuit Television (CCTV) Surveillance system for the entire construction Site throughout the Construction activity right from the taking over the Site and till handed over the Building and Facility to IIT Delhi. CCTV Surveillance system of HD quality shall be included with the necessary hardware, software, networking cables, switches, signal boosters etc. for construction site shall cater minimum requirements but not limited to the following:

i. Real time viewing, watching progress as it unfolds.
ii. Record of constant traffic all day long and during the night.

iii. keeping track of all the construction and other activities that occur at the site on day-to-day basis.
iv. Archiving, all major project milestones saved and logged.
v. Embeddable video (java script), to view any of the site related feeds on the website.
vi. CCTV camera shall act as deterrent against crime and vandalism at site.
vii. CCTV cameras shall be able to provide a virtual experience of going around the entire site to determine the progress of work and current worker‟s activities at site.
viii. **Time lapse video of the construction progress from commencement to till date of the request.**
ix. The cost towards CCTV Surveillance system establishment and removal after completing the project is deemed included in the tendered amount and shall not be paid separately.

1.99. All charges towards Pest Controls, Malaria prevention, Dengue Prevention, Mosquito breeding control and any other such prevention programme, to be implemented at site, by the notification of Municipality and other such statutory bodies, from time to time during the Project period, shall be borne by the Contractor at his own cost. No claim in this regard shall be entertained by IIT Delhi. The contractor shall be responsible for keeping the site free of any kind of mosquito breeding. If it is found that breeding is taking place the entire responsibility shall be of contractor to bear challan etc. done by local bodies.

1.100. In addition to the security deposit already deducted under clause-1A of GCC -**2023**, an amount of 10% of the total amount of waterproofing work shall be deducted from the final bill of the contractor as an additional security deposit which will be refunded only after completion of the period of Guarantee Bond and Warranty period of five years. However, this can be released on submission of Bank guarantee/FDR issued from a scheduled bank in favor of Registrar, IIT Delhi.)

1.101. SPECIAL CONDITION RELATED TO DELHI METRO RAIL CORPORATION (DMRC).

i. The proposed structure is being constructed with basement over a portion of DMRC tunnel for which 2.5mtr of existing soil shall be removed as per the site conditions and directions of Engineer-In-Charge to safeguard the DMRC tunnel.
ii. The excavation and foundation work shall be carried out in close co-ordination & in the presence of executive(s) of Civil/O&M wing of DMRC.
iii. Any existing utilities of DMRC, if encountered during the execution of the work shall be brought to the notice of DMRC and the work shall resume only after NOC from the concerned department of DMRC for which nothing extra shall be paid on account of idle labour, T&P, etc.
iv. During the construction, if any tilt, shift, sag, crack, settlement etc. is observed in the existing DMRC structure, the same shall also brought to the notice of DMRC and the work shall be stopped immediately until further instructions/NOC by DMRC for which nothing extra shall be paid on account of idle labour, T&P, etc.
v. The contractor shall submit the excavation methodology around the DMRC influence zone prior to start the basement excavation work for the approval of Engineer – In – Charge.

1.102. SPECIAL CONDITION RELATED TO MAINTENANCE OF E&M WORKS.

MAINTENANCE OF ELECTRICAL AND ELV WORKS
i. **SCOPE OF WORKS**
ii. **Scope includes the following:**
iii. **• Repair / Replace, Service and maintenance of Electrical installations.**
iv. **• Repair / Replace, Service and maintenance of Ceiling fans & Exhaust fans.**
v. **• Repair / Replace, Service and maintenance of Street lights & Security lights.**
vi. **• Annual / Monthly / Fortnightly Repair / Replacement, Service and maintenance of ELV SYSTEM containing FA/PA, CCTV, IPABX, LAN system as per CPWD maintenance schedule.**
vii. **• Any other work assigned by AE/JE.**
viii. **• Daily routine work.**
ix. **a. Checking of Main Board, Sub-Main Board, DB's, LT panel.**

x. **b. There is no sign of heating up burning smell Discoloration or Sparking, over loading, Lose Termination, Highly Unbalance Loading of current, Earthing, No Light and temporary wiring etc.**

xi. **• Annual check-up.**

xii. **• Checking and clearing of fitting and checking of suspending arrangements.**

xiii. **• Checking and clearing of Ceiling fans and checking of spilt pins suspending arrangement.**

xiv. **• Down roads, noise of fan, fixing of fan blades, wobbling etc.**

xv. **• Maintenance and repairing of E.I in east campus area including maintenance of main board**

xvi. **• DB's fault finding, testing checking and rectification of fault of power points/fan points.**

xvii. **• Replacement of MCCBs, MCB, Switches, Thimbles etc. and any other work assign by Engineer in-charge / AE.**

xviii.

xix. **Following T & P instrumentation shall be provided by the contractor to his staff.**

xx. **1. Electric tool kit set for all the mechanics**

xxi. **2. Megger-500 volts = 01 Nos.**

xxii. **3. Tong tester = 01 Nos.**

xxiii. **4. Box spanner = 01 Set.**

xxiv. **5. Allen key set = 01 Set.**

xxv. **6. D-Spanner set = 01 Set.**

xxvi. **7. Ring Spanner set = 01 Set.**

xxvii. **8. Earth Tester = 01 Set.**

xxviii. **9. Lux Meter = 01 No.**

xxix. **10. Insulated Hand Gloved = 02 set.**

xxx. **11. Gum boot = 02 set.**

xxxi. **12. First Aid Box = 01 set.**

xxxii. **13. Umbrella = 05Nos**

MAINTENANCE OF LIFTS

Scope of work includes:

i. Operation and Rescue operation of Lift

ii. Cleaning of Lifts.

iii. Repair & Maintenance of electrical installations (Installed in Lifts and Machine rooms)

iv. Repair & Maintenance of ceiling fans, exhaust fans. (Installed in Lifts and Machine rooms)

v. Repair & maintenance of Electrical boards in machine room/control room.

vi. Minor repair work of Lifts.

vii. Any others work assigned by JE /AE/AEE

viii. Stationary required/Logbook of lifts submitting daily/ weekly/ monthly/ yearly report shall be provided by the contractor.

ix. All measuring instruments to note down the reading wherever measuring meters are not installed shall be provided by the contractor. Work shall be carried out as per preventive maintenance schedule. (One job means to carry out the above work by deputing above specified staff for one month as per duty chart.)

70.0 ADDITIONAL TERMS & CONDITION FOR CAMC OF LIFTS

i. All the works shall be carried out as per CPWD specifications, Indian Electricity Rules-1965 amended up to date and to the entire satisfaction of Engineer-in-Charge.

ii. Comprehensive, preventive, periodic and fault-based maintenance & repair of different make & Capacity of 104Nos passenger / goods lifts including replacement of all required parts complete as required.

iii. The technician/lift maintenance staff of the OEM shall make entries in the logbook of the service and other works carried out by him. The lift mechanic of the company shall certify in the logbook that the lift "is fit for use" and that the entire safety devices are working properly. The technician / maintenance staff shall also mention his name with dates and time in the logbook.

iv. No T&P will be issued to the contractor for the work.

v. In the event of mishap/accident caused not due to the user lift/operator fault/ misuse but due to in-proper or non-maintenance of lift then the firm shall be responsible.

vi. The department (IITD) shall not have any responsibility or liability in case of any accidental injury to the personnel of the contractor at the work site or to the general public at the work site due to

the miss-handling of equipment by the personnel of the contractor or any other similar reason. The responsibilities and liabilities for such accidents and incidents shall be borne by the contractor.

vii. Break down calls shall be attended to immediately, even after office hours, holidays & Sundays within the shortest possible period.

viii. Recovery will be made on a proportional/pro-rata basis for any number of days beyond above, if the lift remains out of order. The rates of recovery shall be made as per the SLA attached on a case-to-case basis.

ix. Fortnightly & monthly lift service are to be carried out on a regular basis as preventive maintenance.

x. It is the responsibility of the Firm to check the Installation periodically by authorized and experienced maintenance personnel at least once a month. Any type of defects & Irregularities noticed in the Lift Installation; the Firm should rectify the same immediately.

xi. The defective spares replace by the Firm will be the property of the Firm and will be returned to them with proper challan or receipt issued by the Junior Engineer-In-Charge at site.

xii. Lift is an essential & important part of a high rise Building so special care should be taken for safety, comfort and trouble-free run of the lifts. The Firm should ensure its best performance and service for Bonafide.

xiii. The Firm should send their maintenance personnel as soon as information received regarding breakdown or irregularities of the Lift noticed by the Operational Staff or site Engineer-In- Charge or Client / Department personnel.

xiv. The Firm should send their maintenance personal and Supervisor at least once in a month to check the installation properly and examine the lubricant, adjustment of all moving parts of Car & sill level, replacement of any defective worn out parts for smooth functioning of their Lift.

xv. It is the responsibility of the Firm to check the following important parts and give a satisfactory certificate of the installation: a) Controller- complete with its all mechanical, electronics and electrical component. b) Breaks-Break magnet including electrical and mechanical components. c) Over speed governor with electrical and mechanical components. d) Ropes79 Checking the tension of main ropes and its physical condition, if there are any irregularities adjusting it properly or replace immediately if reqd. e) proper checking of Governor Rope should be done. f) Guide rails and guide shoes, counterweight trailing cable, landing gate lock, safety switch, door switch bolts etc. should be checked properly. g) Pit Equipment –Governor Bottom pull, selector pulley buffer spring should be checked properly. h) Car Equipment – All car equipment's like door motor driven pulley and "V" bolts safety switch and car control panel stop swatch car indicator should be checked properly. i) The Firm should submit their periodically maintenance chart or schedule and the frequency of checking for examination of Lift components along with the tender.

xvii. In case of a major breakdown the Firm will have to fix a time schedule for rectification/repair job, if it is more than 04(four) days recovery will be made on pro-rata basis for the entire breakdown period.

xviii. **MAINTENANCE OF SUBSTATION AND DG SET EQUIPMENT**

Comprehensive maintenance of the HT / LT Substation Equipment, B Check of DG sets including material, attending all minor and major faults and rectification as per the CPWD maintenance schedule.

The scope includes Routine maintenance, Preventive Maintenance, Special Repair, Annual Repairs as per CPWD specifications.

A) **Minimum Manpower Requirement for Day-to-day maintenance works (For E&M Work)**

I	**Routine, preventive Maintenance and Operation**			
1	System Operator	1		
II	**For attending Day to day complaints**			
Sl. No	Staff	6:00 AM to 2:00 PM	2:00 PM to 10:00 PM	10:00 PM to 6:00 AM

1	Electrician (High Skilled) for Substation and DG set	1	1	1
2	Electrician Skilled (ELV Works)	1	1	1
3	Electrician Skilled (EI Works)	1	1	1
4	Lift Operator and Rescue Operation	1	1	1
5	Helper	2	2	2

It will be the responsibility of the contractor to deploy well trained manpower for the deployment. The contractor shall take prior approval before the deployment for the screening of manpower from the Engineer – In – Charge. Only approve manpower shall be deployed to the site for operation and maintenance work. The contractor shall also provide appropriate reliever and the cost of the reliever shall be inclusive.

The above manpower shall be deployed by the contractor during the Defect Liability Period and Comprehensive Maintenance Period i.e. (1 + 5) Years. The rates of the deployment shall be included in the item rates and no extra shall be paid by the department for deployment of minimum manpower as above.

That the contractor shall particularly abide by the provisions of Minimum Wages Act, 1948. Minimum wages shall be paid by the Agency / Contractor at the rate fixed by Central Govt. of India from time to time. Arrears, if due as result of increase in minimum wages, National Holidays would be paid by the contractor to the worker. In case of half yearly increase in Minimum wages by the Central Govt. of India, the contractor will comply the same. The contractor shall also abide the Clause 19 of the GCC for the deployment of manpower.

The contractor is bound to deploy the minimum manpower as per chart. However, in case of absenteeism of deployed manpower by the contractor Recoveries of the absenteeism of staff will be done on Minimum Wages Basic Rate (+) Bonus (+) Contractor Profit (+) GST@18% (+) Labour Cess @ 1% and (+/-) rates quoted by the bidder in percentage (%) above / below the estimated cost put to tender.

Specifications of Effluent Treatment Plant

Supplying, installing, testing & commissioning of **Common Effluent Treatment Plant (CETP)** of **50 m3/day** based on SBR technology (excluding excavation, back filling & disposal of surplus earth MS / Civil construction work) for the following duty: Nature of Sewage - Domestic Sewage waste water shall be discharged into the STP. Design to take consideration of same.
The CETP design based on the following parameters:
Daily average flow: 50 M3/ Day
pH : 5.5 - 9
BOD : 500 mg/ l
COD : 800 - 1100 mg/ l
TSS : 1000 - 1500 mg/ l
Oil & Grease : 20 mg/ l
CETP discharge standard after treatment:
pH : 6.5 - 8.5
BOD : <= 20 mg/ l
COD : <= 50 mg/ l
TSS : <= 10 mg/ l
Oil & Grease : Nil
CETP discharge standard after UF :-
PH : 6.5-7.5
BOD : <=10 mg/l
COD : <=30 mg/l
TSS : <=2 mg/l
Oil & Grease : Nil
Electro-Mechanical Equipment
Bar Screen:
Supplying, installing, testing & commissioning of perforated manual screen including 2 nos. coarse & fine screen of particular size having provision for lifting arrangement etc. complete as required.
Size : 650 mm X 650 mm
MOC : SS-304
Quantity: 2 nos.
Purpose: For Separation of Large Solids
Supply, installation, testing & commissioning of non-clogging type **Submersible Sewage Pumps** having CI casing & CI impeller complete with foundation bolt and all accessories, motor of required capacity. pressure gauge on delivery line with isolation cock. Pumps shall have following duty: 2 No.(1W+1S)
Flow Rate : 5 M^3/Hr
Head : 10 m
Solid handling: 20 MM
Quantity: 2 nos.
Purpose: For Effluent transfer from equalisation tank to Reaction Tank
Supply, installation, testing & commissioning of Poly dosing system comprising of 100 ltrs HDPE tank with 0-6 lph electronic metering type pump and air line in Dosing tank. 1nos
Quantity: 1 no.
2 Nos. twin type rotary air blowers (1W + 1S) capable of delivering **64 M3/ hr** of free air at 0.5 kg/cm2 driven through “V” belt or directly coupled through flexible coupling to a TEFC motor of suitable HP Suitable for 415 ± 10% volts, 3 phase, 50 cycles A/C supply. Including foundation and foundation bolts work.
Quantity: 2 nos.
Purpose: For air supply to equalisation tank/sludge holding tank/SBR reactor
Non clog, Self Cleaning type air dispersion system capable of handling 3-5 cfm of air with oxygen transfer efficiency of 3-4% per / meter water depth. Air dispersion grid shall be assembled in modular form so that they can be replaced / repaired easily from plat form at the top.
Coarse Bubble Diffuser 1lot
Fine Bubble Diffuser 1lot
Purpose :- For Providing the path of Air

Supply, installation testing and commissioning of Agitator of required capacity to be anoxic tank in all respect 1nos
Supply, installation, testing and commissioning of SBR Package (Floating Type)
Decanter Diameter Size : **70MM NB** 1nos
Purpose: For Collection of Water from SBR Reactor
Supply, installation, testing & commissioning of Self Priming, Non-Clogging, Monoblock Type **Sludge Recirculation** having CI casing & CI impeller complete with and foundation bolts all accessories, motor of required capacity. pressure gauge on delivery line with isolation cock. (1 Working + 1 Standby) Pumps shall have following duty:
Flow Rate : 2 M^3/Hr
Head : 10 m
Solid handling : 7 MM
Quantity: 2 nos.
Purpose: For transfer sludge to Sludge holding tank and recirculation to SBR Reactor
Supplying, installing, testing & commissioning of Horizontal centrifugal non clog water pumps with CI casing and CI Impeller along with motor, pressure gauge with isolation cock, Isolation valve, NRV on delivery line. Isolation valve, stainer (with by-pass) at suction. Mechanical seal, suitable vibration elimination pads of approved design, drainpipe with valve for the pump. The pump shall be suitable for 415±10% volts 3 phase AC supply. Including foundation bolts (1 Working + 1 Standby)
Filter Feed Pump
Capacity :2.5 M^3/Hr
Head :25 m
Quantity: 2 nos.
Purpose : For Feed Water into Filter MGF/ACF
Providing, fixing, testing & commissioning of vertical filter with adequate dirt holding capacity complete with initial charge filter media. The filter shall also be provided with set of internals for raw water inlet and bottom collecting system.
Pressure Sand Filter
Type : Down Flow
Flow rate: 3 M^3/hr
Dia : 450 mm
Filter Media: Sand & Gravel
MOC: frp
Quantity: 1 no.
Purpose: For removal of suspended solids
Activated Carbon Filter
Type : Down Flow
Flow rate: 3 M^3/hr
Dia : 450 mm
Filter Media: Activated Carbon
MOC: frp
Quantity: 1 no.
Purpose: For removal of colour & odour
Supply, installation, testing and commissioning of Sludge Feed Pumps Screw Type Complete with all fittings & accessories. Including foundation and foundation bolts. (2 Nos.- 1W+1S)
Capacity :1 M^3/H
Head : 40mtr
MOC :CI
Quantity: 2 nos.
Purpose: For Feed Sludge to filter press
Supply, installation, testing and commissioning of Filter Press of required size with all fittings & accessories. manually operated
Size of Filter Press : 12"×12"+11 Plates
Quantity: 1 no.
Purpose : For Sludge Drying

Providing and fixing all piping (as described below) and isolation control valves for making the system complete.
UPVC : Submerged air piping
MS Epoxy : Air piping & pumped effluent riser (non-submerged)
UPVC : Interconnecting pipe line after delivery header of pump/ filter
UPVC : Pumped effluent (submerged) & tank overflow pipe line
Quantity: 1 no.
Purpose :- For Flow Control & Transfer path of Flow
Supply, installation, testing & commissioning of Chlorine dosing system comprising of 100 ltrs HDPE/FRP tank with 0-6 LPH Hypochlorite Dosing electronic metering type pump.
Quantity: 1 no.
Purpose : For Disinfection of water
Supply, installation testing and commissioning of UV System. The UV unit shall have with reactor, cabinet housing, cabinet cooling, treatment chamber, electrical panel, temperature safety control, lampout alert
Flow rate: 2.5 M3/hr
Quantity: 1 no.
Purpose : For Disinfection of water
Supply, installation, testing & commissioning of non-clogging type **Plant Room Sump Pump** having CI casing & CI impeller complete with foundation bolt and all accessories, motor of required capacity. pressure gauge on delivery line with isolation cock. Pumps shall have following duty: 2 No.(1W+1S)
Plant Room Sump Pump
Capacity : 2.5M^3/Hr
Head:10 m
Quantity: 2 nos.
Purpose : For Transfer Drain Water to Equalization Tank
Note: If STP land is located above the ground, This Sump Pump is not required.
Supply, installation testing and commissioning of packaged type Ultra filtration unit with all components and accessories complete to make the system functional and shall be installed after water treatment system in STP With UF Feed pump, backwashing arrangement with all respect
Capacity : 2.5 M3/ Hr
Quantity: 1 no.
Purpose:- For Membrane Filtration
INSTRUMENTATION WORK FOR SEWAGE TREATMENT PLANT
Supply, installation, testing and commissioning of motorised valves for SBR suitable to Line Size
For Decanter 1nos
For Sewage 1nos
For Air 1nos
For Sludge Recirculation 2nos
Suppy, installation, testing & commissioning of electro-magnetic type flow meter at inlet of reactor tanks.
Quantity: 1 no.
Purpose : For Measure flow quantity with time
Supply, installation, testing & commissioning of electronic type water meter at the outlet of the plant
Quantity: 1 no.
Purpose : For Measure flow quantity with time
Supply, Installation, Testing & Commissioning of Water level controller for operation of the system connected to control panel for automatic switching ON / OFF of each pump.
Quantity: 1 no.
Purpose : For control Amount of Influent in tank
Supply, Installation, Testing & Commissioning of pressure gauges within all respect
Quantity: 1 no.
Purpose : For Measure & Indicate the pressure into vessel
Supply, Installation, Testing & Commissioning of PH Indicator within all respect
Quantity: 1 no.
Purpose : For measure acidic & alkaline nature of water

This includes Design, supply, installation, testing and commissioning of STP Main Electrical Panel (MCC) housing with individual DOL starter of suitable capacity up to 10 HP motor and Star delta starter above 10 HP motor panels for various loads complete in all respects with suitable switchgear. It shall be provided with metering, MCCB Units, lamps, bus bars etc. The accessories used shall conform to the latest IS codes. 1set

Tender Drawings

Please click on the following link to download the tender drawings:

https://owncloud.iitd.ac.in/nextcloud/index.php/s/HLMXwcccGpDbFdW

PREFFERED LIST OF MAKES

1. **The material shall be procured as per preference of Make in India Policy and Government of India circulars / guidelines issued time to time.**
2. In case the makes of certain items are missing or not available in the preferred make list, the appropriate make shall be selected with the approval of the NIT/TS approving authority. The NIT approving authority may permit an equivalent or alternate make, provided that proper justification is submitted along with documentary evidence demonstrating the non-availability of the preferred make. If the approved equivalent or alternate make is of a lower rate, a cost adjustment in the form of recovery shall be applied at the time of approving the alternate or equivalent make. However, if the equivalent or alternate make is of a higher rate than the makes listed in the preferred make list, no cost adjustment shall be made.
3. The Contractor shall obtain prior approval from the Engineer-in- charge before placing order for any specific material or engaging any of the specialized agencies. The Contractor shall make a detailed submittal with catalogues and highlighted proposed specifications, as well as full details of the works proposed to be executed by the specialized agency, as specified.
4. All makes shall further confirm to standard specifications of each item as mentioned in technical specifications of tender documents.
5. The Engineer-In-Charge shall verify that manufacturers must have valid IS certification as on date for materials wherever applicable.

S. No.	Material	Preferred make
1.0	**STRUCTURAL & CIVIL**	
1.	Ordinary Portland Cement/ Portland Pozzolana Cement	ACC / BIRLA / ULTRATECH / AMBUJA / JK CEMENT
2.	White Cement	BIRLA WHITE / J K WHITE / ULTRATECH.
3.	Ready Mix Concrete	ACC/ ULTRATECH / JK / LAFARAGE / L&T
4.	Reinforcement Steel – TMT bars (CRS) FE 500D grade minimum	PRIMARY MANUFACTURERS APPROVED BY MINISTRY OF STEEL / SECONDARY MANUFACTURER HAVING VALID BIS LICENSE (TO BE AS PER LATEST BIS PROVISIONS)
5.	Mechanical Bar Couplers for Reinforcement	DEXTRA INDIA / SANFIELD INDIA / TATA / HALFEN MOMENT / G-TECH
6.	Re-barring Chemical, Mechanical Fastener, Anchor Fastener, Chemical Anchor Fastener, Core Cutting Machine/ Dry Stone Cladding Clamps, Expandable Fastener, Fire sealant, Smoke sealant	HILTI / WURTH / FISCHER / 3M INDIA / CANON / MUNGO / FOSROC
7.	Structural Steel	PRIMARY MANUFACTURERS APPROVED BY MINISTRY OF STEEL / SECONDARY MANUFACTURER HAVING VALID BIS LICENSE (TO BE AS PER LATEST BIS PROVISIONS)
8.	MS Pipe	JINDAL / APL APOLLO / SAIL / SWASTIK / TATA / SURYA
9.	Super Plasticizer / Plasticizers / Admixtures / Concrete curing compound/ Polysulfide sealant / Epoxy grouting compound	MYK / PIDILITE/ STP LTD / FOSROC / BASF/ CHRYSO (SAINT GOBBIN), FERROUSCRETE / SIKA
10.	Crystalline waterproofing compound	BASF / PIDILITE / SIKA / MYK / FOSROC / KERAKOLL / CICO
11.	Red Bricks	COMMERCIALLY AVAILABLE OF REQUIRED

		STRENGTH
12.	Fly Ash Bricks	KJS CONCRETE / GARG BUILD SOLUTIONS (GYPSONA) / ASHTECH INDUSTRIES PVT LTD.
13.	AAC Block Adhesive	FOSROC / ROFF/ SIKA / ULTRATECH / MYK LATICRETE
14.	Polymer modified Cementitious grout	FOSROC / SIKA / BASF / PIDILITE / MYK
15.	Curing Compound	PIDILITE/ FOSROC / CHRYSO (SAINT GOBBIN) / CICO / STP / BASF
16.	Expansion Joint- (Modular type)	SANFIELD INDIA / MIGUA/ HERCULES / Z-TECH / VEXCOLT / DEVIN
17.	Expansion Joint Armour Board	DURAFILL / DECOCRETE / SUPREME
18.	Anti-Termite Treatment	BAYER / HINDUSTAN INSECTICIDES / DE-NOCIL
19.	Precast cover blocks of required grades	ACC / NUVOCO / ULTRATECH / STEELMAX / FOSROC / KK MANHOLE
20.	Formwork Systems	PERI / DOKA / SYMONS
21.	Aluminium Shuttering	MIVAN / MAINI / S-FORM / MFE FORM WORK
22.	Metal Standing Seam Roofing System	MULTI-INFRATECH (MULTI-ZIP) / LYSAGHT FLEX-LOK OF TATA BLUE SCOPE / LLOYD
1.1	**WATERPOOFING**	
1.	Waterproofing Self-adhesive (HDPE/SBS) Membrane	PIDILITE / SIKA / MYK ARMENT / STP LTD/ CHRYSO (SAINT GOBBIN) / CICO / FOSROC / KERAKOLL
2.	Double Component Liquid PU Elastomeric Membrane (spray applied)	PIDILITE / SIKA / CICO / FOSROC / BASF / KERAKOLL / ASIAN PAINTS
3.	EPDM Waterproofing	ECMAS / PIDILITE/ STP / FIRESTONE / CICO
4.	Acrylic Cementitious Coating	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
5.	Elastomeric Acrylic UV resistant liquid applied coating	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
6.	Construction Joints (Water Stops)	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
7.	Drainboard	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
8.	Food Grade Epoxy Coating	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
9.	Bituminous Epoxy Coating	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
10.	Water Proofing Compounds (Admixtures, Plasticizer, Super Plasticizer)	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
11.	Water Proofing compounds (Integral) with cement for plaster & mortar	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
12.	Water Proofing compounds (for Bathroom/Toilets/Balcony/ & other wet areas)	PIDILITE / SIKA / CICO / FOSROC / STP LTD / CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
13.	Swellable bar	PIDILITE / SIKA / CICO / FOSROC / STP LTD /

		CHRYSO (SAINT GOBBIN) / BASF / ASIAN PAINTS
1.2	**DOOR, WINDOWS & WOODWORK**	
1.	All Types of Plywood	MERINO / GREENPLY / CENTURY / DURO / KIT (SWASTIK) / EVEREST
2.	Laminates	MERINO / GREENLAM / CENTURY / DURO / ARCHID / EVEREST
3.	Veneer	MERINO / GREENPLY / CENTURY / DURO / KIT (SWASTIK) / EVEREST
4.	Moisture Resistant HDF/MDF Board	ACTION TESA / GREEN / CENTURY / SAINT GOBAIN / MERINO / USG BORAL
5.	Extruded Polysterene Board	STP / UP Twiga / Ownes Corning / SHALIMAR
6.	Flush door shutters	CENTURY / GREENLAM / MERINO / ARCHIDPLY / DURO / JAYANA / KIT (SWASTIK)
7.	Glass wool Insulation	UP TWIGA / POLY GLASS / LLOYDS / OWENS-CORNING
8.	Rock Wool Insulation	LLOYDS / ROXUL ROCKWOOL/ KANUF
9.	Polycarbonate Sheet	BAYER / GE-LEXAN / DANPALON / DPI SYSTEM / MG POLYPLAST / COXWELL
10.	Decking Steel sheet	TATA STEEL / LLOYDS / JSW
11.	Fire Sealant / Fire Smoke Seal	HILTI / FISCHER/ WURTH INDIA / 3M
12.	Extruded Polystyrene Insulation System	STP LTD / SUPREME / BERGER/ PIDILITE / SHI / BEARDSHELL / STYRENE PACKAGING
13.	Metal / Glazed/ Wooden - Fire rated Door System	NAVAIR / SHAKTI- HORMANN / SYNERGY THRISLINGTON / RADIANT / SIGNUM /PROMAT
14.	Fire Rated Rolling Shutter	NAVAIR / SHAKTI- HORMANN / SYNERGY THRISLINGTON / RADIANT / SIGNUM /PROMAT
15.	UPVC Doors & Windows	FENESTA / REHAU / SAINT GOBAIN / ENCRAFT / WINTECH / WINDOWMAGIC
16.	UPVC Door / Window Hardware	HIVIK / GU / HOPPE / YALE / OBEN / ROTO / GEZE
17.	Fire rated glass (2 hours fire rating)	SAINT GOBAIN / SCHOTT / GLABERVEL / FIRELITE / PILKINGTON
18.	Cement Fibre Board/ Calcium Silicate Ceiling Tile / Board	LAFARGE / CENTURY / NCPL / EVEREST / USG BORAL / VISAKA
19.	WPC Board, Doors & Door Frame	ALSTONE / CENTURY / RAJSHREE / FLORESTA ECOSTE / REYNORCH
20.	Aluminium Louvers	KALCO / NOTION / ALSTONE / HUNTER DOUGLAS / KAWNEER / COLT
1.3	**FINISHING**	
1.	Polyester Powder Coating Shades	ASIAN PAINTS / NEROLAC / BERGER / AKZONOBEL / DULUX / SHALIMAR
2.	Plaster of Paris (POP)	ADHARSHREE / SHREE RAM / J.K. / BIRLA
3.	Cement based Wall Putty	BIRLA WALL CARE / JK WHITE / ASIAN PAINTS / SAKARNI / SAINT GOBAIN
4.	Textured Exterior Paint	ASIAN PAINTS (APEX ULTIMA) / BERGER / SHALIMAR/ AKZONOBEL (DULUX) / ULTRATECH TEXTURE / UNISTONE / NEROLAC KANSAI (EXCEL)
5.	Epoxy Paint	AKZONOBEL (DULUX) / ASIAN PAINTS / FOSROC / SIKA / STP LTD / ICI / NEROLAC KANSAI
6.	Fire Retardant Paint	ASIAN PAINT / BERGER PAINTS / AKZONOBEL
7.	Gypsum Plaster	ULTRATECH / ELITE (100) OF GYPROC / FEEROUSCRETE (FERRO-500) / KERAKOL (K-100)
8.	Cement based Ready Mix Plaster	MYK ARMENT / SAINT GOBAIN / ARDEX

		ENDURA / FEEROUSCRETE / ULTRATECH
9.	Pre-Cast GRC Jali	BIRLA WHITE GRC / UNISTONE / DALAL / SWASTIK ALWAR / ULTRA / ECOVISION
10.	Polysulphide sealant	FOSROC / SIKA / PIDILITE / MYK LATICRETE / STP LTD
11.	Silicone / Weather Sealant	WACKER / DOW CORNING / GE / MCOY / STP LTD / TIKIDAN (Tiki Siliseal/ Tikiseal PU Range)
12.	Paint: Acrylic Emulsion	ASIAN PAINTS (Premium Interior Emulsion paint) / BERGER (Rangoli Total Care) / ICI DULUX (Super Cover) / NEROLAC (Beauty Gold) or equivalent of SHALIMAR PAINTS
13.	Paint: Premium Acrylic	ASIAN PAINTS (Royale Luxury Emulsion) / BERGER (Silk) / ICI DULUX (Velvet Touch) / NEROLAC (Impression) or equivalent of SHALIMAR PAINTS
14.	Paint: Plastic Emulsion	ASIAN PAINTS (Apcolite) / BERGER (Easy Clean) / ICI DULUX (Weather Shield) / NEROLAC (Excel Super) or equivalent of SHALIMAR PAINTS
15.	Paint: Acrylic Smooth Exterior Paint	ASIAN PAINTS (Apex) / BERGER (Weather Coat) / ICI DULUX (3 in 1) / NEROLAC (Impression) or equivalent of SHALIMAR PAINTS
16.	Paint: Premium Acrylic Smooth Exterior Paint with Silicon Additive	ASIAN PAINTS (Apex Ultima) / BERGER (Long Life 7) / ICI DULUX (Weather Shield Max) / NEROLAC (Excel total Super) or equivalent of SHALIMAR PAINTS
17.	Paint: Synthetic Enamel Paint	ASIAN PAINTS (Apcolite Premium Gloss Enamel)/ BERGER (Luxol Hi Gloss) / ICI DULUX (Gloss Synthetic Enamel) / NEROLAC (Synthetic Hi Gloss) or equivalent of SHALIMAR PAINTS
18.	Primer: Cement Primer	ASIAN PAINTS (Decoprime WT) / BERGER (BP White) / ICI DULUX (White Primer) or equivalent of SHALIMAR PAINTS OR NEROLAC
19.	Primer: Steel Primer (Red Oxide Zinc Chromate Primer)	ASIAN PAINTS / BERGER / NEROLAC / ICI DULUX / SHALIMAR PAINTS
20.	Primer: Wood Primer	ASIAN PAINTS / BERGER / NEROLAC / ICI DULUX / SHALIMAR PAINTS
21.	Paint: Fire Retardant Paint	ASIAN PAINTS / AKZONOBEL / SHALIMAR / BERGER PAINTS
22.	Intumescent Paint	PPCPL / JOTUN PAINT / STARTCOAR 1800
23.	Melamine Polish	ASIAN PAINT MELAMINE GOLD / WUDFIN OF PIDILITE / TIMBER TONE OF ICI DULUX / BERGER
1.4	**STEEL & ALUMINIUM WORKS**	
1.	Stainless Steel Grade 316/304	JSW / SAIL/ TATA STEEL/ JSPL / JINDAL / SALEM
2.	Welding Electrodes	ADVANI-OERLIKON / MODI / TATA / L&T
3.	Dash / Anchoring Fasteners	HILTI / WURTH / FISCHER / 3M INDIA / CANON / MUNGO
4.	Aluminium Structural Sections	JINDAL / HINDALCO / NALCO / INDALCO / MAHAVIR / EVERITE / GODREJ
5.	Modular Stainless-Steel Railing, Accessories etc.	DORMAKABA / GEZE/ OZONE / D-LINE / KICH
6.	Aluminium Composite Panel	EUROBOND / ALUCOBOND/ ALSTONE/ VIRGO/ ALUDECOR / ALUTECH
1.5	**CEILINGS**	
1.	False Ceiling – Gypsum	SAINT GOBAIN / ARMSTRONG / INDIA GYPSUM / BORAL LAFARAGE / AEROLITE
2.	False Ceiling – Metal	ARMSTRONG / DURLUM / HUNTER DOUGLAS/ SAINT GOBAIN / BOLLARD / WESTERN
3.	Baffle Ceiling with Grid System	ARMSTRONG / DRULUM INDIA PVT. LTD. / HUNTER DOUGLAS / BOLLARD / SAINT GOBAIN

4.	Open Cell Ceiling System	HUNTER DOUGLAS / DURLUM INDIA PVT LTD / ARMSTRONG / BOLLARD / WESTERN
5.	Moisture Resistant Calcium silicate ceiling system	GYPROC / AEROLITE / USG BORAL / HILUX / ARMSTRONG / EVEREST / RAMCO
6.	Building Signage	AS PER APPROVED TECH. SPECIFICATION DATA BY EIC
1.6	**FLOORING / WALL TILES**	
1.	Mosaic / Chequered Tiles	BISAZZA / NITCO / UNITILE
2.	Floor & Wall Tiles: Rectified Ceramic/Vitrified (double charged) tiles (Double Charged) / Antiskid / Matt / Glazed / Full Body Vitrified tiles.	SOMANY / KAJARIA / ASIAN (AGL) / JOHNSON / ORIENT / NITCO
3.	Engineered stone - Marble / Quartz / Granite	ASIAN / JOHNSON / QUTONE / NITCO / KALINGA
4.	Tile Adhesive / Stone Adhesive	BALENDURA / MYK LATICRETE / PIDILITE / FERROUSCRETE
5.	Floor hardener	PIDILITE / FOSROC / SIKA / BASF /STP / FERROUSCRETE / HARDONITE / IRONITE
6.	Bonding Agent	NITOBOND EP OF FOSROC / SIKADUR 32LP OF SIKA / CONCRESIVE 1414 OF BASF / STP LTD/ FERROUSCRETE
7.	Epoxy Flooring	FOSROC / SIKA/ BASF / PIDILITE / MAPIE / MYK
8.	Ceramic based Heat-Resistant Tiles (10mm)	JOHNSON / SOMANY / ORIENT BELL / KAJARIA / SWASTIK / THERMAX / NTC
9.	Over deck foam Insulation	LLYODS / PIDILITE / STP LTD/ ASIAN PAINTS
10.	Kerb stones, Paver blocks, CC Blocks etc.	DALAL / HINDUSTAN TILES / SWASTIK / KK MANHOLE / NITCO / UNITILE / ULTRA
11.	Tile Grout	BALENDURA / MYK LATICRETE / PIDILITE / FERROUSCRETE
12.	Terracotta facade Solutions	HUNTER DOUGLAS / CLAYTON / UNISTONE
13.	PVC Flooring	ARMSTRONG / TARQET / PERGO / POLY FLOOR
14.	Clamp System for Dry Stone Cladding	HILTI / FISCHER / BOSCH
1.7	**GLAZINGS**	
1.	Clear / Float / Frosted Glass / Looking Mirror	MODIGUARD / SAINT GOBAIN / AIS / PILKINGTON / ASAHI
2.	Toughened Glass / Hermetically sealed glass / High Performance Glass / Structural Glazing	MODIGUARD / SAINT GOBAIN / AIS / PILKINGTON / ASAHI / GLAVERBAL
3.	Fire Rated Vision Panels	SAINT GOBAIN / SCHOTT / PILKINGTON / GLAVERBEL
4.	Glass Partition	DORMAKABA / HAFELE / JAQUAR / CERA / MODI GUARD / SAINT GOBAIN
5.	Sun Control Film	3M/ GARWARE / SAINT GOBAIN
6.	Glass Processor for making DGU / Toughing	SAINT GOBAIN / GOLD PLUS / KAENAT GLASS / ART N GLASS
1.8	**HARDWARE**	
1.	Nuts / Bolts / Fasteners / Screws	HILTI / WURTH INDIA / FISCHER / GKW / ATUL
2.	All type of hardware and fittings for all type of glazing / doors/ windows etc. including mortise latch & lock, tower bolt, ball bearing butt hinges, friction stay hinges, sliding door	DORMAKABA / HAFELE / GEZE/ ASSA ABLOY / DORSET / GODREJ / EVERITE / OZONE / HETTIC / HARDWYN / KICH

	bolts, lever handle, magic eye, hydraulic door closer, etc. Stainless Steel hardware, fittings & Accessories for Modular Kitchen and wardrobe	
3.	Modular Kitchen Basket and Accessories (SS-304 Grade)	HETTICH / KICH / PLUM / PECOCK
4.	Modular Toilet Cubicles	MERINO / GREENLAM / CENTURY
5.	Hardware for Fire Check Door/ panic bar/ panic trim/ door closer/ hinges/ Handel/ tower bolt/door stopper/mortise lock / Dead Lock, etc.	NAVAIR / SHAKTI HARMONN / ICLEAN / GODREJ / BHAVANI FIRE / AIS PYROBEL / DORMAKABA / ASSA ABLOY / GEZE
6.	EPDM Gasket	EBCO / ANAND / IGP / CROWN GASKET / OSAKA
1.9	**PLUMBING & SANITARY**	
1.	GI Pipes	JINDAL (HISAR) / TATA / BHUSAN / APL APOLLO
2.	GI Fittings	UNIK / ZOLOTO / AM / TATA
3.	SS Pipes & fittings (304 / 316 Grade)	JSL LYFESTYLE / VIEGA / J-PRESS / AQUINOX INDIA / TATA / ALFA PRESS
4.	DWC HDPE Pipes	SUPREME / ASTRAL / APL APOLLO
5.	DI Pipes	ELECTROSTEEL (VEDANTA) / JINDAL/ TATA DUCTURA
6.	DI Fittings	KARTAR / ELECTROSTEEL (VEDANTA) / JINDAL/ TATA DUCTURA / KESORAM / KALINGA
7.	CI Double flanged sluice valve	KIRLOSKAR / KARTAR / ZOLOTO / CASSLE
8.	Float Valve	LEADER / ZOLOTO / KSB / IVC/ NRV / SANT
9.	Hubless Centrifugally Cast (Spun) Iron Pipes & Fittings / Centrifugally Cast (Spun) Ductile Iron Pipes & Fittings	JAYASWAL NECO / SKF / RPMF / BENGAL IRON WORKS / RIF
10.	Centrifugally Cast (Spun) Iron (Class LA) Pipes	JAYSAWAL NECO / ELECTRO STEEL / TATA/ BENGAL IRON WORKS / RIF
11.	Centrifugally Cast (Spun) Ductile Iron Pipes & Fittings	NECO /JINDAL (HISSAR) /KALINGA / RPMF / BENGAL IRON WORKS / RIF
12.	CI Manhole covers, Frames & GI Gratings	JAYASWAL NECO / RIF / SKF/ RPMF / ELECTROSTEEL CASTINGS
13.	SFRC Manhole Covers & Gratings	KK / OCR / PARGATI / T-CON / NECO / DUDHI
14.	Stoneware Pipes and Gully Traps	PERFECT / PARRY / BURN / ANAND / RK / HIND
15.	RCC Manhole covers & Frames	KK MANHOLE / GRATING CO. (P) LTD / DALAL TILES INDUSTRIES
16.	FRP Cover	R.X./ THERMODRAIN / FIBROCAST / DUDI/ CRECENT / VIKRANT FOUNDARY
17.	Gun Metal Valves, Globes	ZOLOTO / CASTLE / KARTAR / SANT
18.	CP Brass Fittings & Fixtures	JAQUAR / HINDWARE / CERA / KOHLER / GROHE / KEROVIT
19.	Sanitary Vitreous Chinaware	JAQUAR / HINDWARE / CERA / KOHLER / GROHE
20.	Toilet & Bathroom Accessories (towel ring, rod, toilet paper holder, soap dish, wash couplings, extension nipples, etc.)	JAQUAR / HINDWARE / CERA / KOHLER / GROHE / JONHSON / EURONICS
21.	Water Meter	KENT / MARSHALL / SANT

22.	Brass Stop & Bib Cock	AGI / ELITE / SHAKTI / ZOLOTO / SANT / L&K / LEADER / ASTRAL
23.	UPVC / CPVC / PVC Pipe & Fittings	AKG / ASTRAL / SUPREME / FINOLEX / PRINCE / PRAKASH / APL APOLLO
24.	Non-Return Valve (Check valve) and other kind of Valves	ZOLOTO / SANT / LEADER
25.	Brass Ferrules	DHAWAN SANITARY UDYOG / KALSI / POINEER / STERLING / ANNAPURNA
26.	Insulation for hot water pipes	MARSHLAND / ARMAFLEX / CAREFLEX / LLOYD / THERMAFLEX
27.	Pipe protection for external water supply pipes	THERMAFLEX / PYPKOTE / ARMAFLEX / MAKPOLYKOTE
28.	Stainless Steel Sink	NEELKANTH / NIRALI / CERA / FRANKE FABRE /ALLEX / JAYNA / KINGSTON
29.	RCC Pipes	LAKSHMI / SOOD & SOOD / JAIN & CO./ DIWAN SPUN PIPES / INDIAN HUME PIPE / BALAJI / RAJ CEMENT PRODUCT
30.	Polyethylene water storage tank	SINTEX / UNIPLAST / POLYWELL / EURO / POLYCON
31.	Pumps	GRUNDFOSS / XYLEM / WILLO / KSB / CROMPTON
32.	Water Treatment Plant	ION EXCHANGE / BRISANZI / NETSOL / THERMAX / HYDRO TECH PARYAVARAN
33.	Packaged STP	TREK ENVIRO (SUSBIO) / DIAKI AXIS / KUBOTA / ORION STP / SVG INFRA PROJECT / B.S. ENVIRO & INFRACON (P) LTD.
1.10	**MISCELLANEOUS**	
1.	SMC water tank	SINTEX / MAHINDRA / SPL / SUPREME / VECTUS
2.	Window Blinds	VISTA / DECK / HUNTER / MAC / MARVEL / SAINT GOBAIN
3.	Automatic Sliding Door	DORMA / OZONE / GEZE

S. No.	Material	Preferred make
	E&M Works	
1.	Air Circuit Breaker	Schneider / LK / Siemens / ABB
2.	Panels- Type Tested Assemblies (TTA)	ABB / Schneider / LK / Siemens / Rittal
3.	LT Panel Builder (TTA & PTTA)	Advance / Tricolite / Milestone / Marine / Asiatic
4.	Transformer (Oil Type)	Schneider / Crompton Greaves / Siemens / ABB / Bharat Bijlee / BHEL
5.	Outdoor Lighting / Solar Lights	Phillips / Bajaj / Wipro / Vak / Valmont
6.	33 / 11 KV VCB HT Panels	Schneider / ABB / Siemens / LK
7.	APFC Panel	Schneider / ABB / Siemens / LK / Rittal
8.	Cables Glands	Comet / Dowel / Braco / Siemns
9.	Maintenance Free Earthing & Lightening protection System	Altec / Teksai / OBO Betterman / Jef Techno / ABB / Cape
10.	Protection Relays	Schneider / ABB / Siemens
11.	BMS	ABB / Schneider / Siemens / Allen Bradley / GE
12.	SCADA System	ABB / Schneider / Siemens / Allen Bradley / GE
13.	MCB(10KA)/ Isolators & MCB DB with End Box.	Legrand /Siemens/ L&T / ABB/ Schneider
14.	MCCB	ABB / Legrand /Schneider / LK / Siemens
15.	MCCB BOX	Legrand / Siemens/ L&T / ABB/ Schneider
16.	Modular type switch/ socket, TV socket, Fan Regulator.	Legrand (Arteor) / Panasonic (Europa) / Schneider Electric (Zencelo) / ABB (IVIE) / Crabtree -

		Murano
17.	Steel conduit pipe and Accessories (ISI)	BEC/ AKG/ NIC / Steel Krafts
18.	PVC conduit pipe and Accessories(ISI)	BEC/ AKG/ NIC
19.	Junction Boxes/ MS Boxes	Havells Crabtree / Anchor / North West / Legrand
20.	Bushes	PVC/ Nylon
21.	FRLS PVC insulated copper conductor cable	Polycab / Finolex / Havells/ KEI/ Universal
22.	LED Light Fixture	Philips/ Wipro / Trilux
23.	Street Light Poles	Crompton/ Wipro/ Transrail / Bajaj
24.	Ceiling Fans (BLDC) & Wall Fan	Havells/ Atomberg/ Bajaj/ Crompton
25.	Exhaust Fan/ Fresh Air Fan	Havells/ Bajaj/ Crompton
26.	Industrial type socket	Legrand / Siemens/ L K / ABB/ Schneider
27.	DLP U-PVC channel & accessories	Schneider / Legrand
28.	Distribution Board	Legrand /Siemens/ L K / ABB/ Schneider
29.	XLPE Alumium/ Copper conductor Armoured cable	Polycab/ Finolex/ / KEI/ Universal
30.	Multifunction Meter	LK/ AE/ Schneider/ Rishabh/ Fluke / Conzerv / Secure
31.	Ammeter	LK/ AE/ Universal/ Rishabh/ Meco/ Kaycee/ Enercom / Fluke / Conzerv / Secure
32.	Voltmeter	LK/ AE/ Universal/ Rishabh/ Meco/ Kaycee/ Enercom / Fluke / Conzerv / Secure
33.	Frequency Meter	Digitron/ AE/ Rishabh/ Meco/ Keltron / Fluke / Conzerv / Secure
34.	CT's	LK/AE/ KAPPA/ Pragati/ Marshal/ L K / Precision
35.	Selector Switches	LK/AE/ KAPPA/ Pragati/ Marshal/ L K / Precision
36.	Contractors	Legrand /Siemens/ LK / ABB/ Schneider
37.	Push button & Pilor lamps	BCH/ L K/ Seimens/ Vaishno
38.	LED indicating Lights	L K/ Siemens/ Kaycee/ Crompton/ Vaishno
39.	GI Pipe	Jindal Steel/ Jindal Hisar/ Sail/ Tata
40.	DW HDPE Pipe	Reliance/ Duraline/ Hasti
41.	Cat 6 LAN Cable	Legrand/ Molex/ Amp
42.	Air conditioners	Mitsubishi/ O general/ Hitachi/ Daikin/ Blue Star/ Carrier/ LG/ Lloyds/ Panasonic/ Voltas
43.	Access Control System	Bosch/ Honeywell/ HID / Lenel
44.	Intruder Alarm Systerm	Ademco/ bosch/ DSC/ Honeywell
45.	Cable raceway floor/ wall mounted & Accessories(MS/G.I)	Legrand/ BEC/ Honeywell/ OBO Betterman.
46.	Sandwitch Bus trunking/ Rising Main	Siemens / C&S/ LK/ Schneider/ ABB / Anant Power (Advance)
47.	Telephone wire	Delton/ Finolex/ Havells/ Skytone
48.	Occupancy Sensor	Wipro/ Schneider/ Honeywell/ Seimens/ Bosch
49.	Gooseneck Microphone	Televic/ Beyerdynamic/ Bosch/ Bose/ Sennheiser
50.	Amplifier	Crown/ Extrom/ Crestron
51.	Network Switch	Cisco
52.	8 Port LIU	Legrand/ AMP/ Molex
53.	16 Port Gigabit POE Switch	Netgear/ Juniper/ Cisco
54.	HDMI/ USB Cable	AMX/ Crestron/ Manhatten
55.	AV Speaker	JBL/ Bosch/ Bose/ Sony
56.	CCTV Camera	Pelco/ Bosch/ Honeywell
57.	DVR (Digital Video Recorder)	Bosch/ Honeywell/ Pelco
58.	Fire Suppression System	Minimax/ Ceasefire/ Ansul

59.	Fire Panel	Johnson Control (IFC)/ Notifier (UL) / Bosch (UL) / Fike (UL).
60.	PA System	Notifier/ Johnson Control/ Fike/ Cooper/ Bosch/ Honeywell
61.	Addressable Heat/ Smoke detector/ Hooter/ RI/ Pullstation/	Johnson Control (IFC)/ Notifier (UL) / Bosch (UL) /) / Fike (UL).
62.	Conventional Heat/ Smoke detector/ Hooter/ RI/ Pullstation/	Cooper/ Ravel/ Fike/ Honeywell/ Bosch/ Siemens
63.	HT Termination Cable joint Kit	Raychem/ M-Seal/ Densons/ 3M
64.	Diesel Engine	Cummins / Caterpillar / Mitsubishi
65.	Alternator	Siemens / Caterpillar / Stamford
66.	Batteries	Panasonic / Exide / Amaron / Amarraja
67.	Batteries Charger	Amarraja / Statcon / Chhabi / AE
68.	Firewall	Cisco
69.	Boom Barrier	Speed Gatz /Came /FAAC
70.	Co-Axial TV Cable	Polycab /RR Cables/ Havells
71.	Optical Fiber cable (Single & Multimode) and all accessories including LIU etc.	Commscope (Systimax) /Molex/ Siemon
72.	CAT6/Cat 6A 24Port Jack Panel /Passive networking -Cat6A cable and all accessories	Commscope (Systimax) /Molex Siemon
73.	Networking – IT racks	CISCO /Rittal /APW /Legrand
74.	Network Attached Storage	HP /Dell /Camera OEM
75.	Desktop PC	HP /Dell / Lenovo
76.	Professional Display Panel	HP /Dell / Lenovo
77.	EPABX / IPABX & Accessories	CISCO / Avaya / Alcatel
78.	Sprinkler Head	Tyco /Eversafe/ Reliable /Spraysafe/ Viking
79.	Fire Hose Pipes/ First Aid/ Fire Hose Reel / Fireman's Axe	Newage /Ceasefire /Jayshree / Ushafire/ Safex/ Eversafe/ Jyoti
80.	Fire Hydrant Valves / Short Branch pipe / FB Withdrawl & inlet	Newage/ Ceasefire/ Vijay /Safex/ Eversafe/ Minimax/ Peter autokit/ Padmini
81.	Pipe Coat Material	Pypkote /Makphalt/ Safex/ Mlote
82.	Fire Suppression system	Minimax /Ceasefire/ Ansul
83.	Electric Driven fire pump, jockey pump, terrace pump, dewatering pump	Mather & Platt (willo)/ Kirloskar/ Beacon/ Grundfos/ ITT
84.	Electric driven fire pump's motor	ABB /KEC/ CGL/ Bharat Bijlee/ Grundfos
85.	Solar water Heating System	Tata BP/ Racold/ Honeywell
86.	Solar PV	TATA / ADANI / Waree / Nouvas Green
87.	Water Supply and Drainage Pump	ABB /KEC/ CGL/ Bharat Bijlee/Grundfos

ANNEXURE-I

COMPLIANCE SHEET
TECHNICAL SPECIFICATION

S.No.	Technical Bid Requirement As per Tender Notice & NIT & IITD form 7	Compliance Yes / No	Page No.
1.	Demand Draft / Pay order or Banker`s Cheque / Deposit at Call Receipt / FDR of any Scheduled Commercial Bank or through RTGS/ NEFT with UTR details against EMD		
2.	Enlistment / Registration order of contractor, if applicable in this tender, as per NIT Form 6 Tender notice.		
3.	Certificate of Registration for GST and acknowledgement of up to date filed return of GST.		
4.	Certificate of Financial Turnover from Chartered Accountant (Form - A)		
5.	Banker's Certificate (Form – B) or Net Worth Certificate (Form – B1)		
6.	Certificates of Work Experience (Form – C, Form – C1 & Form - D)		
7.	Bidding Capacity Form – C-3.		
8.	Structure & Organization details of the bidder (Form – E)		
9.	Undertaking on structural stability and soundness of already completed buildings and infrastructure projects (Form "F").		
10.	Proforma of Affidavit for Non-Blacklisting – (Form "G").		
11.	Declaration about Site inspection - (Form "H").		
12.	Affidavit regarding non execution of work on back-to-back basis - (Form "I").		
13.	Signed copy of Letter of Transmittal.		
14.	Acceptance to execute Integrity Pact.		
15.	Undertaking as per 'Sl. No. 19 on page No. 8 on firm's letter head.		
16.	ESI & EPF registration certificates.		
17.	In the case of a Partnership firm, if all the tender papers are not signed by all the partners, a power of attorney authorizing the person who has signed the tender paper must be uploaded with the tender documents.		
18.	Annexure-I (duly filled & signed by the bidders)		
19.	Annexure-II (duly filled & signed by the bidders)		
20.	Any other documents as specified in the NIT.		
21.	**Valid Electrical License of the Contractor or the associate agency.**		
22.	**OEM authorization of the Specialized E&M component.**		

I / We have also enclosed all relevant documents in support of my claims, (as above) on the following pages.

Signature of Bidder(S)

ANNEXURE-II

<< Organization Letter Head >>
DECLARATION SHEET

I/We,_____hereby certify that all the information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I have gone through the specifications, conditions and stipulations in detail and agree to comply with the requirements and intent of specifications.
This is certified that our organization has been registered as per Tender Notice & NIT & IITD form 7 Tender. I/We further certified that our organization meets all the conditions of eligibility criteria laid down in this tender document.

We, further specifically certify that our organization has not been Blacklisted/De Listed or put to any Holiday by any Institutional Agency/ Govt. Department/ Public Sector Undertaking in the last three years.	NAME & ADDRESS of the Vendor/ Manufacturer / Agent
1. Phone	**As per Tender Notice & NIT**
2. Fax	
3. E-mail	
4. Contact Person Name	
5. Mobile Number	
6. GST Number	
7. PAN Number	
8.(In case of on-line payment of EMD) UTR No. (For EMD)	

Signature of Bidder(S)

Online Bid Submission
List of Documents to be uploaded

The Online bids (complete in all respect) must be uploaded online in **two** Envelops as explained below: -

Envelope – 1 (Following documents to be provided as single PDF file)			
Sl. No.	**Documents**	**Content**	**File Types**
1.	Technical Bid	Demand Draft / Pay order or Banker`s Cheque / Deposit at Call Receipt / FDR of any Scheduled Commercial Bank or through RTGS/ NEFT with UTR details against EMD	.PDF
2.		Enlistment / Registration order of contractor, if applicable in this tender, as per NIT Form 6 Tender notice.	.PDF
3.		Certificate of Registration for GST and acknowledgement of up to date filed return of GST.	.PDF
4.		Certificate of Financial Turnover from Chartered Accountant (Form - A)	.PDF
5.		Banker's Certificate (Form – B) or Net Worth Certificate (Form – B1)	.PDF
6.		Certificates of Work Experience (Form – C, Form – C1 & Form - D)	.PDF
7.		Bidding Capacity Form – C-3	.PDF
8.		Structure & Organization details of the bidder (Form – E)	.PDF
9.		Undertaking on structural stability and soundness of already completed buildings and infrastructure projects (Form "F").	.PDF
10.		Proforma of Affidavit for Non-Blacklisting – (Form "G").	.PDF
11.		Declaration about Site inspection - (Form "H").	.PDF
12.		Affidavit regarding non execution of work on back-to-back basis - (Form "I").	.PDF
13.		Signed copy of Letter of Transmittal.	.PDF
14.		Acceptance to execute Integrity Pact.	.PDF
15.		Undertaking as per 'Sl. No. 19 on page No. 9 on firm's letter head.	.PDF
16.		ESI & EPF registration certificates.	.PDF
17.		In the case of a Partnership firm, if all the tender papers are not signed by all the partners, a power of attorney authorizing the person who has signed the tender paper must be uploaded with the tender documents.	.PDF
18.		Annexure-I (duly filled & signed by the bidders)	.PDF
19.		Annexure-II (duly filled & signed by the bidders)	.PDF
20.		Any other documents as specified in the NIT.	.PDF
21.		Valid Electrical License of the Contractor or the associate agency.	.PDF
22.		OEM authorization of the Specialized E&M component	.PDF
Envelope – 2			
Sl. No.	**TYPES**	**Content**	
1.	Financial Bid	The price bid should be submitted in BOQ format.	**.Xls**

All the above documents shall be as per Tender Notice.

SCHEDULE OF QUANTITY

Name of work : Construction of residential building (3B+G+11) including allied services at IITD Extension Campus at Sector-3, R.K.Puram, Delhi.

Part-A: Civil Work

SLNo	Description	Qty	Unit	Rate	Amount
1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and for all lift, as directed by Engineer-in-charge.				
1.1	All kinds of soil	13260	cum	177.50	2353650.00
2	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including getting out and disposal of excavated earth lead upto 50 m and lift upto 1.5 m, as directed by Engineer-in-charge.				
2.1	Ordinary rock	1556	cum	498.90	776288.00
3	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, for all lift, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m.				
3.1	All kinds of soil.	722	cum	260.30	187937.00
4	Excavating trenches by mechanical / manual means of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, for all depth, including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m:				
4.1	All kinds of soil				
4.1.1	Pipes, cables etc, not exceeding 80 mm dia.	320	metre	215.60	68992.00
4.1.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia	645	metre	352.15	227137.00
5	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 and for all lif.	5194.85	cum	196.00	1018191.00
6	Supplying and filling in plinth with sand under floors, including watering, ramming, consolidating and dressing complete.	713	cum	2123.75	1514234.00
7	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth up to 30 cm measured at a height of 1 m above ground level and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared.	2500	sqm	17.60	44000.00
8	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level:				
8.1	1:2:4 (1 cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources)	375	cum	7878.50	2954438.00

SLNo	Description	Qty	Unit	Rate	Amount
9	Providing and laying cement concrete in retaining walls, return walls, walls (any thickness) including attached pilasters, columns, piers, abutments, pillars, posts, struts, buttresses, string or lacing courses, parapets, coping, bed blocks, anchor blocks, plain window sills, fillets, sunken floor etc., up to floor five level, excluding the cost of centering, shuttering and finishing:				
9.1	1:2:4 (1 Cement : 2 coarse sand (zone-III) derived from natural sources : 4 graded stone aggregate 20 mm nominal size derived from natural sources)	621	cum	9895.20	6144919.00
10	Extra for concrete work in superstructure above floor V level for each four floors or part thereof by mechanical means.	467	cum	169.45	79133.00
11	Making plinth protection 50 mm 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 75 mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand, including necessary excavation, levelling & dressing & finishing the top smooth.	223	sqm	749.30	167094.00
12	Providing and laying in position ready mixed or site batched design mix cement concrete for plain cement concrete work; using coarse aggregate and fine aggregate derived from natural sources, Portland Pozzolana/ Ordinary Portland /Portland Slag cement, admixtures in recommended proportions as per IS: 9103 to accelerate / retard setting of concrete, to improve durability and workability without impairing strength; including pumping of concrete to site of laying, curing, carriage for all leads; but excluding the cost of centering, shuttering and finishing as per direction of the engineer-in-charge; for the following grades of concrete. Note: Extra cement up to 10% of the minimum specified cement content in design mix shall be payable separately. In case the cement content in design mix is more than 110% of the minimum specified cement content, the contractor shall have discretion to either re-design the mix or bear the cost of extra cement.				
12.1	All works upto plinth level:				
12.1.1	Concrete of M10 grade with minimum cement content of 220 kg /cum	302	cum	8835.15	2668215.00
13	Centering and shuttering including strutting, propping etc. and removal of form for				
13.1	Foundations, footings, bases of columns, etc. for mass concrete	610	sqm	392.15	239212.00
13.2	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	4104	sqm	842.50	3457620.00
13.3	Suspended floors, roofs, landings, balconies and access platform	186	sqm	927.25	172469.00
13.4	Shelves (Cast in situ)	433	sqm	927.25	401499.00
13.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers	194	sqm	736.40	142862.00
13.6	Columns, Pillars, Piers, Abutments, Posts and Struts	178	sqm	961.30	171111.00
13.7	Stairs, (excluding landings) except spiral-staircases	83	sqm	764.95	63491.00
14	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level.				

SLNo	Description	Qty	Unit	Rate	Amount
14.1	Thermo-Mechanically Treated bars of grade Fe-500D or more.	454777	kg	107.85	49047699.00
15	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete above plinth level.				
15.1	Thermo-Mechanically Treated bars of grade Fe-500D or more.	170463	kg	107.85	18384435.00
16	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.				
16.1	All works upto plinth level				
16.1.1	Concrete of M30 grade with minimum cement content of 350 kg /cum	2592	cum	9655.70	25027574.00
16.2	All works above plinth level upto floor V level				
16.2.1	Concrete of M30 grade with minimum cement content of 350 kg /cum	1720	cum	10011.35	17219522.00
17	Add for using extra cement in the items of design mix over and above the specified cement content therein.	2156	quintal	733.50	1581426.00
18	Extra for R.C.C./ B.M.C/ R.M.C. work above floor V level for each four floors or part thereof.	5879	cum	355.65	2090866.00
19	Providing and fixing in position Stainless steel Grade 304 plate-1.0 mm thick as per design for expansion joints.				
19.1	300 mm wide.	236	metre	1208.05	285100.00
20	Providing and fixing of expansion joint system related with floor location as per drawings and direction of Engineer-In-Charge. The joints system will be of extruded aluminum base members, self aligning / self centering arrangement and support plates etc. as per ASTM B221-02. The system shall be such that it provides floor to floor /floor to wall expansion control system for various vertical location in load application areas that accommodates multi directional seismic movement without stress to it's components. System shall consist of metal profiles with an 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				

SLNo	Description	Qty	Unit	Rate	Amount
	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 conform to ASTM 6063).				
20.1	Floor Joint of 150 mm gap	9	metre	7812.35	70311.00
21	Providing and fixing of expansion joint system related with wall joint (internal/external) location as per drawings and direction of Engineer-In- Charge. The joints shall be of extruded aluminum base members, self aligning / centering arrangement and support plates as per ASTM B221- 02. The material shall be such that it provides an Expansion Joints System suitable for vertical wall to wall/ wall to corner application, both new and existing construction in office Buildings & complexes with no slipping down tendency amongst the components of the Joint System. The Joint System shall utilize light weight aluminum profiles exhibiting minimal exposed aluminum surfaces mechanically snap locking the multicellular to facilitate movement. (Material shall conform to ASTM 6063).				
21.1	Wall Joint of 150 mm gap	128	metre	5981.40	765619.00
22	Providing and fixing of expansion joint system of approved make and manufactures for various roof locations as per approved drawings and direction of Engineer-In-Charge. The joints shall be of extruded aluminum base members with, self aligning and self centering arrangement support plates as per 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 an universal aluminum base member designed to accommodate various project conditions and roof treatments. The cover plate shall be designed of width and thickness required to satisfy movement and loading requirements and secured to base members by utilizing manufacturer's pre-engineered self-centering arrangement that freely rotates / moves in all directions. The Self centering arrangement shall exhibit circular sphere ends that lock and slide inside the corresponding aluminum extrusion cavity to allow freedom of movement and flexure in all directions including vertical displacement. The Joint System shall 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 watertight joint is mandatory requirement. (Material shall conform to ASTM 6063).				
22.1	Roof Joint of 150 mm gap	18	metre	6699.85	120597.00

SLNo	Description	Qty	Unit	Rate	Amount
23	Constructing cast-in situ RCC diaphragm wall by providing and laying machine batched, machine mixed, self compacting, ready mix reinforced cement concrete, tramie controlled, of M 30 grade using minimum 400 kg cement per cum of concrete including providing and mixing required admixtures in recommended proportions as per IS : 9103, as approved by the Engineer-in-charge, for achieving 150 - 200 mm slump, for diaphragm wall having thickness as per approved structural design not exceeding 600 mm, in pannels of required depth and lengths as per approved drawing, including constructing necessary guide walls as required and as specified including boring in all kinds of soils and rocks, including working in or under water and / or liquid mud, in foul conditions and pumping or bailing out of water and removing slush, including disposal of earth/ rock/ slush etc. for all leads and all lifts, including preparing, providing and re-circulating bentonite slurry in the trench as and when required for all depths, including agitating bentonite slurry during trenching etc., providing and fixing stop ends or form tubes, upto the required depth of diaphragm wall including extracting the same after casting, including chipping of the bentonite adulterated concrete or unsound concrete up to the cut of level for obtaining the sound concrete, dressing undulations on the exposed face of diaphragm wall after excavation by chipping / chiselling etc. including filling the depression/ cavities with sound concrete etc. complete and as directed by the Engineer-in-charge, including providing recess for bearing plates and fixing insert boxes for inclined rock anchors etc. complete as per the specifications and approved design and as directed by the Engineer-in-charge, but excluding the cost of reinforcement and inserts. (rates include cost of all inputs of labour, material and T & P, cost of handling, lifting & placing in position the reinforcement cage in the trench, including the additional cost of welding the reinforcement bars etc. involved in the work and all other incidental expenditure for completing the work as directed by the Engineer-in- charge), However, the actual area of the diaphragm wall, correct to two places of decimal, from design bottom level to the design cut of level (including portion anchored in the rock upto the design bottom level) only shall be measured for payment. (rates include cost of all inputs of labour, material and T & P, cost of handling, lifting & placing in position the reinforcement cage in the trench, including the additional cost of welding the reinforcement bars etc. involved in the work and all other incidental expenditure for completing the work as directed by the Engineer-in-charge), However, the actual area of the diaphragm wall, correct to two places of decimal, from design bottom level to the design cut of level (including portion anchored in the rock upto the design bottom level) only shall be measured for payment. Excess/less cement used for design mix including the extra cement required for under water concreting is payable / recoverable separately.	1323	cum	20460.45	27069175.00

SLNo	Description	Qty	Unit	Rate	Amount
24	Brick work with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5 in foundation and plinth in:				
24.1	Cement mortar 1:6(1 cement :6 coarse sand)	134	cum	7132.25	955722.00
25	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.	1265	cum	169.45	214354.00
26	Extra for half brick masonry in superstructure, above floor V level for every four floors or part thereof by mechanical means.	14464	sqm	15.00	216960.00
27	Extra for providing and placing in position 2 Nos 6 mm dia. M.S. bars at every third course of half brick masonry.	11571	sqm	104.80	1212641.00
28	Brick work with non-modular fly ash bricks conforming to IS:12894, class designation 10 average compressive strength in super structure above plinth level up to floor V level in:				
28.1	Cement mortar 1:4(1 cement :4 coarse sand)	1687	cum	8962.35	15119484.00
29	Brick edging 7cm wide 11.4 cm deep to plinth protection with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5 including grouting with cement mortar 1:4 (1 cement : 4 fine sand).	200	metre	60.85	12170.00
30	Half brick masonry with non-modular fly ash bricks of class designation 10, conforming to IS :12894, in super structure above plinth upto floor V level.				
30.1	Cement mortar 1 : 4 (1 cement : 4 coarse sand)	11571	sqm	1105.80	12795212.00
31	Providing and fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished, machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing of edges to give high gloss finish etc. complete at all levels.				
31.1	Granite stone slab of all colour and texture except black, Cherry/Ruby red				
31.1.1	Area of slab over 0.50 sqm	1054	sqm	3848.70	4056530.00
32	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.	1490	metre	568.55	847140.00
33	Extra for providing opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter and similar location in marble/ Granite/ stonework, including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete.	441	each	978.70	431607.00
34	Providing and fixing cramps of required size & shape in RCC/ CC/ Brick masonry backing with cement mortar 1:2 (1 cement :2 coarse sand), including drilling necessary hole in stones and embedding the cramp in the hole (fastener to be paid separately).				
34.1	Stainless steel cramps	272.7	kg	714.40	194817.00
35	Providing and fixing expansion hold fasteners on C.C. /R.C.C./Brick masonry surface backing including drilling necessary holes and the cost of bolt etc complete.				
35.1	Wedge expansion type				

SLNo	Description	Qty	Unit	Rate	Amount
35.1.1	Fastener with threaded dia 10 mm	1818	each	40.00	72720.00
36	Providing and fixing 1st quality ceramic glazed wall tiles conforming to IS: 15622 (thickness to be specified by the manufacturer), of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3(1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete.	5893	sqm	1267.95	7472029.00
37	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 4 mm thick aluminium composite panel material consisting of 3 mm thick FR grade mineral core sandwiched between two Aluminium sheets (each 0.5 mm thick). The aluminium composite panel cladding sheet shall be coil coated, with Kynar 500 based PVDF / Lumiflon based fluoropolymer resin coating of approved colour and shade on face # 1 and polymer (Service) coating on face # 2 as specified using stainless steel screws, nuts, bolts, washers, cleats, 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 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 framework for ACP cladding is payable under the relevant aluminium items. 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.	1050	sqm	5015.05	5265803.00

SLNo	Description	Qty	Unit	Rate	Amount
38	Providing and fixing ISI marked flush door shutters conforming to IS: 2202 (Part I) non-decorative type, core of block board construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters:				
38.1	35 mm thick including ISI marked Stainless Steel butt hinges with necessary screws	1472	sqm	2392.65	3521981.00
39	Providing and fixing oxidised M.S. Safety chain with necessary fixtures for doors, (weighting not less than 450 gms) and Copper oxidised as per IS 1378	585	each	100.60	58851.00
40	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	819	each	121.65	99631.00
41	Providing and fixing magnetic catcher of approved quality in cupboard/ ward robe shutters, including fixing with necessary screws etc. complete.				
41.1	Double strip (horizontal type)	3620	each	39.70	143714.00
42	Providing & fixing decorative high pressure laminated sheet of plain / wood grain in gloss / matt/ suede finish with high density protective surface layer and reverse side of adhesive bonding quality conforming to IS: 2046 Type S, including cost of adhesive of approved quality.				
42.1	1.0 mm thick	2944	sqm	897.30	2641651.00
43	Providing and fixing fly proof stainless steel grade 304 wire gauge, to windows and clerestory windows using wire gauge with average width of aperture 1.4 mm in both directions with wire of dia. 0.50 mm all complete.				
43.1	With 12 mm mild steel U beading	190	sqm	1228.00	233320.00
45	Providing and fixing bright /matt finished Stainless Steel handles of approved quality & make with necessary screws etc all complete.				
45.1	75 mm	894	each	58.75	52523.00
46	Providing and fixing 18 mm thick both sides Pre-laminated cement bonded wood particle board as per IS : 15786:2008 of approved brand and shade with suitable full threaded steel screws etc. in partitions, boxes, shelves, racks and cupboard, kitchen cabinet under kitchen counter etc. all complete as per direction of Engineer-in-charge (Note: Fittings to be paid separately).				
46.1	18 mm thick	1178.7	sqm	1362.30	1605743.00
47	Providing and fixing cupboard shutter with 19 mm thick one side decorative and other side balancing lamination factory pressed BWP grade marine ply as per IS 710 of approved brand including 2 mm thick PVC edge banding tape with hot glue by edge bending machine etc. with auto closing spring loaded hinges (hydraulic type) etc. complete as per direction of Engineer-in-charge. (Payment of providing and fixing auto closing hinges shall be paid separately)	1178.7	sqm	2829.25	3334837.00
48	Providing and fixing stainless steel fancy handle of approved make fixed with SS screws etc. complete as per direction of Engineer-in-charge.				
48.1	200 mm	458	each	186.65	85486.00
49	Providing and fixing stainless steel soft closing spring hinges at 0-degree hinges (hydraulic type) of approved make/brand to cupboard shutters with full threaded steel screws including making necessary	1810	each	272.00	492320.00

SLNo	Description	Qty	Unit	Rate	Amount
	recess in board and finished etc. complete as per direction of Engineer-in-charge.				
50	Providing and fixing stainless steel soft closing heavy type telescopic drawer channels of approved make 500 mm long with screws etc. complete as per direction of Engineer- in-charge,	527	one set	885.10	466448.00
51	Providing and fixing readymade 304 grade stainless steel Modular kitchen basket and accessories such as right-angle basket (Plain Cup & Saucer, plant, Partition, Bottle rack, Thali, Cutlery) kitchen utensil basket, Dinner set basket, kitchen grain basket, Multipurpose basket as per site requirement including finishing (wherever required) and fittings. The same shall be fixed with necessary stainless-steel nuts & bolts, Stainless Steel screws & telescopic channel etc. as per direction of Engineer-in- charge. (For payment purpose only weight of Stainless-steel basket shall be considered excluding weight of all fixing accessories such as nuts, bolts, fasteners telescopic basket channels etc. Payment of providing and fixing telescopic channel shall be paid separately)	1490	kg	533.25	794543.00
52	Providing and fixing 2 mm thick 16 to 19 mm wide PVC edge binding tape of approved quality for cupboard/wardrobe shutters including necessary synthetic resin hot pressed to edges on binding machine etc. complete as per direction of Engineer-in-charge.	3876.9	metre	43.80	169808.00
53	Providing and fixing mild steel round holding down bolts with nuts and washer plates complete.	2426	kg	97.20	235807.00
54	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.				
54.1	In stringers, treads, landings etc. of staircases, including use of chequered plate wherever required, all complete	180	kg	123.60	22248.00
54.2	In gratings, frames, guard bar, ladder, railings, brackets, gates and similar works	37087	kg	172.60	6401216.00
55	Providing and fixing carbon steel galvanised (minimum coating 5 micron) dash fastener of 10 mm dia double threaded 6.8 grade (yield strength 480 N/mm2), counter sunk head, comprising of 10 mm dia polyamide PA 6 grade sleeve, including drilling of hole in frame, concrete/ masonry, etc. as per direction of Engineer-in-charge.				
55.1	10 x 120 mm	264	each	170.95	45131.00
56	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc., including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete, i/c fixing the railing with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge, (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.).	3178	kg	772.40	2454687.00

SLNo	Description	Qty	Unit	Rate	Amount
57	Precast terrazzo tiles 22 mm thick with graded marble chips of size upto 12 mm, laid in floors, and landings, jointed with neat cement slurry mixed with pigment to match the shade of the tiles, including rubbing and polishing complete, on 20 mm thick bed of cement mortar 1:4 (1 cement:4 coarse sand) :				
57.1	Light shade pigment using white cement	4129	sqm	1549.45	6397679.00
58	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) :				
58.1	25 mm thick	445	sqm	1948.25	866971.00
59	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.	45	sqm	2354.70	105962.00
60	Providing and laying Ceramic glazed floor tiles of size 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement :4 Coarse sand), Jointing with grey cement slurry @ 3.3 kg/sqm including pointing the joints with white cement and matching pigment etc., complete.	1606	sqm	1096.55	1761059.00
61	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption less than 0.08% and conforming to IS: 15622, of approved make, in all colours and shades, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joints with white cement and matching pigments etc., complete.				
61.1	Size of Tile 600x600 mm	7200	sqm	1553.45	11184840.00
62	Providing and laying Vitrified tiles in different sizes (thickness to be specified by manufacturer), with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make, in all colours & shade, in skirting, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), jointing with grey cement slurry @ 3.3 kg/ sqm including grouting the joint with white cement & matching pigments etc. complete.				
62.1	Size of Tile 600x600 mm	1080	sqm	1623.05	1752894.00
63	Grouting the joints of flooring tiles having joints of 3 mm width, using epoxy grout mix of 0.70 kg of organic coated filler of desired shade (0.10 kg of hardener and 0.20 kg of resin per kg), including filling / grouting and finishing complete as per direction of Engineer-in-charge.				
63.1	Size of Tile 600x600 mm	8280	sqm	309.05	2558934.00

SLNo	Description	Qty	Unit	Rate	Amount
64	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.				
64.1	Polished Granite stone slab of all colour and texture except Black, Cherry/Ruby Red	3232	sqm	3071.05	9925634.00
65	Providing fixing thermal insulation of ceiling (under deck insulation) with Resin Bonded Fibre glass wool conforming to IS : 8183, density 24kg / m3, 50 mm thick, wrapped in 200 G Virgin Polythene bags, fixed to ceiling with metallic cleats (50x50x3 mm) @ 60 cm and wire mesh of 12.5 mm x 24 gauge wire mesh, for top most ceiling of building.	1142	sqm	703.05	802883.00
66	Providing and fixing on wall face unplasticized Rigid PVC rainwater pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion, (i) Single socketed pipes.				
66.1	110 mm diameter	489	metre	377.40	184549.00
67	Providing and fixing on wall face unplasticized - PVC moulded fittings/ accessories for unplasticized Rigid PVC rainwater pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS :5382, leaving 10 mm gap for thermal expansion.				
67.1	Single pushfit Coupler				
67.1.1	110 mm	36	each	127.60	4594.00
67.2	Bend 87.5°				
67.2.1	110 mm bend	12	each	150.35	1804.00
67.3	Shoe (Plain)				
67.3.1	110 mm Shoe	12	each	131.85	1582.00
68	Providing and fixing unplasticized -PVC pipe clips of approved design to unplasticized - PVC rainwater pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete.				
68.1	110 mm	330	each	371.30	122529.00
69	Providing and fixing to the inlet mouth of rainwater pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	12	each	54.70	656.00
70	Providing and fixing false ceiling at all heights including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50 mm long with 6 mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger				

SLNo	Description	Qty	Unit	Rate	Amount
	fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25 mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :				
70.1	12.5 mm thick tapered edge gypsum moisture resistant board	5966	sqm	1529.10	9122611.00
71	Providing and fixing tiled false ceiling of specified materials of size 595x595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanized steel sections (galvanized @ 120 grams/ sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38 mm made from 0.30 mm thick (minimum) sheet, spaced at 1200 mm center to center and cross "T" of size 24x25 mm made of 0.30 mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanised butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200 mm center to center along main T, bottom exposed width of 24 mm of all T-sections shall be pre-painted with polyester paint, all complete for all heights as per specifications, drawings and as directed by Engineer-in-charge.				

SLNo	Description	Qty	Unit	Rate	Amount
71.1	GI Metal Ceiling Lay in perforated Tegular edge global white color tiles of size 595x595 mm and 0.5 mm thick with 8 mm drop; made of GI sheet having galvanizing of 100 grns/sqrn (both sides inclusive) and 20% perforation area with 1.8 mm dia holes and having NRC (Noise Reduction Coefficient) of 0.5, electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending and perforation and backed with a black Glass fiber acoustical fleece.	1616	sqm	2068.75	3343100.00
72	Providing and Fixing 15 mm thick densified tegular edged ecofriendly light weight calcium silicate false ceiling tiles of approved texture of size 595 x 595 mm in true horizontal level, suspended on inter locking metal grid of hot dipped galvanised steel sections (galvanising @ 120 grams per sqm including both side) consisting of main 'T' runner suitably spaced at joints to get required length and of size 24x38 mm made from 0.33 mm thick (minimum) sheet, spaced 1200 mm centre to centre, and cross "T" of size 24x28 mm made out of 0.33 mm (Minimum) sheet, 1200 mm long spaced between main 'T' at 600 mm centre to centre to form a grid of 1200x600 mm and secondary cross 'T' of length 600 mm and size 24 x28 mm made of 0.33 mm thick (Minimum) sheet to be inter locked at middle of the 1200x 600 mm panel to from grid of size 600x600 mm, resting on periphery walls /partitions on a Perimeter wall angle pre-coated steel of size(24x24X3000 mm made of 0.40 mm thick (minimum) sheet with the help of rawl plugs at 450 mm centre to centre with 25 mm long dry wall screws @ 230 mm interval and laying 15 mm thick densified edges calcium silicate ceiling tiles of approved texture in the grid, including, cutting/ making opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc., wherever required. Main 'T' runners to be suspended from ceiling using al. slotted cleats of size 25x35x1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm G.I. adjustable rods with galvanised steel level clips of size 85 x 30 x 0.8 mm, spaced at 1200 mm centre to centre along main 'T'. Bottom exposed with 24 mm of all T-sections shall be pre-painted with polyster baked paint, for all heights, as per specifications, drawings and as directed by Engineer-in-Charge. Note :- Only calcium silicate false ceiling area will be measured from wall to wall. No deduction shall be made for exposed frames/opening (cut outs) having area less than 0.30 sqm. The calcium silicate ceiling tile shall have NRC value of 0.50 (Minimum), light reflection >85%, non- combustible as per B.S. 476 part IV, 100% humidity resistance and also having thermal conductivity <0.043 w/mK.	4972	sqm	2158.15	10730322.00
74	12 mm cement plaster of mix:				
74.1	1:6(1 cement: 6 fine sand)	36767	sqm	333.35	12256279.00
75	15 mm cement plaster on rough side of single or half brick wall of mix:				
75.1	1:6(1 cement: 6 coarse sand)	6488	sqm	395.35	2565031.00
76	Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade:				

SLNo	Description	Qty	Unit	Rate	Amount
76.1	Two or more coats on new work over an under coat of suitable shade with ordinary paint of approved brand and manufacture	200	sqm	226.25	45250.00
77	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.	36767	sqm	156.05	5737490.00
78	Wall painting with acrylic emulsion paint, having VOC (Volatile Organic Compound) content less than 50 grams/ litre of approved brand and manufacture, including applying additional coats wherever required, to achieve even shade and colour.				
78.1	Two coats	36767	sqm	137.45	5053624.00
79	Applying priming coats with primer of approved brand and manufacture, having low VOC (Volatile Organic Compound) content.				
79.1	With water thinnable cement primer on wall surface having VOC content less than 50 grams/litre	36767	sqm	73.95	2718920.00
80	Manufacturing, supplying and fixing retro reflective overhead signage boards made up of 2 mm thick aluminium sheet, face to be fully covered with high intensity and encapsulated lens type heat activated retro reflective sheeting conforming to type - III of ASTM-D-4956-01 as approved by Engineer-in-charge, letters, borders etc. as per IRC : 67-2001 in silver white with blue colour back ground and with high intensity grade, pasted on substrate by pressure sensitive adhesive backing which shall be activated by applying pressure conforming to class II of ASTM-D-4956-01 and fixing the same to the plate of structural frame work by means of suitable sized aluminium alloys, rivets or bolts & nuts @ 300 mm centre to centre all along the periphery as well as in two vertical rows along with theft resistant measures, including the cost of painting with two or more coats of epoxy paint in grey colour on the back side of aluminium sheet including appropriate priming coat. The rate includes the cost of rounding off the corners, lowering down the structural framework from the gantry, fixing and erecting the same in position all complete as per drawings, specification and direction of the engineer-in-charge. (Structural framework including M.S. plate to be provided separately. Rectangular area of the sheet only shall be measured for payment).				
80.1	Overhead informatory road signage	20	sqm	5879.90	117598.00
81	Providing and applying 2.5 mm thick road marking strips (retro- reflective) of specified shade/ colour using hot thermoplastic material by fully/ semi-automatic thermoplastic paint applicator machine fitted with profile shoe, glass beads dispenser, propane tank heater and profile shoe heater, driven by experienced operator on road surface including cost of material, labour, T&P, cleaning the road surface of all dirt, seals, oil, grease and foreign material etc. complete as per direction of Engineer-in-charge and accordance with applicable specifications.	120	sqm	747.80	89736.00

SLNo	Description	Qty	Unit	Rate	Amount
82	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 5 mm), including making drainage opening wherever required complete etc. as per direction of Engineer- in-charge (length of finished kerb edging shall be measured to calculate volume for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	27	cum	10117.60	273175.00
83	Providing and laying tactile tile (for vision impaired persons as per standards) of size 300x300x9.8 mm 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 20 mm 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.	36	sqm	2017.60	72634.00
84	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 50 mm 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.				
84.1	60 mm thick cement concrete paver block of M-35 grade with approved colour, design & pattern.	1931	sqm	1045.65	2019150.00
85	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS:13983 with C.I. brackets and stainless-steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required:				
85.1	Kitchen sink without drain board				
85.1.1	610x510 mm bowl depth 200 mm	149	each	4940.80	736179.00
86	Providing and fixing CP Brass 32 mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge.	219	each	1034.80	226621.00
87	Providing and fixing CP Brass Single lever telephonic wall mixer of quality & make as approved by Engineer in charge. (a) 15 mm nominal dia	217	each	6940.75	1506143.00
88	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing:				
88.1	Rectangular shape 1500x450 mm	219	each	2093.00	458367.00
89	Providing and fixing 600x120x5 mm glass shelf with edges round off, supported on anodised aluminium angle frame with C.P. brass brackets and guard rail complete fixed with 40 mm long screws, rawl plugs etc., complete.	219	each	1083.50	237287.00

SLNo	Description	Qty	Unit	Rate	Amount
90	Providing and fixing toilet paper holder:				
90.1	C.P. brass	219	each	803.70	176010.00
91	Providing and fixing soil, waste and vent pipes:				
91.1	100 mm dia				
91.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	1462.8	metre	1169.30	1710452.00
91.2	75 mm diameter:				
91.2.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	504	metre	964.25	485982.00
92	Providing and fixing M.S. holder-bat clamps of approved design to Sand Cast iron/cast iron (spun) pipe embedded in and including cement concrete blocks 10x10x10 cm of 1:2:4 mix (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size), including cost of cutting holes and making good the walls etc.:				
92.1	For 100 mm dia pipe	1492.8	each	362.85	541662.00
92.2	For 75 mm dia pipe	504	each	360.00	181440.00
93	Providing and fixing bend of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
93.1	100 mm dia				
93.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	50	each	567.20	28360.00
94	Providing and fixing plain bend of required degree.				
94.1	100 mm dia				
94.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	939	each	368.00	345552.00
94.2	75 mm dia				
94.2.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	295	each	252.50	74488.00
95	Providing and fixing heel rest sanitary bend				
95.1	100 mm dia				
95.1.1	Sand cast iron S&S as per IS - 3989	10	each	548.70	5487.00
96	Providing and fixing double equal plain junction of required degree.				
96.1	100x100x100x100 mm				
96.1.1	Hubless centrifugally cast (spun) iron pipes epoxy coated inside & outside IS:15905	36	each	760.70	27385.00
97	Providing and fixing single equal plain junction of required degree with access door, insertion rubber washer 3 mm thick, bolts and nuts complete.				
97.1	100x100x100 mm				
97.1.1	Sand cast iron S&S as per IS - 3989	90	each	925.70	83313.00
98	Providing and fixing single equal plain junction of required degree:				
98.1	100x100x100 mm				
98.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	40	each	581.45	23258.00
99	Providing and fixing single unequal plain junction of required degree:				
99.1	100x100x75 mm				
99.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	30	each	551.55	16547.00
100	Providing and fixing terminal guard:				

SLNo	Description	Qty	Unit	Rate	Amount
100.1	100 mm				
100.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	35	each	427.80	14973.00
100.2	75 mm				
100.2.1	Sand cast iron S&S as per IS - 3989	10	each	404.75	4048.00
101	Providing and fixing shielded coupling for Hubless centrifugally cast-iron pipe				
101.1	100 mm dia				
101.1.1	SS 304 grade coupling with EPDM rubber gasket	1462	each	432.05	631657.00
101.2	75 mm dia				
101.2.1	SS 304 grade coupling with EPDM rubber gasket	504	each	389.05	196081.00
102	Providing and fixing M.S. stays and clamps for sand cast iron/ centrifugally cast (spun) iron pipes of diameter:				
102.1	100 mm	35	each	139.70	4890.00
102.2	75 mm	10	each	90.30	903.00
103	Providing and fixing trap of self-cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors:				
103.1	100 mm inlet and 100 mm outlet				
103.1.1	Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905	360	each	854.55	307638.00
104	Painting sand cast iron/ centrifugally cast (spun) iron soil, waste vent pipes and fittings with two coats of synthetic enamel paint of any colour such as chocolate grey, or buff etc. over a coat of primer (of approved quality) for new work:				
104.1	100 mm diameter pipe	1024.8	metre	82.80	84853.00
104.2	75 mm diameter pipe	504	metre	62.95	31727.00
105	Providing and fixing white vitreous china extended wall mounting water closet of size 780x370x690 mm of approved shape including providing & fixing white vitreous china cistern with dual flush fitting, of flushing capacity 3 litre/ 6 litre (adjustable to 4 litre/ 8 litres), including seat cover, and cistern fittings, nuts, bolts and gasket etc complete.	219	each	14999.15	3284814.00
106	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold-water supply and all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall				
106.1	20 mm nominal dia Pipes	520	metre	335.00	174200.00
106.2	25 mm nominal dia Pipes	375	metre	401.55	150581.00
106.3	32 mm nominal dia Pipes	470.5	metre	518.75	244072.00
106.4	40 mm nominal dia Pipes	530.5	metre	702.95	372915.00
106.5	50 mm nominal dia Pipes	242.5	metre	934.15	226531.00
107	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold-water supply, including all CPVC plain & brass threaded fittings and fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same				

SLNo	Description	Qty	Unit	Rate	Amount
	including testing of joints complete as per direction of Engineer in Charge. Concealed work, including cutting chases and making good the walls etc.				
107.1	15 mm nominal dia Pipes	1379	metre	497.80	686466.00
107.2	20 mm nominal dia Pipes	38	metre	537.60	20429.00
107.3	25 mm nominal dia Pipes	9	metre	627.25	5645.00
108	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, including cutting and making good the walls etc. Internal work - Exposed on wall				
108.1	50 mm dia nominal bore	660	metre	1048.35	691911.00
109	Providing and laying S&S centrifugally cast (spun) iron pipes (Class LA) conforming to IS :1536:				
109.1	150 mm dia pipe	360	metre	2037.00	733320.00
110	Providing and fixing C.I. sluice valves (with cap) complete with bolts, nuts, rubber insertions etc. (the tail pieces if required will be paid separately) :				
110.1	100 mm diameter				
110.1.1	Class II	50	each	4985.85	249293.00
111	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:1.5:3 mix (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size), including necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :				
111.1	With common burnt clay F.P.S. (non-modular) bricks of class designation 7.5	1	each	10862.40	10862.00
112	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931				
112.1	15 mm nominal bore	1729	each	574.30	992965.00
113	Providing and fixing C.P. Brass extension nipple (size 15 mm x 50 mm) of approved make and quality as per direction of Engineer-in-charge.	1729	each	74.80	129329.00
114	Providing and fixing C.I. double acting air valve of approved quality with bolts, nuts, rubber insertions etc. complete (The tail pieces, tapers etc if required will be paid separately):				
114.1	100 mm dia	1	each	8893.00	8893.00
115	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. ccomplete:				
115.1	150 mm dia. R.C.C. pipe	60	metre	556.45	33387.00
115.2	300 mm dia. R.C.C. pipe	125	metre	994.30	124288.00

SLNo	Description	Qty	Unit	Rate	Amount
116	Constructing brick masonry manhole in cement mortar 1:4 (1 cement : 4 coarse sand) with R.C.C. top slab with 1:1.5:3 mix (1 cement : 1.5 coarse sand (zone-III) : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand (zone-III) : 8 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) finished with a floating coat of neat cement complete as per standard design :				
116.1	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):				
116.1.1	With common burnt clay F.P.S. (non-modular) bricks of class designation 7.5	10	each	12770.55	127706.00
117	Providing and fixing in position pre-cast R.C.C. manhole cover and frame of required shape and approved quality				
117.1	H D - 20				
117.1.1	Circular shape 560 mm internal diameter	5	each	1675.70	8379.00
118	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 / panelling, 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) :				
118.1	For fixed portion				
118.1.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	14608	kg	530.90	7755387.00
118.2	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)				
118.2.1	Powder coated aluminium (minimum thickness of powder coating 50 micron)	4199	kg	634.45	2664056.00
119	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item):				
119.1	With float glass panes of 5 mm thickness (weight not less than 12.50 kg/sqm)	763	sqm	1505.25	1148506.00
120	Providing and fixing stainless steel (SS 304 grade) adjustable friction windows stays of approved quality with necessary stainless-steel screws etc. to the side				

SLNo	Description	Qty	Unit	Rate	Amount
	hung windows as per direction of Engineer-in-charge complete.				
120.1	355 X 19 mm	2556	each	325.80	832745.00
121	Providing and fixing aluminium casement windows fastener of required length for aluminium windows with necessary screws etc. complete.				
121.1	Powder coated minimum thickness 50-micron aluminium	2556	each	97.95	250360.00
122	Providing and fixing anodised aluminium grill (anodised transparent or dyed to required shade according to IS: 1868 with minimum anodic coating of grade AC 15) of approved design/pattern, with approved standard section and fixed to the existing window frame with C.P. brass/ stainless steel screws @ 200 mm centre to centre, including cutting the grill to proper opening size for fixing and operation of handles and fixing approved anodised aluminium standard section around the opening, all complete as per requirement and direction of Engineer-in-charge. (Only weight of grill to be measured for payment).	5692	kg	638.35	3633488.00
123	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & double acting hydraulic floor spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).	6	sqm	5325.90	31955.00
124	Filling the gap in between aluminium/ stone/ wood frame and adjacent RCC/Brick/ Stone/ wood/ Ceramic/ Gypsum work by providing weather/ structural non sag elastomeric PU sealant over backer rod of approved quality as per architectural drawings and direction of Engineer-in-charge complete, complying to ASTM C920, DIN 18540-F & ISO 11600				
124.1	Upto 5 mm depth and 5 mm width	2556	metre	148.10	378544.00
125	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for underground structures as directed by Engineer-in-Charge and consisting of : (i) Ist layer of 22 mm to 25 mm thick approved and specified rough stone slab over a 25 mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) including applying of twice (at base and top of mortar) cement slurry @ 2.2kg/m2 (each time) mixed with water proofing compound conforming to IS:2645 in the recommended proportion over the levelling course (levelling course to be paid separately). Joints sealed and grouted with cement slurry mixed with water proofing compound. (ii) 2nd layer of 25 mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportions. (iii) Finishing top with stone aggregate of 10 mm to 12 mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer.				
125.1	Using rough kota stone.	1391	sqm	1515.60	2108200.00

SLNo	Description	Qty	Unit	Rate	Amount
126	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25 mm thick with cement slurry mixed with water proofing compound conforming to IS:2645 in recommended proportions with a gap of 20 mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:3 (1 cement : 3 coarse sand) 20 mm thick with neat cement punning mixed with water proofing compound in recommended proportion complete at all levels and as directed by Engineer-in-charge :				
126.1	Using rough Kota stone	1890	sqm	2024.70	3826683.00
127	Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C., kitchen and the like consisting of: (i) Ist course of applying cement slurry @ 4.4 kg/sqm mixed with water proofing compound conforming to IS : 2645 in recommended proportions including rounding off junction of vertical and horizontal surface. (ii) IInd course of 20 mm cement plaster 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound in recommended proportion including rounding off junction of vertical and horizontal surface. (iii) IIIrd course of applying blown or residual bitumen applied hot at 1.7 kg. per sqm of area. (iv) IVth course of 400-micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100 mm wide and pasted to each other with bitumen @ 1.7 kg/sqm).	2046	sqm	769.60	1574602.00
128	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:				
128.1	Serrated with central bulb (225 mm wide, 8-11 mm thick)	250	metre	327.65	81913.00
129	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations: (a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300 mm height including cleaning the surface before treatment. (b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs. (c) After two days of proper curing applying a second coat of cement slurry using 2.75 kg/ sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by				

SLNo	Description	Qty	Unit	Rate	Amount
	Engineer-in-charge. (d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3 mm deep. (e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. “All above operations to be done in order and as directed and specified by the Engineer-in-Charge”:				
129.1	With average thickness of 120 mm and minimum thickness at khurra as 65 mm.	1190	sqm	1684.60	2004674.00
130	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 equipment’s, tools, plants & machineries required for the job, all complete as per direction of Engineer-in-charge, upto 90 metre depth below ground level.				
130.1	All types of soil				
130.1.1	400 mm dia	25	metre	990.80	24770.00
131	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.	10	cum	1509.80	15098.00
132	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.	10	cum	1538.25	15383.00
133	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.	10	cum	1538.25	15383.00
134	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.	1.2	cum	2024.50	2429.00
135	Providing and fixing factory made precast RCC perforated drain covers, having concrete of strength not less than M-25, of size 1000 x 450x50 mm, reinforced with 8 mm dia four nos longitudinal & 9 nos cross sectional T.M.T. hoop bars, including providing 50 mm dia perforations @ 100 to 125 mm c/c, including providing edge binding with M.S. flats of size 50 mm x 1.6 mm complete, all as per direction of Engineer-in-charge.	6	each	1399.95	8400.00
136	Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 mild steel screwed and socketed/plain ended casing pipes of required dia, conforming to IS: 4270, of reputed & approved make, including painted with outside surface with two coats of anticorrosive paint of approved brand and manufacture, including required hire & labour				

SLNo	Description	Qty	Unit	Rate	Amount
	charges, fittings & accessories, all complete, for all depths, as per direction of Engineer-in-charge.				
136.1	200 mm nominal size dia having minimum wall thickness 5.40 mm	25	metre	2442.75	61069.00
137	Supplying, assembling, lowering and fixing in vertical position in bore well, ERW (Electric Resistance Welded) FE 410 plain slotted (having slot of size 1.6/3.2 mm) mild steel threaded and socketed/ plain bevel ended pipe (type A) of required dia, conforming to IS: 8110, of reputed and approved make, having wall thickness not less than 5.40 mm, including painted with outside surface with two coats of anticorrosive bitumestic paint of approved brand and manufacture, including hire & labour charges, fittings & accessories, all complete, for all depths, as per direction of Engineer -in-charge.				
137.1	200 mm nominal size dia	5	metre	2571.05	12855.00
138	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.				
138.1	200 mm clamp	1	each	2293.65	2294.00
139	Providing and fixing Bail plug/ Bottom plug of required dia to the bottom of pipe assembly of tubewell as per IS:2800 (part I).				
139.1	200 mm dia	1	each	357.60	358.00
140	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 framework. Nothing extra shall be paid on this account). The weight of aluminium extruded section shall be taken for purpose of payment.	660	kg	414.30	273438.00

SLNo	Description	Qty	Unit	Rate	Amount
141	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 separator 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. (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. (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	66	sqm	3510.50	231693.00

SLNo	Description	Qty	Unit	Rate	Amount
	end, the Contractor shall provide a watertight 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. 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. The NIT approving authority will decide the necessity of testing on the basis of cost of the work, cost of the test and importance of the work. 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 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 2. Static Water Penetration Test. (50pa to 1500pa) as per ASTME-331-09 testing method for a range up to 2000 ml. 3. Dynamic Water Penetration (50pa to 1500pa) as per AAMA 501.01- 05 testing method for a range upto 2000 ml 4. Structural Performance Deflection and deformation by static air pressure test (1.5 times design wind pressure without any failure) as per ASTME-330-10 testing method for a range upto 50 mm 5. Seismic Movement Test (upto 30 mm) as per AAMA 501.4-09 testing method for Qualitative test, Tests to be conducted on site. 6. Onsite Test for Water Leakage for a pressure range 50 kpa to 240 kpa (35psi) upto 2000 ml				

SLNo	Description	Qty	Unit	Rate	Amount
142	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 6 mm 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 6 mm thick, spacer tube 12 mm 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. (Payment for fixing of IGU Panels in the curtain glazing is included in cost of item No.25.2) 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. (i) Coloured tinted float glass 6 mm thick substrate with reflective soft coating on face # 2, + 12 mm Airgap + 6 mm Heat Strengthened clear Glass of approved make having properties as visible Light transmittance (VLT) of 25 to 35 %, Light reflection internal 10 to 15%, light reflection external 10 to 20 %, shading coefficient (0.25- 0.28) and U value of 3.0 to 3.3 W/m2 degree K etc. The properties of performance glass shall be decided by technical sanctioning authority as per the site requirement.	66	sqm	3718.70	245434.00
143	Providing and fixing factory made 18 mm thick single extruded WPC (Wood Polymer Composite) solid plain white colour board Jali, CNC (Computer numeric control) routed of approved design by Engineer-in -charge which are machine cut for duct/shaft covering, partitions and facades comprising of virgin polymer of K value 58-60 (Suspension Grade), calcium carbonate and natural fibers (wood powder/ rice husk/ wheat husk) and nontoxic additives(maximum toxicity index of 12 for 100 gms) having minimum density of 650 kg/cum and screw withdrawal strength of 1800 N (Face) minimum compressive strength 50 N/mm2, modulus of elasticity 850 N/mm2 and resistance to spread of flame of Class A category with properties of being termite/borer proof, water/ moisture proof and fire retardant and fixing on M.S (mild steel) frame made of 25 x 25 x 1.5 mm square hollow box section including applying a priming coat of approved steel primer, placed at grid made at 1.0 x 1.0 m or as per requirement at site with necessary stainless steel fasteners and SS screws etc., all complete as per direction of Engineer-In- Charge. (Note: M.S (mild steel) framework with priming coat and necessary SS fasteners and SS screws shall be paid separately.	210	sqm	3437.15	721802.00

SLNo	Description	Qty	Unit	Rate	Amount
144	Providing and laying in position ready mixed or site batched design mix cement concrete for reinforced cement concrete work at all level and heights; 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.				
144.1	Concrete of M60 grade with minimum cement content of 390 kg/cum	500	cum	10615.30	5307650.00
	Total of SR & DR Items				**375705898.00**
	Multiplying Factor @ 0.973				**365561839.00**
145	Providing and fixing factory-made ISI marked partially insulated metal fire rated doorset assembly, for staircase / exit pathway and refuge areas applications, consisting of galvanized iron steel frame and double leaf shutter including necessary hardware accessories conforming to FD 120 PI classification of IS 3614 :2021 with fire rating of 120 minutes integrity and 30 minutes insulation. The door frame and shutter shall be made out of minimum 1 20 mm thick GI Sheet with minimum 120 GSM Zinc coating as per IS: 277. The entire fire rated doorset assembly shall be tested in latched condition as per IS 17518 (Part -1): 2022 Frame The frame shall be of minimum size 90 x 60 mm with grooved profile to take appropriate fre rated smoke seal, having mitred cut joint (self-tab/screwed assembled at site) and provided with appropriate reinforcement suitable for taking hardware and flush fixing as per IS 4351. The smoke seal material shall be of EPDM tested in accordance with ASTM E-84 of minimum size 10 x 4mm, fixed within the inbuilt groove or stuck with adhesive on the entire perimeter of the frame The door frame shall be fixed to the three sides to masonry wall opening with CSK/Hex headed fastener of minimum 8 mm dia size and minimum 80mm long hot dip galvanized with 8mm dia Polyamide sleeves @ 5 number at each on vertical sides and 3 number on top side. Door shutter The double skinned double leaf partially insulated door shutters shall be consisting of minimum 50 mm thickness and having box like structure, slots cut and holes punched. for fixing of hardwares with stiffners as per IS: 16074 including resin bonded mineral wool / ceramic wool in fill material of minimum density 96 kg/cum. Each door leaf shall be provided with vision panel, having maximum area of 0.06 sqm, of 120-minute fire rated minimum 6 mm thick clear borosilicate glass pane fixed with clip-on				

SLNo	Description	Qty	Unit	Rate	Amount
	arrangement and fire rated ceramic tape having minimum size 13x2 mm to be fixed all around the glass on both the sides. The intumescent seal of minimum size 15x1,5 mm or of size as per test evidence shall be fixed on all the three edges of the door leaves. Integral astragals to be provided for double leaf door on the meeting style each on active and inactive leaf. The door shutters shall be mounted on the frame with SS 304 grade ball bearing butt hinges as per EN 1935 : 2002 or butt hinges as per IS 12817, of minimum size 100x75x3 mm @ 5 numbers hinges upto 2400mm height or as per test evidence, whichever is more, fixed with M6 25 screws. All doors shall be factory prepared for receiving appropriate hardware and provided with necessary reinforcement for hardware accessories. Accessories Hardware Fire doorset assembly shall be provided with one number of single point panic push bar (cross bar) for active leaf and one number double point panic push bar (cross bar) with bottom strike of desired finish with vertical shoot bolts on top and bottom for inactive leaf of double leaf door as per EN 1125, one number external trim with half cylinder 42 mm long with one side key as per EN 1125, two number heavy duty door closers of size EN 3-5 with standard arm with of desired finish (suitable for 1250 mm wide door leaf) conforming to IS 3564 / EN 1154, and one number surface mounted door coordinator for sequencing of closing. Finishing: Both frame and door shutters shall be factory finished with polyester powder coating of minimum 50 microns thick and shall have passed salt spray test as per IS:13871 of approved colour and shade all complete as per manufacturer's specifications and as per direction of the Engineer-in-charge. Installation: The hollow space in the door frame shall be filled / injected with fire rated self-extinguishing type polyurethane foam (PUF) after installation at site of work. The rate shall be inclusive of complete fire rated door assembly, supply and installation by the approved manufacturer.				
145.1	Double leaf partially Insulated metal fire rated doorset of PD 120 PI classification with 120 minutes integrity and 30 minutes insulation as per IS 3614:2021 for Staircase/ Exit pathway / Refuge area etc	133	sqm	20285.60	2697985.00

SLNo	Description	Qty	Unit	Rate	Amount
146	Designing, providing and fixing multiwall three or more-layered polycarbonate sheet panel co-extruded Ultraviolet (UV) protective coating on external surface with standing seam on both the running ends, sheet shall be connected using polycarbonate connectors having grip lock double tooth locking mechanism and provided with endcap at the ends to ensure water and air tightness. The light transmission from transparent or translucent or opaque or in combination polycarbonate sheet, varies from 15 to 85%, shall be decided by engineer in charge as per requirement. The polycarbonate sheet shall have Dart drop impact value more than 60 Joules as per IS14434:2023 and confirm either flame retardancy of class Ul.-9411B/94V-0 category as per 1S14434:2023 or category VO & 1113 as per ASTM D635-I8 or 13S I DO classification as per EN1350 I for fire safety The yellowness index tested as per ASTM E313 (D1925) or AS'I'M [313 (1)1925) shall be equal to or more than 10 unit or 6 units respectively on a sample after 5000 Hours of exposure of UV / sun light. The cross section ends of poly carbonate sheet shall be provided with self-adhesive aluminium impermeable tape at top and aluminium ventilated tape at bottom of the sheet and covered with polycarbonate / aluminium u-shaped protective profile. The poly carbonate sheet shall be held in position by using stainless steel (SS304 grade) trapezoidal cleat of 1 mm thick having minimum bottom width 35mm and top width 50mm or any other shape and size as per design requirement and manufacturer specification, cleat fixed with 2 or more stainless steel screws of 5 mm diameter with 25mm long with structural steel framework. The cleat shall be tested to withstand pull out force equal to wind speed of 50m/s as per IS: 875 and design test report shall be submitted to Engineer-in-charge for approval before use. The cost of ridge and gutters of pre-coated galvanized iron sheet of approved specifications and structural steel framework of shall be paid in respective item for separately.				
146.1	12 mm thick, 1000 (t10%) wide panel with U value not more than 2.50 W/m2K and weight not less than 2.25 kg/sm.	680	Sqm	3108.15	2113542.00
	Total				**370373366.00**
	Add cost index @ 3%				**11111201.00**
147	Credit for surplus/unwanted excavated earth arising from site excavation, which is not required for backfilling or reuse at the site and is handed over to the contractor for his own use. The contractor shall be responsible for all loading, transportation, handling, and statutory compliances related to the material. Measurement will be done in volume.	8214	cum	-515.60	-4235138.00
148	Designing, providing and installing prestressed ground anchors at founding level, below ground of following capacities in accordance with BS:8081 & specifications based on the provided data such as service life of anchor, design load, soil investigation report using prestressing steel with minimum fixed length of 5 mts. or more depending on the pull out criteria. Rate shall include drilling through over burden, all type of soils, weathered/hard rock,	159	Nos	62985.00	10014615.00

SLNo	Description	Qty	Unit	Rate	Amount
	concrete with either rotary/pneumatic percussion method, flushing the hole, fabrication & installing of anchors, stressing of anchors after stressing the anchor after the grout achieving its strength to its capacity level & anchoring to the desired locking force level, providing adequate corrosion protective etc., (excluding supply of cement) 60 T capacity				
149	Providing and fixing 18mm thick gang saw cut mirror polished premoulded and prepolished) for wall lining (veneer work), /bands 200mm wide backing filled with a grout of average 12 mm thick in cement mortar 1:3 (1 cement : 3 coarse sand) including pointing with white cement mortar 1:2 (1 white cement : 2 marble dust) with an admixture of pigment to match the marble shade: (To be secured to the backing by means of cramps, which shall be paid for separately). Granite of any colour and shade	232	sqm	7780.00	1804960.00
150	Providing and fixing 2mm thick 25 to 35mm wide PVC edge bending tape of approved quality for cupboard/wardrobe shutters including necessary synthetic resin hot pressed to edges on binding machine etc. complete as per directions of Engineer-in-charge.	4842	metre	78.51	380145.00
151	Providing and fixing Satin Finish Stainless Steel (Grade 304) Mortise Handle of approved design with necessary SS screws etc. complete as per directions of Engineer-In-Charge.	819	Each	786.00	643734.00
152	Providing and fixing Satin Finish Stainless Steel Cylindrical Knob Latch Set of size 60mm of approved design with necessary SS screws etc. complete as per directions of Engineer-In-Charge.	229	Each	868.00	198772.00
153	Providing and fixing Satin Finish Stainless Steel (Grade 304), 22mm dia, 300mm long D-Type or H-Type Pull Handle of approved design with necessary SS screws etc. complete as per directions of Engineer-In-Charge.	1638	Each	810.00	1326780.00
154	Providing and fixing Stainless Steel (Grade 304), tower bolts of size 300x10mm of approved design with necessary SS screws etc. complete as per directions of Engineer-In-Charge.	819	Each	605.00	495495.00
155	Providing and fixing Stainless Steel (Grade 304), tower bolts of size 150x10mm of approved design with necessary SS screws etc. complete as per directions of Engineer-In-Charge.	819	Each	314.00	257166.00
156	Providing and fixing stainless steel (Grade 304) curtain rods having weight upto 0.72 kg./metre with two S.S. bracket (Grade 202) and end show cap fixed with S.S screws and rawal plug complete as per direction of Engineer-in-charge. Size: 25mm dia (Heavy Type)	411	Meter	375.00	154125.00
157	Supplying, fabricating, assembling, hoisting/ erecting and fixing in position at all heights and with all leads, structural steel E350 (In tubes for column, struts, beams, etc.,) and/or I shaped fabricated sections all as per structural drawings and as per detailed specifications (for materials & workmanship) in the situations described hereinafter including: The tubes shall be allowed to be made of two rolled sections with maximum 2 side butt weld i.e. tube made of two C shaped sections. The C sections should be completely rolled or bent from plates. For smaller tubes, single size butt weld or completely	1600	MT	167566.00	268105600.00

SLNo	Description	Qty	Unit	Rate	Amount
	rolled section is preferred i.e tube made of one open box section which is closed by welding at one corner only. Other sections like plates, angles, channels can be rolled/fabricated as per structural drawings and as per detailed specifications (for materials & workmanship) in the situations described hereinafter including: i) Cutting of components to required lengths/ widths and shapes/ profiles. ii) Smooth grinding/ machining of edges/ faces/ all welding joints. iii) Preparing the surface to ensure complete removal of mill scale by grit & sand blasting to achieve finish to grade SA 2.5. iv) Necessary welding (electric arc welding) for required weld lengths and sizes. v) Allow for surface preparation, derusting primer coat, three or more coats of synthetic enamel paint etc. complete all as directed by the Owner. vi) Providing & Fixing with Anchor Fastener of approved make & size as per drawing & design wherever required by Project Manager. Note: The contractor shall submit fabrication drawings for work involved based on construction drawings (that may be issued during construction period) for approval by the Owner. The fabrication work shall start only after approval of the fabrication drawings. Any change required in the fabrication drawings shall be carried out at no extra cost. Fabrication shall be in a perfect Architectural workmanship manner and as provided in Section V & VI of IS 800 & IS 7215. Welding shall be carried out by qualified welders. Electrodes for welding, the procedure, selection, test and inspection shall confirm to provisions in IS 816, IS 818, IS 822, & IS 833. All electrodes must be E70XX for E350 grade steel. Erection/ hoisting shall commence only after passing of fabricated parts by the Owner.				
158	Providing and fixing 1.00 mm thick deck sheeting (including shear connectors/ stud of 19mm dia. & 110mm height or as /drawing) for RCC slabs as per specifications and structural drawings including fixing the same. The contractor shall take all precautions to prevent any bending in sheeting. (RCC & R/F shall be paid separately). Plan area shall be measured for payment. The vendor must be able to supply 2hr fire rating for deck sheet with concrete. The deck sheet must have minimum zinc coating of 275 g/m2 (Plan Area shall be measured for Payment)	16580	sqm	1760.00	29180800.00
159	Providing and fixing High Strength Friction Bolts (M8.8/10.9) of following grades for connections, as per structural drawing and as instructed by Project Managers. Rate to include cost of grouting, MS washer fastening screws/bolts, tightening with nuts and check nuts, providing necessary holes in shear walls (if required), etc. All bolts above 24 mm diameter must be tightened with electric torque-controlled wrenches. All bolts must have zinc coating as per IS 800:2007 or 40 microns (whichever is more)	96	MT	176495.00	16943520.00

SLNo	Description	Qty	Unit	Rate	Amount
160	Vermiculite Fireproofing Providing and applying passive fire protection complying to UL 263/ ASTM/ BS 476 for composite steel structure by supplying & installing non-corrosive, Spray Applied Cementitious Fireproofing Vermiculite, consisting of factory controlled premixed cement with a minimum dry density of 350 kg/cum and installed by manufacturer/ supplier approved applicator. Spray shall be done in one or more coats of approved make for a two-hour fire protection rating on structural steel members/sections of different shapes and sizes at all locations. The coating should be asbestos-free & non-gypsum-based (gypsum-based fireproofing material is not acceptable). The thickness of fireproofing is to be dependent on Hp/A or W/D or A/P as the case may be & as calculated by the manufacturer& approved by the Engineer In charge. The minimum thickness of fire protection coating to be applied on structural steel of different shapes and sizes shall be 17 mm and above irrespective of as calculated by the manufacturer to achieve two-hour fire protection and to withstand thermal shocks up to 550 Degree Centigrade. Structural steel surface members shall be manually cleaned by wire brush to ensure all it is free of oil, grease, loose mill scale, dirt, dust, or other materials that would impair the bond of coating to the surface before the application of the fire protection coating. The fire protection coating of specified thickness shall be achieved by applying the material to the structural steel surface by spraying method after mixing the material in the recommended quantity of water to achieve the targeted density. The material thickness should be calculated and shall conform to fire protection requirements of either BS 276 or UL 263 or ASTM E119 or EN in unrestrained assembly conditions. The contractor shall furnish test report from the International Test Laboratory of material before execution of work. Item includes cost of all tools, tackles, machinery; scaffolding, proper storage of material etc. required to complete activity & nothing shall be paid extra. Actual surface area of structural steel members shall only be measured for payment. The contractor shall furnish a certificate for material & workmanship and fire protection rating for two hours. Minimum performance characteristics of materials shall be as under • Physical Properties Requirement • Dry Density - 350 Kg/m³ (minimum) ASTM E605 • Bond Strength - >200 K Pa (minimum) ASTM E736 • Air Erosion - 0.02 g/m² (max ASTM E859 • Compressive Strength - >900 KPa (minimum) ASTM E761 • Corrosion Does not promote corrosion of steel ASTM E937 • Bond Impact - No cracking, spalling or delamination ASTM E760 • Deflection - No cracking, spalling or delamination ASTM E759	12000	sqm	1357.00	16284000.00

SLNo	Description	Qty	Unit	Rate	Amount
161	Intumescent Fire Paint Providing & applying intumescent fire retarding coating of approved make in minimum thickness of required thickness as per design for fire rating of 2 hour/ 120 minutes to exposed steel work at any height in its finally erected position as per manufacturer's recommendations for surface treatment and application including primer cross beams sprayed in position & at site including all scaffolding, primer, finish coat & ancillary tools machinery required all as per manufacturers recommendation & certification, etc. all completed to the entire satisfaction of Project Manager. Intumescent coating shall be very low VOC, single component, acrylic,, intumescent heat insulation paint providing excellent fireproof performance, good film appearance and easy application providing very effective fire barrier due to high active solid content of minimum 63% plus minus 4%, char strength and nano fillers and shall have minimum density of 1.30 kg/l Intumescent coating shall be such which shall provide fast development of stable, low heat transfer so as to provide effective and long term protection to flammable and non-flammable substrates.Intumescent coating shall have comply to PCCC, CCCF, JSSC or UL Certification for passive fire protection of steel structures Intumescent coating shall have following minimum properties: 1. Density: 1.3 2. Solid Content: 63% plus minus 4% 3. Colour: off White 4. Spreading Rate: 1.21 kg/sqm for 6600-micronthickness 5. Touch Dry – 2 hours 6. Hard Dry – 4 hours 7. For 2 hours fire rating: 2.18mm thickness 8. Application: By air less spray. For small area or retouching, brush or roller can be used. 9. Minimum & Maximum Application Temperature: 5 deg Celsius and 45 deg Celsius. Intumescent coatings shall be done over primer surface. Primer shall be selected based on exposure. For indoor exposure (most common for an intumescent system), one pack phenolic alkyd primer shall be used, and primer shall provide anti corrosive properties and good adhesion to steel and zinc coated steel. For aggressive environment, where higher corrosion protection is required, 2 pack epoxy primer shall be used. Phenolic Alkyd primer shall have following minimum properties: Density: 1.4 ; Solid CContent:60%; Colour: RAL 7038. For 2 pack epoxy primer shall have following minimum properties (i) Density 1.4; Solid Content: 60% minimum. Suitable acrylic paint topcoat is recommended over intumescent coating and is useful in internal environment to improve aesthetics and reduce dirt pick up. For moist surfaces and outdoor exposure, topcoat is recommended of solvent-borne 2 component polyurethane is recommended.	3000	sqm	4360.00	13080000.00

SLNo	Description	Qty	Unit	Rate	Amount
162	Providing and laying weather and ultraviolet resistant, water repellent, dust, dirt and satin resistant fungus and algae resistant natural stone pigmented texture (100% natural crushed granite or stone dust / powder only) of approved make and colour with final coat of texture with stone chips (attainable thickness :0.7mm to 0.9 mm to offer grooved finish) applied with trowel over a coat of texture without chips (attainable thickness : 0.5mm to 0.7 mm to offer smooth surface as base coat) over a repair check with exterior grade putty over a coat of acrylic primer mixed with wall sealer in the ratio of 1:1 and finally one coat of water base acrylic protection coat applied with roller and brush to make surface streak resistance complete as approved by Engineer-In Charge.	4420	sqm	683.00	3018860.00
163	Extra for providing toughened glass in window frames as per the architectural drawings and as per the directions of the Engineer-In-Charge.	863	sqm	730.00	629990.00
164	Providing and fixing of Extruded Hollow Clay / Terracotta Façade "Slat" Tiles of 105mm width/ height and upto 900mm length in a horizontal direction on the building facade with aluminium sub-framework and void areas in between the tiles vertically. The tiles shall be rigid and of adequate strength and shall have a total thickness of min. 24mm (+/- 10%).The void to covered area ratio in elevation to be 50:50. The clay tiles shall be of the Hollow type, fixed to a supporting aluminium sub-framework (alloy 6063 T5/T6) consisting of special C-Clamps screwed with AISI 304 stainless steel screws/ nuts and bolts to existing primary vertical steel supporting framework erected at max. 900mm c/c to coincide with tile vertical joints. Special aluminium hooks 50mm long to be inserted in the top and bottom grooves provided on the the tile back faces at both ends and then the tiles to be mounted on the C-Clamps using the aluminium hooks such that the tiles are supported at top and bottom at both ends. Levelling bolts inserted in the top row of hooks at both ends to be used to align the tiles horizontally and then a stainless-steel screw to be used to fix the hook at one end to the C-clamp below. The tiles and system shall be designed to resist a maximum design wind load of 2.5 Kpa including all factors of safety based on a static/ structural calculation. The vertical gap between adjacent tiles horizontally to be 6mm. Rates include cost of excess 2% attic stock of tiles to be handed over to the client on completion. Area for measurement shall be the elevation end-to-end including the void areas between the tiles.	1604	sqm	5624.00	9020896.00
165	Supply of Aluminium Ventilated Façade / Louver System of approved colour consisting of panel 50 mm wide x 50mm depth x 0.6mm thick panel length up to 5mtrs coil coated on a continuous paint line double baked and roll formed from enamelled corrosion Resistance Aluminum Alloy AA3005 / AA5050 for higher strength and good Roll forming characteristics. Panels shall be mounted in a module of 100 mm on a mullion profile grooved (Slotted Fastening Profile) by means of Clamp, Locking Pop and Pop Rivet (Gap will be 50 mm between two panels). Slotted Fastening Profile shall be fixed at	480	sqm	6024.00	2891520.00

SLNo	Description	Qty	Unit	Rate	Amount
	150 mm from panel ends and at a distance of maximum 1200 mm center to center across the panel span and Slotted Fastening Profile shall be fixed to a suitable sub-structure by means of Square Brackets. Paint Finish: Panel shall be stove enamelled and finished with Luxacote, a patented special three layered coating system (consisting of first a conversion layer of thickness 800-2000mg/sq mtr, a polyurethane basecoat of 16-20 microns, and a special top coat of polyamide particles of 8-12 microns thick to provide excellent abrasion and damage resistance) in a continuous coil coating process of the approved colour on the exposed side and the reverse side with epoxy.				
166	Providing and fixing stainless steel (Grade 304) 2MM SS SHEETS 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 with necessary accessories & stainless steel dash fasteners , stainless steel bolts etc., of required size, on the top of the floor or the side of Columns /wall /slab with suitable arrangement as per approval of Engineer-in-charge.	109	sqm	5141.00	560369.00
167	Providing & fixing automatic sensor Bi-Parting Sliding Door Operator having modular design including internal cover with operator dimensions 155mm T x 185mm H x 6000mm L for maximum opening size of 3.00 mtr wide & weight capacity for double/single leaf door is 240 Kg. Microprocessor controlled unit will be self-learning with adjustable parameters for opening and closing speed, hold open time, reversing when obstacles are encountered. Operator will have 100W DC brush less motor and timing belt. Operator can be integrated with microwave sensor / Presence Detector Sensor / Foot Switch Sensor / Hardware Sensor / Safety Beam (Light Barrier) /, Programmable remote control to set different modes & automatic locking mechanism, RFID / Biometric / Fingerprint / Access Card Control System complete as per the directions of Engineer-in-Charge. (Toughened Glass shall be paid seperately). Approx opening size 3000x2400mm	2	Nos	222117.00	444234.00
168	Providing and Fixing Stainless Steel L-Angle (matt finish) for corner guard size 50x50x3 mm thk. to be fixed on surface horizontally or vertically with SS concealed screws i/c making hole, screws etc. complete.	1024	Kg	504.00	516096.00
169	Providing and erecting 10.00-metre-high temporary barricading at site; each panel of size 2.50mx2.00m made of 40x40x6mm angle iron or 50x50x3mm hollow MS tube posts/horizontal members/bracings covered with 1.63mm thick MS sheet. The sheet shall be fixed with 30x5mm MS flat by suitable welding/riveting. The panels shall be made so that gap of 50cm above the ground is available making overall height as 2.5m. MS channel ISLC 75 @ 5.70 kg/m, 50cm long shall be provided at the bottom having oval shaped holes of size 50x25mm at both ends with 50cm long MS angle 40x40x6mm bracing. Suitable arrangement shall be made to fix the barricading to avoid from overturning by providing 250mm long expansion fasteners at both ends. The	2500	sqm	1673.00	4182500.00

SLNo	Description	Qty	Unit	Rate	Amount
	work shall be executed as per drawing/direction of Engineer-in-Charge which includes writing and painting, arrangement for traffic diversion such as traffic signals during construction at site for day and night, glow lamps, reflective signs, marking, flags, caution tape as directed by the Engineer-in-Charge. The barricading provided shall be retained in position at site continuously i/c shifting of barricading from one location to another location as many times as required during the execution of the entire work till its completion. Rates include its maintenance for damages, painting, all incidentals, labour materials, equipment's and works required to execute the job. The barricading shall not be removed without prior approval of Engineer in-Charge.				
170	Providing and Fixing Stainless Steel Letters of Size = 300 mm with necessary screw 18-gauge 316 SS grade as per the direction of Engineer-In-Charge.	100	Each	1468.00	146800.00
171	Providing & Fixing SS name plate 304 grade 18 gauge, with digital engraving & colouring with necessary screws and various sizes as per the direction of Engineer-In-Charge.	49	sqm	22754.00	1114946.00
172	Providing and fixing of Electric fire safety led signage of size = 12" x 6" in 8 mm acrylic sheet as per the directions of the Engineer-In-Charge.	150	Each	2691.00	403650.00
173	Providing and fixing warning sign measuring 12 x 6-inch with3mm thick ACP sheet digitally printed 3M radium vinyl (No smoking, fire exit, stairs, No horn, and use dust bin.) as per the directions of the Engineer-In-charge.	150	Each	1125.00	168750.00
174	Designing, Providing & Fixing, sketching, modelling & fabricating a three dimensional artistic/ murals approx. 10ft x 6.5ft each handmade in well burnt Ceramic/Fibre with fine clay/fibre. The art ceramic/Fibre murals are a set of handmade and hand painted tiles suitable for outdoor and indoor areas according to the requirement. Each tile that forms the amazing ceramic/fibre mural is manufactured with a meticulous artisan process with the latest techniques. The special clay (mud)/fibre used should not be of Chinese quality, reason being the colour is not able to stay on it's surface firmly. It get's spread over in an uneven way. If in case the tile breaks or there's a crack in between, we make a new one immediately. Artist will then make the drawing or design on it and then it's formed into a proper shape with the help of a tool . Now once all this is ready then the tiles are coloured according to the design and requirement. And colour should be of the best quality so as get best results. The colour is not uneven anywhere. The tiles are fixed firmly with a special type chemical mixture. The rate istype oflusive of all T&P, Scaffolding, leads & heights operations. Hardware items and Footing Arrangement with plinth top Granite Finishing required in proper fixing of the mural as per direction of Engineer-in-charge	2	Each	211725.00	423450.00

SLNo	Description	Qty	Unit	Rate	Amount
175	Design, Supply & Fixing Marble stone sculptures with Size 6ft x 3.5ft x 2ft. Providing & making individual pieces using laser cutting machine desired shape and profile. All components of origami figure to be developed in 3d model hollow from inside, then laser cut with proper dimensions and edges. Smoothening by using machine and tools to get edge finish. using necessary tools and machinery to get even and mirror like finishing in all respects. Designing, making and approval of shop drawings of the entire ser good to be fabricated and assembled at site. Providing and finishing the sculptural Marble stones with mirror finish and balanced flat surface to be kept at the site. Hardware items and Footing Arrangement with plinth top Granite Finishing required in proper fixing of the mural as per direction of Engineer-in-charge	1	Each	416667.00	416667.00
176	Providing and fixing white vitreous china wash basin countertop basin of size 49x40x15 cm (+- 5mm), including 32 mm CP brass waste coupling, including painting of fittings and brackets, cutting and making good the walls wherever required all complete as per directions of Engineer-In-Charge.	219	Each	5811.00	1272609.00
177	Providing and fixing CP brass single lever basin mixer without popup waste with 450mm long braided hoses (connection pipes) of approved design as per directions of Engineer-In-Charge.	219	Each	3872.00	847968.00
178	Providing and fixing Glass Corner Tray / Corner Shelf of size 11"x11" of approved design as per directions of Engineer-In-Charge.	438	Each	1297.00	568086.00
179	Providing and fixing 140 mm dia Stainless Steel Grating with frame (with or without hole) of approved design as per directions of Engineer-In-Charge.	1015	Each	343.00	348145.00
180	Providing and fixing Chrome Finish 600mm long towel rail of approved design with required accessories as per directions of Engineer-In-Charge.	217	Each	2527.00	548359.00
181	Providing and fixing CP brass with soap dish holder with all complete as directed by the Engineer-in-Charge.	217	Each	1240.00	269080.00
182	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold-water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall 65 mm dia nominal bore	247	Metre	1751.00	432497.00
183	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold-water supply, including all CPVC plain & brass threaded fittings, i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Internal work - Exposed on wall 80 mm dia nominal bore	420	Metre	2230.00	936600.00

SLNo	Description	Qty	Unit	Rate	Amount
184	Providing and fixing Forged Brass Ball Valve (Screwed) with setting and gland of superior quality having minimum working pressure of 16 kg/cm2. 20 mm nominal bore	532	Each	500.00	266000.00
185	Providing and fixing Forged Brass Ball Valve (Screwed). with setting and gland of superior quality having minimum working pressure of 16 kg/cm2. 25 mm nominal bore	8	Each	549.00	4392.00
186	Supply, Erection, Testing & Commissioning of Automatic water level control panel & related accessories for pumping automation with consisting of automatic water level controller, level sensor with stainless steel probe, motorized butterfly valve, motorized valve controller with complete in all respect. upto 50 mm dia. nominal bore	2	Each	25413.00	50826.00
187	Providing and fixing Stainless Steel braided connection pipe with brass unions: 45 cm length 15 mm nominal bore	1729	Each	246.00	425334.00
188	Providing and fixing Hand Shower (Health Faucet) with 8mm Dia and one-meter-long flexible tube and wall hook of approved make as per the directions of Engineer-In-Charge.	219	Each	1452.00	317988.00
189	Providing and fixing 15mm dia. CP brass 2 Way Bib Cock with wall flange and suitable length CP brass extension pipe of approved design as per the directions of Engineer-In-Charge.	219	Each	1754.00	384126.00
190	Providing and fixing chrome finish wall mounted regular Kitchen Sink Mixer with Swinging Spout of approved make as per the directions of Engineer-In-Charge.	149	Each	4941.00	736209.00
191	Providing and fixing chrome finish wall mounted regular Kitchen Sink Tap with Swinging Spout of approved make as per the directions of Engineer-In-Charge.	149	Each	1973.00	293977.00
192	Providing and fixing overhead shower 150 x 150 mm square shape multi flow (ABS Body chrome plated with gray face plate) with rubit cleaning system and 304mm long CP Brass square shower arm with wall flange of approved make and design as per the directions of engineer-in-charge.	217	Each	3686.00	799862.00

SLNo	Description	Qty	Unit	Rate	Amount
193	Supplying, installing, testing & commissioning of Common Effluent Treatment Plant (CETP) of 50 m3/day based on SBR technology (excluding excavation, back filling & disposal of surplus earth MS / Civil construction work) for the following duty: Nature of Sewage - Domestic Sewage waste water shall be discharged into the STP. Design to take consideration of same." The CETP design based on the following parameters: Daily average flow: 50 M3/ Day, pH: 5.5 - 9, BOD: 500 mg/ l, COD: 800 - 1100 mg/ l, TSS: 1000 - 1500 mg/ l, Oil & Grease: 20 mg/ l. CETP discharge standard after treatment: pH: 6.5 - 8.5, BOD: <= 20 mg/ l, COD: <= 50 mg/ l, TSS: <= 10 mg/ l, Oil & Grease: Nil. CETP discharge standard after UF :- pH: 6.5 - 7.5, BOD: <= 10 mg/ l, COD: <= 30 mg/ l, TSS: <= 2 mg/ l, Oil & Grease: Nil. This includes Design, supply, installation, testing and commissioning of STP Main Electrical Panel (MCC) housing with individual DOL starter of suitable capcity upto 10 HP motor and Star delta starter above 10 HP motor panels for various loads complete in all respects with suitable switchgear. It shall be provided with metering, MCCB Units, lamps, bus bars etc. The accessories used shall conform to the latest IS codes. Detailed Specifications attached.	1	Set	2920060.00	2920060.00
	Total Estimated Cost of Civil Work				**771479987.00**

SCHEDULE OF QUANTITY

Part-B: E & M Works.

S.No.	Description	Qty	Unit	Rate	Amount
	Internal Electrical Work				
A	**SUB HEAD- I - POINT WIRING IN STEEL CONDUIT**				
1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
A	Group A	3975	Point	1440	5724000
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/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
A	Group A	1300	Point	914	1188200
3	Wiring for light/ power plug with 2X4 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit along with 1 No. 4 sq. mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	31800	Metre	480	15264000
4	Wiring for light/ power plug with 4X4 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit along with 2 Nos. 4 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable for loop earthing as required.	7000	Metre	724	5068000
5	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.				
a	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	8000	Metre	370	2960000
b	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	14580	Metre	652	9506160
c	4 X 6 sq. mm + 2 X 6 sq. mm earth wire	4220	Metre	1001	4224220
6	Supplying & fixing suitable size GI box wih 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.	753	each	807	607671
7	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.	1895	each	545	1032775
8	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.	1654	each	659	1089986

S.No.	Description	Qty	Unit	Rate	Amount
9	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 5/6 amps shaver socket outlet 230-240V & 110-120 V and connection etc. as required.	530	each	3223	1708190
10	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 (75mm X 75mm)	1000	each	354	354000
11	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
a	5/6 Amp Switch	530	each	121	64130
b	2 way 5/6 A Switch	26	metre	168	4368
c	Bell Push	150	each	159	23850
12	Supplying & fixing call bell / buzzer suitable for single phase 230 V, complete as required.	150	each	112	16800
	SUB HEAD -II-ELECTRICAL PANELS & DBs				
13	Fabrication, supply, installation, testing and commissioning of wall/ floor mounted cubicle panels LT panel, suitable for 415 Volt, 3 phase- 4 wire, 50 Hz. AC supply system made out of 2 mm thick CRCA sheet steel for frame works & covers, 3 mm thick for gland plates, including cleaning & finishing complete with 7 tank process for powder coating in approved shade, all incomngs/ outgoings shall be arranged in suitable size compartments, locking arrangement for each compartments, including interconnection with 1100 V grade PVC insulated aluminium alloy conductor bus bar, control copper wiring, labelling, earthing, brass compression glands for incoming and outgoing cables, powder coated painting etc. as required. All Incomer of distribution board shall be provided with surge protection devices, danger plates. Bottom base channel of MS section not less than 75mm X 50mm X5mm thick. Entire panel shall have a common copper earth bar of size 25mmX5mm at the rear with 2 no. earth studs.				
	Note : The type of the MCCB upto 250 Amp should be Thermal Magnetic type (O/C,S/C) Protection & Rom and above 250 Amp it should be Microprocessor Type (O/C,S/C,E/F) Protection, ST,Ready to close Indication, ZSI in all panels mentioned below. Digital Multifunction Meter With RS-485 CL-0.5S in all below mentioned panels				
a	**MDB - L**				
	Incoming:				
	200 A, 4P MCCB 36 KA - 1 No.				
	400 A TPN AL. bus bar with coloured heat shrinkable PVC sleeve-1 Set				
	Outgoings:				
	200 A, 4P MCCB 36 KA - 1 No.				
	125 A, 4P MCCB 25 KA - 1 No.				
	100 A 4P MCCB, 25 KA - 2 Nos.				
	63 A 4P MCCB, 25 KA - 10 Nos.				
	63 A 4P MCB - 3 Nos.				
	40 A DP MCB - 1 Nos.				

S.No.	Description	Qty	Unit	Rate	Amount
	Instruments :				
	Multi function Meter (MFM) with CTs and MCB				
	Indication lamp RYB with 2A SP MCB etc as req.	1	each	250882	250882
b	**MDB - P**				
	Incoming :				
	1250A, 4P ACB 50 KA - 2 No.				
	1250 A TPN AL. bus bar with coloured heat shrinkable PVC sleeve-1 Set				
	Bus Coupler:				
	1250A, 4P ACB 50 KA - 1 No.				
	Outgoings :				
	Section-1				
	800A, 4P ACB 50 KA - 1 No.				
	400 A, 4P MCCB 36 KA - 1 No.				
	200 A 4P MCCB, 25 KA - 1 Nos.				
	100 A 4P MCCB, 25 KA - 1 Nos.				
	Section-2				
	800A, 4P ACB 50 KA - 1 No.				
	400 A, 4P MCCB 36 KA - 1 No.				
	200 A 4P MCCB, 25 KA - 1 Nos.				
	100 A 4P MCCB, 25 KA - 1 Nos.				
	Instruments:				
	Multi function Meter (MFM) with CTs and MCB				
	Indication lamp RYB with 2A SP MCB etc as req.	1	each	1434118	1434118
c	**Lift Panel- 2 Lifts**				
	Incoming :				
	125 A, 4P MCCB 36 KA - 1 No.				
	200 A TPN AL. bus bar with coloured heat shrinkable PVC sleeve-1 Set				
	Outgoings:				
	63 A TPN MCCB, 25 KA - 4 No.				
	32 A DP MCB - 4 No.				
	Instruments:				
	Multi function Meter (MFM) with CTs and MCB				
	Indication lamp RYB with 2A SP MCB etc as req.	1	each	93473	93473
d	**Distribution Board for 14 Nos.Common Area DBs**				
	Incoming :				
	Meter space Provision for incomer should be there				
	63 A, 4P MCCB 25 KA - 1 No.				
	100 A TPN AL. bus bar with coloured heat shrinkable PVC sleeve-1 Set				
	Outgoings:				
	40 A FP MCB - 14 No.				
	Instruments:				
	Multi function Meter (MFM) with CTs and MCB				
	Indication lamp RYB with 2A SP MCB etc as req.	1	each	81213	81213

S.No.	Description	Qty	Unit	Rate	Amount
14	Supply, installation, testing and commissioning of LT Distribution and Meter Board of 2 mm thick sheet steel cubical design for **indoor** mounting factory fabricated suitable for operation on 440 V 3 phase, 50 Hz, A.C. supply with MCCBs/MCB and other accessories, all in compartmentalized, cubical construction complete in all respects including mounting plate, hinged lockable cover with window for Meter reading and internal wiring, labels, ferrules, cable termination gland plates, earth terminals, painting etc. conforming to specifications.				
a	**Distribution and Meter Board for 12 Nos. Three phase Meters**				
	Incoming :				
	125 A, 4P MCCB 36 KA - 1 No.				
	200 A TPN AL. bus bar with coloured heat shrinkable PVC sleeve-1 Set				
	Outgoings:				
	Meter cubicals for Three phase KWH Meter - 12 Nos.				
	40 A FP MCB - 12 No.				
	Indication and Metering				
	Neutral Link- 12 Nos.				
	Three (3) Nos. LED type Phase indicating lamps with protection 2A SP MCBs.				
	SITC of Distribution and meter board described as above.	3	each	99366	298098
b	**Distribution and Meter Board for 8 Nos. Three phase Meters**				
	Incoming :				
	100 A, 4P MCCB 36 KA - 1 No.				
	200 A TPN AL. bus bar with coloured heat shrinkable PVC sleeve-1 Set				
	Outgoings:				
	Meter cubicals for Three phase KWH Meter - 8 Nos.				
	40/63 A FP MCB - 8 No.				
	Indication and Metering				
	Neutral Link- 8 Nos.				
	Three (3) Nos. LED type Phase indicating lamps with protection 2A SP MCBs.				
	SITC of Distribution and meter board described as above.	20	each	96519	1930380
15	Supplying, Installation,Testing and commissioning of 1 or 3 phase energy meter with RS485 for metering complete as required.	150	each	3826	573900
16	Providing and fixing following rating and breaking capacity and pole MCCB with thermomagnetic release and terminal spreaders in existing cubicle panel board including drilling holes in cubicle panel, making connections, Ics=100% Icu and Operational Voltage 690V etc. as required.				
a	100/63 Amp, 30 KA, FP MCCB	20	each	8127	162540
b	125 Amp, 36 KA, FP MCCB	3	each	8644	25932
c	Supply, installation testing and commissioning of 2000A microprocessor-based FP ACB - 75 KA with enclosure and GI support frame, connections complete as required.	2	each	422485	844970

S.No.	Description	Qty	Unit	Rate	Amount
17	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, base 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	4 way (4 + 12), Double door	1	each	7951	7951
18	Supplying and fixing of following way **Horizontal Type three pole & Neutral** sheet steel, MCB distribution board 415 V on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, interconnections powder painted including earthing etc.as required. (but without MCB / RCCB / isolator)				
a	6 way (4+ 18), Double door	71	each	5299	376229
b	8 way (4+ 24), Double door	80	each	6337	506960
19	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	14	each	2773	38822
20	Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, MCB suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	Single pole	2376	each	285	677160
b	Double pole	14	each	696	9744
21	Supplying and fixing following rating, double pole, (single phase and neutral), 240 volts, residual current circuit breaker (RCCB), having a sensitivity current upto 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as req.				
a	32/40 amps	151	each	2512	379312
22	Supplying and fixing following rating, four pole, 415 volts, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a	40 amps	71	each	1049	74479
b	63 amps	80	each	1115	89200
23	Supplying and fixing TP sheet steel enclosure on surface/ recess along with following Amp 415 V "C" curve TP MCB complete with connections, testing and commissioning etc. as required.				
a	32 amps	4	each	1263	5052
24	Providing and fixing M.V. danger plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with insciption in single red colour on front side as required.	165	each	315	51975
	SUB HEAD -III- Rising Mains & CABLES				
	SUPPLYING & FIXING OF 1.1 KV XLPE CABLES				
25	Supplying of following sizes and core PVC/XLPE insulated PVC sheathed, heavy duty, armoured electrical cable with aluminium conductor for working voltage upto and including 1100 volts. Complying IS-7098.				

S.No.	Description	Qty	Unit	Rate	Amount
a	3.5 x 35 sq mm XLPE Aluminium Cable	170	metre	442	75140
b	3.5 x 50 sq mm XLPE Aluminium Cable	540	metre	599	323460
c	3.5 x 70 sq mm XLPE Aluminium Cable	400	metre	807	322800
d	3.5 Core, 300 sq.mm. XLPE Aluminium Cable	140	metre	2926	409640
26	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.				
a	upto 35 sq. mm (clamped with 1mm thick saddle)	170	meter	53	9010
b	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	940	meter	109	102460
c	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	140	meter	226	31640
	END TERMINATION OF XLPE CABLES				
27	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 x 35 sq mm	4	each	437	1748
b	3.5 x 50 sq mm	50	each	484	24200
c	3.5 x 70 sq mm	4	each	542	2168
d	3.5 x 300 sq.mm.	8	each	1336	10688
28	Supplying, installation by suspension on ceiling, testing and commissioning of following capacity Sandwich Type Rising Mains for use on 3 phase 4 wire 415 volts, 50Hz A.C. supply with metal clad enclosure having IP-54 rating after fixing the tap off boxes and all accessories, made of 1.6mm thick steel sheet duly powder coated in convenient sections complete with 4 Nos aluminium bus bars having current density of 130 A/ sq cm at nominal current rating, necessary joints, elbow joints & expansion joints and bends, fire barrier at each floor, provision of tapping at every metre, adopter box and copper flexible for joints, continuous earthing with 2 Nos aluminium strip of suitable size (one on each side) including, G.I. clamping brackets, suspenders, angle iron bracket, steel fasteners, connecting to earthing system etc. as required				
a	800 A Isc = 50kA for 1 second	76	metre	22841	1735916
29	Supplying, installation, testing & commisioning of following capacity End Feed Unit for the existing bus trunking/ rising mains for use on 3 phase 4 wire 415 volts, 50Hz A.C. supply made with 1.6mm thick steel sheet enclosure (IP54) duly powder coated with provision of MCCB/ACB (but without MCCB/ACB) complete with necessary joints including clamping brackets, angle iron bracket, steel fasteners, connecting to earthing system etc. as required				
a	800 A 50kA SC for 1 sec	2	each	239204	478408
30	Supplying, installation, testing & commisioning of following capacity Plug In/ tap off box on the existing bus trunking/ rising mains for use on 3 phase 4 wire 415 volts, 50Hz A.C. supply made with 1.6mm thick sheet steel enclosure (IP54) duly powder coated with MCCB/ACB complete etc. as required				
a	100 amps 36 KA SC for 1 sec	20	each	26200	524000
b	125 amps 36 KA SC for 1 sec	3	each	30353	91059

S.No.	Description	Qty	Unit	Rate	Amount
31	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
a	150 mm width X 50 mm depth X 1.6 mm thickness	500	metre	803	401500
b	300 mm width X 50 mm depth X 1.6 mm thickness	400	metre	1062	424800
	SUB HEAD - IV- Earthing & Lightening Conductor				
	Earthing				
32	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	13	set	8351	108563
33	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.	60	metre	755	45300
34	Providing and fixing 25 mm X 5 mm G.I. strip on surface or in recess for connections etc. as required.	125	metre	287	35875
35	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	4	set	15004	60016
36	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.	60	metre	1638	98280
37	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	100	metre	1246	124600
38	Providing & fixing 6 SWG dia G.I. Wire on surface or recess for loop earthing as required.	1400	metre	84	117600
39	Providing and fixing of lightning conductor finial, made of 25 mm dia 300 mm long, GI tube, having single prong at top, with 85 mm dia 6 mm thick GI base plate including holes etc. complete as required.	7	each	609	4263
40	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	100	each	139	13900
40	Providing & fixing of G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.(For horizontal run)	275	metre	148	40700
41	Providing & fixing of G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required.(For vertical run)	400	metre	238	95200
42	Providing and laying G.I. tape 32 mm X 6 mm from earth electrode directly in ground as required.	200	meter	221	44200
43	Providing and fixing testing joint, made of 20 mm X 3 mm thick GI strip, 125 mm long, with 4 nos. of tinned GI bolts, nuts, chuck nuts and spring washers etc. complete as required.	10	each	140	1400
	SUB HEAD - V - Light Fitting, Fans and Fixtures				

S.No.	Description	Qty	Unit	Rate	Amount
	All LED fittings shall have LM79 reports and UGR as per NBC space utilization & minimum 5 years warranttee.				
44	Supply Installation testing & commissioning of 230V, 400 MM dia wall bracket fan in the existing opening/wall, including making good the damage, connection, testing, commissioning etc. complete as required.	161	each	2652	426972
45	Extra for fixing the louvers / shutters complete with frame for a exhaust fan of all sizes.	373	each	260	96980
46	**LED Down lighter (COB Type) (System lumen efficacy ≥120 lm/Watt)**				
	Supplying, installation, Testing & Commissioning of LED Recessed / surface Down lighter (Round / square/ Rectangular) COB Type of following body material and construction as per IS:10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140- 270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection,THD < 10%, P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), life time of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends, CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.).				
	Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. "complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy ≥120 <135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector				
a	5 - 7 watt	567	each	926	525042
b	12 -15 watt	2845	each	1187	3377015
47	**LED Batten light (System lumen efficacy >135 lm/Watt)**				

S.No.	Description	Qty	Unit	Rate	Amount
	Supplying, installation, Testing & Commissioning of LED surface mounted Batten light of following body material and construction as per IS : 10322 with driver (Replaceable) as per the requirement with Driver efficiency >85% ,Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range - 15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection,THD < 10% , P. F.≥0.95, IP20, CRI >80 , Flicker free (flicker should be below 5 %), life time (LED,Driver & electrical circuitry), of minimum 50000 Burning Hours with, 70% of initial Lumen maintained till life ends, CCT 3000°K/4000°K/5700°K /6000°K/6500° K (As per ANSI Bin),SDCM (Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.).				
	Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output. LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineerin- Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C)				
	Powder coated die cast /Extruded aluminum Body (Thickness ≥ 1.20 mm)				
a	18- 22 watt	8	each	787	6296
b	36 watt	300	each	816	244800
48	Supply Installation testing & commissioning of LED based 2ft. Surface Mounted Luminaire with a nominal system lumen output of 1150 lumens and a minimum system efficacy of 110 lm/W. The luminaire shall have a rated system lifetime of 25000 burning hours @L70B50. The luminaire shall have a IP20 Rating with PF>0.9 and THD<10% an operating Voltage Range of 140 - 270 V. THe luminare housing should be made of aluminium Extrusion with Polycarbonate Diffuser. The total power consumption should not exceed 10 W (including driver).	280	each	1306	365680
49	Supply Installation testing & commissioning of LED Bulkhead with Wattage including driver <= 10-12 W, System Lumen >= 750 ,Fixture efficacy at System level (Not Chip Level) >100lumens/watt, Life of fixture 50000hrs@L70% Lumen maintenance, CCT Range 5700-6500 K, CRI >80, PF >0.9, THD <10%. Life of fixture 50000hrs@L70% Lumen maintenance, The luminaire shall meet IP65 rating and IK 08 rating . The luminaire housing should made of High pressure die cast Aluminium/ UV stabilized polycarbonate with polycarbonate front diffuser.	38	each	1539	58482

S.No.	Description	Qty	Unit	Rate	Amount
50	Supply, Installation, Testing and Commissioning of ceiling fan with Brush Less Direct Current (BLDC) Motor, class of insulation: B, 3 nos. metal (Aluminum alloy) blades, 30 cm long down rod, 2 nos. canopies, shackle kit, safety rope, copper winding, steel/Al body Power Factor not less than 0.9, Service Value (CM/M/W) minimum as below, 350 RPM (tolerance as per IS : 374-2019), THD (Total Harmonic Distortion) less than 10%, **suitable for operation with regulator for speed control an**d all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C (max.), insulation resistance more than 2 mega ohm, suitable for 230 V, 50 Hz, single phase AC Ceiling Fan compliant to IS 374:2019 fan Supply, earthing etc. complete as req				
51	1200mm, service value ≥ 6.0 CM/Min/Watt, air delivery 210 CM/Min (Minimum)	463	each	2695	1247785
52	Supply Installation testing & commissioning of heavy duty Exhaust fans suitable for 230 Volt, 50 Hz, Single phase, A.C. supply and complete with all standard accessories required.				
a	300 mm dia.	371	each	3967	1471757
b	450 mm dia.	2	each	5642	11284
	UPS SYSTEM				
53	**Online UPS - Input supply: Single Phase, Output Supply : Single Phase**				
	Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) ON LINE Uninterrupted Power Supply (UPS) system suitable for Single Phase input, Single Phase output AC Supply. The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. The UPS systems shall be Microprocessor based Digital Control, using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter with PWM (Pulse Width Modulation) Technology.				
	The quality of design, manufacturing and inspection process should confirm to the relevant Inter-national standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >95% at 100% non-linear loads. Current total harmonic distortion (ITHD)/ total demand distortion (TDD) on the input grid shall be < 5% at 100 %load. (The required LC filters shall be included in UPS cost), extreme power factor kit to be include to limit the input pf to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1) however UPS shall be suitable to take load at 0.7 laging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC single phase 160-270V 50 Hz and delivering output AC supply true sine wave single phase 220/230/240 Volt, 50 Hz +/- 0.2Hz,Overload capacity of 120% for 10 mins and 150% for 1 minute.				

S.No.	Description	Qty	Unit	Rate	Amount
	Operating temperature 0 to 40 deg C, Relative humidity 0-95% non condensing, noise level less than 60db at 1 meter distance, Protection for Under voltage, over voltage, abnormal output voltage, battery over charging, output over current, short circuit, battery deep discharge , 10 KV surge. Display for watt/VA,Amp and Voltage power parameters etc. UPS shall comply with low voltage electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI) type UPS (as per standard IEC 62040-1, 2 & 3) . The UPS should be with IGBT Based Inverter Technology, Communication RS232 /RS485/ SNMP port open protocol for BMS integration as per approved by Engineering in charge. Required battery racks, DC breaker of suitable rating and interconnecting copper conductor cable of suitable size and connectors and all required accoseries are inclusive in the cost. The UPS should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc				
	10KVA	1	each	168506	168506
	SUB HEAD - VI - PASSIVE & ACTIVE LAN SYSTEM				
	Note: Wiring shall include numbering, Ferruling, termination and testing of cables at both ends.				
	Fiber Splicing, Testing with OTDR etc. shall be the part of installation of the fibers.				
	Test Reports of Passive Items with dully authorized by OEM shall be submitted for 25 years warranttee.				
	All Active devices shall have minimum 5 years of support from the date of handover.				
54	Supplying and fixing of following sizes of medium class PVC 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	9000	metre	168	1512000
b	32 mm	3000	metre	209	627000
55	Supplying and fixing following size/ modules, GI box alongwith modular base & cover plate for modular switches in recess etc as required.				
a	1 or 2 Module (75 mm X 75 mm)	677	each	354	239658
56	Supply, Installation, Testing & Commissioning of Category 6A U/UTP LSZH Cable, Flame Rating IEC 60332-1, 23 AWG solid copper conductors in accordance to TIA/EIA 568.2-D (Category 6) & ISO/IEC 11801 2nd ed(Class Ea), ETL 04-Connector Channel Verified with MTPL, tested @600 Mhz or more, with HDPE insulation of individual conductor and over all Dia of 5.9 ± 0.3 mm with Cross-filler and cable shall not have any kind of Non Metallic Barrier Tape or Metallic Shield inside for Connectivity of Hub room to End Point on surface / recess / in existing pipe / open duct complete etc as required.	35000	metre	96	3360000

S.No.	Description	Qty	Unit	Rate	Amount
57	Supply, Installation, Testing & Commissioning of Category 6A RJ45 Unshielded Modular Jack, Keystone information outlet (I/O) in accordance with ANSI/TIA 568.2-D, IEC 60603-7-4 2nd Edition, ISO/IEC 11801, ROHS Compliant. The I/O should have minimum 750 mating cycle and 200 insertion cycle and ETL 04-Connector Channel Verified with MTPL, tested @ 600Mhz for Data, Voice, & Wi-Fi at Field End complete etc as required.	677	each	724	490148
58	Supply, Installtion, Testing and comissioning of 15U Floor standing rack with fans, 5 cable managers, satationary shelf, 2 Nos of hardware pkts & 5Nos. 6/16A sockets PDU also complete as required.	13	each	22100	287300
59	SITC of 600-800 mm x 1000 mm 42 U Free standing cabinet with front locable door, side panels, 230 V AC 90 CFM fan 2 , three Hardware packet 2 set (containing 20 Nos each of 3), AC power strip. Cantilever Tray 1U 225D, one earthing Strip 150 mm H,1 Cable manager 1U height.	2	each	80920	161840
60	Supply, Installation, Testing & Commissioning of Category 6A RJ45 Unshielded LSZH Patch Cord as per ANSI/TIA/EIA 568.2-D and ETL 04-Connector Channel Verified, ROHS Compliant, 24AWG Patch Cord, Diameter 5.9 ± 0.03 mm, 1 Meter, Operating Temperature -10 Deg C to +60 Deg C. patch cord 1 Mtr for Data at Rack Side for Switch to Jack Panel Connectivity complete etc as required.	677	each	614	415678
61	Supply, Installation, Testing & Commissioning of Category 6A RJ45 Unshielded LSZH Patch Cord as per ANSI/TIA/EIA 568.2-D and ETL 04-Connector Channel Verified, ROHS Compliant, 24AWG Patch Cord, Diameter 5.9 ± 0.03mm, 2 Meter, Operating Temperature -10 Deg C. to +60 Deg C. patch cord 2 Mtr for end user connectivity complete etc as required	677	each	661	447497
62	Supply, Installation, Testing & Commissioning of Staggred 24 Port Unshielded, Loaded with Category 6A RJ45 Unshielded Modular Jack, Keystone information outlet (I/O) in accordance with ANSI/TIA 568.2-D, IEC 60603-7-4 2nd Edition, ISO/IEC 11801, ROHS Compliant. The I/O should have minimum 750 mating cycle and 200 insertion cycle and ETL 04-Connector Channel Verified, 1U height, Black with integrated cable support bar, clear label marks and earthing plug for UTP cable termination at rack end complete etc as required.	38	each	23477	892126
63	Supply, Installation, Testing & Commissioning of 1, 2, and 4 Port face plate, British Style with Shutter, 2 Plate system clear finish with transparent labelling, ABS-UL94-V0, ROHS Compliant, in accorandce with standards like ANSI/TIA-568.2-D, ISO/IEC 11801:2002 & ISO/IEC 60603-7 white for I/O fixing at user side complete etc as required.	677	each	198	134046
64	Supply, Installation, Testing & Commissioning of armoured 06 Core Singlemode (OS2) 9/125 Fiber Cable, ITU G.652.D, G.657A1, Outdoor Corrugated ECCS Armor, HDPE (UV) Sheathing, Theoxtropic gel filled OFC cable with 2 Nos steel wire embedded in side sheathing as strengthening member for switch connectivity. Cable should be ROHS compliant and as per ANSI/TIA-568.3-D, Telcordia GR-20, IEC 60794-2/60794-3-10, ISO/IEC 11801, ISO/IEC 24702 complete on surface / recess / in existing pipe / open duct complete etc as required.	1300	metre	206	267800

S.No.	Description	Qty	Unit	Rate	Amount
65	Supply, Installation, Testing & Commissioning of 12F 1U x 19" LIU Loaded with Singlemode OS2 LC Adapters & LC Type LSZH Pigtails should meet IEC 61034-1 ,IEC-60332-1, IEC-60754-1, Insertion loss <= 0.35 dB, Return Loss >= 50, Attenuation: 1310/1550 : 0.3/0.2 dB/KM, Repeatability: <= 0.2DB 1000 times mating cycles along with Spilce tray, cable holder and 4 nos of cable entry exist point with rubber gurment along with the LIU, SPCC Powder Coated, 2-Cut Out type, 1U, RoHS Complied, Meets ANSI/TIA 568.3-D. etc complete as required.	13	each	25581	332553
66	Supply, Installation, Testing & Commissioning of 24F 1U x 19" LIU Loaded with Singlemode OS2 LC Adapters & LC Type LSZH Pigtails should meet IEC 61034-1 ,IEC-60332-1, IEC-60754-1, Insertion loss <= 0.35 dB, Return Loss >= 50, Attenuation: 1310/1550 : 0.3/0.2 dB/KM, Repeatability: <= 0.2DB 1000 times mating cycles along with Spilce tray, cable holder and 4 nos of cable entry exist point with rubber gurment along with the LIU, SPCC Powder Coated, 2-Cut Out type, 1U, RoHS Complied, Meets ANSI/TIA 568.3-D. etc complete as required.	7	each	34109	238763
67	Supply, Installation, Testing & Commissioning of LC-LC 9/125µm OS2 Singlemode Round Cord duplex, LSZH fiber patch cord having a protective layer of metal braiding for LIU to switch connectivity. Patch Cord should have Blue Jacket with 1000 time mating cycle complete etc as required.	40	each	2973	118920
68	Supplying, installation, testing & commissioning of High performance Non Blocking Distribution Switch with 24X 1/10/25G Gigabit Ethernet + 4X40/100G Uplink and redundand power supply and necessary Transceivers. The switches, should be implemented in Active - Active, redundant topology for High Availability. Device should have atleast 5 years of support & shall be with all accessories including stacking kit, cables etc. complete as required and as per Tender Specifications.	2	each	2235561	4471122
69	Supplying, installation, testing & commissioning of Access Switch with 24 ports full PoE+ (8 mGig ports up to 10G, 16 ports up to 1G) and additional 4 nos. of 1/10G SFP+ uplinks ports and dedicated stacking module also support redundant power supply from day 1. Device should have atleast 5 years of support & shall be with all accessories including stacking kit, cables etc. complete as required and as per Tender Specifications..	38	each	702884	26709592
70	Supplying, installation, testing & commissioning of 10G/25G BASE SFP Module complete as required. SFP Model No. Cisco SFP-10/25G-LR-S=. should have atleast 5 years of support/ warranttee.	152	each	41465	6302680
71	Supplying, installation, testing & commissioning for Indoor Access Point supporting 4X4 MIMO on both radio interfaces along with 1 X 100, 1000, 2500 Multigigabit Ethernet (RJ-45) - IEEE 802.3 bz ports. Access point should be wifi 6 certified. Device should have atleast 5 years of support & shall be with all accessories as required. Wifi devices shall be controlled from the existing Wireless Controller in the campus.	38	each	84822	3223236
	SUB HEAD - VII- IPABX SYSTEM				

S.No.	Description	Qty	Unit	Rate	Amount
72	Supply, Installtion, Testing and Comissioning of Pure IP based Voice solution with 1x PRI Trunk lines (30 Ch) Circuit with CLIP Facility, 500 IP users License, 08 CO Trunks, 01 Nos. IP Operator Console, 120 Party Conference, Speed Dial, Music on Hold, Internal/ External ring difference, Call Barring, Call Pickup, TEC should be with GR Number complete as reqd.	1	each	7151376	7151376
73	Supply, Installation, Testing & Commissioning of Type-1 IP Phone with 1 SIP accounts, graphical display, etc as required.	151	each	10325	1559075
	SUB HEAD - VIII- Fire Detection & Alarm System and PA System				
74	Supplying, installation, testing & commissioning of addressable fire control module complete as required.	30	each	3156	94680
75	Supplying, installation, testing & commissioning of addressable horn cum strobe complete as required.	30	each	3682	110460
76	Supplying, installation, testing & commissioning of addressable manual call point complete as required.	30	each	4063	121890
77	Supplying, installation, testing & commissioning of fault isolator complete with base as required.	5	each	3434	17170
78	Supplying, installation, testing & commissioning of fire fighter telephone handset complete as required.	30	each	6016	180480
79	Supplying, installation, testing & commissioning of fire fighter phone jack complete as required.	30	each	1689	50670
80	Supplying, installing, testing and commissioning approved make Microprocessor based Multi-loop, Networkable Addressable **Fire Alarm Control Panel** with minimum 600 characters LCD display, **4000 trouble events including 1000 alarm log history events**, **Self Programmable alphanumeric keypad for programming.** The panel should be equipped with sufficient number of loops & each loop shall have a capacity of minimum 125 detectors & 125 other devices excluding 20% spare. The panel shall work in **degrade mode in case of CPU failure**, Products not having this feature may offer Redundant CPU. Four access levels, flash EPROM, 240 volts AC power supply, automatic battery charger, 24 volts sealed lead acid batteries sufficient for 24 hours normal working and 30 mins in alarm condition with **the charging capacity of 200AH**. The panel shall be capable of self programing **without any dependancy on dongle** or programming software. Quoted rate shall include supply of necessary software & hardware for programming the panel with all necessary licence. Panel shall have **Modbus/ Bacnet over IP protocol** for future integration with BMS. However, for present arrangement FA system will be standalone with 24x7 monitoring. **The panel shall be capable for remote accessibility on a mobile app through cloud platform/solution. Complied to meet UL864, 10th Edition and FM Approved.**				
a	Two Loop Panel	1	each	598672	598672
81	Supplying and fixing of 25mm dia size of steel conduit alongwith 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.	600	metre	289	173400

S.No.	Description	Qty	Unit	Rate	Amount
82	Supplying and drawing following sizes of FR PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/PVC as required.				
a	2 x 1.5 sq. mm	800	metre	77	61600
	Public Address System				
83	Supplying, installation, testing & commissioning of 6 zone, voice alarm controller with USB, MP3 player (including 6 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required.	1	each	132115	132115
84	Supplying, installation, testing & commissioning of 1.5/3/6W metal box ceiling/wall speakers complete as required.	225	each	1891	425475
85	Supplying, installation, testing & commissioning of Voice command keypad 6 zone, with microphone assembly complete as required.	1	each	85450	85450
86	Supply, installation, testing & commissioning of 1X500W Class-D Amplifier with 2 independent channels and can provide automatic re-settable overcurrent, overload, overheating, overvoltage, under-voltage and DC protection	4	each	344166	1376664
87	Supplying and fixing of 25mm dia size of steel conduit alongwith 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.	2400	metre	289	693600
88	Supplying and drawing of cable Fire Retardant PVC insulated copper conductor cable in the existing surface / recessed steel conduit of following pairs, cores and size including connections and interconnections etc. as required.				
89	speaker cable Single pair, 2-core, 1.5 sqmm	2700	each	61	164700
	SUB HEAD - IX- CCTV SYSTEM				
	Note:1. All CCTV items shall be NDAA complaint for cyber security.				
	2. Proper tagging of good quality should be done for all items.				
	3. The Camera OEM should not be black listed in any Govt /PSU /Semi-Govt etc. from last 5 years.				
	4. Video Management Software, All Cameras, NVR & software shall be of same make				

S.No.	Description	Qty	Unit	Rate	Amount
90	Supply, Installation, Testing & Commissioning of 2MP IP Network Bullet Camera, Image Sensor 1/2.8"CMOS or better, 2MP (1920 x 1080), Dynamic Range 120 dB, 3DNoise Reduction Filter, IR Illumination (high power 850nm LEDs) 30M, Minimum Illumination Without IR Color mode:0.3lux BW mode:0.1lux, Max Aperture F1.4, Lens Control Remote Zoom and Focus, Auto focus Varifocal 2.7- 13.5mm, IRCut Filter, Streaming Multi-streamH.264,Multi-streamH.265,MotionJPEG, Iris Control Fixed/P-Iris, Electronic Shutter Control Automatic,Manual(1/2to1/32000sec), Shutter-Priority: (1/2to1/ 10000sec), Flicker Control 60Hz , 50Hz, White Balance Automatic, Manual, Backlight Compensation Adjustable, Image Rotation 0°,90°,180°,270°including Corridor Mode, Privacy Zones Upto 8 zones, ONVIF®compliance Profile S, Profile T, Profile M and Profile G, Network 100Base-T/TX, autosensing, Security Password protection, HTTPS encryption, digest authentication, WS authentication, user access log, 802.1x port based authentication, SSL Encryption, Secure Boot, Protocols IPv6, IPv4,HTTP,HTTPS,DNS, NTP,RTSP,RTCP,RTP,RTMP,TCP,UDP, IGMP, ICMP, DHCP, Zero conf, ARP, uPnP, DDNS,FTP,SFTP,SSH,TLS/TTLS,SNMP,QOS, Streaming Protocols RTP/ UDP, RTP / UDP multicast, RTP / RTSP/ TCP,RTP/ RTSP/ HTTP/ TCP, RTP/ RTSP/ HTTPS/ TCP,HTTP , Onboard Storage MicroSD/ micro SDHC/ microSDXCslot-ClassV10, Power Source PoE:IEEE802. 3af Class3,12vDCAux, Certifications UL, cUL, CE, ROHS, RCM, UKCA, NOM, KC, BIS, CMIM, Analytics Motion Detection, Sabotage Motion, Adaptive Motion, Direction Violated, Object Left/Removed, Camera Automation, Analytics Schedules IEC60529IP66, IP67 rating IEC/EN62262 impact IK10, FCCPart15,Sub PartB (ClassB) ICICES-003 (ClassB) EN55032 (ClassB) EN61000-6-3 EN61000-3-2 EN61000-3-3.	106	Each	48713	5163578
91	Supply, installation, testing & commissioning of NVR software Shall be listed on ONVIF website for ONVIF S, G & T support compliance, Channel License support 200 per server, Supported Features :- Focus of Attention Interface , Facial Recognition Technology, Appearance Search Technology, Self-Learning Video Analytics, Unusual Activity and Unusual Motion Detection, Intelligent Search,Video Archive, Detailed Management, Monitoring, and Reporting of System Status and Security, Third-party IP cameras and encoders , Mobile Software, Intelligent Search , Dual Streaming for ONVIF compliant cameras, bookmarks support, Event / Rule triggers alerts, Automatic device discovery, Fisheye dewarping, Joystick support, FIPS 140-2 Encryption, Cloud Services Web Client, Multi-camera export with optional password protection, configurable recording schedule , Maps with configurable icons and camera thumbnail previews, Active Directory integration, Intelligent Virtual Matrix, Collaborative investigations, Multi-camera privacy blurred export from Appearance Search results, Point-of-sale (POS) transaction search , Saved views ,Intelligent motion search, Event search, LPR or FR event search, Server Hardware - Operating System Windows Server 2016 or Windows 10, Processor Intel® Xeon® E5 v3 (6 cores, 1.9GHz),System RAM	106	Each	18003	1908318

S.No.	Description	Qty	Unit	Rate	Amount
	16GB DDR4, Network Interface 4 x 1 Gbps,OS Drive 2x M.2 SSDs 240 GB (RAID 1). Power Supply Dual (Reduntant).				
92	Supply, Installation, Testing & Commissioning of Network Video Recording (NVR) Support Recording Channels upto 200 Cameras Operating System Windows Server 2022 LTSC, OS Drive 2 × 480 GB M.2 SSD Drives, RAID 1, Recording Drive RAID5/6 Up to 12 × 3.5" SATA Drives, hot-, Recording to be concidered for 30 days at 2MP, 25 FPS in RAID 5 , Bit Rate on SFP Upto 1500 Mbps or on RJ45 Upto 800 Mbps , Network Interface 4 × 10 GbE SFP+ ports and 6 × 1 GbE RJ-45 ports, Memory 4 × 16 GB DDR5, Processor 2 × Intel® 8-core Xeon®, Video Outputs 1 × VGA, 2U Rack Mount Form D Chassis, Power Input 100 to 240 VAC, 50/60 Hz, auto-switching, Dual (1+1) 1400 W redundant, Operating Temperature 10°C to 35°C (50°F to 95°F), UL, cUL, CE, NRCS, NOM, RCM, VCCI, BSMI, CCC, KC, UKCA, RoHS, CMIM,BIS1, UL/CSA/IEC/EN 62368-1, FCC Part 15 Subpart B (Class A), ICES-003 (Class A), EN 55032 (Class A), EN 61000-3-2,EN 61000-3-3.	1	Each	2742735	2742735
93	Supply, installation, testing & commissioning of Client Workstation as per following specifications:Intel Core i7-8700K or better, 4.2GHz, OS - Genuine Microsoft Microsoft® Windows 10 Enterprise/IOT 64 Bit, RAM - 16GB, OS - 480 GB SSD/SATA, Graphic Card - In-built Processor Graphics (GPU):Intel® HD Graphics 630 or Intel Q470 Processor, supporting 2 Monitors, 01 LAN 01GBPS, Audio IN & Out, USB3.0, Keyboard and Mouse, associated cables etc complete.	3	Each	224855	674565
94	S.I.T.C of Professional/commercial Monitor 42" HD LED display, HDMI X2, VGA X1, Video IN X 1, USB X 1, Audio IN X1, 10W in built speaker, IPS LED display, USB media player etc including making connection, integration, testing etc. complete as required at site	3	Each	59655	178965
95	Supply, Installation, Testing and Commissioning of 15 Mtr. HDMI Cable as required at site for CCTV operation.	3	Each	14134	42402
	Sub Head-X-LIFTS				
96	Supplying, installation, testing & commissioning of 15 Passenger / Stretcher gearless lift without Machine Room (MRL) having contract speed of 1.5 MPS in the existing lift shaft as per detailed specifications enclosed and as under				
	(i) Speed : 1.5 MPS				
	(ii) Floors : 15 (3B+G+11)				
	(iii) Travel : 47 mtrs (approx.)				
	(iv) Stops & opening : 15 / 15				
	(v) Controller: A.C. variable voltage & variable frequency				
	(vi) Operation **:** Microprocessor based simplex selective collective with / without attendant				
	(vii) Power **-** 415 V, 3 phase, 50 Hz, 4 wires system				
	(viii) Type of doors				
	(a) Car Doors: Automatic Power operated, center opening horizontal sliding, stainless steel scratch proof (Linen finish)				
	(b) Landing Doors: Glass (Transparent) with stainless steel bordering with matching proper finish.				

S.No.	Description	Qty	Unit	Rate	Amount
	(ix) Car body will be of scratch proof SS finish.				
	(x) Emergency light in the lift car.				
	(xi) Full height Infra Red protection is to be provided for landing/ car doors.				
	(xii) Provision of Toe guards, Fireman's switch etc.				
	A Stainless steel hand rail not less than 600 mm long at 900 mm above floor level to be fixed adjacent to control panel in the lift car.				
	Button in car operating panel & landing operating panel shall be having Braille Inscription & shall be fixed for the handicaped.				
	Voice announcement system in the car to announce the position of the elevator in the hoistway as the car passes or stops at a floor served by the elevator.				
	Rear Panel shall be of Mirror finish.				
	Flooring:-chequered aluminium sheet.				
	Lift installation shall include all safety like ARD with suitable battery backup etc. & control features as specified in the specifications.				
	The features required for use of the lift by handicapped persons eg hand rail, braile signage closing speed of doors etc	1	each	2731848	2731848
97	Supplying, installation, testing & commissioning of 13 Passenger gearless lift without Machine Room (MRL) having contract speed of 1.5 MPS in the existing lift shaft as per detailed specifications enclosed and as under				
	(i) Speed : 1.5 MPS				
	(ii) Floors : 16 (3B+G+11+T)				
	(iii) Travel : 50 mtrs (approx.)				
	(iv) Stops & opening : 16 / 16				
	(v) Controller: A.C. variable voltage & variable frequency				
	(vi) Operation **:** Microprocessor based simplex selective collective with / without attendant				
	(vii) Power **-** 415 V, 3 phase, 50 Hz, 4 wires system				
	(viii) Type of doors				
	(a) Car Doors: Automatic Power operated, center opening horizontal sliding, stainless steel scratch proof (Linen finish)				
	(b) Landing Doors: Glass (Transparent) with stainless steel bordering with matching proper finish.				
	(ix) Car body will be of scratch proof SS finish.				
	(x) Emergency light in the lift car.				
	(xi) Full height Infra Red protection is to be provided for landing/ car doors.				
	(xii) Provision of Toe guards, Fireman's switch etc.				
	A Stainless steel hand rail not less than 600 mm long at 900 mm above floor level to be fixed adjacent to control panel in the lift car.				
	Button in car operating panel & landing operating panel shall be having Braille Inscription & shall be fixed for the handicaped.				
	Voice announcement system in the car to announce the position of the elevator in the hoistway as the car passes or stops at a floor served by the elevator.				
	Rear Panel shall be of Mirror finish.				

S.No.	Description	Qty	Unit	Rate	Amount
	Flooring:-chequered aluminium sheet.				
	Lift installation shall include all safety like ARD with suitable battery backup etc. & control features as specified in the specifications.				
	The features required for use of the lift by handicapped persons eg hand rail, braile signage closing speed of doors etc	1	each	2522777	2522777
	SUB HEAD-XI - SUBSTATION EQUIPMENTS				
	11 KV HT Panel				
98	Supplying, Installation, Testing & Commissioning including design, manufacture and testing at works of indoor type floor mounted metal clad, **11 KV VCB panel** board totally enclosed & fully interlocked, Horizontal drawout, Horizontal isolation type breaker as per IEC-62271-100/200, as amended up to date and additional specifications, having capacities as mentioned below, single break, trip free mechanism, motor charged and manually/electrically closing breaker suitable for use on 11 KV,3 Phase, 50Hz A.C. supply with STC 26.3 KA for 3 Sec (500 MVA). Internal Arc for AFLR 26.3kA at rated voltage for 1s at individual compartments i.e. Busbar, VCB and cable compartment. complete with self contained, fully interlocked, rack in and rack out mechanism, air insulated and encapsulated copper bus bars of 800 Amps capacity, breaker featured with mechanical ON/OFF indicator with hand trip device, spring release coil, shunt trip coil and auxiliary switch of 4 NO + 4 NC and equipped with following switch gears and accessories.				
	The panel shall be complete with following switchgear and accessories. All major sub-components (switchgear, relays & vacuum interrupters) shall be of same make. Separate earthing truck shall be required for each bus earthing & cable earthing. Earthing truck shall be so designed that it is impossible to earth a live. It shall be provided with capacitive voltage divider and complete with audio visual annunciation, one for each panel.				
	INCOMER PANEL - Each Comprising of				
	1-Metal clad housing with truck having 800A, 500 MVA, TP integral VCB with manually /electrically operated mechanism (spring charging motor-230 V AC)				
	1 set of air insulated bus bar of 800 A				
	1 set of isolating plug and receptacle				
	1 set of automatic safety shutter				
	1- set of breaker control switch, lockable type Trip /Neutral /Closed (TNC)				
	1 set of dual core CT's				
	Core I 400/200/5/5 A class 5P-20 (15 VA) protection				
	Core II 400/200/5/5 A class 0.5 (15 VA) metering				
	1- Shunt trip closing coil 24 V DC				
	1- 11 KV end termination kit for 3x300 sq.mm AI.XLPE 11 KV armoured cable				
	3-No's P.T'S 11/0.110 KV of (100 VA) cast resin type				
	1-set ON/OFF /Trip & Circuit healthy and phase indicating LED lamps.				

S.No.	Description	Qty	Unit	Rate	Amount
	1- No Micoprocessor based Numerical relay with O/C EF &SC Protection. Relay should have arc flash fault protection in cable, busbar and breaker chamber and shall communicate over IEC61850 protocol to SCADA.				
	1-No UL&CE Multifunction Digital meter displaying Voltage, Amps, kWh, kW, P.F., Active, reactive, apparent energy, disturbance direction detection, Individual harmonic up to the 63rd harmonic. at least 256 samples/cycle with ethernet Port with inbuilt webserver and complying to IEC 61557-12, IEC 62053-22 certified by third party laboratory.				
	1-No master trip relay				
	1-12 No's annunciation window with relays and push buttons				
	OUTGOING PANEL : Each Comprising of :				
	1-Metal clad housing with truck having 800 A ,500 MVA TP integral VCB manually/ electrically operated mechanism (spring charged motor 230 V A.C.)				
	1- Set of air insulated bus bar				
	1- Set of isolating plug and receptacle				
	1- Set of automatic safety shutters				
	1- Set of breaker control switches (TNC)				
	1-Set of dual core CT'S				
	Core I - 200 /100/ 5 /5 class 5P -10 (15 VA)				
	Core II - 200 / 100/ 5/5 class 1 (15 VA)				
	1- Shunt trip closing coil 24 V DC / 110 V A.C				
	1- 11 KV end termination for 3 x 240 sq.mm AI.XLPE 11 KV cable				
	1-set ON/OFF /Trip & Circuit healthy Indicating LED lamps.				
	1- No Micoprocessor based Numerical relay with O/C EF &SC Protection. Relay should have arc flash protection in cable busbar and breaker chamber and shall communicate over IEC61850 protocol to SCADA.				
	1-No master trip relay				
	1-12 No's annunciation window with relays and push buttons				
	1-No 2 elements auxiliary relay for transformer (WTI with alarm & trip)				
	1-set of terminal block with 20% extra terminal for connection with 2.5sq.mm 4 core copper conductor pvc insulated pvc sheathed copper cable from panel to transformer				
	SITC of 11 KV HT Switchboard of 5 panels, 2 I/C & 3 O/G panels as above and as per specifications shall be with all accessories, interconnections, internal wiring, labels etc. complete as required.	1	Set	3243704	3243704
99	**SITC of RMU type VCB 11 KV HT Panel - Stainless steel tank, (Non Extensible & manual) complete as required.**				

S.No.	Description	Qty	Unit	Rate	Amount
	Supplying, Installation, Testing & Commissioning including design, manufacture and testing at works of indoor type floor mounted metal clad, **11 KV VCB RMU panel** board totally enclosed & fully interlocked, Horizontal drawout, Horizontal isolation type breaker as per IEC-62271-100/200, as amended up to date and additional specifications, having capacities as mentioned below, single break, trip free mechanism, motor charged and manually/electrically closing breaker suitable for use on 11 KV,3 Phase, 50Hz A.C. supply with STC 26.3 KA for 3 Sec (500 MVA). Internal Arc for AFLR 26.3kA at rated voltage for 1s at individual compartments i.e. Busbar, VCB and cable compartment. complete with self contained, fully interlocked, rack in and rack out mechanism, air insulated and encapsulated copper bus bars of 800 Amps capacity, breaker featured with mechanical ON/OFF indicator with hand trip device, spring release coil, shunt trip coil and auxiliary switch of 4 NO + 4 NC and equipped with following switch gears and accessories.				
	The panel shall be complete with following switchgear and accessories. All major sub-components (switchgear, relays & vacuum interrupters) shall be of same make. Separate earthing truck shall be required for each bus earthing & cable earthing. Earthing truck shall be so designed that it is impossible to earth a live. It shall be provided with capacitive voltage divider and complete with audio visual annunciation, one for each panel.				
	INCOMER PANEL - Each Comprising of				
	1-Metal clad housing with truck having 800 A,500 MVA, TP integral VCB with manually /electrically operated mechanism (spring charging motor-230 V AC)				
	1 set of air insulated bus bar of 800 A				
	1 set of isolating plug and receptacle				
	1 set of automatic safety shutter				
	1- set of breaker control switch, lockable type Trip /Neutral /Closed (TNC)				
	1 set of dual core CT's				
	Core I 400/200/5/5 A class 5P-20 (15 VA) protection				
	Core II 400/200/5/5 A class 0.5 (15 VA) metering				
	1- Shunt trip closing coil 24 V DC				
	1- 11 KV end termination kit for 3x300 sq.mm Al.XLPE 11 KV armoured cable				
	3-No's P.T'S 11/0.110 KV of (100 VA) cast resin type				
	1-set ON/OFF /Trip & Circuit healthy and phase indicating LED lamps.				
	1- No Micoprocessor based Numerical relay with O/C EF &SC Protection. Relay should have arc flash fault protection in cable, busbar and breaker chamber and shall communicate over IEC61850 protocol to SCADA.				
	1-No UL&CE Multifunction Digital meter displaying Voltage, Amps, kWh, kW, P.F., Active, reactive, apparent energy, disturbance direction detection, Individual harmonic up to the 63rd harmonic. at least 256 samples/cycle with ethernet Port with inbuilt webserver and complying to IEC 61557-12, IEC 62053-22 certified by third party laboratory.				

S.No.	Description	Qty	Unit	Rate	Amount
	1-No master trip relay				
	1-12 No's annunciation window with relays and push buttons				
	OUTGOING PANEL : Each Comprising of :				
	1-Metal clad housing with truck having 800 A ,500 MVA TP integral VCB manually/ electrically operated mechanism (spring charged motor 230 V A.C.)				
	1- Set of air insulated bus bar				
	1- Set of isolating plug and receptacle				
	1- Set of automatic safety shutters				
	1- Set of breaker control switches (TNC)				
	1-Set of dual core CT'S				
	Core I - 200 /100/ 5 /5 class 5P -10 (15 VA)				
	Core II - 200 / 100/ 5/5 class 1 (15 VA)				
	1- Shunt trip closing coil 24 V DC / 110 V A.C				
	1- 11 KV end termination for 3 x 240 sq.mm AI.XLPE 11 KV cable				
	1-set ON/OFF /Trip & Circuit healthy Indicating LED lamps.				
	1- No Micoprocessor based Numerical relay with O/C EF &SC Protection. Relay should have arc flash protection in cable busbar and breaker chamber and shall communicate over IEC61850 protocol to SCADA.				
	1-No master trip relay				
	1-12 No's annunciation window with relays and push buttons				
	1-No 2 elements auxiliary relay for transformer (WTI with alarm & trip)				
	1-set of terminal block with 20% extra terminal for connection with 2.5sq.mm 4 core copper conductor pvc insulated pvc sheathed copper cable from panel to transformer				
	SITC of 11 KV HT VCB RMU (3 panel) of 2 incomer & 1 outgoing at incomer panels as above and shall be with all accessories, interconnections, internal wiring, labels etc. complete as required.	1	Set	769934	769934
100	Supply, installation, testing and commissioning of following capacity (continuous loading) BEE 5 Star rated (Corresponding Level as per BIS amended upto date of receipt of tender) , 11/0.433 KV step down, 3 Phase, 50 Hz, Dyn 11 vector group, KNAN [K(K-Class insulating liquid) Natural Air Natural] copper wound transformer (Electrolytic grade 99.9% pure copper, Core made of first grade Cold Rolled Grain Oriented (CRGO) Core grade MOH or better),Dielectric material shall be type -A, suitable for out door/indoor applications with On Load Tap Changer (OLTC) on HV side having AVR relay and Remote Tap Changer Control (RTCC) for automatic sensing of incoming voltage, automatic operation of OLTC and facility for remote and manual operation of OLTC HV side in range of +5% to -15% in steps of 2.5%, having cable end boxes on HV side suitable for 3x300 sqmm XLPE cable of 11 KV grade, including bus trunking				

S.No.	Description	Qty	Unit	Rate	Amount
	arrangement on LV side including supplying and laying of copper conductor multicore control cable from transformer to HT breaker/panel for safety tripping, complete with all accessories and safety provisions as per relevant IS 1180 (Part-3) including first filling of filtered dehydrated Synthetic organic Ester oil, i/c supplying and grouting of suitable M.S. Channel with all accessories and transformer shall be confirming to IS : 2026 (Part 1 to Part 5), IS : 1180 (Part-3) and duly ISI Marked and as per CPWD specifications complete in all respects etc as required at site.				
	The maximum flux density in any part of the core and yoke at rated voltage and frequency shall be such that the flux density with +12.5 percent combined voltage and frequency variation from rated voltage and frequency does not exceed 1.9 Tesla. The permissible temperature-rise shall not exceed 40 dg.C for oil and 45 dg. C for winding up to 200 KVA and 45 dg.C for oil and 50 dg. C for winding for above 200 KVA. Inside of tank shall be painted with varnish or liquid resistant paint. For external surfaces one coat of thermo setting powder paint or one coat of epoxy primer followed by two coats of polyurethane base paint shall be used. IS: 1180 (Part 3) shall be referred for paint thickness for normal to medium corrosive atmosphere.				
	For highly polluted atmosphere and special application external paint work shall be as per direction of Engineer-in-Charge. Design ambient condition : a) air temperature 50 deg C, b) Relative Humidity 90 % Max, c) Seismic Zone as per location of site, d) Altitude as per location/site. Noise level Shall not exceed limits as per NEMA TR-1 with all accessories running measured as per IEC 551 / NEMA standard. The transformer should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location etc. Marking Each transformer shall be provided with rating plate made of anodized aluminum/ stainless steel material securely fixed on the outer body, easily accessible,as per IS: 1180 Part-3. The entries on the rating plate shall be indelibly marked.				

S.No.	Description	Qty	Unit	Rate	Amount
	Fitting and Accessories : The following fittings shall be provided:- a) Two earthing terminals with the earthing symbol b) Oil level gauge indicating oil level at minimum, 30°C and maximum operating temperature; c) Air release device (for non-sealed type transformers) d) Rating and terminal marking plates; e) Silica gel breather f) Drain-cum-sampling valve (¾″ nominal size thread, IS 554) preferably steel with plug for three phase transformers; g) Thermometer pocket with cap; h) Oil filling holes having (1¼″ nominal size thread) with cover (for sealed type transformers without conservator); i) Lifting lugs for the complete transformer as well as for core and winding assembly; j) Pressure relief device or explosion vent above 200 kVA; k) One filter valve on the upper side of the tank (for transformers above 200 kVA); l) Unidirectional flat rollers (for transformers above 200 kVA); m) Inspection hole (for transformers above 200 kVA); n) HV side neutral grounding strip (where one of the HV bushing terminal is connected to earth);				
	o) Buchholz relay for transformers above 800 kVA. p) Arcing horns or suitable rating lightning arrestors for HT side – 3 Nos. q) Bird guard; r) Oil temperature indicator and winding temperature indicators for transformers above 200 kVA with suitable tripping mechanism above permissible limit s) Jacking pads (for transformer above 1600 kVA); t) Additional Neutral separately brought out on bushing for earthing. u) Magnetic oil level gauge (for transformer above 1600 kVA) with low oil level alarm contact; v) Non return valve (for conducting pressure test);w) Pressure relief device or explosion vent x). Monogram Plate y) Inspection cover z). Detachable type radiators with top and bottom shutoff valve. aa) Oil Conservator with Oil level indicator, minimum level marking and drain plug for all transformers of capacity 50 KVA and above. bb) Necessary hardware, clamps, lugs etc. for termination on HV/MV etc. for all transformers				
	1250 KVA	2	each	3401165	6802330
	Main L.T. PANEL				
101	Design, manufacture, testing at works, supply, installation, testing and commissioning of MODBUS ready SCADA Compatible 415V LT Panel Tested Assembly – TTA, CPRI /Independent international test house tested for all the tests as per IEC61439-1 & 2 and internal arc tests as per IEC 61641, 70kA for 0.5 SEC. Copies of the test reports & certificates shall be submitted with the tender. LT Panel shall also be tested of design as per Seismic Zone 4 of IEC 60068-3-3 requires compliance against 0.4g acceleration. Panel shall be rated for Impulse withstand capability as per IEC-61439. For operator safety IP2 X (touch proof) protection to be available even after opening the feeder compartment door. The compartmentalization to be achieved by using metal separators, use of PVC sheet / Hylem sheets shall not be allowed.				

S.No.	Description	Qty	Unit	Rate	Amount
	Main LT Panel shall be form 4b, only metallic covers shall be used, Hylem / PVC sheets shall not be allowed. The panel shall be FRONT operated, suitable for bus duct entry for transformer incomings. Outgoing panels shall be suitable for cable entry from the top/bottom. The type tested design of the Switchboard shall be proven design from the main switchgear manufacturer (OEM). All switchboards shall be supplied by authorized system integrator and design, design warranty, including performance warranty on the switch boards shall be from original equipment (switchgear) manufacturers.				
	Note : ALL the Panels should be SCADA Compatible for Monitoring & Control on Ethernet and should include all accessories as required.Each breaker in Main LT Panel & Emergancey panel shall have Zone Selective Interlocking feature. Provision of DLP gas suppression to be provided by panel manufacturer. Switchgear shall be communication compatible at single point.				
	Motor Feeder shall be with Type-2 Cordination & complied to IEC 60947. Temperature rise protection & monitoring at the ACB terminal shall be with Trip/Alarm facility. The current rating of function unit shall be selected by OEM as per the type tested design of OEM.				
	INCOMING FROM TRANSFORMER (1250 KVA)				
	2 No. 2000A, 4-pole EDO -65kA type ACB having release with following functions :Protection for O/C, S/C, E/F and Metring for Current- I1,I2,I3,In,Iavg,Imax, Voltage- Vph, Vline,Power- KW, KVA, KVAR, Power factor, Maximeters /minimeters Energy –KWh,KVAh, KWArh, Demand current- Ph & Neutral, Demand power-KWh, Under & over frequency, current unbalance, reverse power, phase seq. reversal, Last 10 faults with date and time stamping, Last 10 alarms with date and time stamping, Current and Voltage Harmonics till 31st multiple with Waveform capture. All release data should be available over MODBUS.				
	TNC breaker control switch.				
	ON, OFF, Trip, Ready to close and RYB indication lights with backup MCBs of 2A.				
	96 x 96 sq.mm display module mounted on panel door directly connected from release to display all parameters of ACB/MCCB.				
	Bus Coupler				
	1 No. 2000A, 4-pole EDO -65KA type ACB having microprocessor release with following functions :Protection for O/C, S/C, E/F and Last 10 faults with date and time stamping,Last 10 alarms with date and time stamping, All release data should be available over Modbus.				
	ON, OFF, Trip, Ready to close and RYB indication lights with backup MCBs of 2A.				
	Bus Bar				
	Set of 2500 Amps rating TPN AL Bus Bars of suitable length shall be provided for entire length of panel board. Busbar Design suitable for Temperature rise 40 degree over & above ambient temp. of 45 degrees				
	Outgoing Panels				

S.No.	Description	Qty	Unit	Rate	Amount
	All ACB shall have release with following functions :Protection for O/C, S/C, E/F and Metring for RMS values of highest current, Bargraph for % loading, Ammeter, Current- I1,I2,I3, In,Iavg,Imax, Voltage- Vph, Vline, Power- KW,KVA, KVAR, Power factor, Maximeters/minimeters, Energy –KWh, KVAh, KWArh, Demand current- Ph & Neutral, Demand power-KWh. The electrical endurance of ACB shall be 10000 operations upto 1600 AMP ACB and 6000 operation upto 3200 AMP ACB. All release data should be available over MODBUS. All MCCBs shall have Microprocessor release with following inbuilt functions :Protection for O/C, S/C, E/F.				
	Bus Section - A				
	1250 amp, 65KA FP ACB- EDO ----------1 Nos.				
	1000 amp, 65KA FP ACB- EDO ----------1 Nos.				
	630 amp, 65KA FP MCCB ----------1 Nos.				
	400 amp, 65KA FP MCCB ----------1 Nos.				
	200 amp, 65KA FP MCCB ----------1 Nos.				
	Bus Section - B				
	1250 amp, 65KA FP ACB- EDO ----------1 Nos.				
	1000 amp, 65KA FP ACB- EDO ----------1 Nos.				
	400 amp, 65KA FP MCCB ----------1 Nos.				
	315 amp, 65KA FP MCCB ----------1 Nos.				
	200 amp, 65KA FP MCCB ----------1 Nos.				
	100 amp, 65KA FP MCCB ----------1 Nos.				
	Metering & Indication for each outgoing feeders.				
	96 x 96 sq.mm display module mounted on panel door directly connected from release to display all parameters of ACB/MCCB.				
	Set of ON/OFF/Trip/Trip Circuit healthy/ready to close (for ACB) lamp with control MCBs of 2A.				
	SITC of Main LT Panel ESS (TTA Type) as per specifications and details above complete as required.-	1	Set	3305626	3305626
	EMERGENCY PANEL (DG Sychnronization cum AMF/PLC Panel) in ESS				
102	Design, manufacture, testing at works, supply, installation, testing and commissioning of MODBUS ready SCADA Compatible 415V LT Panel Tested Assembly – TTA, CPRI /Independent international test house tested for all the tests as per IEC61439-1 & 2 and internal arc tests as per IEC 61641, 70kA for 0.5 SEC. Copies of the test reports & certificates shall be submitted with the tender. LT Panel shall also be tested of design as per Seismic Zone 4 of IEC 60068-3-3 requires compliance against 0.4g acceleration. Panel shall be rated for Impulse withstand capability as per IEC-61439. For operator safety IP2 X (touch proof) protection to be available even after opening the feeder compartment door.				

S.No.	Description	Qty	Unit	Rate	Amount
	The compartmentalization to be achieved by using metal separators, use of PVC sheet / Hylem sheets shall not be allowed. Main LT Panel shall be form 4b, only metallic covers shall be used, Hylem / PVC sheets shall not be allowed. The panel shall be FRONT operated, suitable for bus duct entry for transformer incomings. Outgoing panels shall be suitable for cable entry from the top/bottom. The type tested design of the Switchboard shall be proven design from the main switchgear manufacturer (OEM). All switchboards shall be supplied by authorized system integrator and design, design warranty, including performance warranty on the switch boards shall be from original equipment (switchgear) manufacturers.				
	Note : ALL the Panels should be SCADA Compatible for Monitoring & Control on Ethernet and should include all accessories as required.Each breaker in Main LT Panel & Emergancey panel shall have Zone Selective Interlocking feature. Provision of DLP gas suppression to be provided by panel manufacturer. Switchgear shall be communication compatible at single point.				
	Motor Feeder shall be with Type-2 Cordination & complied to IEC 60947. Temperature rise protection & monitoring at the ACB terminal shall be with Trip/Alarm facility. The current rating of function unit shall be selected by OEM as per the type tested design of OEM.				
	EMERGENCY PANEL (IEC 61439-1&2)				
	INCOMING FROM AMF PANEL				
	1 No.315A, 4-pole microprocessor based MCCB having release with following functions :Protection for O/C, S/C, E/F and Metring for Current- I1,I2,I3,In, Iavg, Imax, Voltage- Vph, Vline, Power- KW, KVA, KVAR, Power factor, Maximeters /minimeters Energy –KWh, KVAh, KWArh, Demand current- Ph & Neutral, Demand power-KWh, Under & over frequency, current unbalance, reverse power, phase seq. reversal, Last 10 faults with date and time stamping,Last 10 alarms with date and time stamping, Current and Voltage Harmonics till 31st multiple with Waveform capture. All release data should be available over MODBUS.				
	TNC breaker control switch.				
	ON, OFF, Trip, Ready to close and RYB indication lights with backup MCBs of 2A.				
	96 x 96 sq.mm display module mounted on panel door directly connected from release to display all parameters of ACB/MCCB.				
	Bus Bar				
	Set of 400 Amps rating TPN AL Bus Bars of suitable length shall be provided for entire length of panel board.				
	Outgoing Panels				

S.No.	Description	Qty	Unit	Rate	Amount
	All ACB shall have release with following functions :Protection for O/C, S/C, E/F and Metring for RMS values of highest current, Bargraph for % loading, Ammeter, Current- I1,I2,I3, In,Iavg, Imax, Voltage- Vph, Vline, Power- KW,KVA,KVAR, Power factor, Maximeters/minimeters, Energy –KWh, KVAh, KWArh, Demand current- Ph & Neutral, Demand power-KWh. The electrical endurance of ACB shall be 10000 operations upto 1600 AMP ACB and 6000 operation upto 3200 AMP ACB. All release data should be available over MODBUS. All MCCBs shall have Microprocessor release with following inbuilt functions :Protection for O/C, S/C, E/F.				
	400 amp, 65KA FP MCCB ----------1 Nos.				
	200 amp, 65KA FP MCCB ----------2 Nos.				
	125 amp, 65KA FP MCCB ----------1 Nos.				
	100 amp, 65KA FP MCCB ----------2 Nos.				
	63 amp, 65KA FP MCCB ----------1 Nos.				
	Metering & Indication for each outgoing feeders.				
	96 x 96 sq.mm display module mounted on panel door directly connected from release to display all parameters of ACB/MCCB.				
	Set of ON/OFF/Trip/Trip Circuit healthy/ready to close (for ACB) lamp with control MCBs of 2A.				
	AMF/PLC Panel				
	AMF/PLC based panel for Auto Start, Auto Load Sharing and Logic Load Management and Synchronization Panel complete with Control / Power wiring and necessary hardware as required for ESS with 2 Nos. 1250 KVA T/R, 1 Nos. 125 KVA DG, 1 Bus Coupler etc. It shall be compatible to supervise and integrate to SCADA system.				
	SITC of Emergency Supply Panel as per specifications and details above complete as required.	1	Set	717802	717802
103	**HYBRID Power Factor Correction System**				
	Supply, Installation, testing and commissioning of HYBRID APFC Panel, 3 phase 4 wire, 415 V, 50 Hz AC System for Ambient temperature -5°C to +40°C of following capacity with passive solution of 60% capacity and active solution of 40% capacity, 3Phase 4 wire Hybrid Power Factor Correction Solution (with arrangement for neutral current balance) to achieve >0.99 lag and TDDI/THDV values within IEEE recommended limits.APFC should be designed as per IS 16636 Or IEC 61921. The active section and passive section shall work in sync to give optimized output. The degree of protection of passive section should be IP 42, and of active section should be minimum IP 21.The switching device for APFC passive section should be through capacitor duty contactor and for the active compensation system shall be IGBT based with 3 level topology having 12 IGBT in inverter circuit. The active compensation system should filter harmonics from 2nd to 50th individual harmonic order and shall be selectable for the entire range. The active compensation system should have feature to improve PF correction and harmonic filtration having response time <25Micro second.				

S.No.	Description	Qty	Unit	Rate	Amount
	The hybrid panel shall be indoor type floor mounted free standing totally enclosed, extensible, fabricated in compartmentalized designed made of CRCA sheet steel of 2.0mm thick for framework & covers, 3 mm thick for gland plate i/c cleaning & finishing complete with 9 tank process for powder coated of approved shade (RAL 7032-Siemens gray or as approved by Engineer-in- Charge), having front section (switch gear and control accessories) and rear section (capacitor and reactor), front and rear access, having suitable current carrying capacity, extensible TPN Aluminum alloy bus bar of high conductivity, DMC/SMC bus bar supports, bottom base channel of MS Section, fabrication shall be done in transportable section, entire panel shall have common copper earth bar of minimum size of 25mm x 5mm with 2 nos. earth studs, the earth terminals provided on the body of capacitor bank shall also be bonded to the main capacitor panel earth bus with 2 nos. 8 SWG or 6 SWG GI earth wires/ equivalent size of copper conductor cable, forced ventilation for maintaining temperature rise not more than 5°C from ambient, interconnections, connections with 14% detuned reactor and heavy duty 525 V ISI marked Impregnated MPP(Metalized Polypropylene) Capacitor (IS 13340 Part -1 & 2) APFC Panel shall be in compliance with IS :16636 & CPWD Specifications etc. as per below details.				
	(A) Incomers				
	Suitable capacity MCCB/ACB (Upto 300 KVAR, MCCB and above 300 KVAR, ACB) Microprocessor base with O/C, S/C, E/L release of TPN 50KA breaking capacity (Ics=Icu), ON, OFF, Trip, R, Y, B - LED Indicating Lamp set along with required Instruments and accessories with extended rotary handel and door interlocking arrangement. Current rating of the Incomer in ampere shall be APFC Panel rating in KVAR x 1.4 x 1.5 or Nearest higher standards rating.				
	(B) Instruments & Indications				
	a)For Passive Section :				
	i) 3-Phase current sensing APFC microprocessor relay/controller , advance 12/16 stages (12 stages for over all capacity of panel (active + passive) below 500 KVAR and 16 stages 500 KVAR & above) and having display of Phase wise V, A, PF, Cos-Phi, KW, KVA, KVAR, THD-V , THD-I, harmonics up to 31 level.				
	ii) Auto Manual Selector switch, auxiliary contactors with timer for delay in manual mode.				
	iii) Digital Multi function meter with LED Display for V, A, PF, KW, KVA, KVAR, THD-V & I, Frequency.				
	iv) Suitable rating control transformer shall be provided for control and indication circuit.				
	v) All components like control transformer, meter, relay and indicating lamp shall be protected by using suitable rating individual MCB's.				
	vi) Wiring of the control circuit shall be done by using 2.5 sq mm, FRLS 1100 V grade, PVC insulated multi stranded copper control wire.				
	vii) Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge.				

S.No.	Description	Qty	Unit	Rate	Amount
	b) For Active Section : Dedicated HMI (Human Machine Interface) (Minimum 7 inch display) for controlling and communication and having display of Phase wise V, A, PF, Cos-Phi, KW, KVA, KVAR, THD-V , THD-I, harmonics up to 50th level. Communication Ethernet/RS485/SNMP port open protocol for BMS integration as per approved by Engineering in charge.				
	400 KVAR	2	Set	2183152	4366304
	H.T. / L.T. CABLES, CABLE TERMINATIONS AND CABLE TRAY				
104	Supply of following size of 11 KV XLPE insulated aluminium conductor earthed and armoured cable conforming to IS 7098 complete as required.				
	3 Core, 300 sq.mm	140	metre	3839	537460
105	Laying of one number additional PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size direct in ground in the same trench in one tier horizontal formation including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
a	Above 120 sq. mm and upto 400 sq. mm	100	metre	498	49800
106	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
a	Above 120 sq. mm and upto 400 sq. mm	30	metre	170	5100
107	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	240 sq. mm	8	each	17414	139312
108	Supplying, receiving, storing, laying, effecting proper connections, Cable Termination with compression gland, crimping the joints etc., testing and commissioning of the following sizes of 1.1 KV grade PVC insulated copper conductor armoured stranded control cable complete as required and as per specifications.				
	4 core, 2.5 sq,mm Cu. Cable	500	metre	323	161500
	LT CABLES				
109	Supply of following sizes and core PVC/ XLPE insulated PVC sheathed, heavy duty, armoured electrical cable with aluminium conductor for working voltage upto and including 1100 vlots. (Conforms to IS:1554, part-1).				
a	1 Core, 630 sq.mm. XLPE Aluminium Cable with end termination	330	metre	1906	628980
b	3.5 Core, 400 sq.mm. XLPE Aluminium Cable	890	metre	3738	3326820
c	3.5 Core, 300 sq.mm. XLPE Aluminium Cable	370	metre	2926	1082620
110	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
a	Above 185 sq. mm & upto 400 sq.mm	940	metre	564	530160
111	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.				

S.No.	Description	Qty	Unit	Rate	Amount
a	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	320	metre	226	72320
	END TERMINATIONS OF 1.1KV CABLES				
112	Supply and making cable end termination with brass compression glands and crimped aluminium lugs following sizes of PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade of the following sizes as required.				
a	3½ X 400 sq. mm (82mm)	10	each	1713	17130
b	3½ X 300 sq. mm (70mm)	20	each	1336	26720
	CABLE TRAY / RCC PIPE				
113	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
a	300 mm width x 50mm depth x 1.6 mm thickness	50	metre	1062	53100
b	450 mm width x 50mm depth x 2.0 mm thickness	20	metre	1439	28780
c	600 mm width x 50mm depth x 2.0 mm thickness	20	metre	1925	38500
114	Providing and laying non-pressure NP2 class (light duty) RCC. Pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement:2 fine sand) including testing of joints etc. complete.				
a	100mm dia . RCC pipe	50	metre	771	38550
b	250mm dia . RCC pipe	30	metre	1120	33600
115	Supplying and laying of following size DWC HDPE pipe ISI marked along with all accessories like socket, bend, couplers etc. conforming to IS 14930, Part II complete with fitting and cutting, jointing etc.direct in ground (75 cm below ground level) including excavation and refilling the trench but excluding sand cushioning and protective covering etc., complete as required.				
a	63 mm dia (OD-63 mm & ID-51 mm nominal) For Fiber & Power cables	700	metre	289	202300
b	120 mm dia (OD-120 mm & ID-103 mm nominal) For Fiber & Power cables	300	metre	417	125100
	SAFETY EQUIPMENT				
116	Supply & erecting of following items for substation.				
a	Rubber hand gloves suitable for 11 KV.	1	Pair	623	623
b	Shock treatment chart both in Hindi & English for treating person suffering due to electric shock mounted on wall hooks.	2	each	2456	4912
c	Providing and fixing H.T. danger notice plate of 250 mm X 200 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required.	2	each	340	680
d	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enameled white on both sides, and with inscription in single red colour on front side as required	2	each	315	630
e	Carbon dioxide fire extinguishers of 4.5 kg each mounted on wall hooks as per IS : 2878-1976 complete with all accessories.	3	each	6971	20913
f	Dry chemical fire extinguishers 5 kg as per IS: 2171-1976 mounted on wall hooks.C8	3	each	3970	11910

S.No.	Description	Qty	Unit	Rate	Amount
g	G.I. Fire buckets 13 litre capacity filled with dry sand and fixed on wall on hook made out of 13mm dia MS rod & conforming IS 2546 - 1974.	6	each	1059	6354
h	First aid box containing material as prescribed by St. John Ambulance brigade OR Indian Red Cross complete as required.	1	each	2056	2056
i	Rubber mat 914.4 mm wide and 15 mm thick to withstand 11 KV dielectric strength as per IS 5424-1969.	5	metre	3194	15970
j	Rubber mat 914.4 mm wide and 6 mm thick to withstand 1.1KV dielectric strength.	10	metre	2135	21350
	Fire Suppression system				
	Supplying, installation, testing and commissioning of pre-engineered Automatic Clean Agent 3M Novec 1230 (UL Listed/ FM approved) Direct Low Pressure (DLP) System complete With DOT/PESO approved cylinder fitted with Automatic Valve. Complete System shall be Tested and Certified to LPCB/VDS/UL.				
117	Supply, installation, testing and commissioning of 10LB. Novec-1230 DLP Assembly with automatic valve mounted on DOT/PESO approved cylinder, push in connector for tube, Mounting bracket etc.	1	each	109918	109918
118	Supply, installation, testing and commissioning of 5LB. Novec-1230 DLP Assembly with automatic valve mounted on DOT/PESO approved cylinder, push in connector for tube, Mounting bracket etc.	2	each	90957	181914
119	Supplying, installation, testing and commissioning of 2.5LB. Novec-1230 DLP Assembly with automatic valve mounted on DOT/PESO approved cylinder, push in connector for tube, Mounting bracket etc.	4	each	58435	233740
120	Supply, installation, testing and commissioning of UL listed Linear Pneumatic Heat Detection Tube (operating temp at 120 Degree Centigrade, Colour-Red) For Automatic Fire Detection & Suppression.	200	mtr.	3220	644000
121	Supply, installation, testing and commissioning of tee connection.	10	each	4302	43020
122	Supply, installation, testing and commissioning of elbow connection.	10	each	4302	43020
123	Supply, installation, testing and commissioning of end of line adapter with Pressure Gauge For charging & monitoring.	10	each	6367	63670
124	Supply, installation, testing and commissioning of Low pressure switch for monitoring system activation.	7	each	13605	95235
125	Supply, installation, testing and commissioning of Master control Unit with LED Flasher, Electronic Hooter, LED Indicator with provision for Integration with Fire Alarm Control Panel complete as required.	7	each	16779	117453
	Earthing For Substation Equipments				
126	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	14	Set	15004	210056
127	Providing and fixing 25 mm X 5 mm copper. 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.	50	Metre	1638	81900

S.No.	Description	Qty	Unit	Rate	Amount
128	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	100	Metre	1246	124600
	SUB HEAD-XII - DG SET WORK				
129	Supply, installation, Testing & Commissioning of 'Silent Type Diesel Generating set as per CPCB IV + or better norms along with having Prime Power Rating of KVA as below, 415 volts at 1500 RPM, 0.8 lagging power factor at 415 V suitable for 50 Hz, 3 phase system & for 0.85 Load Factor, including testing at factory and site with fuel, load for test and other necessary arrangements Complete as per CPWD specifications, should have QR code which should contain drawing, test report OEM manual,Geo- Tag of manufacturing location, rating plate as per relevant IS Code etc. and consisting of the followings:				
	(A) Diesel Engine:				
	Turbocharged Diesel engine 4 stroke water cooled, multi cylinder, dynamically balanced fly wheel, electric start of suitable BHP at 1500 RPM suitable for above output of alternator at 40 Degree C, 50% RH & at 1000 Meter MSL, capable of taking 10% over loading for one hour after 12 hours of continuous operation. The engine will be with Electronic governor, Dry type Air filter with service indicator, first filling of engine fuel (after commissioning) lubricating Oil, Coolant and other consumables complete with all the required accessories, the Electronic governor shall be as per ISO 8528.The engine shall comply to the latest CPCB norms (CPCB IV + or better) and Conforming to BS 5514, BS 649, IS 10000, IS 10002, IS 13018 and as per CPWD specifications.				
	(B) Engine mounted Instrument Panel fitted with and having digital display for following:				
	(i) Start-stop switch with key				
	(ii) Water temperature indication				
	(iii) Lubrication oil pressure indication				
	(iv) Lubrication oil temperature indication				
	(v) Battery charging indication and Voltage indication				
	(vi) RPM indication				
	(vii) Over speed indication				
	(viii) Low lubricantion Oil trip indication				
	(ix) Engine Running Hours indication				
	(x) Fuel Level				
	(C) Alternator:				
	Synchronous alternator rated of appropriate KVA, 415 volts at 1500 RPM, 3 phase 50 Hz, AC supply with 0.8 lagging power factor at 40 Degree C, 50% RH & at 1000 Meter MSL. The alternator shall be having Screen Protected Drip Proof (SPDP) enclosure IP23, brushless, continuous duty, dynamically balanced rotor, capable of taking 10% over loading for one hour after 12 hours of continuous operation, self cooled,self-excited and self-regulated through AVR conforming to IS13364(Part 2)/IS: 4722/BS 2613 suitable for tropical conditions and with class- H insulation.				
	(D) Base Frame & Foundation:				

S.No.	Description	Qty	Unit	Rate	Amount
	Both the engine and alternator shall be mounted on suitable base frame made of MS channel with necessary reinforcement which shall be installed on suitable cement concrete foundation and vibration isolation arrangement as per recommendations of manufacturer.				
	(E) FUEL TANK:				
	Daily service fuel tank of suitable liters capacity as per CPWD Specifications, fabricated out of 3 mm thick M.S. sheet complete with all standard accessories and fuel piping between fuel tank and diesel engine with MS class 'C' pipes of suitable dia. Complete with valves, level indications & accessories as required as per specifications.				
	(F) Exhaust System:				
	Dry exhaust manifold with hospital type exhaust silencer and catalytic convertor.				
	(G) Starting System:				
	12V/24V DC starting system comprising of starter motors: voltage regulator and arrangement for initial excitation complete with suitable numbers of batteries (180 AH capacity lead acid SMF type) as required as per specifications. The battery shall be housed inside the acoustic enclosure of DG Set.				
	(H) Acoustic and weather proof enclosure with arrangement for fresh air intake for cooling of the engine & alternator, extraction, discharging hot air in to the atmosphere and the temperature rise inside the enclosure, noise level outside enclosure. The acoustic enclosure should be suitable for cable connection /connection through bus-trunking. Such arrangements on acoustic enclosure should be water proof & dust-proof conforming to IP-65 protection. The enclosure shall be as per CPCB IV + or better norms etc. and as per CPWD specifications.				
	(I) AMF Panel:				
	Free standing floor mounted IP 42 automatic mains failure control panel including auto by-pass, suitable for KVA as below for silent type DG set complete with relays, timers, set of CTs for metering & protection and energy analyser to indicate currents, phase and line voltages, frequency, power factor, KWH, Kilo Volt Ampere Reative Hour (KVARH), KVA (Phase & Total), KW & provision for overload, short circuit, restricted earth fault, under frequency, power (aluminum) and control (copper) cabling of suitable size upto 15 meter between AMF panel, LT Panel and DG Set including connection interconnection etc. as required, all complete and inter locking and communication/ Ethernet /RS485/SNMP port open protocol for BMS integration including suitable software, the panel shall be of DG Set OEM make etc. as per approved by Engineering in charge and including the following:				
	1. Suitable numbers and appropriate capacity 4 pole motorised electrically operated draw out with cradle type 3 position ACB/ MCCB with electronic release for O/C & E/F and shunt trip.				
	2. Auto/Manual/Test/Off selector switch				

S.No.	Description	Qty	Unit	Rate	Amount
	3. Protection for under and over voltage phase reversal (2 nos Over voltage relay, 2 Nos. reverse power relay and 2 Nos. under voltage relay).				
	4. 3 Sets of current transformers 15 P 10 accuracy for protection and 15 VA class-I for metering				
	5. Energy analyser unit to indicate current, Voltage(L-N & L-L), kW, kVA (Phase & Total), Frequency, KWH, PF				
	6. LED Indicating lamps for load on mains and load on set.				
	7. Fuse/ MCB for instruments.				
	8. Battery charger, complete with transformer/ rectifier, D.C. voltmeter and ammeter, selector switch for trickle, off and boost and current adjustment.				
	9. Main supply failure monitor.				
	10. Supply failure timer.				
	11. Restoration timer				
	12. Control unit with three impulse automatic engine start/stop and failure to start lockout.				
	13. Impulse counter with locking and reset facility.				
	14. ON/OFF/Control circuit switch with indicator				
	15. Audio/Video annunciation for				
	(i) High water temperature				
	(ii) Low lubricating oil pressure				
	(iii) Engine over speed				
	(iv) Engine fails to start				
	(v) Full load/maximum load warning				
	16. Protection for over/under Frequency, Loss of AC sensing, Over Current, Unbalancing load with suitable number of relays and accessories				
	17. Maintenance notification based on Engine Run Hour & due date				
	18. Load Management through PLC to achieve auto opening and closing of incomer breakers, bus coupler switching of essential panel , interlocking providing signal to AMF Panel for load status and AMF shall give command to DG Set to auto start / auto stop depending upon load status and requirement etc. and necessary hardware and software required to perform the operation shall be provided by the contractor including all control wiring				
	125KVA	1	Set	885383	885383
	SUB HEAD-XIII - EXTERNAL LIGHTING				
130	Supply and erection of 6 metre height Hot dip galvanized octagonal street light pole with following arm with Top dia 70 mm and bottom dia A/F 135 mm, made of 3 mm thick sheet along with base plate of size 225 X 225 X 16 mm, small door opening for junction box mounting and suitable size foundation with bolt with template and all complete as required . (but without pole collar)				
	Single arm, 1500-2000 mm	26	each	26032	676832
131	**LED Smart Street light fixture, powder coated pressure die cast aluminum (System. System lumen efficacy >135 lm/Watt)**				

S.No.	Description	Qty	Unit	Rate	Amount
	Supplying, installation, Testing & Commissioning of Smart Street light LED fixture, powder coated pressure die cast aluminum body with built in or separate driver as per the requirement (< 700ma), Input voltage: 140-270 Volt AC, freq 50/60 hz, Operating temp range -15 deg to 50 deg centigrade, internal surge protection of 5 KV L,N,E as per IEC 61000- 4-5, Driver efficiency >85%,THD < 10% as per IEC 61000-3-2 , P. F.≥0.95, IP-66,IK-08, CRI >80 , under voltage and over voltage protection, EMI- EMC as per CISPR-15, lenses for beam angle as per IESNA type I/II/III as per the width of the road and the project requirement., suitable to fit in up to 65mm dia pipe, life time of minimum 50000 Burning Hours with 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report , CCT 3000°K / 4000°K / 5700°K /6000°K/6500°K (As per ANSI Bin) ,				
	Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminum housing such that LED junction temperature shall not rise above 90°C).				
	Smart inbuilt controller shall have following features.				
	Control and monitor LED luminaries with bi directional control (Status, Fault, Alarm, dimming level, wattage, energy)				
	to measure voltage, current, power, power factor, apparent energy, active energy, operating hours.				
	Inbuilt ambient light sensor, motion sensor based on Passive Infra Red (PIR).				
	Wi-Fi LoRA/Zigbee/Power line with Ethernet network based IOT feature as per site requirement or engineer in charge.				
	should be controlled through auto/ manual				
	Programmable level of not less than 48 different light intensity settings,				
	Inbuilt repeater & relay signals function to other controllers				
	90 watt	26	each	6962	181012
132	Supply and fixing 40-45 Watt LED Type Post top Gate Light with die cast aluminium housing for ingress protection of IP65 and complete with all accessories etc. on GI bracket for Gate Light of building including connection with FR PVC insulated copper conductor cable and earthing the body etc. as required.	6	each	8908	53448

S.No.	Description	Qty	Unit	Rate	Amount
133	Supplying, Installation, Testing and commissiong of **10 W, 5700 K, IP 66 decorative LED bollard, with CRI 80, Life of LED 50000K @L70 , PF >0.9 with** die cast Aluminium housing with corrosion resistance powder coating using nano technology in approved color suitable for landscape application with control gear and overall height of **1000 mm - 1100 mm** with base flange / plate suitable for mounting above ground level, with foundation complete as required.	12	each	6453	77436
134	Supply and fixing of floor mounting, totally enclosed, compartmentalized, cubical, dust, vermin proof and **Outdoor** type **ROAD LIGHTING PILLAR** fabricated out of 2mm thick cold rolled carbon anealed CRCA, sheet steel, intermnally strengthened with angle iron frame work with following incoming and outgoing feeders (fabricatedout of 2mm CRCA sheet steel) including supplying and mounting including making connectins / interconnections with lugs / glands crimping tools, testing and commissioning of following items inside the panel/pillar. The pillar shall be suitable for automatic operation of external lighting.				
	Road Light pillar				
	Incoming				
	100 A TP MCCB (25KA) -1 No.				
	100 A, TP Contactor-1 No.				
	Time Switch with daily dial suitable for operation on 230V single phase 50Hz AC supply -2No.				
	Auto Manual Selector Switch - 1 No.				
	Bus Bars				
	TPN Al bus bar of 200A rating				
	Outgoings				
	20A DP MCB - 4 No.				
	32A DP MCB - 4 No.				
	Indication lamps (LED Type) - 3 No.				
	SITC of Road lighting Pillar of above details & specifications	1	each	64274	64274
135	Supply of following sizes and core PVC/ XLPE insulated PVC sheathed, heavy duty, armoured electrical cable with aluminium conductor for working voltage upto and including 1100 vlots. (Conforms to IS:1554, part-1).				
	4 Core, 16 sq.mm. XLPE Aluminium Cable	1200	metre	298	357600
136	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
a	Upto 35 sq. mm	1200	metre	453	543600
137	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
a	4 X 16 sq. mm (28mm)	80	each	366	29280
138	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. (but without charcoal/ coke and salt) as required.	2	set	5958	11916

S.No.	Description	Qty	Unit	Rate	Amount
139	Providing and laying earth connection from earth electrode with 6 SWG dia G.I. Wire in 15 mm dia G.I. pipe from earth electrode including connection with G.I. thimble excavation and re-filling as required.	2400	metre	313	751200
140	Supply, Laying, Termination, Testing and Commissioning of Electric Push Button type IP 65 Boom Barrier of Length upto 6 mtr. at Entry & exit Gates of Complex including Motors & all accessories complete as required at site.	6	set	132447	794682
	SUB HEAD-XIV- Solar Power Generation System				
141	Supply, Installation, Testing and Commissioning of ongrid Solar Photo voltaic Power Plant conforming to MNRE specifications as amended, consisting of Mono Crystalline silicon solar cells, net metering facility, necessary protections, earthing, mounted on Aluminium /GI structure of suitable strength with following components complete as required:-a) Solar Photo voltaic Module of capacity 550Wp or above, manufactured in India, conforming to IS14286/IEC61215, IS/IEC61730-Part-1, IS/IEC61730-Part-2. Solar Photo voltaic Module conversion efficiency shall not be less than 16.5%. PV modules used 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 350-800VDC Input voltage range and 400 VAC, three phase, 4 wire, 50Hz+/-2.5Hz, output voltage suitable to generate AC 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 adjust the voltage 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 cable along with glands, lugs and other accessories etc. as required. e) Lightning and surge voltage protection. f) Connections & Interconnections by supplying & fixing required size XLPE insulated copper conductor 1.1 kV grade 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.	100	KWp	54280	5428000
	Sub Head XV : Fire Fighting System				
20.1	Supplying, installation, testing and commissioning of Electric driven Main Fire Pump conforming to IS 12469: 2019 suitable for automatic operation and consisting of following, complete in all respects, as required :				
b)	Horizontal type, multistage, centrifugal, split casing pump of cast iron body & bronze impeller with stainless steel shaft, mechanical seal as required.				
c)	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-12615: 2018.				

S.No.	Description	Qty	Unit	Rate	Amount
d)	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
e)	Suitable cement concrete foundation duly plastered with anti vibration pads.				
A	2280 lpm at 70 m Head	1	Set	388181	388181
20.2	Supplying, installation, testing and commissioning of diesel engine driven main fire pump conforming to IS 12469: 2019 suitable for automatic operation and consisting of following, complete in all respects, as required : (Diesel Driven Pump)				
b)	Horizontal type, multistage, centrifugal pump of cast of iron body and bronze impeller with stainless steel shaft, mechanical seal as required.				
c)	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.				
d)	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
e)	Suitable cement concrete foundation duly plastered with anti vibration pads.				
d)	2280 lpm at 70 m Head	1	Set	642112	642112
20.3	Supplying, installation, testing and commissioning of electric driven pressurisation pump conforming to IS 12469: 2019 suitable for automatic operation and consisting of following, complete in all respects, as required : (Jockey Pump)				
b)	Horizontal type, multistage, centrifugal pump of cast iron body and bronze impeller with stainless steel shaft, mechanical seal as required.				
c)	Suitable HP squirell cage induction motor TEFC type suitable for operation on 415 volts, 3 phase 50 Hz AC supply with IP 55 class of protection for enclosure, horizontal foot mounted type with Class- 'F' insulation, conforming to IS-12615: 2018.				
d)	M.S. fabricated Common base plate, coupling, coupling guard, foundation bolts etc. as required.				
e)	Suitable cement concrete foundation duly plastered with anti vibration pads.				
A	180 lpm at 70 m Head	1	Set	109254	109254

S.No.	Description	Qty	Unit	Rate	Amount
20.4	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 specification with following in coming and Outgoings, suitable for operation on 415V, 3 phase, 50Hz Ac Supply with enclosure protection class IP 42 as required :				
	COMMON PANEL IN FIRE PUMP HOUSE				
	Incomings				
	630A, 50kA 4 Pole MCCB, Ics=100% Icu Rating Digital Voltmeter 0-500V with selector switch Ammeter (0-630 A) with selector swtich & CTs etc.				
	LED type RYB phase indicating lamps, ON, OFF, trip indicating lamps				
	Set of Copper Bus Bar 800Amps				
	OUTGOINGS : (Electrical Fire / Sprinkler Pump)				
	(Note : All outgoing feeders for pumps should have digital Ammeter with selector switches, and LED type ON, OFF, trip indicating lamps)				
	Main Fire Pump				
	200 Amp, 50kA TPN MCCB, Ics=100% Icu, with fully automatic Star/Delta starter suitable for 75 hp pump with overload protection, current sensing type single phase preventor complete with all acceessories and internal wiring required for automatic operation, selector switch for local/remote, auto/manual/OFF operation. - 2 sets				
	Jockey Pump				
	100 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 acceessories 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:-				
	Auto/Manual selector switch & 3 attempt starting device, timers and relays as required, push buttons, start/stop in manual mode.				
	Indication lamp for High/Low Lub. Oil pressure, High Water Temp. and Engine ON indication.				
	Battery charger suitable for 12 V/24V DC with boost and trickle selector switch, 0-30 V Dc volt meter and 0-20A DC Ammeter.				
	All standard relays and accessories for automatic operation of diesel engine.				
	SYSTEM CONTROLLER				

S.No.	Description	Qty	Unit	Rate	Amount
	Designing, Supply, Installation, Testing and Commissioning of system controller to control operation of Main Electric Fire Pump, Diesel Pump, Pressurisation Pump, in sequence as per specification consisting of relays, times, sensors, annunciation window for fault indication, complete as per specification.	1	Set	469546	469546
	Suitable cement concrete foundation duly plastered with anti vibration pads.				
20.5	Supplying and Laying of XLPE insulated, PVC sheathed alluminium conductor 1.1 KV grade armoured U.G Cable of following sizes on surface/ in existing cable tray suitably clamped as required				
a)	3x120 sq.mm	75	metre	1128	84600
b)	3x25 sq.mm	75	metre	319	23925
20.6	Supplying and laying of XLPE/PVC insulated stranded copper conductor 1.1 KV grade (un-armoured) of following size on existing cable tray suitably clamped including termination with copper lugs at both ends as required.				
a)	3 core 95 sq.mm	50	metre	7778	388900
b)	4 core 16 sq.mm	50	metre	1623	81150
20.7	Supplying and making end termination with brass compression gland & Al.lugs for following sizes of PVC insulated, PVC sheathed/XLPE Al.conductor cables of 1.1 KV grade as required				
a)	3x120 sq.mm	50	each	694	34700
b)	4x25 sq.mm	50	each	373	18650
20.8	Earthing with **GI Earth plate** 600 mm x 600 mm x 6 mm th.including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipe with charcoal or coke and salt complete as required.	1	Set	8351	8351
20.9	Providing & fixing 25 mm x 5 mm **G.I. Strip** in 40 mm dia GI pipe from earth electrode including connections with GI nut, bolt, spring, washer excavation and re-filling etc. as required.	75	metre	755	56625
20.10	Providing & fixing 25 mm x 5 mm **G.I. Strip** in on surface or in recess for connections etc as required.	50	metre	287	14350
20.11	Providing and fixing 6 SWG dia G.I wire on surface or in recess for loop earthing as required.	50	metre	84	4200
20.12	Supplying and installing following size of perforated painted with powder coating M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc. as required.				
a)	300 mm (W) x 50 mm (D) x 1.6 mm (T)	50	metre	866	43300
20.13	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 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				
b)	150 mm dia	150	metre	5104	765600

S.No.	Description	Qty	Unit	Rate	Amount
20.14	Providing, laying, testing & commissioning of **'C' class heavy duty MS pipe** conforming to IS 3589 and 1239 including fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc., fixing the pipe on the wall/ceiling with suitable clamps and painting with two or more coats of synthetic enamel paint of required shade complete as required.				
a)	150 mm dia	492	metre	4299	2115108
b)	100 mm dia	100	metre	3077	307700
c)	80 mm dia	65	metre	2277	148005
d)	65 mm dia	70	metre	1955	136850
e)	50 mm dia	80	metre	1557	124560
f)	40mm dia	365	metre	1259	459535
g)	32 mm dia	365	metre	1039	379235
h)	25 mm dia	552	metre	920	507840
20.15	Supplying and fixing single headed internal hydrant valve with instantanous Gun metal couplings of 63mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type-A) with blank Gunmetal cap and chain as required	30	each	8208	246240
20.16	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 Gunmetal	5	each	8208	41040
20.17	Supplying, fixing, testing and commissioning of double flanged sluice valve of rating PN 1.6 with non rising spindle, bronze/gun metal seat, ISI marked complete with nuts bolts washers, gaskets and conforming to IS 780 of following size asrequired:				
a)	80 mm dia	6	each	11314	67884
b)	150 mm dia	8	each	23968	191744
20.18	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	2	each	8255	16510
b)	150 mm dia	2	each	18884	37768
20.19	Supplying and fixing 63mm dia, 15mtr. Long **RRL hose** pipe with 63mm dia Male and Female Gun metal couplings duly binded with GI wire, rivets etc. conforming to IS 636 (type-A) as required.	56	each	5455	305480
20.20	Supplying and fixing First-Aid-Hose Reel with MS construction spray painted in Post office Red, conforming to IS 884 with upto date amendments, complete with the following as required.				
a)	30 m long 20mm (nominal internal) dia water hose Thermoplastic (Textile reinforced) Type-2 as per IS: 12585				
b)	20 mm (nominal internal) dia gun metal globe valve & nozzle.				
c)	Drum and brackets for fixing the equipments on wall.				
d)	Connections from riser with 40 mm dia stop valve (gun metal) & M.S. Pipe	28	each	17034	476952

S.No.	Description	Qty	Unit	Rate	Amount
20.21	Providing and fixing **Fire hose cabinet door** (40mm x 40mm x 5mm) angle depth fabricated with **2100mm x 1200mm** MS sheet. Complete in all respect with 25mmx25mmx3mm angle frame all around and stiffened in between i/c hinges, handle, locking arrangement, painting with approved synthetic enamel paint i/c sign writing on glass at internal hydrant including providing & fixing S.S. sheet 2mm thick on remaining portion above door to close opening i/c painting etc. as required. Glass shall be 6 mm thick.	28	each	24892	696976
20.22	Supply and fixing 63mm dia Gun Metal **branch pipe** with 20mm (nominal internal diameter) size Gun Metal nozzle conforming to IS 903, suitable for instantaneous connection to interconnect hose pipe coupling as required.	28	each	4977	139356
20.23	Supplying and fixing following fire brigade connection of cast iron body with Gun metal male instantaneous inlet couplings complete with cap and chain as required for 150mm dia MS pipe connection, conforming to IS 904 as required.				
a)	2 way-100 mm dia M.S. Pipe	3	each	7262	21786
b)	4 way - 150 mm dia M.S. Pipe	1	each	14820	14820
20.24	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 pain of approved shade as required.	4	each	19402	77608
20.25	Providing fixing testing & commissioning of 15 mm size quartzoid bulb type sprinklers, of rating 68 degree C. pendent / upright with required accessories.				
	Sprinkler (Pendent / Upright)	298	each	599	178502
	Horizontal side wall sprinkler	40	each	699	27960
20.26	Providing & fixing of pressure switch in M.S. pipe line including connection etc. as required	4	each	1670	6680
20.27	Providing & fixing flow switch in 150 mm dia sizes M.S. pipe including connection etc as required	4	each	9644	38576
20.28	Providing and fixing in position the industrial type pressure gauges with gun metal / brass valves complete as required	28	each	1491	41748
20.29	Providing and fixing standard **Fireman's Axe** with heavy insulated rubber handle.	28	each	517	14476
20.30	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 150 mm dia sizes as required.	1	each	50805	50805

S.No.	Description	Qty	Unit	Rate	Amount
20.31	Providing, installing, testing & commisioning of fire brigade draw out connection (fire department connection) with suction pipe MS class 'C' 100 mm dia. & 100 mm dia. foot valve & steel chain including wall mounted box M.S. construction made out of 16 gauge MS Sheet with glass door to house the above mentioned componenets. It should be complete as per manufacturer's specifications & as directed by Engineer- in-charge. (to be connected to static water tank) It should be complete as per manufacturer's specifications & as directed by Engineer- in-charge.	1	each	7999	7999
20.32	Providing and fixing **mechanical foam** type(ISI marked) fire extinguishers consisting of welded M.S. cylindrical body squeeze lever discharge valve 30 cm long high pressure discharge hose, discharge nozzle suspension bracket ISI marked as per IS 933 finished externally with red enamel paint and fixed to wall with brackets complete with internal charger.				
a)	6 litres capacity I.S.I. Marked.	71	each	2871	203841
20.33	Providing and fixing **Carbon-di-oxide fire extinguishers** consisting of welded M.S cylinderical body,squeeze lever discharge valve fitted with internal dischargetube, 30cms long high pressure discharge hose, discharge nozzle, suspension bracket, confirming to IS : 934 finished externally with red enamel paint and fixed to wall with brackets with rawl plug/dash fasteners complete with internal charge.				
a)	Capacity 4.5 kg. I.S.I. Marked.	71	each	5524	392204
	SUB HEAD -XVI- Water Supply and Drainage Pump				
20.1	Supplying, installing, testing and commissioning of flooded Vertical Inline cetrifugal pump set with stainless steel body , stainless steel impller and SS shaft capable to deliver of following capacity and head. given by TFC squirrels induction motor suitable for operation on 415 volt , 50 HZ AC power supply running speed 2900 RPM .The installation shall be complete with all necessary ancillaries & accessories including base plate , coupling guard etc complete as required.				
	Flow rate : 300LPM				
	Head : 70 Mts				
	Required for : UG T (Domestic Water)	2	set	192578	385156
20.2	Supply, installation, testing and commissioning of continuous duty submersible centrifugal non-clogging drainage pumps complete with 3 phase motor with all necessary protection and mechanical seal etc. complete with all ancillaries etc required.				
	Flow rate : 360 LPM				
	Head : 15 Mts				
	Solid Handling : 10 – 12 MM				
	Purpose : Drainage				
	MOC : CI	4	set	76557	306228
20.3	SITC of borewell submersible pump set coupled with wet type squirrel cage induction motor of suitable HP capable of deliverying minimum 500 LPM water at a head of 111 mtrs. Consisting shaft, thurst bearing, non return valve complete with copper conductor PVC insulated submersible cable conform to IS 694, supporting clamps, DOL starter etc. as required.	2	set	92311	184622

S.No.	Description	Qty	Unit	Rate	Amount
	SUB HEAD - XVII-Comprehensive Maintenance				
	Comprehensive Maintenance of Electrical Substation				
1	Providing services of comprehensive preventive, annual servicing maintenance contract for the Entire Substation equipment consisting of HT & LT equipments, Oil Filteration, inclusive of all parts consumables, cables, earthing, safety equipments and labour for all equipments supplied as well as replacement of any equipment / component/ part which can be repaired to the satisfaction of Engineer In Charge. after DLP period				
	For 1st Year	12	Month	47229	566748
	For 2nd Year	12	Month	49590	595085
	For 3rd year	12	Month	52070	624840
	For 4th Year	12	Month	54673	656082
	For 5th Year	12	Month	57407	688886
2	Annual preventive maintenance for 1 Nos. 125 KVA DG Set installed in Electric substation along with AMF Panel & Carrying out A,B& C periodic maintenance check, including B-Check Kit, Air Cleaning elements, coolant,& lubricating oil, attaending all major& minor faults and rectification as per terms & conditions after DLP period				
	For 1st Year	12	Month	1476	17712
	For 2nd Year	12	Month	1550	18598
	For 3rd year	12	Month	1627	19527
	For 4th Year	12	Month	1709	20504
	For 5th Year	12	Month	1794	21529
	COMPREHENSIVE MAINTENANCE OF LIFTS				
3	Comprehensive Maintenance of 1 Nos. 15 Passeneger Lift with Machine Room (3B+G+11) 1.5 MPS & preventive Maintenance, repair and replacement complete as required as per terms & conditions attached. after DLP period				
	For 1st Year	12	Month	11383	136596
	For 2nd Year	12	Month	11952	143426
	For 3rd year	12	Month	12550	150597
	For 4th Year	12	Month	13177	158127
	For 5th Year	12	Month	13836	166033
4	Comprehensive Maintenance of 1 Nos. 13 Passeneger Lift with Machine Room (3B+G+11) 1.5 MPS & preventive Maintenance, repair and replacement complete as required as per terms & conditions attached. after DLP period				
	For 1st Year	12	Month	10512	126144
	For 2nd Year	12	Month	11038	132451
	For 3rd year	12	Month	11589	139074
	For 4th Year	12	Month	12169	146027
	For 5th Year	12	Month	12777	153329
	COMPREHENSIVE MAINTENANCE OF CCTV SYSTEM				
5	Comprehensive Maintenance of different type of Cameras, LED Display,NVR, VMS Software, Server station, Client Workstations, HDD and HDMI Cable etc. as above mentioned in this schedule & preventive Maintenance, repair and replacement complete as				

S.No.	Description	Qty	Unit	Rate	Amount
	required as per terms & conditions attached. after DLP period				
	For 1st Year	12	Month	17851	214212
	For 2nd Year	12	Month	18744	224923
	For 3rd year	12	Month	19681	236169
	For 4th Year	12	Month	20665	247977
	For 5th Year	12	Month	21698	260376
	COMPREHENSIVE MAINTENANCE OF FAS & PA SYSTEM				
6	Comprehensive Maintenance of Photothermal detector,Thermal detectors, Fire Control Module, Horn cum strobe, MCPs, Fire Fighter Jack, Fire Fighter Telephone Handsets, Intelligent Interface Unit, Fault Isolators, Central Graphical FAS Monitoring System, Ten Loop FAS Panel, PA Controller, 6W metal Speakers,Power Amplifier, 6 zone stylish call station, 25 mm dia steel conduit, speaker cable, 2X1.5 FR PVC copper Cable etc. & preventive Maintenance, repair and replacement complete as required as per terms & conditions attached. after DLP period				
	For 1st Year	12	Month	7145	85740
	For 2nd Year	12	Month	7502	90027
	For 3rd year	12	Month	7877	94528
	For 4th Year	12	Month	8271	99255
	For 5th Year	12	Month	8685	104218
	COMPREHENSIVE MAINTENANCE OF IPABX SYSTEM				
7	Comprehensive Maintenance of IPABX system including Server, Telephone instruments, PRI Lines all Hardware software etc. & preventive Maintenance, repair and replacement complete as required as per terms & conditions attached. after DLP period				
	For 1st Year	12	Month	14517	174204
	For 2nd Year	12	Month	15243	182914
	For 3rd year	12	Month	16005	192060
	For 4th Year	12	Month	16805	201663
	For 5th Year	12	Month	17646	211746
	Sub Head-XVIII- Basement Ventilation & Pressurization				
	Sub Head- (High Side)				
	Axial Fans (Car Parking Ventilation)				
	Noramal Fresh/Exhaust Air Fans				
1	Supply, Installation, Testing and commissioning of Smoke Spill Tube Axial flow fan confirming to BS 7346 PART-2 complete with MS Double flanged long casing, impellers, pressure casted aluminium adjustable pitch blades, bird screen, gravity louvers (for smoke exhaust/Fresh air fans) fire retardent double fold moisture and fire proof with flame retardent fabric confirming to IS-206 (revised) fire retardent flexible connection & necessary nut bolts. The fan operating temperature shall be 250 deg C for minimum 2 hrs with totally enclosed motor with single speed and min IP 54 protection with direct driven TEFC Sq.cage induction motor and the air flowing from motor to the impeller. Motor shall be suitable for 415±10% volts, 50 cycles/second, 3 phase AC supply. Each fan shall include all accessories of the following Capacities				

S.No.	Description	Qty	Unit	Rate	Amount
	Static pressure and Motor Rating : The Indicated static pressure and motor rating is only provisional. Contractor to calculate static pressure based on final approved construction drawing and pressure drop of finalized Equipment / Items and submit for review / approval to the consultants. The procurement shall be processed only after duly verification / approval of calculation and selection from the Engineer In Charge.				
	Basement-3				
a)	**Zone - 01** Air Qty. = 3700 CFM Static Pressure = 25 mm Wg Fan Speed = not exceeding 1450 rpm Motor = 1.1 kw Fan Dia = To be Confirm by Manufacturer Noise level = not exceed 75 dB at 3 meter distance Fan efficiency = Not less than 60% Tube Axial Fans as described above with H class insulation for motor.	4	Nos.	26225	104900
b)	**Zone - 02** Air Qty. = 7000 CFM Static Pressure = 25 mm Wg Fan Speed = not exceeding 1450 rpm Motor = 2.0 kw Fan Dia = To be Confirm by Manufacturer Noise level = not exceed 75 dB at 3 meter distance Fan efficiency = Not less than 60% Tube Axial Fans as described above with H class insulation for motor.	4	Nos.	40995	163980
	Basement-2				
a)	**Zone - 01** Air Qty. = 5500 CFM Static Pressure = 25 mm Wg Fan Speed = not exceeding 1450 rpm Motor = 1.5 kw Fan Dia = To be Confirm by Manufacturer Noise level = not exceed 75 dB at 3 meter distance Fan efficiency = Not less than 60% Tube Axial Fans as described above with H class insulation for motor.	4	Nos.	40995	163980
b)	**Zone - 02** Air Qty. = 6500 CFM Static Pressure = 25 mm Wg Fan Speed = not exceeding 1450 rpm Motor = 1.5 kw Fan Dia = To be Confirm by Manufacturer Noise level = not exceed 75 dB at 3 meter distance	4	Nos.	40995	163980

S.No.	Description	Qty	Unit	Rate	Amount
	Fan efficiency = Not less than 60%				
	Tube Axial Fans as described above with H class insulation for motor.				
	Basement-1				
a)	**Zone - 01**	4	Nos.	40995	163980
	Zone - 01				
	Air Qty. = 5500 CFM				
	Static Pressure = 25 mm Wg				
	Fan Speed = not exceeding 1450 rpm				
	Motor = 1.5 kw				
	Fan Dia = To be Confirm by Manufacturer				
	Noise level = not exceed 75 dB at 3 meter distance				
	Fan efficiency = Not less than 60%				
	Tube Axial Fans as described above with H class insulation for motor.				
b)	**Zone - 02**	4	Nos.	40995	163980
	Air Qty. = 6500 CFM				
	Static Pressure = 25 mm Wg				
	Fan Speed = not exceeding 1450 rpm				
	Motor = 1.5 kw				
	Fan Dia = To be Confirm by Manufacturer				
	Noise level = not exceed 75 dB at 3 meter distance				
	Fan efficiency = Not less than 60%				
	Tube Axial Fans as described above with H class insulation for motor.				
	Pressurization Fans				
3	Supplying, installation, testing and commissioning of Tube Axial flow fan suitable for outdoor application of following capacity with GSS casing and aluminium alloy impellers with high efficiency (efficiency-2) aero-foil sections, blades, the impeller directly driven by TEFC induction motor, suitable for 3 Phase 50 Hz 415 V ± 10 %, 1400 RPM of class 'H' insulation, fire retardent flexible connection etc. complete as required and as per specifications (For Pressurization of lift lobby, lift well, stairwell). TP isolator with MS enclosure box should be Provided.				
a)	**Lift Well Pressurization**				
	Air Qty. = 13500 CFM				
	Static Pressure = 25 mm Wg				
	Fan Speed = not exceeding 1450 rpm				
	Motor = 3.7 kw				
	Fan Dia = To be Confirm by Manufacturer				
	Noise level = not exceed 75 dB at 3 meter distance				
	Fan efficiency = Not less than 60%				
	Tube Axial Fans as described above with H class insulation for motor.	2	Nos.	63501	127002
c)	**Staircase Pressurization**				
	Air Qty. = 17000 CFM				
	Static Pressure = 25 mm Wg				
	Fan Speed = not exceeding 1450 rpm				
	Motor = 5.5 kw				

S.No.	Description	Qty	Unit	Rate	Amount
	Fan Dia = To be Confirm by Manufacturer				
	Noise level = not exceed 75 dB at 3 meter distance				
	Fan efficiency = Not less than 60%				
	Tube Axial Fans as described above with H class insulation for motor.	2	Nos.	75318	150636
d)	**Lift Lobby Pressurization**				
	Air Qty. = 15500 CFM				
	Static Pressure = 25 mm Wg				
	Fan Speed = not exceeding 1450 rpm				
	Motor = 1.5 kw				
	Fan Dia = To be Confirm by Manufacturer				
	Noise level = not exceed 75 dB at 3 meter distance				
	Fan efficiency = Not less than 60%				
	Tube Axial Fans as described above with H class insulation for motor.	2	Nos.	75318	150636
	Axial Flow Fans				
4	Supplying, Installing, Testing and Commissioning of Axial flow fans complete with motor, supporting frame, gravity louvres, weldmesh inlet guard etc. as per drawings and specifications. suitable for 3 Phase 50 Hz 415 V ± 10 %,1400 RPM of class 'F' of insulation				
a)	**Pump Room**				
	Air Qty. = 16000 CFM				
	Static Pressure = 25 mm Wg				
	Fan Speed = not exceeding 1450 rpm				
	Motor = 1.1 kw				
	Fan Dia = To be Confirm by Manufacturer				
	Noise level = not exceed 75 dB at 3 meter distance				
	Fan efficiency = Not less than 60%	2	Nos.	58876	117752
b)	**STP Room**				
	Air Qty. = 4500 CFM				
	Static Pressure = 25 mm Wg				
	Fan Speed = not exceeding 1450 rpm				
	Motor = 1.1 kw				
	Fan Dia = To be Confirm by Manufacturer				
	Noise level = not exceed 75 dB at 3 meter distance				
	Fan efficiency = Not less than 60%	2	Nos.	33804	67608
	Sub head-II (Air Distribution)				
	G.I. Sheet Metal Ducting				
5	Supply, installation, balancing and commissioning of factory fabricated GSS sheet metal rectangular 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.				
	Factry Fabricated (Rectangular)				
a)	Thickness 0.63 mm sheet	1650	Sqm	1191	1965150
b)	Thickness 0.80 mm sheet	1200	Sqm	1382	1658400
c)	Thickness 1.00 mm sheet	650	Sqm	1488	967200
d)	Thickness 1.25 mm sheet	250	Sqm	2013	503250

S.No.	Description	Qty	Unit	Rate	Amount
6	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.				
	Site Fabricated (Rectangular)				
a)	Thickness 0.63 mm sheet	180	Sqm	1213	218340
b)	Thickness 0.80 mm sheet	120	Sqm	1415	169800
c)	Thickness 1.00 mm sheet	70	Sqm	1851	129570
d)	Thickness 1.25 mm sheet	30	Sqm	2063	61890
	Grilles				
7	Supplying, Fixing, installation, testing and commissioning of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers in confirmation to SMACNA/IS and as per specifications complete etc. as required	45	Sqm.	9623	433035
7.1	Supplying, installation, testing and commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc in confirmation to SMACNA/IS and as per specifications complete etc. as required.	12	Sqm.	7580	90960
	Louvers				
8	Supplying & fixing of powder coated extruded aluminium Return Air Grills with louvers but without volume control dampers complete in confirmation to SMACNA/IS and as per specifications complete etc. as required.	15	Sqm.	6285	94275
	Exhaust Shaft Acoustic Treatment				
9	Supplying and fixing of acoustic lining of supply air duct and plenum with 25 mm thick resin bonded glass wool having density of 32 kg/m³, with 25 mm X 25 mm GI section of 1.25 mm thick, at 600 mm centre to 229 DELHI SCHEDULE OF RATES (E&M)-2025 centre covered with Reinforced Plastic tissue paper and 0.5 mm thick perforated aluminium sheet fixed to inside surface of ducts with cadmium plated nuts, bolts, stick pins, CPRX compound in confirmation to SMACNA/IS and as per specifications complete etc. as required.	20	Sqm.	890	17800
	Fire Damper				
10	Supplying, Fixing, testing and commissioning of fire dampers of minimum 90 minutes fire rated in supply air duct/main branch and return air path as and where required of required sizes i/c control wiring, the damper shall be motorized and spring return so as to close the damper in the event of power failure automatically and open the same in case of power being restored. The spring return action shall be inbuilt mechanism and not externally mounted. The damper shall also be closed in the event of fire signal and, in confirmation to IS and as per specifications complete etc. as required..				
a)	Supply air fire damper	15	Sqm.	11355	170325
b)	Return air fire damper	15	Sqm.	11355	170325
c)	Actuator	12	Nos.	10645	127740
	CO Sensor				

S.No.	Description	Qty	Unit	Rate	Amount
11	Providing & fixing of CO Sensors suitable for RS 485/ModBus network communication, complete with display, controllers, wall/duct housing as per specifications & drawings.				
	Range: 0-100 ppm, 24 volt AC/DC, 50 Htz. Operating Temp. range: 0-50 ˚C	12	Nos.	10560	126720
11.1	Providing and fixing control cables from CO Sensors to the exhaust fans panel boards through walls/ceiling with appropriate clamps and fixing arrangements etc. as per specifications and drawings.				
	3 Core- 2.5 mm2	210	Nos.	516	108360
	Sub Head -III (Electrical Works)				
	Electrical Control Panel	-	-	-	
12	Supply, erection, testing & commissioning of cubicle type Panel fabricated (folded joints construction) out of 14 SWG CRCA sheet steel floor mounted totally enclosed extendable on both sides switchboard of uniform width with top and bottom cable entry and suitable for use on 433 V 3 phase 4 wire 50 c/s having 50 KA fault capacity complete and housed with Aluminium bus bar equipments and their accessories including supply and fixing of base channels of 100x50x6mm as required and with following incoming and outgoing switchgear with protection, metering etc. and also compataible to PC/PLC/BMS with communiction port RS-485, complete as required and as per specification and schematic diagram complete as required.				
	All MCCBs shall be rating for 50kA (Ics=Icu). All MCCBs above 63A should be provided with Copper Spreader Terminals				
	Approval shall be taken for each panel before fabrication. Galvanized hardwares with zinc passivation shall be used in fabrication of panels.				
	All MCCBs will have adjustable microprocessor O/L, S/C & inbuilt E/F protections.				
	Set of RYB phase indicating lamps with control MCBs on each outgoing to be provided. Each backed up with 2A MCB.				
	Cable entry suitable from top and bottom				
	Panel shall be intigrated with fire alarm system, in case of fire in particulr zone all fans shloud be start of that zone				
a)	**Sub Panel-1 (Basement- 3)**				
	incomer				
	1 Nos. 80 Amps TPN Pole MCCB (25KA) with M.R. releases for O/C, S/C & E/F releases.				
	Metering & Indication:				
	Multifunction with all function meter with communication port of RS-485 and suitable ratio, CL-1, 10VA CT's with control MCB.				
	Set of Phase indicating lamps. Each backed up with 2 Amps Control MCB.				
	Bus Bars:				
	200A, 4P aluminium, colour coded bus bars suitable for 415V, 50Hz. (after deration)				
	Outgoings				
	8 No. 16 Amps TPN MCB 10 KA outgoing for Basement Ventilation Fan				

S.No.	Description	Qty	Unit	Rate	Amount
	8 No. voltmeter with selector switch with control MCB				
	8 Set of RYB indication lamps				
	8 No. of star delta starter for 2.0 KW motor				
	8 No. single phase preventer (current based)MPRD-2.				
	8 No. Ammeter with C.T.'s				
	2 No. 16Amps TPN MCB 10 KA spare				
	Each star-delta/DOL starter consists of current operated MN type over load relay, contactor, push button, ON/OFF indication light	1	Sets	356313	356313
b)	**Sub Pane-2 (Basement- 2)**				
	incomer				
	1 Nos. 80 Amps TPN Pole MCCB (25KA) with M.R. releases for O/C, S/C & E/F releases.				
	Metering & Indication:				
	Multifunction with all function meter with communication port of RS-485 and suitable ratio, CL-1, 10VA CT's with control MCB.				
	Set of Phase indicating lamps. Each backed up with 2 Amps Control MCB.				
	Bus Bars:				
	200A, 4P aluminium, colour coded bus bars suitable for 415V, 50Hz. (after deration)				
	Outgoings				
	8 No. 16 Amps TPN MCB 10 KA outgoing for Basement Ventilation Fan				
	8 No. voltmeter with selector switch with control MCB				
	8 Set of RYB indication lamps				
	8 No. of star delta starter for 2.0 KW motor				
	8 No. single phase preventer (current based)MPRD-2.				
	8 No. Ammeter with C.T.'s				
	2 No. 16Amps TPN MCB 10 KA spare				
	Each star-delta/DOL starter consists of current operated MN type over load relay, contactor, push button, ON/OFF indication light	1	Sets	356313	356313
c)	**Sub Pane-3 (Basement- 1)**				
	incomer				
	1 Nos. 80 Amps TPN Pole MCCB (25KA) with M.R. releases for O/C, S/C & E/F releases.				
	Metering & Indication:				
	Multifunction with all function meter with communication port of RS-485 and suitable ratio, CL-1, 10VA CT's with control MCB.				
	Set of Phase indicating lamps. Each backed up with 2 Amps Control MCB.				
	Bus Bars:				
	200A, 4P aluminium, colour coded bus bars suitable for 415V, 50Hz. (after deration)				
	Outgoings				
	8 No. 16 Amps TPN MCB 10 KA outgoing for Basement Ventilation Fan				
	8 No. voltmeter with selector switch with control MCB				
	8 Set of RYB indication lamps				
	8 No. of star delta starter for 2.0 KW motor				
	8 No. single phase preventer (current based)MPRD-2.				

S.No.	Description	Qty	Unit	Rate	Amount
	8 No. Ammeter with C.T.'s				
	2 No. 16Amps TPN MCB 10 KA spare				
	Each star-delta/DOL starter consists of current operated MN type over load relay, contactor, push button, ON/OFF indication light	1	Sets	356313	356313
d)	**Sub Panel-4 (Lift well/Lift Lobby/Staircase Pressurization starter panel) at terrace**				
	1 No. 32 Amps TPN MCB 10 KA outgoing for Lift well Pressurization Fans				
	1 No. voltmeter with selector switch with control MCB				
	1 Set of RYB indication lamps				
	1 No. of DOL STARTOR for 3.7 KW motor				
	1 No. single phase preventer (current based)MPRD-2.				
	1 No. Ammeter with C.T.'s				
	Each DOL starter consists of current operated MN type over load relay, contactor, push button, ON/OFF indication light starter panel shall be integrated with fire alarm system	6	Sets	23970	143820
e)	**Sub Panel-5 (Pump Room)**				
	1 No. 16 Amps TPN MCB 10 KA outgoing for Lift well Pressurization Fans				
	1 No. voltmeter with selector switch with control MCB				
	1 Set of RYB indication lamps				
	1 No. of DOL starter for 1.1 KW motor				
	1 No. single phase preventer (current based)MPRD-2.				
	1 No. Ammeter with C.T.'s				
	Each star-delta/DOL starter consists of current operated MN type over load relay, contactor, push button, ON/OFF indication light	2	Sets	23970	47940
f)	**Sub Panel-6 (STP Room)**				
	1 No. 32 Amps TPN MCB 10 KA outgoing for Lift well Pressurization Fans				
	1 No. voltmeter with selector switch with control MCB				
	1 Set of RYB indication lamps				
	1 No. of DOL starter for 3.7 KW motor				
	1 No. single phase preventer (current based)MPRD-2.				
	1 No. Ammeter with C.T.'s				
	Each star-delta/DOL starter consists of current operated MN type over load relay, contactor, push button, ON/OFF indication light	2	Sets	24618	49236
	Cables				
13	Supplying XLPE insulated armoured aluminium / COPPER conductor cables from panel boards to various equipments through walls/ceiling with appropriate clamps and fixing arrangements etc. as per specifications and drawings.				
a)	3 Core-16 mm2	100	Rmt.	498	49800
b)	3 Core-10 mm2	250	Rmt.	463	115750
c)	3 Core-4 mm2 copper cables	120	Rmt.	727	87240
d)	3 Core-2.5 mm2 copper cables	20	Rmt.	516	10320
	Cable Tray				

S.No.	Description	Qty	Unit	Rate	Amount
14	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				
a)	100 mm width X 50 mm depth X 1.6 mm thickness	500	Rmt.	754	377000
b)	225 mm width X 50 mm depth X 1.6 mm thickness	600	Rmt.	991	594600
	Earthing				
15	Providing and fixing 25 mm x 5 mm G.I. strip on surface or in recess for earth connection etc. complete as required.	50	Rmt.	287	14350
16	Providing & fixing 6 SWG dia G.I. Wire on surface or recess for loop earthing as required.	35	Rmt.	84	2940
	Total amount				**217794709**

Estimated Cost of Civil Work : Rs.77,14,79,987/-
Estimated Cost of Electrical Work : Rs.21,77,94,709/-
Total Estimated Cost : Rs.98,92,74,696/-

Note: The agency shall strictly submit the financial bid (percentage above/below) only in the separate BoQ file provided in .xls format comprising Schedule of Quantity of Part-A (Civil Work) & Part-B (E&M Works). Submission of any financial/price information in the technical bid or along with the technical documents is strictly prohibited. If any agency fails to comply with this requirement or submits the price bid in any form with the technical bid, their bid shall be summarily rejected without any further consideration.