

TENDER DOCUMENT

Name Of Work: Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.

NIT No: - 40/Civil/D2/2019-20/01

- Note-1:-** The intending bidder must read the terms and conditions carefully. He should submit his bid only if he considers himself eligible and he is in possession of all the documents as required.
- Note-2:-** The intending bidder must upload all the documents as detailed in **Para 25 on pages- 10 & 11** of this document.
- Note-3:-** Applicants are advised to keep visiting www.iitk.ac.in/iwd/tenderhall.htm, <https://eprocure.gov.in/eprocure/app> & www.tenderhome.com, from time to time (till the deadline for bid submission) for any updates in respect of the tender documents, if any. Failure to do so shall not absolve the applicant of his liabilities to submit the applications complete in all respect including updates thereof, if any. An incomplete application may be liable for rejection.
- Note-4:-** The EMD shall be prepared in favour of **The Director, IIT Kanpur payable at Kanpur** as detailed in the tender document. A part of EMD is acceptable in the form of bank guarantee as per the details in the tender document. This bank guarantee shall also be in favour of **The Director, IIT Kanpur**.
- Note-5:-** **The defect liability period is 36 months** from the date of handing over the completed building to the engineer in charge except for the items specifically mentioned in this tender document. Other related details are elaborated in the tender document.
- Note-6:-** Pre-bid meeting shall be held on **13/02/2020 at 11:00 AM** as detailed in this document
- Note-7:-** The construction work is to be carried out at IIT Kanpur campus.

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This NIT amounting to Rs. 41,22,71,432/-contains 426 pages numbered from 01 to 425

Executive Engineer (Elect.) Executive Engineer (AC) Executive Engineer (Civil)

Approved

Acting Superintending Engineer

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR
INSTITUTE WORKS DEPARTMENT
CENTRAL OFFICE
Notice Inviting e-Tender - 40/Civil/D2/2019-20/01**

**Section-A
Technical Bid
(Eligibility bid)**

Name of Work: Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.

**INDIAN INSTITUTE OF TECHNOLOGY,
KANPUR INSTITUTE WORKS DEPARTMENT**

INVITATION FOR BID

The **Superintending Engineer, IWD, IIT Kanpur** on behalf of Board of Governors of IIT Kanpur invites online percentage rate open bids on **Engineering, Procurement and Construction (EPC) Contract basis** from eligible firms/contractors of repute in two bid system (Eligibility cum Technical bid & Financial Bid) for the following work:-

Sl. No.	NIT No.	Name of work & Location	Estimated cost put to bid	Earnest Money	Period of completion	Pre-Bid meeting	Last date & time of technical & financial bid for online submission	Last date & time for submitting hardcopy of EMD and other documents as specified in the bid documents	Time and date of opening of Technical bid
01	40/Civil/D2/2019-20/01	Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side)& BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.	Rs.41,22,71,432 i/c Civil works : 32,88,39,659/- Electrical works: 5,66,81,773/- HVAC works: 2,67,50,000/-	Rs.51,23,000/-	24 Months	11:00 A.M. on 13/02/2020	Upto 5:00 P.M. on 28/02/2020	Upto 3:00 P.M. on 03/03/2020	At 03:30 P.M. on 03/03/2020

Note: Prior to submitting the tender, the contractor should read the tender documents.

1. The bidder should carefully read the mile stone (Appendix-II) and conditions.
2. Contractors who fulfill the following requirements shall be eligible to apply. **Joint ventures are not accepted.**

(i) Should have satisfactorily completed the works as mentioned below during the last Seven years ending previous day of last date of submission of bids.

Three similar work each costing not less than **Rs. 1649.08 lacs**

Or

Two similar work each costing not less than **Rs. 2473.63 lacs**

Or

One similar work costing not less than **Rs. 3298.17 Lacs**

Or

Similar work mean “Construction of building in RCC framed structure having minimum one building of five storied (G + 4) or completing balance construction work of one building (including structural work) minimum up to five storey including Internal water supply, Sanitary installation, Internal Electrical installations all executed under one agreement. The five storied building should have firefighting system or lift or Fire alarm system or HVAC executed under the said agreement”

Note-1: - Basement/Stilt, if any will be considered as storey. In case, if any RCC framed structure is having basement and stilt both, it will be considered two story. The Machine Room and Mumty will not be considered as Storey.

Note-2:- One building of the specified storeys, as mentioned in the definition of similar work constructed in each work should have been executed.

Note-3: - The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to the previous day of last date of submission of tenders. This calculation shall be based on the completed days basis, (example If a work is completed on 30.12.2017, and the last date of submission of tenders is 31/03/2019, then the enhancement shall be for 1 years and 90 days (1 year + 1 day of Dec + 31 days of Jan + 28 days of Feb + 30 days of March) and the applicable percentage enhancement shall be (7% + 7% x 90/365).

- (ii) Should have had average annual financial turnover of **Rs 2061.35 lacs** on construction works during the last three years ending 31st March 2019.
 - (iii) Should not have incurred any loss (Profit after tax should be positive) in more than two years during the last five years ending 31st March, 2019
 - (iv) Should have net worth certificate of minimum **Rs. 618.40 lacs** issued by a certified Chartered Accountant.
 - (v) Should have a solvency of **Rs. 1649.08 lacs.**
 - (vi) Should have the calculated bidding capacity equal to or more than the estimated cost of the work.
 - (vii) The bidder should not have been barred/black listed by the central/State Government, or any entity controlled by it, from participating in any tender, and the bar subsists as on the Bid Due Date, would not be eligible to submit the bid.
3. The intending bidder must read the terms and conditions carefully. He should submit his bid only if he considers himself eligible and he is in possession of all the documents required.
 4. Information and Instructions for bidders posted on website shall form part of bid document.

5. The bid document consisting of Technical (eligibility) & the Financial bid i/c 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 contractor whose bid may be accepted and other necessary documents can be seen in the office of the Engineer-in-Charge between hours of 11:00 AM and 4:00 PM **from date of publicity of tender to date of submission of tender every day** except on Saturday & Sunday and public holidays or can be seen on website www.iitk.ac.in/iwd/tenderhall.htm, <https://eprocure.gov.in/eprocure/app> & www.tenderhome.com

Applicant has to deposit earnest money of Rs. **51,23,000.00** in the form of receipt/ Treasury Challan or Demand Draft or Pay order or Banker's Cheque or Deposit at Call **Receipt or Fixed Deposit Receipt (drawn in favour of Director IIT Kanpur)** along with tender document.

Earnest Money in the form of Treasury Challan or Demand Draft or Pay order or Banker's Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of "Director IIT Kanpur") shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The original EMD should be deposited in the office of Superintending Engineer along with PQ documents in separate envelop mentioning "EMD for the work" on specified date and time.

A part of earnest money (EM) is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any scheduled bank having validity for six months or more from the last date of receipt of bids which also is to be scanned and uploaded by the intending bidders.

Copy of certificate of work experience and other documents as specified in the technical bid/eligibility bid document shall be scanned and uploaded to the e-Tendering website www.iitk.ac.in/iwd/tenderhall.htm, <https://eprocure.gov.in/eprocure/app> & www.tenderhome.com within the period of bid submission. **However, copy (original/self-certified as mentioned in para 25) of all the scanned and uploaded documents as specified in bid document shall have to be submitted by the all bidders on specified date and time physically in the office of tender opening authority.**

Online technical bid documents submitted by intending bidders shall be opened only of those bidders whose original EMD deposited and other documents scanned and uploaded are found in order.

Online financial bid document submitted by the bidders shall be opened only of those bidders who on the basis of pre-qualification documents uploaded by them within the period of bid submission, qualify in accordance with the provision of technical bid. The financial bid shall be opened at the notified time, date & place in presence of qualified bidders or their representative

6. 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.
7. The intending bidder must have valid class-III **digital signature** to submit the bid.
8. On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
9. Contractor can upload the documents in the form of **JPG** format and **PDF** format.
10. **Certificate of Financial Turn Over** At the time of submission of bid, contractor has to upload Affidavit/Certificate from **CA** mentioning Financial Turnover on construction work of last 5 years as specified in the bid document and further details if required may be asked from the contractor after opening of technical bids containing pre-qualification documents. The balance

sheet in case of Private/Public limited company shall include its standalone finance statement and consolidated financial statement both. There is no need to upload entire voluminous balance sheet. (See form A)

11. **If a tenderer does not quote any percentage above/below on the total amount of the tender or any section/sub head in the percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.**
12. The **Technical bid** shall be **opened first** on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the technical bid shall be communicated to them at a later date.
13. **Pre Bid meeting** shall be held in the office of the Superintending Engineer IWD, IIT Kanpur at 11:00 AM, on 13/02/2020 to clear the doubt of intending bidders/associates, if any. **The bidders may attend the meeting along with probable associates. Bidders are advised to send their queries/ doubts by email to the executive engineer on email id tarung@iitk.ac.in at least one day prior to the pre-bid meeting. A bidder can send multiple mails with different queries/doubts in each mail.** The bidder may also raise query on the date of prebid meeting. If found necessary, an addendum/corrigendum to the tender document and /or minutes of meeting shall be issued and same shall be uploaded on the website and no further queries after pre-bid meeting shall be entertained. Such addendum/corrigendum shall become part of tender.
14. The department reserves the right to reject any prospective application without assigning any reason and to restrict the list of qualified contractors to any number deemed suitable by it, if too many bids are received satisfying the laid down criterion.
15. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
16. The rates for all items of work, shall unless clearly specified otherwise, include cost of all operations and all inputs of labour, material, T&P, scaffolding at all heights irrespective of any location, wastages, watch and ward, other inputs, all incidental charges, all taxes, cess, duties, levies, etc. required for execution of the work. GST shall be paid extra along with the bills at prevailing rates.
17. Copy of certificate of work experience and other documents as specified in the technical bid/eligibility bid document shall be scanned and uploaded to the e-Tendering website within the period of bid submission. However, copy (original/self-certified as mentioned in **para 25** below) of all the scanned and uploaded documents as specified in bid document shall have to be submitted by the all bidders within specified date, physically in the office of tender opening authority.
18. Online technical bid documents submitted by intending bidders shall be opened only of those bidders who have deposited Earnest Money.
Online financial bid document submitted by the bidders shall be opened only of those bidders who on the basis of pre-qualification documents uploaded by them within the period of bid submission, qualify in accordance with the provision of technical bid. The financial bid shall be opened at the notified time, date & place in presence of qualified bidders or their representative.
19. The bid submitted shall become invalid:
 - (i) The bidder is found ineligible.
 - (ii) **The bidder does not deposit original EMD along with other bid documents in the office of Superintending Engineer, IWD, IIT Kanpur.**
 - (iii) The bidder does not upload all the documents (including GST registration) as stipulated in the bid document including the copy of receipt for deposition of original EMD.
 - (iv) 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 bidder in the office of bid opening authority.
 - (v) If a bidder quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section/sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

20. Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra cost 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 bidders 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.
21. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.
22. The contractor shall not be permitted to bid for works in the IWD, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any officer in the Institute Works Department of IIT Kanpur.
23. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.
24. The contractor has to insure the all provisions during execution of work for **3 Star GRIHA rating**. Nothing extra shall be payable on this account.
25. List of Documents to be filled in by the bidders in various forms as indicated in Section III, and other documents to be scanned and uploaded within the period of bid submission and deposited in hard copy:

1.	Treasury challan /Demand draft/Pay order or Banker's Cheque/ Deposit at Call Receipt/Fixed Deposit Receipt of a Scheduled Bank/ Bank Guarantee of any Scheduled Bank against EMD.
2	Letter of transmittal.
3	Financial information (Form 'A').
4	Bank Solvency Certificate from a Scheduled Bank. (Form 'B').
5	Networth certificate of minimum Rs. 1090 lacs issued by a certified Chartered Accountant. (Form 'B1').
6	Details of eligible similar nature of works completed during the last seven years ending previous day of last date of submission of tenders (Form 'C').
7	Details of eligible similar nature of ongoing works (Form 'C1').

8	Performance report of works in Form-“D” for the work referred in form C above
9	Performance report of works in Form-“D1” for the work referred in form C1 above
10	Structure & Organization (Form ‘E’).
11	Details of works in progress or works awarded as on the last date of submission of tenders (Form ‘F’).
12	Affidavit (Form-‘G’)
13	<p>Certificate of Registration for GST (Form ‘H’).</p> <p>or</p> <p>If the agency is not registered with the GST authorities in the state of U.P, then he shall submit and upload a undertaking that:-</p> <p><i>“If the work is awarded to me, I/we shall obtain GST registration certificate of the state of U.P within one month from the date of receipt of award letter or before release of any payment to me by IIT Kanpur. I shall be responsible for any delay in obtaining this GST registration” (Form H)</i></p>
14	Permanent Account Number (PAN) as issued by the Income Tax Department.
15	Copy of Registration of the Concern Department
16	Copy of EPF & ESIC registration

SECTION I

SCOPE and BRIEF PARTICULARS OF THE WORK:

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

Sl No.	Name of Work	Estimated Cost	Earnest money	Period
1	Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.	Rs. 41,22,71,432 Civil works : 32,88,39,659/- Electrical works: 5,66,81,773/- HVAC works: 2,67,50,000/-	51,23,000/-	24 Months

2. The work is situated inside IIT Kanpur Campus, Kalyanpur, Kanpur (UP) Pin: 208016.

3. **General features and scope of the work is as under:**

The scope of the work will be as per section-1, part-B and part-C. In case of any conflict between these components, higher scope of work shall prevail. The decision of the engineer-in-charge shall be final and binding on the contractor.

The proposed building is of (G+5) RCC frame which includes execution of work including foundation, structure & finishing complete in all respect and services and handing over the assets after making them fully functional including maintaining the assets for Three years in all aspects. The work is to be executed on EPC (Turn key) basis. The cost of labour, material, tools and plants and machinery required for execution of the whole project as per approved layout plan and detailed architectural, structural, plumbing, firefighting, Electrical and HVAC, drawings are within the scope of this work. It has Brick work / AAC block on the external, and in the internal walls of the building. It is decided to construct the complete RCC frame.

The external faces of the complete building i.e all the elevations shall be completed/finished (i.e. texture paint, terra-cotta tile cladding, terra-cotta louvers, jaali bricks, exposed bricks in pattern & jaali, exposed concrete (in ceiling & walls) wall over stair case block, spider glazing, Structural Glazing, glass railing in balconies, space frame etc.) upto roof/mumty level (i.e entire building) as per the drawing and as per the tender condition including terrace, mumty. The internal plaster on the external wall shall be completed for the complete building upto the terrace level. The terrace shall be completed with water proofing and heat resistant tiles as per drawings. The balcony railing, balcony flooring and balcony external wall finishing, shall be completed in all floors. The planters, pathway, space frame, atrium, porch etc. shall be completed.

Areas are as under:

S.No.	Floor	Plinth Area (sq.m.)	Facilities
1	Ground Floor (Level 1)	1344	Officers rooms-4nos, Office spaces – 3nos, Record room-1no, AHU room – 2nos, Electrical Room- 1no, Waiting lounge- 2nos, Hall having 10 nos. cubical with soft partition upto height 1.35 m , Double height Atrium cum reception, UPS/ Server/Hub room- 1no, Lift lobby, Central lobby, stair case 1.50 m wide – 2 nos, stair case 1.80 m wide- 1 no, Passenger lifts – 2 nos, Electrical shafts, AC shafts, Service shafts, Common Toilets for females – 4 nos, Common Toilets for males – 3 nos, PwD's toilet- 1 no, Pantry – 2 nos, Janitor - 1no. , Water cooler room with drinking arrangement – 3 nos, Connecting corridors at different levels, Porch (103 sqm), stilt (157 sqm).
2	First Floor (Level 2)	1253	Officers rooms-9nos, Office spaces – 3nos, meeting room-1no., Record room- 2nos,Old record room 1no, AHU room – 2nos, Electrical Room- 1no, Waiting lounge- 2nos, Double height Atrium, UPS/ Server/Hub room- 1no ,Lift lobby, Central lobby, stair case 1.50 m wide – 2 nos, stair case 1.80 m wide- 1 no, Passenger lifts – 2 nos, Electrical shafts, AC shafts, Service shafts, Common Toilets for females – 4 nos, Common Toilets for males – 3 nos, PwD's toilet- 1 no, Pantry – 2 nos, Janitor -1no. ,Water cooler room with drinking arrangement – 3 nos , Connecting corridors at different levels.
3	Second Floor (Level 3)	1555	Officers rooms-6nos, Office spaces – 10nos, Record room-2nos, AHU room – 2nos, Electrical Room- 1no, Waiting lounge- 2nos, Control room -1no, Break out spaces-2nos, Double height Atrium, UPS/ Server/Hub room- 1no ,Lift lobby, Central lobby, stair case 1.50 m wide – 2 nos, stair case 1.80 m wide- 1 no, Passenger lifts – 2 nos, Electrical shafts, AC shafts, Service shafts, Common Toilets for females – 4 nos, Common Toilets for males – 3 nos, PwD's toilet- 1 no, Pantry – 2 nos, Janitor -1no. ,Water cooler room with drinking arrangement – 3 nos , Connecting corridors at different levels, Balcony 1.50 m wide.
4	Third Floor (Level 4)	1555	Officers rooms-9nos, Office spaces – 8nos, Record room-2nos, AHU room – 2nos, Electrical Room- 1no, Waiting lounge- 1no, Conference / meeting room -1no, Class room(capacity 50nos)- 1no, Student weighting area - 1no.,Registration area- 2nos, Store -1no, Double height Atrium, UPS/ Server/Hub room- 2nos ,Lift lobby, Central lobby, stair case 1.50 m wide – 2 nos, stair case 1.80 m wide- 1 no, Passenger lifts – 2 nos, Electrical shafts, AC shafts, Service shafts, Common Toilets for females – 4 nos, Common Toilets for males – 3 nos, PwD's toilet- 1 no, Pantry – 2 nos, Janitor -1no. , Water cooler room with drinking arrangement – 3 nos, Connecting corridors at different levels, Balcony 1.50 m wide.

5	Fourth Floor (Level 5)	1555	Officers rooms-10nos, Office spaces – 6nos, Record room-3nos, AHU room – 2nos, Electrical Room- 1no, Waiting lounge- 2no, Store -1no, Big Hall- 1no, Small Hall -2nos, video conference room -1no, Double height Atrium, UPS/ Server/Hub room- 1no ,Lift lobby, Central lobby, stair case 1.50 m wide – 2 nos, stair case 1.80 m wide- 1 no, Passenger lifts – 2 nos, Electrical shafts, AC shafts, Service shafts, Common Toilets for females – 4 nos, Common Toilets for males – 3 nos, PwD’s toilet- 1 no, Pantry – 2 nos, Janitor - 1no. , Water cooler room with drinking arrangement – 3 nos , Connecting corridors at different levels, Balcony 1.50 m wide.
6	Fifth Floor (Level 6)	1538	Director room with toilet-1no, Dy. Director room with toilet - 1no Waiting area – 3 nos, Meeting room (20 persons) – 2nos, Officers rooms – 4 nos, Meeting room (15 persons) – 1no, Board room (50 persons) – 1no, Office spaces – 3nos, Reception area – 2 nos, Double height Atrium, UPS/ Server/Hub room- 1no ,Lift lobby, Central lobby, stair case 1.50 m wide – 2 nos, stair case 1.80 m wide- 1 no, Passenger lifts – 2 nos, Electrical shafts, AC shafts, Service shafts, Common Toilets for females – 3 nos, Common Toilets for males – 3 nos, PwD’s toilet- 1 no, Pantry – 2 nos, Janitor - 1no. , Water cooler room with drinking arrangement – 1 no, Connecting corridors, Balcony 1.50 m wide.
7	Terrace	----	Machine room, UPS room, Store, Pump room, Overhead tanks with supporting structure – fire and domestic, flushing water tank, service shafts covered at roof level, Pedestal for solar system to be raised up to 500 mm above terrace.
	Total	8800	

The mumty, Lift machine room & RCC overhead water tank will not be counted as story. It shall not be considered for plinth area calculation.

- a) Only 50% of the area of the verandahs & porch has been considered in plinth area calculation irrespective of top being protected or not protected above.
- b) Plinth area does not include shafts open to sky above 2 sq.m. area. However, the shafts/ lift wells covered at top shall be counted at one floor level only.

The work should be executed as per drawing, schedule of finishes, schedule of hardware, latest CPWD Specifications, relevant IS codes of latest edition and other standard specifications except otherwise mentioned in bidding document.

This document is to be read in conjunction with other documents issued by the Institute along with tender. In case of any discrepancy between design drawings and CPWD conditions, the decision of Engineer-in-Charge shall be followed. The Contractor shall refer the drawings while bidding and will read them in conjunction with specifications/ schedules, etc.

The work shall be strictly carried out in accordance with the specifications. The equipment & material supplied at site will also be selected out of the list of approved makes. The contractor shall submit technical documentation for the shortlisted make of material/ equipment, as well as prepare shop drawings for various items/ works, as required for proper execution, whether the same have been indicated in drawings or not. Actual execution shall be based on shop drawings &

documents approved from Institute representative. Nothing extra shall be payable on account of items required to be executed as per approved shop drawing.

The contractor shall be required to demonstrate satisfactory operation of entire system (including equipment's supplied by Client and installed by contractor) and furnish required labour, material & tools to install & commission the system/s.

Contractor shall also be required to undertake the following, for which nothing extra shall be payable:

- Liaisoning and obtaining approval from Local Authorities prior & post installation for operation of equipments (lifts, panels, solar systems, fire systems, etc.)
- Commissioning of the plant including test reports to demonstrate satisfactory working prior to handing over.
- Provide as-built drawings and handing over document comprising of list of recommended spares, catalogues and service schedule for each equipment/material
- Training of Client's staff
- The executed work shall strictly confirm to applicable laws, regulations and Indian Standards which become applicable. In case the specifications and drawings contained in this document call for higher standard than those required by prevailing regulations, then these specifications & drawings shall become applicable. However, in case of any conflict or violation between the document/drawings and prevailing laws, then the applicable laws & regulations shall be governing & binding

Following shall be the procedure followed by contractor while preparation of shop drawings:

- The contractor shall refer the design drawings for understanding the scope and proposed routes to be followed during execution.
- Collect latest architectural backgrounds from the Client representative.
- Examine all related works/ services drawings but not limited to structural, finishes, plumbing, electrical, HVAC and others including as-built works before starting the work. Any discrepancy must be reported to the Client's site representative in writing and obtain approval for go-ahead.
- Within one week of award of work, the Contractor shall prepare a list of shop drawing along with submission schedule for approval of Institute representative. The list of drawings must include layouts for all steel work, aluminium work, structural glazing, glass railing, space frame, electrical panel rooms, lighting, power, cable, cable tray layouts, earthing, lightning protection, SLD, lifts, typical drawings showing exact location of supports, bends, tee connections, reducers, detailed drawings showing exact location and type of supports, fittings etc; electrical panels inside/outside views, power and control wiring schematics, cable trays, supports and terminations.

Maximum headroom shall be maintained at all points and in case the same is inadequate, then written approval from Institute representative must be obtained prior to execution at site.

Ceramic/ Vitrified, stone/ tile dado and panelling, shall be executed at site by the Contractor in symmetrical pattern as far as possible.

These shop drawings shall depict information required to complete the Project as per specifications and as required by the Institute representative. These shop drawings shall contain details of construction, size, arrangement, operating clearances, performance characteristics and capacity of all items of equipment, also the details of all related items of work by other contractors. Each shop drawing shall contain tabulation of all items of equipment/materials/works.

- The contractor shall thereafter furnish six sets of detailed shop drawings to Institute representative for obtaining comments/approval. The Contractor will make unlimited number of re-submissions of shop drawings unless Institute representative approval is obtained.
- The Contractor will thereafter submit six sets of final shop drawings to the Institute representative for their exclusive use and all other agencies.
- No material or equipment may be delivered or installed at the job site until the contractor has in his possession, the approved shop drawing for the particular material/ equipment/ installation.
- In case installation is carried out without following above process or obtaining a waiver to follow the procedure from Institute representative, the work shall be rejected, and contractor shall rectify the same at their own cost.

Approval of shop drawings shall not be considered as a guarantee of measurements or of building dimensions. Where drawings are approved, said approval does not mean that the drawings supersede the contract requirements, nor does it in any way relieve the contractor of the responsibility or requirement to furnish material and perform work as required by the contract.

The contractor prior to supplying material at site, will submit the following documentation to Consultant/ Client representative for approval:

- Manufacturers' drawings, catalogues, pamphlets and other documents in triplicate. Each item shall be properly labelled, indicating the specific services/ works for which material or equipment is to be used, giving reference to the governing section and clause number and clearly identifying in ink the items and the operating characteristics. Data of general nature shall not be accepted
- Samples of all materials shall be submitted to the Institute representative prior to procurement. These will be submitted in two sets for approval and retention by Client's representative and shall be kept in their site office for reference and verification till the completion of the Project. Wherever directed, a mock-up or sample installation shall be carried out for approval before proceeding for further installation.

The contractor to ensure that all materials and equipment supplied shall be new and of best available quality conforming to the relevant Indian Standard Specifications and to these specifications. Makes shall be strictly in conformity with list of approved manufacturers/ vendors as provided herein. The Institute reserves the right to reject any item which in their assessment is second hand or of inferior quality/ make.

Electrical works:

- The scope of Electrical, Mechanical Services & Lifts have been provided in **Part 'Volume-II** of NIT documents.
- Work shall be executed according to General Conditions of Contract 2014 with its upto date amendments for Central P.W.D. Works with modifications as per this document. The General Conditions of Contract for Central Public Works Department is also available on website www.cpwd.gov.in. THE GCC 2014 with its upto date amendments shall be the part of the Contract Agreement.

The other brief of activities to be performed by the contractor:

- a. Construction of an underground water tank defined as per drawing of capacity 150 cum, duly partitioned. Construction of an underground pump room to house the fire fighting pumps, pressure vessels, water pumps etc, all complete. If the clear distance between the edge of the pump house and the edge of the building.
- b. Necessary sleeves shall be provided in the underground water tank for the inlet pipe.
- c. Providing minimum 2 mtr high barricade as per item **No 16.81 of DSR 2016** all around the construction and contractor's working site. Only upto two gates of suitable size and 2 mtr height shall be provided for entry and for exit.
- d. Providing green hessian cloth upto 1.5 mtr height above the 2 mtr high barricade, till the completion of the work.
- e. Proper wheel wash arrangement shall be provided and its effectiveness shall be ensured during the currency of the construction work.

4. Other Scope of the work as per this tender:-

- a. The minimum requirement for the work is attached as drawings, special specifications, tender details, finishing schedule, soil investigation report, etc. The work is to be executed on ENGINEERING, PROCUREMENT AND CONSTRUCTION (EPC) basis. The scope of work includes further development of architectural design, structural design, masonry design, Plumbing & Water Supply design, drainage design, IEI design, HVAC design, lift pressurisation, Fire Fighting System design, Lifts, Fire Alarm System design, PA system design, LT panels design, IBMS design. For complete detail, the respective sub-head may be referred.
- b. The execution will be done on the basis of working drawings and further details to be further developed by the sub-consultant(s) appointed by the contractor and such drawing shall be got approved from the engineer-in-charge. In case the design prepared by the sub-consultant based on the various codes and engineering practices, indicates that the tender drawing/design/detail is extra-safe, no reduction in the detailed parameters of the tender drawing/design/detail shall be permitted. However, in case the design and working drawings developed by the sub-consultant indicates that the existing tender drawing/design/detail is unsafe/inadequate/insufficient and needs to be modified, the same shall have to be done by the contractor within the scope of this work and at no extra cost to the engineer-in-charge. All the working drawings and schemes shall be got approved from the engineer-in-charge based on the CPWD Specifications, relevant IS codes, National Building Code 2016 and other standard specifications suitable for a research lab and also suitable for an academic building. The latest technology will be followed in general except otherwise mentioned in bidding document.
- c. The design and working drawing shall comply with all the relevant IS codes, the NBC, MoRTH specifications, CPWD specifications, specification for differently abled persons, etc

to make the services safe and functional. In case, IS codes, the NBC, MoRTH specifications, CPWD specifications etc is not available, the international codes, good engineering practices and the direction of the engineer-in-charge shall be followed. The working drawings shall also include the working architectural drawings for the provision of differently abled toilets, double railing differently abled persons, even if such detail has not been shown in the architectural drawing. Necessary design shall be done by the contractor and got approved by the engineer-in-charge. Any other detail not shown in the drawing but is functionally required as per various IS/NBC/GRIHA, differently abled norms etc shall also be provided by the contractor.

- d. The working drawings shall be approved by the engineer-in-charge or his authorised representative after satisfying himself that the various codes have been followed and also that the working drawings comply to sound engineering practices. It shall also be ensured by the contractor that the tender drawings which indicate the minimum requirement of the work has definitely been followed and the design has not been lowered.

- e. The contractor shall submit the shop drawings of various components for approval of the engineer-in-charge.
- f. The contractor has to design the various components i.e keeping in view the complete requirement of the building as per the attached architectural drawings and the details mentioned in the tender documents.
- g. Building Information Modelling (BIM) for Integration and Coordination of all services like plumbing, sanitary, Internal Electrical installations, Fire Fighting and Fire alarm, Low side of HVAC, LV services shall be done by the agency.

h. Demolishing the existing structure

There is existing boundary wall having brick work and MS grill in super structure around 120 m in length and 2 m height which need to be demolished. The dismantling shall be including disposal of unserviceable material and taking away the serviceable material outside the IIT Kanpur campus complete as per the direction of Engineer-in-charge. During dismantling all safety precautions as per CPWD specifications shall be followed. All the materials obtained from dismantling / demolishing of the structure shall be the property of the contractor and shall be at his disposal. It will be the responsibility of the contractor to clear the site after demolition so as to make it fit for the new work proposed as per drawings.

- i. Construction of the building, in compliance and as per the approved working drawings, tender conditions, CPWD specifications, NBC 2016, MoRTH, GRIHA, differently abled norms, sound engineering practices, safety norms, etc, all complete to make the building operational. The operational shall also include w.r.t functionality, safety, comfort, aesthetics, all complete.
- j. Tactile upto 25 sqm area, wherever required by the engineer-in-charge shall be provided by the contractor and the same is within the scope of this work.

k. The Agency is required to complete the project on Engineering, Procurement & Construction (EPC) basis. The scope of work is to be carried out complete in all respect including services and rates quoted by the Agency shall be considered for entire scope of work which includes all activities/work starting from the given concept to completion and till handing over of completed project in habitable state from all perspective. All these shall be considered as integral part of Scope of work and deemed to be included in the quoted price of the agency. The As-Built drawings and all input related to site and various compliance shall be provided by the contractor for obtaining statutory approval and certificates. The contractor shall also extend full support to IWD in getting "Occupation and Completion" or any other document required to declare all assets eligible for bringing it in use.

l. It shall be deemed that the Agency has satisfied himself with the nature and location of the work, general and all local conditions. IWD shall bear no responsibility for the lack of such knowledge and also the consequences thereof to the Agency. It is understood that the Agency has satisfied himself for all possible contingencies, situations, bottlenecks and acts of coordination which may be required for the work.

m. The agency shall cooperate and coordinate with other agency(s) as per directions of Engineer-in-charge.

n. The Site shall be handed over to the Agency on "As & Where It is" basis. It is contractor's responsibility for demolition or disposal of existing structure falling on the footprint of the proposed building, and removal of any existing underground services consisting of water supply and sewer passing through the site etc. if any, at no extra cost and in no extra time period.

If any power supply line and / or telephone line is encountered during excavation, the same shall be removed/shifted by the engineer-in-charge within one month of noticing such services. No extra time shall be admissible to the contractor for such shifting of the services by the engineer-in-charge.

o. Work shall be executed according to General Conditions of Contract for Central P.W.D. Works with correction slips issued upto as specified in schedule F.

- p. Building Information Modeling (BIM) for Integration and Coordination of all structural member sizes, services like plumbing, sanitary, Internal Electrical installations, Fire Fighting and Fire alarm, Low side of HVAC, LV services, etc shall be done by the agency. The same shall be submitted to the engineer-in-charge for approval.
- q. Scope of work also includes training the 30% workers of the site as per SKILLED INDIA program under National Skill Development Corporation (NSDC) Norms & Conditions.
- r. The Agency shall hand over the assets after completion of work with as built drawings, services route plans, Maintenance manuals, Warranties / Guarantees or any other document required by the Engineer-in-charge for maintaining these establishments.
- s. The scope of work also covers related allied works on Engineering, Procurement and Construction (EPC) basis within Architectural and Structural parameters.
- (i) Internal and External Plumbing & Sanitary installations.
 - (ii) Site development including Pathways, External Water Supply, Sewerage, Storm Water Drainage System, Rain Water Harvesting, water bodies.
 - (iii) A separate under Ground Sump of 150 cum capacity, partitioned in three equal parts. An under ground pump room as per CPWD specifications to house domestic pumps and to house the fire fighting pumps.
- t. Misc. activities to be performed by the contractor
- Erecting one site office of 30 Sqm with inbuilt "folded drawing"/file storage space, drawing display provision and writing desk. The space should also be capable of being used for meetings and mini conference at site for use of the Engineer-in-charge for 15 person's meeting/conference.
 - One licensed latest version of Software – "PRIMAVERA", to be provided by the Contractor to the Engineer-in-charge, along with organizing training regarding use of above mentioned Software for Site Engineers & IWD Engineers.
- u. Work not included in scope of work:-**
- Plantation of grass/trees etc.
 - Chairs, tables, curtain, if any shown in the drawings.

SECTION II

INFORMATION & INSTRUCTIONS FOR BIDDERS

1.0 General:

- 1.1 The Indian Institute of Technology, Kanpur, is an institution of premier repute, decided to construct “**Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.**”
- 1.2 It is very prestigious and a time bound project being monitored by the highest authority.
Important Note: The construction conditions and milestones have been specifically drafted to complete the project in time.
- 1.3 Letter of transmittal and forms for deciding eligibility are given in Section III.
- 1.4 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 telex and those received late will not be entertained.
- 1.5 The bid should be type- written. The bidder should sign each page of the application.
- 1.6 Over writing should be avoided. Correction, if any, should be made by neatly crossing out, initialing, dating and rewriting. Pages of the eligibility criteria document are numbered. Additional sheets, if any added by the contractor, should also be numbered by him. They should be submitted as a package with signed letter of transmittal.
- 1.7 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.
- 1.8 The bidder may furnish any relevant 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.

2.0 Definitions:

- 2.1 In this document the following words and expressions have the meaning hereby assigned to them.
- 2.2 **Employer:** Means the Board of Governors, acting through the **Superintending Engineer, IWD, IIT Kanpur.**
- 2.3 **Bidder and/or Contractor:** Means the individual, proprietary firm, firm in partnership, limited company private or public or corporation.
- 2.4 “**Year**” means “Financial Year” unless specifically stated otherwise.

3.0 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 later case a certified copy of the power of attorney should accompany the application. In both cases a certified copy of the partnership deed and current address of all the partners of the firm should accompany the application.

- 3.4 If the bidder is a limited company or a corporation, the application shall be signed by a duly authorized person holding power of attorney for signing the application accompanied by a copy of the power of attorney. The bidder should also furnish a copy of the Memorandum of Articles of Association duly attested by a Public Notary.

4.0 **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.

5.0 **Particulars provisional**

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

6.0 **Site visit**

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

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

7.0 **Initial criteria for eligibility:**

- 7.1 The Bidder should have satisfactorily completed works as mentioned below, during the last Seven years ending previous day of last date of submission of tenders. For this purpose cost of work shall mean gross value of 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. In case of works executed for private organizations, the certificate shall be signed by the chief consultant and countersigned by the owner of the project.

A. Three similar works each costing not less than Rs. 1649.08 lacs

Or

Two similar works each costing not less than Rs. 2473.63 lacs

Or

One similar work costing not less than Rs. 3298.17 lacs

Similar work mean “**Construction of building in RCC framed structure having minimum one building of five storied (G + 4) or completing balance construction work of one building (including structural work) minimum up to five storey including Internal water supply, Sanitary installation, Internal Electrical installations all executed under one agreement. The five storied building should have firefighting system or lift or Fire alarm system or HVAC executed under the said agreement**”

Note-1: - Basement/Stilt, if any will be considered as storey. In case, if any RCC framed structure is having basement and stilt both, it will be considered two story. The Machine Room and Mumty will not be considered as Storey.

Note-2:- One building of the specified storeys, as mentioned in the definition of similar work constructed in each work should have been executed.

Note-3: - The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to the previous day of last date of submission of tenders. This calculation shall be based on the completed days basis, (example If a work is completed on 30.12.2017, and the last date of submission of tenders is 31/03/2019, then the enhancement shall be for 1 years and 90 days (1 year + 1 day of Dec + 31 days of

Jan + 28 days of Feb + 30 days of March) and the applicable percentage enhancement shall be (7% + 7% x 90/365).

- 7.2 The bidder should have had average annual financial turn over (gross) of **Rs. 2061.35** on Civil/Electrical construction work during the last three consecutive financial years balance sheets duly audited by Chartered Accountant. Year in which no turnover is shown would also be considered for working out the average. The balance sheet in case of Private/Public limited company shall include its standalone finance statement and consolidated financial statement both.
- 7.3 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, duly certified and audited by the Chartered Accountant. The balance sheet in case of Private/Public limited company shall include its standalone finance statement and consolidated financial statement both.
- 7.4 Should have net-worth certificate of minimum **Rs. 618.40 lacs** issued by a certified Chartered Accountant.
- 7.5 The bidder should have a solvency of **Rs. 1649.08 lacs** certificate by Banker.
- 7.6 Should have the calculated bidding capacity equal to or more than the estimated cost of the work. The bidding capacity shall be = $(2 * N * A - B)$, where
A = maximum turnover in construction works executed in any one year during the last five years taking into account the completed as well as works in progress. The value of the completed work shall be brought to current costing level by enhancing at a simple rate of 7% per annum.
N = Number of years prescribed for the completion of the work for which the bids have been invited.
B = Value of the existing commitments and ongoing works.

8.0 **Evaluation criteria:**

- 8.1 The details submitted by the bidders will be evaluated in the following manner:
- 8.1.1 The initial criteria prescribed in para 7.0 above in respect of experience of eligible similar works completed, loss (Profit after tax), solvency, financial turn over, bidding capacity, etc will first be scrutinized and the bidder's eligibility for the work be determined.
- 8.1.2 The bidders qualifying the initial criteria as set out in para 7.0 above will be evaluated for following criteria by scoring method on the basis of details furnished by them and the basis of inspection of ongoing and completed work carried out by the scrutiny committee duly constituted by the Director IIT Kanpur.

- | | | |
|-----|---|------------------|
| (a) | Financial strength (Form 'A', 'B' & 'B1') | Maximum 20 marks |
| (b) | Experience in eligible similar nature of work during last <i>seven</i> years (Form 'C' and Form 'C1') | Maximum 20 marks |
| (c) | Performance on works (Form 'D') – Time over run | Maximum 20 marks |
| (d) | Performance on works (Form 'D' and Form 'D1') – Quality | Maximum 40 marks |

Total 100 marks

To become eligible for short listing the bidder must secure at least fifty percent marks in each (section a, b, c & d) and sixty percent marks in aggregate.

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

Note: 1. The average value of performance of works for time overrun and quality for completed works in Form D shall be taken on the basis of performance report of the eligible similar works from the list given in Form -C.

2. Performance of works for ongoing works shall be done by selecting not more than any two ongoing works from the list given in Form -C1.

- 8.1.3 Evaluation of the performance of contractors for eligibility shall be done by the Scrutiny Committee on the basis of documents submitted. All the eligible similar works executed and submitted by the bidders and may be got inspected by the committee. The marks for the quality shall be given based on this inspection, if inspection is carried out the scoring for evaluation mentioned in these columns should be done as given in Annexure-I.
- 8.1.4 Even though any bidder may satisfy the above requirements, he would be liable to disqualification if he has:
- (a) made misleading or false representation or deliberately suppressed the information in the forms, statements and enclosures required in the eligibility criteria documents.
 - (b) record of poor performance such as abandoning work, not properly completing the contract or financial failures/weaknesses etc.

9.0 **Financial information:**

Bidder should furnish the following financial information:

Annual financial statement for the last five year in (Form "A"). Solvency (Form "B") and networth certificate in (Form "B1")

10.0 **Experience in works highlighting experience in similar works**

10.1 Bidder should furnish the following:

- (a) List of eligible similar nature of works successfully completed during the last seven years in Form "C" and the list of ongoing works in form "C1".
- (b) Performance reports (corresponding to works mentioned in Form "C") in Form 'D'. The performance report should explicitly mention that the work includes "An RCC framed structure" of five storied (G+4) or more storied including water supply, sanitary installation, electrical installation, in single agreement. It should also mention that the stories mentioned are excluding the Machine Room and Mumty.
The detail shall also specify, whether or not the work contains HVAC or fire fighting system or Lifts or fire alarm system in the said agreement and shall mention the services executed and included in the agreement.
- (c) Performance reports (corresponding to work mentioned in Form – C1) in Form-D1 (information in FORM-D should be complete & no completed work of more than Rs 1000 lacs (as mentioned in FORM-C) should be left out).

11.0 **Organization information:**

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

12.0 **Letter of transmittal:**

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

13.0 **Opening of Price bid**

After evaluation of Pre-Qualification Documents, a list of short listed agencies will be prepared. Thereafter the financial bids of only the qualified and technically acceptable bidders shall be opened at the notified time, date and place in the presence of the qualified bidders or their representatives, if present. The bid shall remain valid for **90 days from date of opening of eligibility bids/Technical bid.**

14.0 Award criteria

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

- (a) Amend the scope and value of contract to the bidder.
- (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.

SECTION III

INFORMATION REGARDING ELIGIBILITY

LETTER OF TRANSMITTAL

From:

To

**The Superintending Engineer
IWD, IIT Kanpur**

Subject: Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.

Sir,

Having examined the details given in press notice and 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 J and accompanying statement are true and correct.
2. I/we have furnished all information and details necessary for eligibility and have no further pertinent information to supply.
3. I/we submit the requisite certified solvency certificate and authorize the Superintending Engineer, IWD IIT Kanpur to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/we also authorize Superintending Engineer, IWD IIT Kanpur to approach individuals, employers, firms and corporation to verify our competence and general reputation.
4. I/we submit the following certificates in support of our suitability, technical knowledge and capability for having successfully completed the following **eligible similar works**.

Sl. No.	Name of work	Certificate from
1		
2		

Certificate:

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

Enclosures:

Seal of bidder

Date of submission:

Signature(s) of Bidder(s).

FORM 'A'

FINANCIAL INFORMATION

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

Financial Year					
Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
i) Gross Annual turnover on construction works.					
ii) Profit (After tax) /Loss on construction works.					

Note-1 - The bidder should give information strictly in above format.

Note-2 - The balance sheet in case of Private/Public limited company shall include its standalone finance statement and consolidated financial statement both.

Signature of Chartered Accountant with Seal

Signature of Bidder(s).

Name of Chartered Accountant

.....

Membership No. ICAI

Date and Seal

FORM "B"

FORM OF BANKERS' CERTIFICATE FROM A SCHEDULED BANK

This is to certify that to the best of our knowledge and information that M/s./Sh
.....having marginally noted address,
.....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

NOTE:

- (1) Bankers 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.
- (3) Solvency certificate should not be more than 6 months old.

FORM "B1"

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 01.04.2019 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 01.04.2019.”

Signature of Chartered Accountant

.....

Name of Chartered Accountant

.....

Membership No. ICAI

Date and Seal

FORM 'C'

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

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

* Indicate gross amount claimed and amount awarded by the Arbitrator.

Signature of Bidder(s)

Note: The agency should give list of only those eligible works which are of '**SIMILAR NATURE**'.

FORM 'C-1'

PROJECTS UNDER EXECUTION

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

Certificated that the above list of works is completed, and no work has been left out and that the information given is correct to my / our knowledge and belief.

SIGNATURE OF BIDDER(S)

WITH STAMP & SEAL

FORM 'D'

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORMS "C"

1. Name of work/project & location
 - 1.(A) Name of the contractor for whom this certificate is being issued
 - 1 (B)* i) Type of Structure (RCC framed Building structure or load bearing structure)
 - ii) No. of storey (Note: Basement &/or Stilt, if any will be considered as storey(s) but Machine Room and Mumty will not be considered as Storey). (Yes/No)
 - iii) Whether water supply, sanitary installation, electrical installation, is included in scope of this agreement (Yes/No)
 - iv) Whether fire - fighting or Lift or Fire alarm system or HVAC is included in scope of this agreement (Yes/No)
 - v) Name of the service included and executed in the agreement as per S. no. iv above (Yes/No)
 - vi) Whether the work executed with basement. (Yes/No)
2. Agreement no.
3. Estimated cost
4. (i) Tendered cost:
(ii) Completion cost:
5. Date of start
6. Date of completion
 - (i) Stipulated date of completion
 - (ii) Actual date of completion
7. (a) Whether case of levy of compensation for delay has been decided or not Yes/No
(b) If decided, amount of compensation levied for delayed completion, if any
8. Performance Report
 - (1) Quality of work Outstanding/Very Good/Good/Poor
 - (2) Financial soundness Outstanding/Very Good/Good/Poor
 - (3) Technical Proficiency Outstanding/Very Good/Good/Poor
 - (4) Resourcefulness Outstanding/Very Good/Good/Poor
 - (5) General Behavior Outstanding/Very Good/Good/Poor

Dated:

Executive Engineer or Equivalent

FORM 'D - 1'

PERFORMANCE ASSESSMENT OF QUALITY FOR COMPLETED AS WELL AS ONGOING WORKS

Name of work:-

Date of Inspection:-

Date of submission of report:-

A	General observation & Operational Aspects	Yes/No
1	Availability of approval from local bodies in case of construction of private building	
2	Availability of approved structural Drawings	
3	Observation of seepage / leakage in the building	
4	Whether line and level maintained	
5	In case of basement, observation of seepage, if any	
6	Any structural defects/distress observed, if yes give details	
7	Whether safety measure adopted at site as per CPWD safety code and or govt. guidelines are adequate or not	
8	Whether the welfare facilities provided to labour as per cause 19 H of GCC CPWD works/ and or govt. guidelines are adequate or not.	
9	Whether AHU getting automatically switched off and fire dampers closed in case of fire signal.	
10	Whether thimbles used for termination of wires in DBs, EBDs and panels?	
B	Quality of works	Mark accessed
1	Quality of plaster / finishing	
2	Quality of RCC / CC work	
3	Quality of flooring	
4	Quality of wood work	
5	Quality of steel work / aluminum work	
6	Quality of plumbing and sanitary installation	
7	Quality of workmanship	
8	Quality of water proofing	
9	Observation on quality of masonry work	
10	Quality of internal electrification work	
11	Quality of DBs, EBDs and panels?	
12	Quality of E & M equipment's, panels & feeder pillar	
13	Quality of fire alarm system / fire-fighting system	
14	Quality of Air-conditioning work	
15	Any other aspect (To be elaborated)	

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

Note:

1	All the above parameters may be considered for assessing the overall quality of work executed by the contractor
2	In case, any attribute is not applicable, the same may not be included in assessment and mentioned are not applicable (N/A)
3	The works as accessed above shall be converted on a scale of 25 /15 marks for completed / ongoing works respectively
4	In case of eligible completed works as well as on going works being more than one the maximum marks assigned for completed works and ongoing works will be equally distributed among the works.

FORM "E"

STRUCTURE & 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 (attach attested photocopy)

Organization/Place of registration	Registration No.
1.	
2.	
3.	
5. Names and titles of Directors & Officers with designation to be concerned with this work.
6. Designation of individuals authorized to act for the organization
7. Has the bidder, or any constituent partner in case of partnership firm Limited Company/Joint Venture, ever been convicted by the court of law? If so, give details.
8. In which field of Civil Engineering construction the bidder has specialization and interest?
9. Any other information considered necessary but not included above.

Signature of Bidder(s)

FORM 'F'

List of the projects under execution or awarded

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

Certified that the above list of works is complete and no work has been left out and that the information given is correct to my knowledge and belief.

Signature of bidder(s)

FORM 'G'
AFFIDAVIT

I/we undertake and confirm that our firm/partnership firm has not been blacklisted and/or debarred 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 IIT Kanpur 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.

I/We undertake and confirm that I/We have not abandoned any of the work entrusted to me /us nor any of the work entrusted to me/us have been rescinded by any of the Central /State Govt Departments, Undertakings, Autonomous institutions, Agencies, Societies, Enterprises and Companies during last 7 (seven) years ending previous day of last date of submission of bid. Further that, if such information comes to the notice of the department then I/we shall be debarred for bidding in IIT Kanpur 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.

NOTE: Affidavit to be furnished on a 'Non-Judicial' stamp paper worth Rs.10/- (Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)

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

Signature of Notary with seal

FORM "H"

Undertaking regarding obtaining GST registration Certificate of The State, in which work is to be taken up

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

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

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

Signature of Notary with seal

ANNEXURE-I

CRITERIA FOR EVALUATION OF THE PERFORMANCE OF CONTRACTORS FOR PRE-ELIGIBILITY

	Attributes	Evaluation
(a)	Financial strength (20 marks)	
	(i) Average annual Turnover (16 marks) (In case of Private/Public limited company, the lower of the value calculated based on standalone finance statement and consolidated financial statement value shall be considered.) (ii) Solvency Certificate (2 marks) (iii) Networth Certificate (2 marks)	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more In between (i) & (ii) – on pro-rata basis
(b)	Experience in similar Class of works (20 marks)	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more In between (i) & (ii) – on pro-rata basis
(c)	Performance on works (time over run) (20 marks)	
	Parameter Calculation For points	Score
		Maximum Marks
		20
	If TOR =	1.00 2.00 3.00 >3.50
	(i) Without levy of compensation	20 15 10 10
	(ii) With levy of Compensation	20 5 0 -5
	(iii) Levy of compensation not decided	20 10 0 0

TOR = AT/ST, where AT=Actual Time; ST=Stipulated Time (+) Justified Period of Extension of Time.

Note: 1. The contractor shall produce documents to ascertain the Justified Period of Extension of Time given to him by the employer. If no such document is provided by him to ascertain his claim, the Justified Period of Extension of Time shall be treated as NIL. For the case where levy of compensation is not decided, the justified extension of time shall be considered only for the period for which the contractor produces supporting documents from the employer of the executed work, to establish his claim.

2. Marks for value in between the stages indicated above is to be determined by straight line variation basis.

Performance of works (quality) as per assessment in Form D-1:			
			Maximum 40 Marks
(d)	Completed works (max. 25 marks)	Ongoing works (max. 15 marks)	Total marks assessed

SECTION-B
FINANCIAL BID

PART-A

CPWD-6 For e-Tendering

1. The Superintending Engineer, IWD IIT Kanpur invites on behalf of Board of Governors, online percentage rate open bids on **Engineering, Procurement and Construction (EPC) Contract basis** from eligible firms/contractors of repute in two bid system (Eligibility cum Technical bid & Financial Bid) for the work of “Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.”

1.1 The work is estimated to cost **Rs. 41,22,71,432/-**. This estimate, however, is given merely as a rough guide.

1.2 Contractor who fulfills the following requirements shall be eligible to apply. **Joint ventures are not accepted.**

(i) Should have satisfactorily completed the works as mentioned below during the last Seven years ending previous day of last date of submission of tenders.

Three similar works each costing not less than **Rs. 1649.08 lacs**

Or

Two similar work each costing not less than **Rs. 2473.63 lacs**

Or

One similar work costing not less than **Rs. 3298.17 Lacs**

Or

Similar work mean “Construction of building in RCC framed structure having minimum one building of five storied (G + 4) or completing balance construction work of one building (including structural work) minimum up to five storey including Internal water supply, Sanitary installation, Internal Electrical installations all executed under one agreement. The five storied building should have firefighting system or lift or Fire alarm system or HVAC executed under the said agreement”

Note-1: - Basement/Stilt, if any will be considered as storey. In case, if any RCC framed structure is having basement and stilt both, it will be considered two story. The Machine Room and Mumty will not be considered as Storey.

Note-2:- One building of the specified storeys, as mentioned in the definition of similar work constructed in each work should have been executed.

Note-3: - The value of executed works shall be brought to current costing level by enhancing the actual value of work at simple rate of 7% per annum; calculated from the date of completion to the previous day of last date of submission of tenders. This calculation shall be based on the completed days basis, (example If a work is completed on 30.12.2017, and the last date of submission of tenders is 31/03/2019, then the enhancement shall be for 1 years and 90 days (1 year + 1 day of Dec + 31 days of Jan + 28 days of Feb + 30 days of March) and the applicable percentage enhancement shall be (7% + 7%x90/365).

(ii) Should have had average annual financial turnover of Rs 2061.35 lacs on construction works during the last three years ending 31st March 2019.

(iii) Should not have incurred any loss (Profit after tax should be positive) in more than two years during the last five years ending 31st March, 2019.

(iv) Should have a solvency of **Rs. 1649.08 lacs.**

- (iv) Should have networth certificate of minimum **Rs. 618.40 lacs** issued by a certified Chartered Accountant.
 - (v) Should have the calculated bidding capacity equal to or more than the estimated cost of the work.
 - (vi) The bidder should not have been barred/black listed by the central/State Government, or any entity controlled by it, from participating in any tender, and the bar subsists as on the Bid Due Date, would not be eligible to submit the bid.
2. Agreement shall be drawn with the successful bidders on prescribed Form No. CPWD 7 which is available as a Govt. of India Publication and also available on website www.iitk.ac.in/iwd/tenderhall.htm, www.tenderhome.com, but the bids can only be submitted online through, <https://eprocure.gov.in/eprocure/app>. 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 **24 months** from the date of start as defined in schedule 'F' or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the bid documents.
 4. The site for the work is available.
 5. The bid document consisting of plans, specifications, schedule of quantity to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents, Standard General Conditions of Contract Form can be seen on website www.iitk.ac.in/iwd/tenderhall.htm, www.tenderhome.com, but the bids can only be submitted online through, <https://eprocure.gov.in/eprocure/app> in free of cost.
 6. After submission of the bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
 7. While submitting the revised bid, contractor can revise the rate any number of times but before last time and date of submission of bid as notified.
 8. a) Applicant has to deposit earnest money of **Rs. 51,23,000.00** in the form of receipt/ Treasury Challan or Demand Draft or Pay order or Banker's Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of Director IIT Kanpur)along with tender document.

Earnest Money in the form of Treasury Challan or Demand Draft or Pay order or Banker's Cheque or Deposit at Call Receipt or Fixed Deposit Receipt (drawn in favour of "Director IIT Kanpur") shall be scanned and uploaded to the e-Tendering website within the period of bid submission. The original EMD should be deposited in the office of Superintending Engineer along with PQ documents in separate envelop mentioning "EMD for the work" on specified date and time.

A part of earnest money (EM) is acceptable in the form of bank guarantee also. In such case, minimum 50% of earnest money or Rs. 20 lac, whichever is less, shall have to be deposited in shape prescribed above, and balance may be deposited in shape of Bank Guarantee of any scheduled bank having validity for six months or more from the last date of receipt of bids which also is to be scanned and uploaded by the intending bidders.

Copy of certificate of work experience and other documents as specified in the technical bid/eligibility bid document shall be scanned and uploaded to the e-Tendering website

www.iitk.ac.in/iwd/tenderhall.htm, <https://eprocure.gov.in/eprocure/app> & www.tenderhome.com within the period of bid submission. However, copy (original/self-certified as mentioned in para 25) of all the scanned and uploaded documents as specified in bid document shall have to be submitted by the all bidders on specified date and time in the office of tender opening authority.

Online technical bid documents submitted by intending bidders shall be opened only of those bidders whose original EMD deposited and other documents scanned and uploaded are found in order.

Online financial bid document submitted by the bidders shall be opened only of those bidders who on the basis of pre-qualification documents uploaded by them within the period of bid submission, qualify in accordance with the provision of technical bid. The financial bid shall be opened at the notified time, date & place in presence of qualified bidders or their representative

b) copy of certificate of work experience and other documents as specified in the technical bid/eligibility bid document shall be scanned and uploaded to the e-Tendering website within the period of bid submission.

However, copy (original/self-certified as mentioned in para 25 of technical / eligibility bid (under the heading Invitation of Bids) on page No. 10 & 11) of all the scanned and uploaded documents as specified in bid document shall have to be submitted by the all bidders within specified date and time from the last date of submission of bid, physically in the office of tender opening authority.

- **Online qualification bid documents submitted by intending bidders shall be opened only of those bidders who have deposited Earnest Money.**
- **Online financial bid document submitted by the bidders shall be opened only of those bidders who on the basis of pre-qualification documents uploaded by them within the period of bid submission, qualify in accordance with the provision of technical bid. The financial bid shall be opened at the notified time, date & place in presence of qualified bidders or their representative.**

The eligibility bid submitted shall be opened at 03:30 PM on 03/03/2020

9. The bid submitted shall become invalid :
- (i) The bidder is found ineligible.
 - (ii) The bidder does not deposit original EMD along with other documents in the office of the Superintending Engineer, IWD, IIT Kanpur.**
 - (iii) The bidder does not upload all the documents (including GST registration) as stipulated in the bid document including the copy of receipt for deposition of original EMD.
 - (iv) 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 bidder in the office of bid opening authority.
 - (v) If a bidder quotes nil rates against each item in item rate tender or does not quote any percentage above/below on the total amount of the tender or any section/sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

10. The contractor whose bid is accepted will be required to furnish performance guarantee of 5% (Five Percent) of the bid amount within the period specified in Schedule F. This guarantee shall be in the form of Deposit at Call receipt of any scheduled bank/Banker's cheque of any scheduled bank/Demand Draft of any scheduled bank/Pay order of any Scheduled Bank of any scheduled bank (in case guarantee amount is less than Rs. 1,00,000/-) or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'F', including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited

automatically without any notice to the contractor. The earnest money deposited along with bid shall be returned after receiving the aforesaid performance guarantee.

11. Description of the work is as follows: “Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.”

Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub-soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidder shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc. will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

12. The competent authority on behalf of the Board of Governor, IIT Kanpur does not bind itself to accept the lowest or any other bid and reserves to itself the authority to reject any or all the bids received without the assignment of any reason. All bids in which any of the prescribed condition is not fulfilled or any condition including that of conditional rebate is put forth by the bidder shall be summarily rejected.

13. Canvassing whether directly or indirectly, in connection with bidders is strictly prohibited and the bids submitted by the contractors who resort to canvassing will be liable for rejection.

14. The competent authority on behalf of Board of Governor, IIT Kanpur reserves to himself the right of accepting the whole or any part of the bid and the bidders shall be bound to perform the same at the rate quoted.
15. The contractor shall not be permitted to bid for works in the IWD for award and execution of contracts, in which his near relative is posted a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any officer in the Institute Works Department, IIT Kanpur.
16. No Engineer of Gazetted Rank or other Gazetted Officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of one year after his retirement from Government service, without the prior permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the bid or engagement in the contractor's service.
17. The bid for the works shall remain open for acceptance for a period of **Ninety (90) days** from the date of opening of eligibility bid. If any tenderer withdraws his tenders or makes any modifications in the terms & condition 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. After 7 days of opening of tender the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 100% of the earnest money absolutely irrespective of the letter of acceptance for the work is issued or not. The bidders shall not be allowed to participate in the rebidding process of the work.
18. This notice inviting Bid shall form a part of the contract document. The successful bidders/contractor, on acceptance of his bid by the Accepting Authority shall within 15 days from the stipulated date of start of the work, sign the contract consisting of:-
 - (a) The Notice Inviting Bid, all the documents forming part of the bid as uploaded at the time of invitation of bid, the tender drawings and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.
 - (b) **Standard C.P.W.D. Form 7** or other Standard C.P.W.D. Form as applicable.

19. ***For Composite Bids***

19.1.1 The Executive Engineer in charge of the major component has called bids for the composite work. The cost of bid document and Earnest Money has been fixed with respect to the combined estimated cost put to tender for the composite bid.

19.1.2 The financial bid document will include following three components:

Part A:- CPWD-6, CPWD-7 including schedule A to F for the major component of the work, Standard General Conditions of Contract 2019 for EPC project, as amended/modified up to as specified in Schedule F.

Part B:- General / specific conditions, specifications and schedule of quantity of the work.

Part C:- Schedule A to F for minor component of the work. General/specific conditions, specifications and schedule of quantity of the work.

19.1.3 The bidder shall quote the rates after considering all the major as well as minor components.

19.1.4 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 Board of Governor, IIT Kanpur. After the work is awarded, the main contractor will have to enter into one agreement with EE in charge of major component and has also to sign two or more copies of agreement depending upon number of EE in charge of minor components. One such signed set of agreement shall be handed over to EE in charge of minor component(s). EE of major component will operate Part A and Part B of the agreement. EE in charge of minor component(s) shall operate Part C along with Part A of the agreement.

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

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

19.1.7 The main contractor has to associate specialized agency(s) for specialized items of work of major component and also has to associate agency(s) for minor component(s) conforming to **eligibility criteria as defined in the bid document** and has to submit detail of such agency(s) to Engineer-in-charge of major/minor component(s) (as applicable) within **prescribed time**. Name of the agency(s) to be associated shall be approved by Engineer-in-charge of major/minor (As applicable) component(s).

19.1.8 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 respective Engineer-in-charge. The new agency/agencies shall also have to satisfy the laid down eligibility criteria. In case Engineer-in-charge is not satisfied with the performance of any agency, he can direct the contractor to change the agency executing such items of work and this shall be binding on the contractor.

19.1.9 The main contractor has to enter into agreement with contractor(s) associated by him for execution of specialized/minor component(s). Copy of such agreement shall be submitted to EE in charge of each specialized/minor component as well as to EE in charge of major component. In case of change of associate contractor, the main contractor has to enter into agreement with the new contractor/agency associated by him.

19.1.10 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.

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

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

**INDIAN INSTITUTE OF TECHNOLOGY KANPUR
INSTITUTE WORKS DEPARTMENT
Percentage Rate Composite Tender & Contract for Works**

(EPC TURN KEY) BID

(A) Tender for the work of : **“Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur..”**

- (i) Last date and time of technical and financial bid for online submission of e-tenders is up to 5.00 PM on 28.02.2020
- (ii) Time and Date of opening of technical bid in presence of tenders who may be present on 3.30 PM on 03.03.2020 in the office of the Superintending Engineer, IWD, IIT Kanpur.
- (iii) The pre-qualification bids shall be opened first on due date and time as mentioned above. The time and date of opening of financial bid of contractors qualifying the technical bid shall be communicated to them at later date.

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, particular specification, Schedule of Rates & 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 Kanpur within the time specified in Schedule ‘F’ viz., schedule of quantity and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule-1 of General Rules and Directions and in Clause 11 of the Conditions of contract and with such materials as are provided for, by, and in respect of accordance with, such conditions so far as applicable.

We agree to keep the tender open for Ninety (90) days from the due date of its Eligibility bid opening and not make any modification in its terms and conditions.

A sum of **Rs. 51,23,000/-** is hereby forwarded in cash/receipt treasury challan / deposit at call receipt of a scheduled bank/fixed deposit receipt of scheduled bank/demand draft of a scheduled bank/bank guarantee issued by a scheduled bank as earnest money. If I/We, fail to furnish the prescribed performance guarantee within prescribed period, I/We agree that the said President of India or his successors, in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I/We fail to commence work as specified, I/We agree that President of India or the successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by him towards security deposit to

execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 of the tender form. Further, I/We agree that in case of forfeiture of Earnest

Money & Performance Guarantee as aforesaid. I/We shall be debarred for participation in the re-tendering process of the work.

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

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

Rs..... (Rupees
.....
.....
.....
.....)

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

- (a)
- (b)
- (c)

For & on behalf of Board of Governors,
IIT Kanpur

Signature.....

Dated:

Designation

PROFORMA OF SCHEDULES

(Composite Tender –Major Component-[Civil])

SCHEDULE 'A'

Schedule of Financial quote for quoting for the work

: Enclose in Page No. 482

SCHEDULE 'B'

Schedule of materials to be issued to the contractor:

No.	Description of item	Quantity	Unit	Rates at which the material will be charged to the contractor	Place of issue
1	2	3		4	5
NIL					

SCHEDULE 'C'

Tools and plants to be hired to the contractor

No.	Description	Hire charges per day	Place of issue
NIL			

SCHEDULE 'D'

Extra schedule for specific requirements/document for the work, if any:	NIL
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SCHEDULE 'E'

Reference to General Conditions of contract:	General conditions of contract 2019 for EPC projects as amendment / modified up to last date of submission of bid.
<i>Name of Work:</i>	Construction of Faculty Building Annexe (G+5) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS and development works all complete at IIT Kanpur.
(I) Estimated cost of work	Total Estimated cost: Rs. 41,22,71,432/- [Civil Work: Rs. 32,88,39,659/- ,Electrical Work: Rs.5,66,81,773/- , HVAC: Rs.2,67,50,000/-]
(II) Earnest Money	Rs. 51,23,000/-
(ii) Performance Guarantee	5% of tendered value
(iii) Security Deposit	2.5% of tendered value

SCHEDULE ' F'

GENERAL RULES & DIRECTIONS:

Officer Inviting tender	Superintending Engineer, IWD, IIT Kanpur.
Definitions:	
Engineer-in-Charge	Civil work-Executive Engineer(Civil), Electrical work-Executive Engineer(Electrical), HVAC work-Executive Engineer(A.C)
Accepting Authority	Superintending Engineer, IWD, IIT Kanpur.
Percentage on cost of materials and Labour to cover all overheads and profits	15%
2(xi) Standard Schedule of Rates	<ul style="list-style-type: none"> a. Plinth area rate 2019 b. DSR 2018 (Civil Works) c. DSR 2018 (E & M) d. DSR (wet risers and sprinkler system 2019) e. Market rate of non DSR Items All the above with correction slips up to the last date of correction slip
(xii) Department	Institute Works Department
3(i) Standard CPWD Contract Form	General conditions of contract 2019 for EPC projects as amendment / modified up to last date of submission of bid..
Clause 1	
(i) Time allowed for submission of Performance Guarantee, Programme Chart(Time and Progress) and applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board or proof of applying thereof from the date of issue of letter of acceptance	15 (Fifteen) days
(ii) Maximum allowable extension with late fee @ 0.1% of Performance Guarantee amount per day beyond the Period provided in (i) above	7 days
Clause 1 A	The defect liability period shall be 3 years after the date of completion of work of contract agreement.
Clause 2: Authority for fixing compensation under clause 2	Superintending Engineer, IWD, IIT Kanpur.
Clause 2A Whether Clause 2A shall be applicable	Not Applicable
Clause 5 Number of days from the date of issue of letter of acceptance for reckoning date of start	22 (Twenty Two) days

Mile Stone(s) shall be as per table given below*			
S.No	Description of Milestone (Physical)	Time allowed from date of start	Amount to be with-held in case of non-achievement of milestone (% of composite tender amount)
1	<ul style="list-style-type: none"> • Erecting one office space of 10mtr X 3 mtr for the use of the Engineer-in-charge • One licensed latest version of Software-“PRIMAVERA” to be provided by the Contractor to CPWD, along with organizing training regarding use of the Software for CPWD • Erecting temporary barricading as per contract Conditions • Construction of Cement godown, testing lab & approved samples keeping room • Electrical:- submission of documents and credential to the entire satisfaction of the engineer-in-charge of the individual minor components of all the specialized E & M agencies to be associated. • Demolishing of the existing structure. • RCC casting of all the lift pits • 	3 Months	1.0%
2	<p>Completion of all RCC works and earth filling work upto plinth level.</p> <p>Submission of the “Building Information Modeling (BIM) duly integrating and Coordinating all services viz plumbing, sanitary, Internal Electrical installations, Fire Fighting, Fire alarm, HVAC, LV service etc”</p> <p>Electrical Work:- Getting Approval of General Arrangement drawings, technical data sheet and shop drawings for all E & M services from the Engineer in-charge.</p>	6 Months	0.5%
3	<ul style="list-style-type: none"> • Completion of 2 RCC slabs • Sample for external finishing and internal finishing items to be got approved from the Engineer-in-charge • E & M: All associated work as per civil work 	10 Months	0.5%
4	<ul style="list-style-type: none"> • Completion of 4 RCC slabs • RCC in the UG tank and UG pump room up to ground level i.e except its roof slab. 	15 Months	1.0%

	<ul style="list-style-type: none"> • E & M: All associated work as per civil • Walls of the ground floor and first floor complete • Getting all the E&M machines and lift inspected at factory by engineering-in-charge. 		
5	<ul style="list-style-type: none"> • Completion of RCC work including mummy, underground water tank, underground pump room, overhead water tank etc. • Complete masonry work. • External finishing of the building 50% complete. • Internal finish of the building 100% complete. • Doors and windows fixing 100 % internal complete. • Window frame fixing 50% external complete • 100% internal plumbing and disposal complete. • E&M: All associated work as per civil • Pumps, AHUs, panels, lift, all E&M machine procurement complete. 	20 Months	1.0%
6	Completion of the building as per the tender conditions, Submission of handing over notes, warranty cards, guarantee cards, technical specifications of the installed materials, along with inventory for each building etc.	24 Months	1.0%

Within 15 days of award of the work, the contractor is permitted to submit a different detailed program chart to the engineer-in-charge for approval. This program shall indicate the resources to be deployed by the contractor to maintain desired progress and for the completion of the work within the specified period. If the submitted program is approved, the milestone shall be redefined accordingly by the Superintending Engineer, IWD, IIT Kanpur. The amount to be withheld in such case, for non-achievement of milestone(s), shall remain unaltered i.e 5% of tendered amount.

Time allowed for execution of work	24- Months
Authority to decide:	
(i) Extension of time	Superintending Engineer, IWD IIT Kanpur
(ii) Rescheduling of milestones	Superintending Engineer, IWD IIT Kanpur
(iii) Shifting of date of start in case of delay in handing over of site	Superintending Engineer, IWD IIT Kanpur

Clause 6, 6A	
Clause applicable - (6 or 6A)	Clause 6
Clause 7	
Gross work to be done together with net payment /adjustment of advances for material collected, if any, since the last such payment for being eligible to interim payment	Rs. 200 Lakhs (Rupees Two Hundred Lacks only) or as mutually agreed by both the parties

Clause 7A: Whether Clause 7A shall be applicable (No Running Account bill shall be paid for the work till the applicable labour licenses, registration with EPFO, ESIC and BOCW Welfare Board, whatever applicable are submitted by the contractor to the Engineer-in-Charge.)	Yes
Clause 10A List of testing equipment to be provided by the contractor at site lab.	As per Annexure 1
Clause 10B (ii) & Clause 10B(iii) Whether Clause 10 B (ii) shall be applicable	No
Whether clause 10-B (iii) shall be applicable	No
Clause 10C	NOT APPLICABLE

Clause 10CA

Sl.No	Material covered under this clause	Nearest Materials (other than cement, reinforcement bars and the structural steel) for which All India Wholesale Price Index to be followed	Base Price excluding GST of all Materials, covered under clause 10 CA for October 2019
1	Portland Pozzolana Cement (PPC)	NA	Rs 4,531/MT
2	Steel for Reinforcement TMT Fe 500D		
2.1	Primary Manufacturer	NA	Rs 38,500/MT
3	Structural Steel	NA	Rs 36,500/MT

Clause 10CC Clause 10 CC to be applicable in contracts where the stipulated Period of completion exceeding the period shown in next column :	More than 12months.
Schedule of component of other Materials, Labour, POL etc. for price escalation.	
Component of civil (except materials covered Under clause 10CA) /Electrical construction value of work -expressed as percent of total value of work.	$X_m=30\%$
Component of Labour –expressed as percent of total value of work.	$Y=25\%$
Component of P.O.L. -expressed as percent of total value of work.	$Z=NIL$
Clause 11 Specifications to be followed for execution of work	C.P.W.D Specifications 2009Vol. 1 & II, with correction Slips issued up to the last date of receipt of tenders.
Clause 12:Type of work	Original work
12.2. Extra / substituted item	Applicable
Clause 16 Competent Authority for deciding reduced rates:	Superintending Engineer, IWD ,IIT Kanpur

Clause 17 Defect liability period	36 months from the date of handing over of the completed work.
Clause 18 List of mandatory machinery, tools & plants to be deployed by the contractor at site:-	As per Annexure 2
Clause 25 (Settlement of Disputes & Arbitration) of General Conditions of Contract for CPWD Works 2014. “Arbitration and Conciliation Act, 1996 (26 of 1996)” in Clause 25 of CPWD Works 2014. “Arbitration and Conciliation Act, 1996 (26 of 1996)” in Clause 25 of General Conditions of Contract for CPWD Works 2014 shall be read as “Arbitration and Conciliation (Amendment) Act, 2015 (3 of 2016)”.	

Clause 25(1)

Constitution of Dispute Redressal Committee (DRC)	Competent Authority to appoint DRC
DRC shall constitute one Chairman and two members	The Director, IIT Kanpur
The Authority competent to reconstitute/Modify the DRC is as follows:-	
Competent authority for reconstitution/ modification of Dispute Redressal Committee (DRC)	The Director, IIT Kanpur

Clause 31/31-B

The contractor shall have to make his own arrangement of water. The withdrawal of water from the network of Institute shall not be allowed. No charges shall be recovered if the contractor develops tube wells at site and pumping arrangement at his own cost. The contractor shall have to seek permission for digging tube well regarding water arrangement from the Engineer –in-charge.

Clause 32 Requirement of Technical Representative(s) and recovery Rate

Sl No.	Requirement of Technical staff (of major + minor component)		Minimum experience in Year	Designation	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 32	
	Qualification (of Major + Minor component)	Number			Figures	Words
1	Graduate Engineer (Major component)	1	20 (and having experience of one similar nature of work)	Project Manager with degree in major discipline of Engineering	Rs.100000/-Pm per person	Rupees One LakhT only per month
2	Graduate Engineer	1 +1	12 (and having experience of one similar nature of work)	Deputy Project Manager	Rs.60000/- pm Per person	Rupees SixtyThousand only per month per person
3	Graduate Engineer Or Diploma Engineer	2+1	5 or 10 respectively	Project /Site Engineer	Rs.40000/- pm Per person	Rupees Forty Thousand only per month per person

4	Graduate Engineer	1	8	Quality Engineer	Rs.40000/- pm Per person	Rupees Forty Thousand per month per person
5	Diploma Engineer	1	8	Surveyor	Rs.30000/- pm Per person	Rupees Thirty Thousand per month per person
6	Graduate Engineer	1+1	6	Project Planning/billing Engineer	Rs.40000/- pm Per person	Rupees Forty Thousand per month per person
7	Safety Manager (a graduate with one year full time advance safety diploma from Central Labour/Mumbai/NICMAR /Hyderabad/Mahatama Gandhi Labour Institute Ahmedabad or an equivalent Qualification)	1	Three Year in Construction/ Infrastructure or allied sector	Safety Manager	Rs.40000/- pm Per person	Rupees Forty Thousand per month per person

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

Clause 38

(i)	(a)	Schedule/statement for determining theoretical quantity of cement, bitumen etc on the basis of Delhi Schedule of Rates	Delhi Schedule of Rates 2018 with correction slips up to the last date of receipt of tenders
(ii)		Variations permissible on theoretical quantities:	
	(a)	Cement	±(plus/minus) 2% (Two percent)
	(b)	Bitumen for all works	+ (plus) 2.5% (Two point five percent) only and nil on – (minus) side.
	(c)	Steel Reinforcement and structural steel sections for each diameter, section and category	+ (plus) 2.0% (Two percent) only and nil on – (minus) side.
	(d)	Paint	As per co-efficient of standard Delhi Analysis of Rate 2018.
	(e)	Any other item viz fire rated paint etc.	As per manufacturer specification

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION (FOR MATERIALS UNDER CLAUSE 10 C A)			
S No	Description of Item	Rates in figures and words at which recovery shall be made from the Contractor	
		Excess beyond permissible variation	Less use beyond permissible variation
1.	Portland Pozzolana Cement (PPC)	Nil	Rs. 4,984.10/- per MT
2.	Steel Reinforcement TMT Bar of all diameters	Nil	Rs. 42,350 /-per MT
3	Structural Steel	Nil	Rs. 40,150 /-per MT

ANNEXURE-1

LIST OF TESTING EQUIPMENTS TO BE PROVIDED BY THE CONTRACTOR AT SITE LAB

1. Balances
 - a. 7 Kg to 10 kg capacity, semi-self-indicating type- Accuracy 10 gm
 - b. 500 gm capacities, semi-self-indicating type- Accuracy 1 gm
 - c. Pan balance- 5kg capacity- Accuracy 10 gms
2. Ovens- electronically operated, thermostatically controlled upto 110°C to 1°C.
3. Sieves as per IS 460-1962.
 - i. IS sieves - 450mm internal dia, of sizes 100mm, 80mm, 63mm, 50mm, 40mm, 25mm, 12.5mm, 10mm, 6.3mm and 4.75mm complete with lid and pan.
 - ii. IS sieves - 200mm internal dia(brass frame), consisting of 2.36mm, 1.18mm, 600 microns, 425 microns, 212 microns, 90 microns, 75 microns with lid and pan.
4. Sieve shaker capable of 200mm and 300 mm dia sieves, manually operated with timing switch assembly.
5. Equipment for slump test-slump cone, steel plate, tamping rod, steel scale, scoop.
6. Dial gauges, 25mm travel- 0.01mm/division least count-2 nos.
7. 100 tonnes compression testing machine, electrical cum manually operated along with one hundred cube moulds of 15x15x15 cm size.
8. Ultrasonic Pulse Velocity Test Equipment (For concrete) - 1 No.
9. Graduated measuring cylinders 200 ml capacity – 3 Nos.
10. Enamel trays (for efflorescence test of bricks)
 - i. 300 mm x 250 mm x 40 mm – 2 Nos.
 - ii. Circular plates of 250mm dia 4 Nos.
11. Steel tapes-3m and 10m, hammer 100 gms.
12. Vernier calipers
13. Micrometer screw 25mm gauge.
14. A good quality plumb bob.
15. Spirit level, minimum 30cms long with 3 bubbles for horizontal vertical.
16. Wire gauge (circular type) disc.
17. Foot rule
18. Long Nylon thread
19. Rebound hammer for testing concrete
20. Magnifying glass.
21. Screw driver 30cms long
22. Ball pin hammer, 100 gms
23. Plastic bags for taking samples.
24. Earth resistance tests
25. Megger
26. Compaction Apparatus (Proctor) as per IS 2720-Part VII-1974
27. Modified ASHO compaction Apparatus as per IS 2720-Part III-1974
28. Sand pouring cylinder with control pouring and tube complete as per IS 2720-Part XXVIII-1974

ANNEXURE – 2

List of machinery, Tools and plants to be deployed by the contractor at site:

S.No	Activity	Name of equipment	Number
1	Earth work	Earth moving equipment like JCB 3D	2Nos
2	Concrete work	a) Plate vibrator, screed leveller	4 No
		b) Needle vibrator	5 No
		c) Concrete pump	2 Nos
3	Building work	a) Bar cutting machine	4Nos
		b) Bar bending machine	2 Nos
		c) Drilling machine	1Nos
		d) Welding machine	2Nos
		e) Cube testing machine	1 Nos
		f) Steel shuttering plates/water proof ply shuttering	9000 sqm
		g) Steel scaffolding Adjustable telescopic props.	16000 Nos
		Adjustable spans	4500 Nos
		h) Grinding / polishing machines	2 Nos
		i)Monkey Lift	2Nos
		j)Tower crane	1 Nos
		k)Power drive earth rammer (Soil compactor)	1 Nos
		l)Tractor with trolley	1 Nos
		m) Water tanker (minimum capacity 5000 ltrs)	1Nos
4	Transportation	Truck & Tippers	4nos
5	Dewatering	Diesel and electrical pumps	2 Nos each
6	Survey	Electronic Total station instrument	1 No
7	NDT test	1. Ultra plus velocity meter	1Nos
	of RCC	2. Rebound hammer test machine	1Nos
Any other machinery required for completion of the work as per actual site requirement			

Contractor is advised to deploy the required Plant and machinery on the project. The number of plant and machinery to be deployed by him is indicated. In case the contractor fails to deploy the plant and machinery whenever required and as per the direction of the Engineer-in-charge, he (Engineer-in-charge) shall be at a liberty to get the same deployed at the risk and cost of the contractor.

In case the contractor is of the opinion that any particular T&P etc. is not being utilized or is not essential, he may request engineer in charge in writing for non-deployment of that particular T&P. The engineer in charge after assessment may permit such relaxation.

INTEGRITY PACT

To,

.....,
.....,
.....,

Sub: NIT NO. For the Work “Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.

Dear Sir,

It is here by declared that IWD, IIT Kanpur is committed to follow the principle of transparency, equity and competitiveness in Public procurement.

The Subject Notice Inviting Tender (NIT) in an invitation to offer made on the condition that the Tenderer will sign the integrity Agreement, which is an integral part of tender/tender documents, failing which the tenderer/bidder will stand disqualified from the tendering process and the tender of the tenderer 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 IWD, IIT Kanpur.

Your faithfully

Executive Engineer

INTEGRITY PACT

To,

Superintending Engineer,
IWD, IIT Kanpur

Sub: Submission of Tender for the work of (NIT No.....)

“Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur.

Dear Sir,

I/We acknowledge that IWD, IIT Kanpur is committed to follow the principles thereof as enumerated in the Integrity Agreement enclosed with the tender/tender 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 documents, failing which I/We will stand disqualified from the tendering process. I/We acknowledge that **THE MAKING OF THE TENDER SHALL BE REGARDED AS AN UNCONDITIONAL AND ABSOLUTE ACCEPTANCE** of this 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/tender is finally accepted by IWD, IIT Kanpur. I/We acknowledge and accept the duration of the Integrity Agreement, which shall be in the 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/tender, IWD, IIT Kanpur shall have unqualified, absolute and unfettered right to disqualify the tenderer/tenderer and reject the tender/tender in accordance with terms and conditions of the tender/tender.

Yours faithfully

(Duly authorized signatory of the Tenderer)

To be signed by the tenderer and same signatory competent / authorized to sign the relevant contract on behalf IWD, IIT Kanpur

INTEGRITY AGREEMENT

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

BETWEEN

Board of Governor represented through Superintending Engineer,.....,
(Name of Division) IWD, IIT Kanpur,
....., (Hereinafter referred as the
(Address of Division) 'Principal/Owner', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

..... (Name and Address of the Individual/firm/Company) through
(Hereinafter referred to as the (Details of duly authorized signatory) "Tenderer/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

WHEREAS the Principal /Owner has floated the Tender(NIT No.....) (hereinafter referred to as "Tender/Bid") and intends to award, under laid down organizational procedure, contract for "Construction of Faculty Building Annexe (G+5) including Internal water supply, Sanitary installation, Internal electrical installations, Fire Fighting, Fire Alarm system, Lifts, HVAC (Low side) & BMS, development works and all other related works to make the building functional on Engineering, Procurement and Construction (EPC) contract basis at IIT Kanpur". Here in after referred to as the "Contract".

AND WHEREAS the Principal/Owner 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 Tenderer(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" or "Pact"), the terms and conditions of which shall also be read as integral part and parcel of the Tender/Tender documents and Contract between the parties.

NOW, THEREFORE, in consideration of mutual covenants contained in this Pact, the parties hereby agree as follows and this 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 Tenderer(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Tenderer(s) the same information and will not provide to any Tenderer(s) confidential / additional

information through which the Tenderer(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 Tenderer(s)/Contractor(s)

1) It is required that each Tenderer/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 Tenderer(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 Tenderer(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 Tenderer(s)/Contractor(s) will not enter with other Tenderer(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 tenders or any other actions to restrict competitiveness or to cartelize in the tendering process.

c) The Tenderer(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Tenderer(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d) The Tenderer(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly Tenderer(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 tender in a tender but not both. Further, in cases where an agent participate 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 Tenderer(s)/Contractor(s) will, when presenting his tender, disclose (with each tender as per proforma enclosed) 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 Tenderer(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

4) The Tenderer(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 Tenderer(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means 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 Tenderer(s)/ Contractor(s) and the Tenderer(s)/ Contractor(s) accepts and undertakes to respect and uphold the Principal/Owner's absolute right:

1) If the Tenderer(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 Tenderer(s)/ Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Tenderer/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 Tenderer(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 Tenderer(s)/Contractor(s).

3) Criminal Liability: If the Principal/Owner obtains knowledge of conduct of a Tenderer(s) or Contractor(s), or of an employee or a representative or an associate of a Tenderer (s) or Contractor(s) which constitutes corruption within the meaning of Indian Penal code (IPC)/Prevention of Corruption 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 Tenderer 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 Tenderer(s) makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Tenderer(s)/Contractor(s) as deemed fit by the Principal/ Owner.

3) If the Tenderer(s)/Contractor(s) 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 Tenderer(s)/Contractor(s)/Subcontractors

1) The Tenderer(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact. The Tenderer(s)/Contractor(s) 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 Tenderers and Contractors.

3) The Principal/Owner will disqualify Tenderer(s), who do not submit, the duly signed Pact between the Principal/Owner and the tenderer(s), 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 Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other tenderer(s), till the Contract has been awarded.

If any claim is made/lodged during the time, the same shall be binding and continue to be valid despite the lapse of this Pacts as specified above, unless it is discharged/determined by the

Competent Authority, IIT Kanpur.

Article 7- Other Provisions

- 1) This Pact is subject to Indian Law, place of performance and jurisdiction is the Head quarters 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 case of a Company, the Pact must be signed by 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 term and condition that any dispute or difference arising between the parties with regard to the terms of this Integrity Agreement / Pact, any action taken by the Owner/Principal in accordance with this Integrity Agreement/ Pact or interpretation thereof shall not be subject to arbitration.

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/Contract documents with regard 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 Tenderer(s)/Contractor(s))

WITNESSES:

1. (signature, name and address)

2. (signature, name and address)

Place:

Dated :

Details of Electrical Contractor

(To be submitted before award of work)

- i. Name of Electrical Contractor : M/s
- ii. Address :
- iii. Class of Registration :
- iv. Details of Registration of the Electrical Contractor

Sl. No.	Department	Registered Yes/No	Registration No.	Tendering limits Rs. Lacs	Validity of Registration	Debarred from Tendering Yes/No
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
1.						
2.						
3.						

Note : All columns of above Proforma must be filled in.

Contractor's signature

CONSENT LETTER

I hereby give my consent to work as electrical contractor till the completion of work. Also I will be responsible for necessary action to hand over the installation and for rectification of defects and repair during the obligatory maintenance period. I will execute the work as per CPWD Specifications and Additional Conditions of the Contract.

I will also engage suitable Engineer for the work as per condition of the contract. I further certify that the above particulars pertaining to me are correct.

Dated :

Signature of Electrical Contractor

Details of HVAC Contractor
(To be submitted before award of work)

- ii. Name of HVAC Contractor : M/s
- ii. Address :
- v. Class of Registration :
- vi. Details of Registration of the HVAC Contractor

Sl. No.	Department	Registered Yes/No	Registration No.	Tendering limits Rs. Lacs	Validity of Registration	Debarred from Tendering Yes/No
1	2	3	4	5	6	7
1.						
2.						
3.						

Note : All columns of above Proforma must be filled in.

Contractor's signature

CONSENT LETTER

I hereby give my consent to work as HVAC contractor till the completion of work. Also I will be responsible for necessary action to hand over the installation and for rectification of defects and repair during the obligatory maintenance period. I will execute the work as per CPWD Specifications and Additional Conditions of the Contract.

I will also engage suitable Engineer for the work as per condition of the contract. I further certify that the above particulars pertaining to me are correct.

Dated :

Signature of HVAC Contractor

MATERIAL AND QUALITY ASSURANCE

1. The contractor shall ensure quality control measures on different aspects of construction including materials, workmanship and correct construction methodologies to be adopted. He shall have to submit quality assurance program within two weeks of the award of work. The quality assurance program should include method statement for various items of work to be executed along with check lists to enforce quality control.
2. The contractor shall get the source of all materials, approved from the Engineer-in-Charge. The contractor shall stick to the approved source unless it is absolutely unavoidable. Any change shall be done with the prior approval of the Engineer-in-Charge for which tests etc. shall be done by the contractor at his own cost. Similarly, the contractor shall submit brand/ make of various materials not specified in the agreement, to be used for the approval of the Engineer-in-Charge along with samples and once the sample is approved, he shall adhere to the approved sample.
3. The contractor shall submit shop drawings of staging and shuttering arrangement, aluminum work, and other works as desired by Engineer In Charge for his approval before execution. The contractor shall also submit bar bending schedule for approval of Engineer –in – charge before execution.
4. Frequency and type of tests of various Materials/items/ article shall be conducted as per specifications and relevant BIS-Codes. The test results confirm to the specification/codes.

5. Test Laboratories :

A) Laboratory at site :

The contractor shall establish a testing lab at site and provide testing equipment and materials for the field tests mentioned in the list of mandatory tests given in CPWD specifications 2009 Vol. 1 & 2. Nothing extra shall be payable to him on this account.

The representatives of the department shall be at liberty to inspect the testing facilities at site and conduct testing at random in consultation with Engineer in charge. The contractor shall provide all necessary facilities for the purpose. The laboratory shall be equipped, inter alia, with the necessary equipment's.

Not less than 90% tests for material be performed at site lab with above stated equipment's, however at least 10% testing of materials shall be got done from IIT Kanpur Institute Laboratories. If such test is not available in the Institute then external independent laboratory will be decided by the engineer in charge. However, for the tests to be carried out by the external laboratories, the contractor shall supply free of charge all the materials required for testing, including transportation. The testing charges of the independent testing shall be paid to contractor subject to the condition the sample passes the test. If test fails the charges shall be borne by the contractor.

If the tests which were to be conducted in the site laboratory are conducted in other laboratories for any reasons attributable to contractor the cost of such tests shall be borne by the contractor.

The cost of the all passed tests conducted through Institute labs shall be borne by the IIT Kanpur and the cost of failed tests should be borne by the contractor.

The testing charges for coupler if used shall be borne by the contractor.

B) Other Laboratories :

For all testing, the contractor shall supply free of charge (except if specifically provided otherwise in the document elsewhere) all the sample materials required for testing, necessary facilities ,manpower, including transportation to required labs, all necessary follow up, report collection from lab to its submission to Engineer in charge. Nothing shall be payable on

above account. Unless specifically specified otherwise, the testing charge for such materials shall be borne by the engineer in charge if the test passes and shall be borne by the contractor if the test fails. The testing charges for the coupler, if used, shall be borne by the contractor.

C) Sampling of Materials :

- (i) Sample of building materials fittings and other articles required for execution of work shall be got approved from the Engineer-in-Charge. Articles manufactured by companies of repute and approved by the Engineer-in-Charge shall only be used. Articles bearing BIS certification mark shall be used. In case the above are not available, the quality of samples brought by the contractor shall be judged by standards laid down in the relevant specifications. All materials and articles 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.
 - (ii) The contractor shall ensure quality construction in a planned and time bound manner.
 - (iii) BIS marked materials except otherwise specified shall be subjected to quality test at the discretion of the Engineer-in-Charge besides testing of other materials as per the specifications described for the item/materials. Wherever BIS marked materials are brought to the site of work, the contractor shall if required, by the Engineer-in-Charge furnish manufacturers test certificate to establish that the material produced by the contractor for incorporation in the work satisfies the provisions of BIS codes relevant to the material and/or the work done.
 - (iv) The contractor shall procure all the materials in advance so that there is sufficient time to testing and approving of the materials and clearance of the same before use in work.
 - (v) All materials 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.
 - (vi) The contractor shall be fully responsible for the safe custody of the materials issued to him even if the materials are in double lock and key system.
 - (vii) The Stone aggregate/stone, sand shall be brought from any quarries subjected to the said materials confirm CPWD specifications
- 5 The day to day receipt and issue accounts of different grade/brand of cement shall be maintained separately in the standard proforma decided by the Engineer-in-Charge or his authorized representative of work and which shall be duly signed by the contractor or his authorized representative.
 - 6 The contractor shall render all help and assistance in documenting the total sequence of this project by way of photography, slides, audio-video recording etc. Nothing extra shall be payable to the contractor on this account.
 - 7 The contractor shall be fully responsible for the safe custody of materials brought by him issued to him even though the materials are under double lock key system.
 - 8 Separate cement registers showing the receipt of the OPC and PPC shall be maintained at site. The contractor shall construct separate godowns for storage of OPC & PPC at site and nothing extra on this account shall be payable.
 - 9 Cement issued shall be for consumption at site only. No cement for factory made items and those not manufactured at site shall be issued.
 - 10 In case there is any discrepancy in frequency of testing as given in the list of mandatory test and that in the individual sub-head of work as per CPWD specification 2009 Vol. 1 & 2 the higher of the two frequencies of testing shall be adopted.

11 Maintenance of Registers:

- (i) All the registers for tests of material to be carried out at construction site or in outside laboratories shall be maintained by the contractor. These register shall be issued to the contractor by Engineer-in-Charge.
 - (ii) The test registers to be issued to the contractor are :
 - a) Materials at site account register.
 - b) Cement register.
 - c) Master test registers.
 - d) Cube test register.
 - e) Paint register.
 - f) Any other test register as required.
 - (iii) All the entries in the register will be made by the designated engineering staff of the contractor and same should be regularly reviewed by engineer in charge and/or his authorized representatives.
 - (iv) Contractor shall be responsible for safe custody of all the registers.
 - (v) Submission of copy of all test registers, material at site register along with each running account bill and final bill shall be mandatory. The contractor shall submit all these registers alongwith the final bill to the Engineer-in-charge.
- 12 Ultrasonic Pulse velocity Method of Test for RCC: Ultrasonic pulse velocity method of test for RCC shall be done as routine test for all the concrete beams and columns as per IS 13311 (Part-I): 1992, after 28 days of casting. Concrete quality grading shall be done and concrete having graded as good and excellent shall be accepted. Necessary testing equipment's and facilities shall be provided by the contractor. The record shall be maintained by the contractor and shall be verified by the engineer-in-charge or his authorized representative. This report shall be submitted with each bill. Nothing extra shall be paid for the same.
- 13 Third party quality control/assurance: Third part quality control/assurance may be conducted by IIT/NIT/Government Engineering College/Government Institutes or any other Empanelled agency, if directed by Engineer-in-Charge. The contractor has to provide all necessary assistance and has to submit compliance report within targeted time frame.

General Terms and Conditions:

- 1 A. The order of preference in case of any discrepancy may be read as the following:
 - i) The conditions mentioned in this tender document
 - ii) Drawings for the work
 - iii) CPWD specifications.
 - iv) Indian standard specifications of B.I.S.
 - v) Applicable DSR.
 - vi) International codes for sound engineering practices.
 - vii) Sound Engineering Practice

A reference made to any Indian Standard specification in these documents, shall imply to be the latest version of that standard including such revision/amendments as are issued by the bureau of Indian standard upto last date of receipt of tender. The contractor shall keep at his own cost all such publications of relevant Indian standard applicable to the work at site all time.

- B. In case of discrepancy between the tender conditions detailed in this document and the applicable General Conditions of Contract, the tender conditions mentioned in this tender document shall prevail.
- 2 Except for the items, for which particular specifications are given in this tender document or where it is specifically mentioned otherwise in the description of items in the schedule of quantities, the work shall generally be carried out in accordance with the “CPWD specifications 2009 Vol. 1 and Vol. 2 (with corrections slips issued upto the last date of submission of tender). (Hereinafter to be referred to as CPWD specifications) and instructions of Engineer-in-Charge. Wherever CPWD specifications are silent the latest IS codes/specification shall be followed.
- 3 The contractor (s) shall study the soil investigation report for the project work site, and satisfy himself about complete characteristics of soil and other parameters of site. However, the contractor has to acquaint himself completely about the soil conditions and characteristics and no claim whatsoever on the alleged inadequacy or incorrectness of the soil report/data provided shall be entertained.
- 4 Existing roads of campus may be used for transport purpose, upto the point where the same is available and allowed with the specific permission of IIT Kanpur authorities in the interest of work. However, restrictions on the existing roads of campus may be imposed by the security personals regarding route available, speed, honking, ply timing etc which shall be strictly observed. Also no claim whatsoever shall be made on this account by the contractor.
- 5 On account of security considerations, there could be some restrictions on the working hours, movement of vehicles for transportation of materials movement of labour and location of labour camp. The contractor shall be bound to follow all such restrictions/instructions and adjust the programme for execution of work accordingly and nothing extra shall be payable on account of the same. The contractor has to obtain pass/identity card for his each

labour/personal for entry in the campus from the IIT authorities. The labours will not be allowed to stay in the campus during night time. They will also have restricted movement inside the campus and should not move to locations inside the campus which do not concern this contract. The contractor shall be fully responsible for any unlawful act, misbehaviour done by its labour and staff at IIT campus. The contractor shall issue Identity card to all labourers and engineers/staff engaged by him and nothing shall be paid on this account. These Identity cards will also be countersigned by the Engineer-in-charge or his authorized representative(s), which can include IIT authorities also. Nothing extra shall be paid on this account.

- 6 The contractor (s) shall give to the Municipality, 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 leviable 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 light and other illumination on for cautioning the public at night.
- 7 The contractor shall fully comply with all legal orders and directions of the Public or local authorities, municipality, IIT authorities and adhere by their rules and regulations and pay all fees and charges for which he may be liable in this regard. Nothing extra shall be paid/reimbursed for the same.
- 8 It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.
- 9 The contractor shall maintain in perfect condition, all portions executed till completion of the entire work allotted to him. Where however phased delivery of work is contemplated these provisions shall apply separately to each phase.

The contractor shall take instructions from the Engineer-in-charge for stacking of materials. No excavated earth or building materials etc. shall be stacked / collected in areas where other buildings, roads, services, compound walls etc. are to be constructed.

The excavated earth of the building from any component should be stacked within 5 km and the same should be brought for back filling of foundation plinth and development of plot area. Nothing extra shall be paid in this account.

- 10 The contractor shall submit the list of engineers / technical staff with charter of duties / responsibilities of each one related to execution of the work.
- 11 PROGRAMME CHART: The contractor shall prepare and submit an integrated programme chart for the execution of work and the detailed provision in GCC.
- 12 Defects Liability Period (DLP)
 - 12.1 Defects liability period shall be taken as **thirty six (36) months** from the date of completion of the work for building as a whole, wherein all the defects shall be rectified by the contractor at his own cost.
 - 12.2 Defects of serious nature causing inconvenience such as leakage, reverse floor slopes affecting the drainage (ponding of water), warping and opening of joints in doors and window shutters etc shall be undertaken by the contractor immediately on receipt of the complaint but not exceeding one week time, failing which the defects will be got removed at his risk and cost plus 25% as supervision and establishment charges.

12.3 All other defects notified to the contractor during the DLP shall be rectified to the entire satisfaction of Engineer-in-Charge or item replaced as soon as possible but not later than one month in any case. Failure to do so in a reasonable period the Engineer-in-Charge shall get it done at his cost plus 25% as supervision and establishment charges after final notice of 10 days. The decision of Engineer-in-Charge regarding a defect being of serious nature or otherwise shall be final and binding.

12.4 The scope of the defect liability for the civil items will be as under:

S.No	Description	Defect Liability
(i)	Concrete work	(a) Rectification of structural /superficial/non-structural cracks. (b) Rectification of dampness/leakages/seepage in roof slab/junctions & sunken portion, depressed portion, through RCC slab, vertical ties, bands, walls, base slab, junction of RCC walls with base slab and construction joints of RCC water tanks. (c) Rectification of cracks in girders, beam, slab, column, lintels, vertical ties, plinth bands, lintel bands etc.
(ii)	Brick work	(a) Rectification of cracks in confined masonry panel wall/partition wall in full length or in part portion. (b) Cracks / settlement of main wall, partition wall or dwarf walls. (c) Rectification of efflorescence, dampness.
(iii)	Woodwork & Joinery	(a) Replacement of warped / bent / weather affected joinery, termite & borer affected joinery of wooden door / window shutters and frames. (b) Cracks in panels, bars / rails / styles of wooden door / window shutters etc.
(iv)	Building Hardware	(a) Repairs / Replacement of loosened / premature failure of fittings including lever mechanics in door locks, hydraulic door closers, handles, tower bolts, cupboard locks etc. (b) Tightening / Replacement of sag in mosquito proofing SS net.
(v)	Steel & iron work	(a) Rectification / Replacement of defective part of girders, gate, shutter, etc. (b) Redoing of defective portion in fabrication / welding including painting thereon. (c) Structural steel work and SS railing. (d) Windows, grills, gates etc. – Defects to be rectified.
(vi)	Roof treatment	(a) Rectification of leakage / seepage in roof slab, expansion/ seismic joints, floor junctions, inadequate/ faulty slope, drain outlets, including covering at junction till guarantee period.
(vii)	Finishing work	(a) Rectification of structural / superficial cracks. (b) Rectification of protruding / peeling off plaster. (c) Rectification of efflorescence, dampness appeared. (d) Undulation / unevenness in plaster. (e) Paint & polishing.
(viii)	Flooring work	(a) Rectification of sunken / deflected / depressed portion of plinth protection flooring in rooms, toilets, entrance foyer, staircase and other locations. (b) Rectification / Replacement of settled floors.

		(c) Settlement of foundation & floors and resultant undulation of door finishes. (d) Rectification / Replacement of floor tiles which are sunken / uneven / undulating at joints / different in colour, texture, etc.
(ix)	Aluminium work/structural glazing/ACP/stone cladding	(a) Rectification / Replacement of defective part of Aluminium frame / shutters / false ceiling. (b) Any defect (normal ageing effect not included) in the stone cladding and any installation error etc.

Note: The above list is illustrative for civil work and not exhaustive. The rectification will include all Civil and Electromechanical works including internal and external services without any exclusion.

12.5 Release of Security Deposit: 25% security deposit will be released after expiry of 12 months from the date of completion of work on satisfactory performance during defect liability period, next 25% of the security deposit will be released after expiry of 24 months from the date of completion of work on satisfactory performance during defect liability period and remaining 50% of the security deposit will be released after expiry of 36 months from the date of completion of work on satisfactory performance during defect liability period.

12.6 Maintenance during DLP:

12.6.1 Maintenance during DLP: The maintenance including manpower and materials of the assets (Assets created under this agreement) for one year after occupation of the building or after completion of the building, whichever is later, shall be done by the contractor free and no payment shall be made for the same. (The date of occupation of the building shall be informed to the contractor by the Engineer-in-charge in writing for taking up of maintenance by the contractor). Prior to the occupation of the building, the contractor shall be given a list of defects, which have been noticed after completion of the building. The contractor shall rectify these defects so that the building is occupied for use.

12.6.2 The maintenance will aim at an effective and economic means of keeping the building and associated services utilizable for which these were intended to. The ordinary use for which building and associated services are designed is a prime factor in determining the standard of care. The scope of work under maintenance shall include day to day Civil / Electrical maintenance, E&M services, repairs, etc of the buildings and associated services constructed under the contract. The scope shall be inclusive of all the necessary cost of skilled / non skilled labourers, cost of required materials, equipments / Tools & Plants, scaffolding, ladders, trolleys / cycle rickshaws / battery operated rickshaws, shotcreting / guiniting machines, welding sets, electric generators, etc required for maintenance of the Assets created under agreement. However, the above maintenance shall not include "Additions / Alterations

/ Up-gradation", day to day operating of the services, providing consumables for operation of various items, "Housekeeping", any façade item cleaning and "Security".

12.6.3 Day to Day Maintenance:

12.6.3.1 Day to day maintenance / repairs is to be attended on day to day basis through a service centre. These services shall be provided through a service centre operating round the clock with all the required manpower, materials, T&P, etc for all days including Sundays and Holidays. A suitable space for service centre may be provided to the contractor free of cost in the IIT Kanpur campus. The responsibility of running and maintenance of service centre including receiving complaints through emails, phones etc, operating staffs, computers &

peripherals, software, internet / broadband connection, etc shall rest with the contractor at his cost. The operation of service centre shall include the following:

- (a) Downloading the complaints received online on daily basis.
- (b) Recording the complaints received at service centre in person or telephonically.
- (c) Assigning the work to the workers of respective trade.
- (d) Uploading the status of attending of the complaints on daily basis.
- (e) Preparing the abstract of attended / unattended complaints on daily, weekly and monthly basis.

12.6.3.2

- a) The contractor shall deploy all the required manpower for day to day maintenance/repairs work.. The contractor shall have to arrange licensed wireman for attending day to day complains related to E & M complaint / service. At least 5 % of inventory of EI including different types of LED fitting shall always be available in the next five months, and thereafter suitable percentage of spare parts shall be kept as per site requirement and past usage record / experience, at site to avoid delay. No payment shall be made for the spare parts and its usage.
- b) The B-check & C-check of DG set of firefighting system shall have to be carried out by the authorized service provider of the DG set supplied, for which no payment shall be made during the maintenance period.
- c) Records of servicing / preventive maintenance of all the E & M service during their warranty period shall be kept by the contractor.
- d) For the E & M services which are to be maintained comprehensive by the manufactures at a notice least three months before the expiry of warranty period is to given by the contractor to the engineer-in-charge and also to his authorized representative(s).

12.6.3.3 Other Conditions:

- (a) The execution of items shall be carried out in accordance to relevant CPWD specifications. For the items which are not covered under CPWD Specifications, the Particular Specifications / B.I.S. Specifications shall have to be followed. The decision of Engineer-in-Charge shall be final in this regard.
- (b) The contractor shall make his own arrangement of water required for the work.
- (c) The contractor shall make his own arrangements for obtaining electric connection for carrying out any maintenance activity and make necessary payment to the department concerned. In the absence of electric connection or failure of power supply, the contractor shall make his own arrangements of generators.
- (d) No residential accommodation shall be provided to any of the staff engaged by the contractor. The contractor shall also not be allowed to erect any temporary set up for his staff in the campus.
- (e) No claim of the labourers shall be entertained including that of providing employment, regularization of services etc.
- (f) The contractor shall take immediate action to attend any complaint received from occupants. In all cases, he shall attend the complaints in the specified duration as mentioned below:-
 - i. No delay complaints–Complaints of emergent nature such as electricity/data networking not being available due to construction fault, plumbing or sewerage systems not working due to construction fault, etc shall be attended on emergent basis but in no case delayed beyond 3 hours.
- (g) Minor complaints – Complaints relating to the trades of mason, carpenter, air-conditioning due to construction fault, are to be attended within 48 hours.

- (h) Major complaints – Complaints other than no delay & minor complaints.
- (i) In case of any complaint mentioned under column (i) and (ii) above is registered again with a period of 7 days, it will be treated as if the complaint registered earlier was not attended.
- (j) In case of failure to meet deadlines to attend a complaint, a lump sum amount of Rs. 200/- (Rupees two hundred only) per complaint per day from the date / time of expiry of attending the respective complaint will be recovered from any sum due to the contractor.
- (k) Any malba / building rubbish generated is to be removed from the site within 24 hours and to be stacked at a pre-designated place. The malba / building rubbish so stacked shall be disposed off as soon as one truck load is accumulated (approx 4 cum) from such designated place.
- (l) In case the malba / building rubbish is not removed either from the site of original malba generation point or from the designated malba stacking place within a period as specified above, recovery of Rs. 1,000/- per day shall be effected from any sum due to the contractor.
 - i. This malba / building rubbish has to be disposed off to the dumping ground as approved by the Engineer-in-Charge in consultation with IITK. The rates quoted by the contractor are inclusive of all operations, labour, leads and lifts from site of work to the dumping ground.
 - ii. Maintenance Engineer/Supervisor shall carry mobile telephone (s) to enable the Engineer-in-Charge / occupants to have easy and quick communication. Nothing extra shall be paid to the contractor on this account and his quoted rates for various items under this contract will be inclusive of this obligation.
- (m) The replaced materials used shall have same or richer specifications to the original materials and compatible to the work.
- (n) The staff employed by the contractor should be well behaved and any complaint of misbehavior shall be taken very seriously and such staff will have to be removed by the contractor immediately from the site.
- (o) The dismantled materials shall be taken away and disposed off by the contractor at his cost. Nothing extra shall be paid / recovered on account of this.
- (p) The contractor shall make all safety arrangements required for the labour engaged by him at his cost. All consequences due to negligence on behalf of security / safety or otherwise shall be on the contractor. The department shall not be responsible for any mishap, injury, accident or death of the contractor's staff. No claim in this regard shall be entertained / accepted by the department.
- (q) Contractor shall be fully responsible for any damages caused to government property by him or his labour in carrying out the work and shall be rectified by the contractor at his cost.
- (r) Chases, holes, etc shall be done using power operated tools in a workmanship manner.
- (s) Each worker shall maintain a complaint diary and get the feedback recorded from the allottee regarding attending the complaint. In case, it is found that the complaint has not been attended satisfactorily, it will be considered as unattended.
- (t) The contractor shall be required to maintain sufficient quantity of spares at site to meet with the requirement of attending the complaints as per direction of Engineer-in-Charge.

13 Safety measures:

13.1 The issue of construction safety & standards has gained utmost importance in recent times. This subject is to be dealt with in an overall manner with an approach to developing and establishing a safety culture at work sites. Broadly, its components are:

- (a) Creating an awareness
- (b) Education
- (c) Training

(d) Implementation

(e) Enforcement measures

All workers of contractor and associate agencies, invariably and at all the times, must follow all safety norms, adopt safe construction practices and use all required safety gadgets in their working throughout the project duration

13.2 The contractor will employ a Safety Manager. Safety Manager shall be a graduate with one year full time advanced safety diploma from Central Labour Institute, Mumbai / NICMAR Hyderabad / Mahatma Gandhi Labour Institute, Ahmedabad or an equivalent qualification and having a working experience (as schedule F) in Construction / Infrastructure or allied sector. The safety supervisor shall be a graduate with safety diploma from Central Labour Institute, Mumbai / NICMAR Hyderabad / Mahatma Gandhi Labour Institute, Ahmedabad or an equivalent qualification.

13.3 Training and Awareness:

(a) Training: The training shall be in two phases- first initial training and then periodic training / refresher workshop.

(b) Initial training: All the workers shall have to undergo a training program of 16 hrs (8 hrs for 2 days) and to be declared satisfactorily trained by the Safety Manager before they are allowed to work on site.

(c) Orientation Program: An orientation program shall be arranged for all people (other than workers) who normally work at or visit the site.

(d) Workshops: Refresher workshops shall be arranged for one day in every three months for all the workers on site.

(e) Advance training: For workers involved in high risk activities (to be identified by the Safety Monitoring Committee) a refresher workshop / training shall be kept once a month.

(f) The training modules shall be designed by the Safety Manager and approved by the Safety monitoring committee.

(g) Training Methodology: The training methodology shall include both classroom and practical demonstration with audio visual techniques. For greater impact, demonstration with dummies will be done to highlight hazards of not following safe practices. The training shall be imparted in vernacular language and may include means such as songs, theatre, puppetry etc. for better appreciation and assimilation by workers.

(h) Implementation:

(i) The basic responsibility of implementation of safe practices shall be that of the safety manager and safety supervisors of the contractor.

(ii) The safety arrangement made by the contractor shall be open to inspection by the IWD officer and the observation made by him shall be complied with by the contractor.

14 Existing drains, pipes, cables, over-head wires, sewer lines, water lines and similar services encountered in the course of the execution of work shall be protected against the damage by the contractor at his own expense. Also any trenching and digging for laying sewer lines/water lines/cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been arranged and closing of the trench(s) thereafter shall be ensured within the least possible time. In case of damage of any such services the same shall

be repaired promptly by the contractor at his own cost and also keep the department indemnified at all times against any claim whatsoever generated by a third party on above account .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.

- 15 The contractor shall be responsible for the watch and ward/guard of the buildings, safety of all fittings and fixtures including sanitary and water supply fittings and fixtures provided by him against pilferage and breakage during the period of installations and thereafter till the building is physically handed over to the department. No extra payment shall be made on this account.
- 16 The contractor shall take instructions from the Engineer-in-charge for stacking of materials. No excavated earth or building materials etc. shall be stacked/collected in areas where other buildings, roads, services, compound walls etc. are to be constructed.
- 17 **Green Building Norms:-**The building is planned as equivalent to minimum four star **GRIHA** rating. The contractor is required to execute the work in a befitting manner to suit the above rating standards. Nothing extra is payable on above account.
- 18 The contractor shall submit for the approval of Engineer-in-Charge names of specialized agencies of repute along with their technical capacity proposed to be engaged by him, who must have executed satisfactorily works of value as specified in mandatory conditions.
- (i) The works shall be carried out in accordance with the Architectural drawings and structural drawings. Before commencement of any item of work, the contractor shall correlate all the relevant architectural and structural drawings issued for the work and satisfy himself that the information available thereof is complete and unambiguous.
- The discrepancy, if any shall be brought to the notice of the Engineer-in-Charge before execution of the work. The contractor alone shall be responsible for any loss or damage executing by the commencement of work on the basis of any erroneous and or incomplete information.
- (ii) The contractor shall take all precautions to avoid accidents by, exhibiting caution boards day and night, speed limit boards, red flags, red light and providing necessary barriers and other measures required from time to time. The contractor shall be responsible for all damages and accidents due to negligence on his part.
- (iii) Other agencies will also simultaneously execute and install the works of electrification, air conditioning, lifts, fire-fighting etc. for this work and the contractor shall provide necessary facilities for the same. The contractor shall leave such recesses, holes openings etc. as may be required for the electric, air- conditioning and other related works (for which inserts, sleeves, brackets, conduits base pinion, clamps etc. shall be supplied free of cost by the department unless otherwise specifically mentioned) and the contractor shall fix the same at time of casting of concrete, stone work & brick work, if required and nothing extra shall be payable on this account.
- (iv) The contractor shall conduct work so as not to interfere with or hinder the progress or completion of the work being performed by other contractor(s) or by the Engineer-in-Charge and shall as far as possible arrange his work and shall place and dispose off the materials being used or removed so as not to interfere with the operations of other contractor or he shall arrange his work with that of the others in an acceptable and coordinated manner and shall perform it in proper sequence to the complete satisfaction of others.
- 19 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.
- 20 The works to be undertaken by the contractor shall inter-alia include the following:
- i.Preparation of detailed SHOP drawings and AS BUILT drawings wherever applicable.
 - ii.Obtaining of Statutory permissions where-ever applicable and required.

iii. Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.

iv. Warranty obligation for the equipment's and / or fittings/fixtures supplied by the contractor. Contractor shall provide all the shop drawings or layout drawings for all the co-ordinated 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.

21 Samples of all materials and fittings to be used in the work in respect of brand manufacturer and quality shall be got approved from the Engineer-in-Charge, well in advance of actual execution and shall be preserved till the completion of the work. Articles bearing BIS certifications mark shall only be used unless no manufacturer has got BIS mark for the particular material. Any material/fitting whose sample has not been approved in advance and any other unapproved material brought by the contractor shall be immediately removed as soon as directed.

22 PREVENTION OF NUISANCE AND POLLUTION CONTROL

- a) 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 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.
- b) 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 materials are fully covered.
- c) The contractor shall ensure that the construction materials including transportation of earth are covered by tarpaulin

23 Security and Traffic Arrangements

- a) In the event of any restrictions being imposed by the Institute authorities/ 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..
- b) No payment shall be made for any damages caused by rain, snowfall, flood, earthquake 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.
- c) The contractor shall construct suitable godowns, yard at the site of work for storing all 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.
- d) 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 local body 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. The Contractor shall arrange to give all notices as required by any statutory / regulatory authority and shall pay to such authority all the fees that is required to be paid for the execution of work. He shall protect and indemnify the Department and its officials & employees against any claim and /or liability arising out of violations of any such laws, ordinances, orders, decrees, by himself or by his employees or his authorized representatives. Nothing extra shall be payable on these accounts.

- e) 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.
- f) 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.
- g) 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.
- h) The contractor will take reasonable precautions to prevent his workman and employees from removing and damaging any flora (tree/plant/vegetation) from the project area.

24 Setting out

- a) The Contractor shall carry out survey of the work area, at his own cost, setting out the layout of buildings/ roads/ services in consultation with the Engineer -in-Charge & proceed further. Any discrepancy between 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. Total station survey instruments only shall be used for layout, fixing boundaries, and centre lines, etc., Nothing extra shall be payable on this account.
- b) .The Contractor shall establish, maintain and assume responsibility for grades, lines, levels and benchmarks. He shall report any errors or inconsistencies regarding grades, lines, levels, dimensions etc. to the Engineer -in-Charge before commencing work. Commencement of work shall be regarded as the Contractor's acceptance of such grades, lines, levels, and dimensions and no claim shall be entertained at a later date for any errors found.
- c) 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.
- d) 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.
- e) 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.
- f) The rates 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, signage, labour safety, labour welfare and labour training measures, preparatory works, working during monsoon, working at all depths, height and location etc. and any other incidental works required to complete this work. Nothing extra shall be payable on this account.

- 25 The contractor 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.

- 26 Wherever required for the execution of work, all the scaffolding at all height 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. It shall be designed to take all incidental loads. It should cater to the safety features for workmen. Nothing extra shall be payable on this account. It shall be ensured that no damage is caused to any structure due to the scaffolding.
- 27 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 used in the construction of this work and they shall not be shifted/ removed from site without the permission of the Engineer-in-Charge.
- 28 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.
- 29 The Contractor shall take all precautions to abide by the environmental related restrictions imposed by any statutory body having jurisdiction in the area 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. No claim what so ever 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.
- 30 The Contractor shall cooperate with and provide the facilities to the associate Contractors and other agencies working at site for smooth execution of the work. The contractor shall indemnify the Department (IWD) against any claim(s) arising out of such disputes. The Contractor shall:
- a) Allow use of scaffolding, toilets, sheds etc.
 - b) Properly co-ordinate their work with the work of other Contractors.
 - c) Provide control lines and benchmarks to his associate Contractors and the other Contractors.
 - d) Provide electricity and water at mutually agreed rates.
 - e) Provide hoist and crane facilities for lifting material at mutually agreed rates.
 - f) Co- ordinate with other Contractors for leaving inserts, making chases, alignment of services etc. at site.
 - g) Adjust work schedule and site activities in consultation with the Engineer-in- Charge and other Contractors to suit the overall schedule completion.

h) Resolve the disputes with other Contractors/ associate contractors amicably and the Engineer- in-Charge shall not be made intermediary or arbitrator.

31 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 & fire alarm system, information technology, communication & electronics and any other services.

32 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.

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

34 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.

35 Supervision of work

The Contractor shall depute Site Engineer & skilled workers as required for the work. He shall submit organization chart alongwith details of Engineers and supervisory staff. It shall be ensured that all decision making powers shall be available to the representatives of the Contractor at Kanpur itself to avoid any likely delays on this account. The Contractor shall also furnish list of persons for specialized works to be executed for various items of work. The Contractor shall identify and deploy key persons having qualifications and experience in the similar and other major works, as per the field of their expertise. If during the course of execution of work, the Engineer-in-Charge is of the opinion that the deployed staff is not sufficient or not well experienced, the Contractor shall deploy more staff or better experienced staff at site to complete the work with quality and in stipulated time limit. Principle Technical representative of the Contractor having minimum experience in similar nature of work as mentioned in the clause 36 of the General Conditions of the Contract, shall always be available at the site during the actual execution of the work.

36 Cleanliness of site

a) The Contractor shall not stack building material/malba/muck on the land or road of the institute 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 bye laws 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 accounts, from any sums due to the Contractor including amount of the Security Deposit and performance guarantee in respect of this contract agreement.

- b) 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.
- c) 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. 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.

37 Inspection of work

Institute authorities, MHRD, HEFA, Local authorities and other Govt. authorities shall be inspecting the on-going work at site at any time with or without prior intimation. The contractor shall, therefore, keep updated the following requirements and detailing.

- a) Display Board showing detail of work, weekly progress achieved with respect to targets, reason of shortfall, status of manpower, wages being paid for different categories of workers.
- b) Entrance and area surrounding to be kept cleaned.
- c) Display layout plan key plan, Building drawings including plans, elevations and sections.
- d) Upto date displays of Bar chart, CPM and PERT etc.
- e) Keep 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.

38 Insurance policy

- a) Before commencing the execution of work, the Contractor shall, without in any way limiting his obligations and liabilities, insure at his own cost and expense against any damage or loss or injury, which may be caused to any person or property, at site of work.

The Contractor shall obtain and submit to the Engineer-in-Charge proper Contractor All Risk Insurance Policy for an amount 1.25 times the contract amount for this work, with Engineer-in-Charge as the first beneficiary. The insurance shall be obtained in joint names of Engineer-in-Charge and the Contractor (who shall be second beneficiary). Also, he shall indemnify the Department from any liability during the execution of the works.

- b) The Contractor shall, from time to time, provide documentary evidence as regards payment of premium for Insurance Policy for keeping them valid till the completion of the work. Without prejudice to any of its obligations and responsibilities specified above, the **Contractor shall within 15 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 Policy along with Certificate of this insurance policy being valid, alongwith documentary evidences as required by the Engineer-in-Charge. No work shall be commenced by the Contractor unless he obtains the Insurance Policy as mentioned above. Also, **no payment shall be made to the Contractor on expiry of insurance policy 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 this account.

- 39 On completion of work, the contractor shall submit at his own cost four prints of **“as built” drawings to the Engineer-in-Charge within 30 days of completion of work.** These drawings shall have the following information:

- a) Route of all piping and their diameters including soil waste pipes & vertical stacks.
- b) Ground and invert levels of all drainage pipes together with locations of all manholes and connections upto outfall.

- c) Route of all water supply lines with diameters, location of control valves, access panels etc.

40 Condition regarding secured advance :-

Secured advance shall be admissible only on those bonafide materials which are likely to be used in the work in a period not exceeding six months from the date of secured advance payment. If agency fails to use the material (in respect of which secured advance have been paid) in the work in this specified period of six month, the said component of secured advance shall be recovered from next running account bill paid to the agency.

41 Personal Safety Measures for Labour

➤ **General:**

Contractor shall provide the following items for safety of workers employed by contractor and associate agencies:

- (i) 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.
- (ii) Welder's protective eye-shields to workers who are engaged in welding works.
- (iii) 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 equipments or machinery.
- (iv) All the workers should be wearing helmet and shoes all the time on site.
- (v) Masks and gloves should be worn whenever and wherever required.
- (vi) Adequate drinking water facility should be provided at site, adequate number of decentralized latrines and urinals to be provided for construction workers.
- (vii) Full time workers (if any with the approval of Engineer-in-Charge) residing on site should be provided with clean and adequate temporary hutment.
- (viii) First aid facility should also be provided.
- (ix) Overhead lifting of heavy materials should be avoided. Barrow wheel and hand-lift boxes should be used to transport materials onsite.
- (x) Tobacco and cigarette smoking should be prohibited onsite.
- (xi) All dangerous parts of machinery are well guarded and all precautions for working on machinery are taken.
- (xii) 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.
- (xiii) Use of durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.
- (xiv) 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.

- (xv) Provide measure to prevent fire. Fire extinguisher and buckets of sand to be provided in fireprone area and elsewhere.
- (xvi) Provide sufficient and suitable light for working during night.
- (xvii) Ensure that measures to protect workers from materials of construction, transportation, storage and other dangers and health hazards are taken.
- (xviii) Ensure that the construction firm/division/company have sound safety policies.
- (xix) Comply with the safety procedure, norms and guidelines (as applicable) as outlined in NBC 2005 (BIS 2005c). All workers shall be provided regular safety training by the designated safety officer of the contractor before allowing them to work at site.
- (xx) Adopt additional best practices and prescribed norms as in NBC 2005 (BIS2005).

➤ **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.

➤ **Air and Noise Pollution**

Contractor shall use dust screens and sprinkle water around the construction site to arrest spreading of dust in the air and surrounding areas.

- a. 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.
- b. For controlling the noise from Vehicles, Plants and Equipments, the Contractor shall confirm the following:
 - (i) All vehicles and equipment used in construction will be fitted with exhaust silencers.
 - (ii) Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced.
- c. Noise emission from compactors (rollers) front loaders, concrete

mixers, cranes (movable), vibrators and saws should be less than 75 dB(A).

- d. As per the standards/guidelines for control of Noise Pollution from Stationary Diesel Generator (DG) sets, noise emission in dB(A) from DG Set (15-500 KVA) should be less than $94+10 \log 10$ (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.

➤ **Construction Vehicles Equipment and Machinery**

- (i) All vehicles, equipment and machinery to be procured for construction shall conform to the relevant Bureau of India Standard (BIS) norms.
- (ii) Emission from the vehicles must conform to environmental norms.
- (iii) Dust produced from the vehicular movement and other site activities is to be mitigated by sprinkling of water.
- (iv) Noise limits for construction equipment's shall not exceed 75 dB(A), measured at one meter from the edge of the equipment in free area, as specified in the Environment Protection Act, 1986, schedule VI part E, as amended on 9th May, 1993. The maximum noise levels near the construction site should be limited to 65 dB (A) Leq (5 min) in project area.

➤ **Construction Wastes Disposal**

- (i) The pre-identified dump locations will be a part of solid waste management plan to be prepared by the Contractor in consultation with Engineer-in-charge.
- (ii) Contractor shall get approved the location of disposal site prior to commencement of the excavation on any section of the project location.
- (iii) Contractor shall ensure that any spoils of material / construction waste will not be disposed off in any municipal solid waste collection bins.
- (iv) No construction waste shall be allowed to be thrown directly on the ground from the higher floors of the building. The required

number of chutes shall have to be provided by the contractor for the disposal of construction waste. Nothing extra shall be paid on this account.

➤ **Procurement of Construction Materials**

- (i) All vehicles delivering construction materials to the site shall be covered to avoid spillage of materials and maintain cleanliness of the roads.
 - (ii) Wheel Tyres of all vehicles used by the contractor, or any of his sub-contractor or materials suppliers shall be cleaned and washed clear of all dust/mud before leaving the project premises. This shall be done by routing the vehicles through tyre washing tracks.
 - (iii) Contractor shall arrange for regular water sprinkling at least twice a day (i.e. morning and evening) for dust suppression of the construction sites and unpaved roads used by his construction vehicles.
- Identify roads on-site that would be used for vehicular traffic. Update vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral type that make up the surface base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10 -20%. Limit vehicular speed on site 10km/h. Nothing extra will be payable for this.
- All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust/particulate emissions.
- Ensure that water spraying is carried out by wetting the surface by spraying water on:
- (i) Any dusty material.
 - (ii) Areas where demolition work is carried out.
 - (iii) Any unpaved main-haul road and.
 - (iv) Areas where excavation or earth moving activities are to be carried out.
- The contractor shall ensure the following:
- (i) Cover and enclose the site by Providing, erecting & maintaining 5.00 metre high temporary barricading with MS tubular members of appropriate sizes out of which brand new profile sheet of 3.00 metre height & rest 2.00 metre height covered with green garden cloth which also covered entire height of profile

sheet as approved by Engineer-in-charge on the construction site. After completion of work, the contractor will take away all the barricading materials

- (ii) Covering stockpiles of dusty material with impervious sheeting.
 - (iii) Covering dusty load on vehicles by impervious sheeting before they leave the site.
 - (iv) Transferring, handling/storing dry loose materials like bulk cement and dry pulverized fly ash inside a totally enclosed system.
 - (v) Spills of dirt or dusty materials shall be cleaned up promptly so that the spilled material does not become a source of fugitive dust and also to prevent seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / cleaned up immediately before they can infiltrate into the soil/ground or runoff in nearby areas. Clear vegetation only from areas where work will start right away.
- Adopt measures to prevent air pollution in the vicinity of the site due to construction activities. There is no standard reference for this. The best practices should be followed (as adopted from international best practice documents and codes).
 - The contractor shall provide experienced personnel with suitable training to ensure that these methods are implemented. Prior to the commencement of any work, the method of working, plant equipment and air pollution control system to be used on-site should be made available for the inspection and approval of the Engineer –in-Charge to ensure that these are suitable for the project.
 - Employ measures to segregate the waste on-site into inert, chemical or hazardous wastes. Recycle the unused chemical/hazardous wastes such as oil, paint, batteries and asbestos. The inert waste is to be disposed off to Municipal Corporation/local bodies dump yard and landfill sites.
 - To preserve the existing landscape and protect it from degradation during the process of construction. Select proper timing for construction activity to minimize the disturbance such as soil pollution due to spilling of the construction material and its mixing with rainwater. The construction management plan including soil erosion control management plan shall be prepared accordingly for each month. The application of erosion control measures includes construction of gravel pits and tyre washing bays of approved size and specification for all vehicular site entry/exits, protection of slopes greater than 10%. Sedimentation Collection System and run-off diversion systems shall be in place before the commencement of construction activity. Preserve and protect the existing vegetation by not-disturbing or damaging to specified site areas during construction.
 - The Contractor should follow the construction plan as proposed by the Engineer-in-charge / landscape consultant to minimize the site disturbance such as soil pollution due to spilling. Use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site.

- Spill prevention and control plans should clearly state measures to stop the source of the spill. Measures to contain the spill and measures to dispose the contaminated material and hazardous wastes. It should also state the designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners and petroleum products.
- The contractor shall prepare and submit 'Spill prevention and control plans' before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.
- The contractor shall ensure that no construction leaches (Ex: cement slurry) is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this including reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant – laden water directly to the treatment device or facility (municipal sewer line).
- All lighting installed by the contractor around the site and the godowns, offices shall be of LED lights of the appropriate illumination levels. This condition is a must, unless specifically prescribed otherwise.

42 NATIONAL GREEN TRIBUNAL BUILDING

- (i) The contractor shall not store/dump construction material or debris on metalled road.
- (ii) The contractor shall get prior approval from Engineer-in-charge for the area where the construction material or debris can be stored beyond the material road. This area shall not cause any obstruction to the free flow of traffic/ inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.
- (iii) The contractor shall ensure that all the trucks or vehicles of any kind which are used for construction purpose/or are carrying construction material like cement, sand and other allied material are fully covered. The contractor shall take every necessary precautions that the vehicles are properly cleaned and dust free to ensure that enroute their destination, the dust, sand or any other particles are not released in air/contaminate air.
- (iv) The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.
- (v) 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 relating to dust emission.
- (vi) 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.
- (vii) The contractor shall compulsory use of wet jet in grinding and

stone cutting.

- (viii) The contractor shall comply all the preventive and protective environmental steps as stated in the MoEF guidelines, 2010.
- (ix) The contractor shall carry out on-Road-Inspection for black smoke generating machinery.
- (x) The contractor shall use cleaner fuel.
- (xi) The contractor shall ensure that all DG sets comply emission norms notified by MoEF.
- (xii) The contractor shall use vehicles having pollution under control certificate. The emissions can be reduced by a large extent by reducing the speed of a vehicle to 20 kmph. Speed bumps shall be used to ensure speed reduction. In cases where speed reduction cannot effectively reduce fugitive, the contractor shall divert traffic to nearby paved areas.
- (xiii) The contractor shall ensure that the construction material is covered by tarpaulin. The contractor shall take all other precaution to ensure that no dust particles are permitted to pollute air quality as a result of such storage.
- (xiv) The paving of the path for plying of vehicles carrying construction material is more permanent solution to dust control and suitable for longer duration projects.
- (xv) The natural drainage system should be maintained by the contractor at his own cost. Local Bye-law/ provisions on Rain Water Harvesting should be followed.

43 Project Monitoring

- (i) The Agency shall prepare the phase wise (monthly) resource chart (materials, manpower and machinery) based on the project execution schedule as per clause 5.1 of GCC.
- (ii) The Agency shall submit the photographs & videos of progress of work on fortnightly basis to make it possible to create a short film of the entire execution of the work to be kept in archive.
- (iii) Agency shall submit a detailed Monthly progress & program report to the Engineer-in-charge by 5th of every month. The format of monthly progress & program report shall be as approved by Engineer-in-Charge.
- (iv) The Agency will make it possible to be represented by a senior level executive who have sufficient financial powers to take decisions required for completing the project in time.
- (v) The agency shall stick to the construction schedule, if there is any hindrance or delay due to any reason the same shall be mitigated through engaging extra manpower, material and machinery.

44 **Documentation of work:** Agency shall make documentation in regard to the various stages of progress of work. Nothing shall be paid on this account to the contractor. The scope includes:-

- (i) Colour photography of the work at every three month interval or lesser interval as per direction of Engineer-in charge and at the completion of work covering the entire work upto that stage and supplying the same in soft copy with storage instrument of required capacity as per direction of Engineer-in-charge.
- (ii) Videography of the execution of work every six months or lesser interval and at completion of work i/c preparation of documentary with voice over showing the progress of work as directed by Engineer-in-charge.
- (iii) Each photograph/video shall be suitably captioned and dated.
- (iv) The photographs/video and materials including soft copy shall form a part of the records of IWD and the prints cannot be supplied to anybody else or published without the written permission of Engineer-in-charge. All documents i/c photograph/video and other documents in hard copy shall be submitted by the agency to the Engineer-in-charge on quarterly basis for record purpose.

45 No extra payment will be made for operation/activity mentioned at Sl. No. 1 to 44 above unless specifically mentioned otherwise.

PART-B

General Conditions for Work

Scope of Work

The work shall be executed in accordance with the layout plan, architectural, structural drawings and services drawings on **EPC Turnkey basis** to completion and handing over in fit condition ready for occupation.

The land is free from encroachment and there is no hindrance to execute the work. The agency shall fix a permanent bench mark at the site of work. Plinth level shall be fixed above the General finished ground level as per drawings and decided by Engineer-in-charge. The data provided in this document are for general guidelines. Changes, if any, would not affect the agreed rates and no claim on this account shall be entertained.

To carry out survey of the site for execution of the project and shall verify the site dimensions as per the site plan provided with bid document.

Providing, erecting & maintaining 5.00 metre high temporary barricading with MS tubular members of appropriate sizes out of which brand new profile sheet of 3.00 metre height & rest 2.00 metre height covered with green garden cloth which also covered entire height of profile sheet as approved by Engineer-in-charge on the construction site. After completion of work, the contractor will take away all the barricading material. There should be only one temporary gate in the temporary barricading erected for the site.

Planning, designing wherever required and execution of all **internal services** like internal sanitary, water supply, drainage system etc. complete for the buildings planned including all its fittings, fixtures, testing etc. complete is in scope.

Execution of all **external services** like water supply, sewerage, drainage system, roads, paths and all connected sub-structures and superstructures within the premises, as per bye-laws and norms of the local bodies including making connections with the peripheral services after getting the services approved from Engineer-in-charge are the part of the scope.

The scope also includes Planning, designing wherever required and construction/installation of underground reservoirs, pump houses for water supply, for firefighting tank including installing of pumps, standby pumps as per approved drawings/specifications or as directed by Engineer-in-charge.

Complete leveling/dressing including filling of earth, its supply, disposal of surplus earth is to be completed as directed by the Engineer-in-charge.

Taking all precautionary measures to safeguard safety measures against any accidents for the agency's employees, labour, public, and staff of IWD by providing all necessary safety equipment, helmets etc. at work site.

Defects liability period shall be 36 months from the date of recording of completion certificate by the competent authority.

The Agency shall construct/provide one site office (semi-permanent structure) with modern outlook and having Air Conditioning, for use by Engineer-in-charge and his staff consisting of 1 room with toilet (not less than 40 sqm). The location and plan shall be got approved from Engineer-in-Charge. Specification for the site office shall be suitable and matching for running an office which shall be got approved from Engineer-in-charge. The Agency shall provide a typical plan of site office (having light fixtures, wiring &, AC etc.) with specification within 15 days of award of work and shall construct after approval of Engineer-in-Charge. All running cost & charges (i/c one office attendant, one data entry operator and AMC etc.) for office including Electricity bill, water supply bills, RO/drinking water bills etc. shall be provided and cost shall be borne by the agency.

The agency shall provide the following furniture (new) for use of IWD staff at site office and will take them away these items after completion of work.

S.No.	Articles	Quantity
1.	Office Tables	2 Nos.

2.	Office Chairs	2 Nos.
3.	Steel Almirah (Big)	2 Nos.
4.	Visitor chairs	6 Nos.

The scope as described above is only indicative and not exhaustive. In additions to the above the agency shall be responsible for executing all the items required for completing the building in all respect to make the building fully functional and ready for occupation with electrical, air-conditioning works complete as per direction of Engineer-in-charge.

The above scope of work includes cost of all materials, manpower, equipment's, T&P fixtures, accessories, royalties, all taxes (excluding GST) watch & ward till handing over the complete premises to the department and all other essential elements for completion Any change, modification, revision etc. required to be done by IWD, CFO, local bodies, proof consultants etc. in accordance with applicable standards and bye- laws will have to be done at agency's cost and nothing extra shall be payable.

External Bulk Services with detailed planning and execution upto completion for 1. Water supply, 2. Sewerage system, 3. Storm water drains, 4. Roads, 5. Paths, differently able person friendly corridors, as per area norms are in the scope of work. Detailed planning and execution to complete for Internal Electrification, Fire Alarm System, Fire-fighting system, , CCTV/LAN, Point wiring, Lifts, HVAC (Low Side) with all equipment's and external lighting, and any other essential services as per requirement of the Engineer-in-charge and also required for satisfactory completion of project etc. are within the scope of work.

Local Body Approvals

The status of local body approvals is as under: - Obtaining local body approvals form different sub-bodies is the responsibility of the master consultant who has been already appointed by the Client. The master consultant/Architect shall obtain approvals relating to building drawings. Approvals/NOC/permissions etc if any other than mentioned above shall be obtained by the contractor at his own level. The following are also obtained by the contractor at his own cost:

The following are also obtained by the contractor at his own cost:

No.	Details	Remarks
1	Department of Fire services (DFS)	Case is being submitted to DFS. Contractor has to pursue and obtain provisional and final approval from the fire department.
2	Charges / fee to be payable to the authority / local body	Shall be paid by the Department

CONTRACT CONDITIONS SPECIFIC TO GREEN BUILDING PRACTICES:

The contractor shall strictly adhere to the following conditions as part of his contractual obligations as the project is targeted to get an equivalent of 4-Star GRIHA ratings certification:

- 1.1 SITE:
 - 1.1.1 The contractor shall ensure that adequate measures are taken for the prevention of erosion of the top soil during the construction phase. The contractor shall prepare and submit Soil Erosion and Sedimentation Control Plan (ESCP) in accordance with GRIHA norms and get it approved from the Engineer-in-Charge as part of the larger Construction Management Plan (CMP) before start of the work and implement effectively. At no time soil should be allowed to erode away from the site. Sediments should be trapped wherever necessary.
The contractor shall take the clearance of the Engineer-in-Charge before any excavation.
 - 1.1.2 The contractor shall prepare and submit “spill prevention and control plan” clearly stating measures to stop/prevention of spill it to contain spills, to dispose the contaminated materials and hazardous wastes, the designation and details of the personnel trained to prevent and control spills, etc and get it approved from the Engineer-in-Charge, before start of the work. The Contractor should follow the construction plan as approved by the Engineer-in-Charge to minimize the site disturbance such as soil pollution due to spilling. The contractor should use staging and spill prevention and control plan to restrict the spilling of the contaminating material on site.
 - 1.1.3 No excavated earth shall be removed from the campus unless suggested/approved otherwise by Engineer in Charge. All subsoil shall be reused in backfilling/landscape, etc as per the instructions of the Engineer-in-Charge.
 - 1.1.4 The contractor shall not change the natural gradient of ground unless specifically instructed by the Engineer-in-Charge. This shall cover all natural features like water bodies, drainage, gullies, slopes, mounds, depressions, etc.
Existing drainage patterns through or into any preservation area shall not be modified unless specifically directed by the Engineer-in-charge.
 - 1.1.5 The contractor shall not carry out any work which results in the blockage of natural drainage.
 - 1.1.6 The contractor shall ensure that existing grades of soil shall be maintained around existing vegetation and lowering or raising the levels around the vegetation is not allowed unless specifically directed by the Engineer-in-charge.
 - 1.1.7 Contractor shall reduce pollution and land development impacts from automobiles use during construction.
 - 1.1.8 Overloading of trucks is unlawful and no overloading shall be permitted. When loose materials like stone dust, excavated earth, sand etc. are moved, proper covering must be provided.
 - 1.1.9 The contractor/sub contractor shall prepare and submit a Site Management plan (SMP) within 15 days of start of work, for approval by the Engineer-in-charge. This SMP shall indicate the locations of godown, stockpiles, barricading, waste storage, offices, vehicular movement routes etc. In short this SMP would comprehensively represent how the site activities shall be managed conforming to GRIHA guidelines. Contractor will be penalized @ Rs. 2000/- per day of delay on non-submission of SMP beyond due date to be recovered from next RA Bill.
 - 1.1.10 Any other site management measures suggested by the Engineer-in-charge shall be followed on site.

1.2 CONSTRUCTION PHASE AND WORKER FACILITIES

- 1.2.1 The contractor shall specify and limit construction activity in pre-planned and pre-designated areas and shall start construction work after securing the approval for the same from the Engineer-in-Charge. This shall include areas of construction, storage of materials, and material and personnel movement.
- 1.2.2 Preserve and Protect Landscape during Construction
- a) The contractor shall ensure that no trees, existing or otherwise, shall be harmed and damage to roots should be prevented during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health. These activities should be restricted to the areas outside of the canopy of the tree, or, from a safe distance from the tree/plant by means of barricading. Trees will not be used for support; their trunks shall not be damaged by cutting and carving or by nailing posters, advertisements or other material. Lighting of fires or carrying out heat or gas emitting construction activity within the ground, covered by canopy of the tree is not to be permitted.
 - b) The contractor shall take steps to protect trees or saplings identified for preservation within the construction site using tree guards of approved specification.
 - c) Contractor should limit all construction activity within the specified area as per the Construction Management Plan (CMP) approved by Engineer-in-Charge.
 - d) The contractor shall avoid cut and fill in the root zones, through delineating and fencing the drip line (the spread limit of a canopy projected on the ground) of all the trees or group of trees. Separate the zones of movement of heavy equipment, parking, or excessive foot traffic from the fenced plant protection zones.
 - e) The contractor shall ensure that maintenance activities during construction period shall be performed as needed to ensure that the vegetation remains healthy.
- 1.2.3 Contractor shall be required to develop and implement a waste management plan, quantifying material diversion goals. He shall establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. A project-wide policy of “Nothing leaves the Site” should be followed, in such a case when strictly followed, care would automatically be taken in ordering and timing of materials such that excess doesn’t become “waste”. The Contractor’s ingenuity is especially called towards meeting this prerequisite/ credit (as per GRIHA). Designate a specific area(s) on the construction site for segregated or comingled collection of recyclable material, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. The diversion may include donation of materials to charitable organizations and salvage of materials on-site.
- 1.2.4 Contractor shall collect all construction waste generated on site and segregate these wastes based on their utility and examine means of sending such waste to manufacturing units which use them as raw material or other site which require it for specific purpose. Typical construction debris could be broken bricks, steel bars, broken tiles, spilled concrete and mortar etc.
- 1.2.5 The contractor shall provide potable water for all workers
- 1.2.6 The contractor shall provide the minimum level of sanitation and safety facilities for the workers at site. The contractor shall ensure cleanliness of workplace with regard to the disposal of waste and effluent; provide clean drinking water and latrines and urinals as per applicable standard. Adequate toilet facilities shall be provided for the workman within easy access of their place of work. The total number to be provided shall not be less than 1 per 30 employees in any one shift. Toilet facilities shall be provided from the start of building operations, connection to a sewer shall be made as soon as practicable. Every toilet shall be so constructed that the occupant is sheltered from view and protected from the weather and falling objects. Toilet facilities shall be maintained in a sanitary condition. A sufficient quantity of disinfectant shall be provided. Natural or artificial illumination shall be provided.
- 1.2.7 The contractor shall ensure that air pollution due to dust/generators is kept to a minimum, preventing any adverse effects on the workers and other people in and around the site. The contractor shall ensure proper screening, covering stockpiles, covering brick and loads of

dusty materials, wheel-washing facility, gravel pit, and water spraying. Contractor shall ensure the following activities to prevent air pollution during construction:

- (a) Clear vegetation only from areas where work will start right away
- (b) Vegetate / mulch areas where vehicles do not ply.
- (c) Apply gravel / landscaping rock to the areas where mulching / paving is impractical.
- (d) Identify roads on-site that would be used for vehicular traffic. Upgrade vehicular roads (if these are unpaved) by increasing the surface strength by improving particle size, shape and mineral types that make up the surface & base. Add surface gravel to reduce source of dust emission. Limit amount of fine particles (smaller than 0.075mm) to 10 – 20%.
- (e) Water spray, through a simple hose for small projects, to keep dust under control. Fine mists should be used to control fine particulate. However, this should be done with care so as not to waste water. Heavy watering can also create mud, which when tracked onto paved public roadways, must be promptly removed. Also, there must be an adequate supply of clean water nearby to ensure that spray nozzles don't get plugged.
- (f) Water spraying shall be done on:
 - i. Any dusty materials before transferring, loading and unloading.
 - ii. Area where demolition work is being carried out.
 - iii. Any un-paved main haul road.
 - iv. Areas where excavation or earth moving activities are to be carried out.
- (g) The contractor shall ensure that the speed of vehicles within the IIT campus is limited to 15 km/hr.
- (h) All material storages should be adequately covered and contained so that they are not exposed to situations where winds on site could lead to dust / particulate emissions.
- (i) Spills of dirt or dusty materials will be cleaned up promptly so the spilled material does not become a source of fugitive dust and also to prevent of seepage of pollutant laden water into the ground aquifers. When cleaning up the spill, ensure that the clean-up process does not generate additional dust. Similarly, spilled concrete slurries or liquid wastes should be contained / cleaned up immediately before they can infiltrate into the soil / ground or runoff in nearby areas.
- (j) Cover stockpiles of dusty material with impervious sheeting.
- (k) Cover dusty load on vehicles by impervious sheeting before they leave the site.

1.2.8 Contractor shall be required to provide an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics, and metals. He shall coordinate the size and functionality of the recycling areas with the anticipated collections services for glass, plastic, office paper, newspaper, cardboard, and organic wastes to maximize the effectiveness of the dedicated areas. Consider employing cardboard balers, aluminium can crushers, recycling chutes, and collection bins at individual workstations to further enhance the recycling program.

1.2.9 The contractor shall ensure that no construction leachate (e.g. cement slurry etc.), is allowed to percolate into the ground. Adequate precautions are to be taken to safeguard against this including, reduction of wasteful curing processes, collection, basic filtering and reuse. The contractor shall follow requisite measures for collecting drainage water run-off from construction areas and material storage sites and diverting water flow away from such polluted areas. Temporary drainage channels, perimeter dike/swale, etc. shall be constructed to carry the pollutant-laden water directly to the treatment device or facility (municipal sewer line).

1.2.10 Staging (dividing a construction area into two or more areas to minimize the area of soil that will be exposed at any given time) should be done to separate undisturbed land from land disturbed by construction activity and material storage.

1.2.11 A copy of all pertinent regulations and notices concerning accidents, injury and first-aid shall be prominently exhibited at the work site. Depending upon the scope & nature of work, a person qualified in first-aid shall be available at work site to render and direct first-aid to

causalities. A telephone may be provided to first-aid assistant with telephone numbers of the hospitals displayed. Complete reports of all accidents and action taken thereon shall be forwarded to the competent authorities.

1.2.12 The contractor shall ensure the safety measures as listed in the General Conditions of Contract (GCC) for construction workers are followed. Some additional measures and few repetitions from “GCC” are listed below:

- (a) Guarding all parts of dangerous machinery.
- (b) Precautionary signs for working on machinery
- (c) Maintaining hoists and lifts, lifting machines, chains, ropes, and other lifting tackles in good condition.
- (d) Durable and reusable formwork systems to replace timber formwork and ensure that formwork where used is properly maintained.
- (e) Ensuring that walking surfaces or boards at height are of sound construction and are provided with safety rails or belts.
- (f) Provide protective equipment; helmets etc.
- (g) Provide measures to prevent fires. Fire extinguishers and buckets of sand to be provided in the fire-prone area and elsewhere.
- (h) Provide sufficient and suitable light for working during night time.

1.2.13 The storage of material shall be as per standard good practices as specified in Storage, Stacking and Handling practices, NBC 2016 and shall be to the satisfaction of the Engineer in Charge to ensure minimum wastage and to prevent any misuse, damage, inconvenience or accident. Watch and ward of the Contractor’s materials shall be his own responsibility. There should be a proper planning of the layout for stacking and storage of different materials, components and equipments with proper access and proper maneuverability of the vehicles carrying the materials. While planning the layout, the requirements of various materials, components and equipments at different stages of construction shall be considered.

1.2.14 The contractor shall provide for adequate number of garbage bins around the construction site and the workers facilities and will be responsible for the proper utilization of these bins for any solid waste generated during the construction. The contractor shall ensure that the site and the workers facilities are kept litter free. Separate bins should be provided for plastic, glass, metal, biological and paper waste and labelled in both Hindi and English with suitable symbols.

1.2.15 The contractor shall prepare and submit ‘Spill prevention and control plans’ before the start of construction, clearly stating measures to stop the source of the spill, to contain the spill, to dispose the contaminated material and hazardous wastes, and stating designation of personnel trained to prevent and control spills. Hazardous wastes include pesticides, paints, cleaners, and petroleum products.

Contractor shall collect & submit the relevant material certificates for materials with high recycled (both post-industrial and post-consumer) content, including materials like RMC mix with fly-ash, glass with recycled content, calcium silicate boards etc.

1.2.16 Contractor shall collect the relevant material certificates for rapidly renewable materials such as bamboo, wool, cotton insulation, agri-fiber, linoleum, wheat board, strawboard and cork etc.

1.2.17 Contractor shall adopt an IAQ (Indoor Air Quality) management plan to protect the HVAC system during construction, control pollutant sources, and interrupt pathways for contamination. He shall sequence installation of materials to avoid contamination of absorptive materials such as insulation, carpeting, ceiling tile, and gypsum wallboard. He shall also protect stored on-site or installed absorptive materials from moisture damage.

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

Wherever required, Contractor shall meet and carry out documentation of all activities on site, supplementation of information, and submittals in accordance with GRIHA program standards and guidelines.

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

b. The contractor shall provide O & M Manuals wherever applicable.

c. The contractor shall make himself conversant with the Site Waste Management Program Manual and actively contribute to its compilation by estimating the nature and volume of waste generated by the process/installation in question.

d. MATERIALS & FIXTURES FOR THE PROJECT

- i. Contractor will produce wherever feasible certificate regarding distance of the source of the relevant material.
- ii. The contractor shall ensure that all paints, polishes, adhesives and sealants used both internally and externally, on any surface, shall be Low VOC products. The contractor shall get prior approval from the Engineer-in-Charge before the application of any such material.
- iii. The contractor shall ensure that all composite wood products/agro-fibre products used for cabinet work, etc do not contain any added urea formaldehyde resin.

1.2.19 CONSTRUCTION WASTE

- a) All construction debris generated during construction shall be carefully segregated and stored in a demarcated waste yard. Clear, identifiable areas shall be provided for each waste type. Employ measures to segregate the waste on site into inert, chemical, or hazardous wastes.
- b) All construction debris shall be used for road preparation, back filling, etc, as per the instructions of the Engineer in Charge, with necessary activities of sorting, crushing, etc.
- c) No construction debris shall be taken away from the site, without the prior approval of the Engineer-in-Charge.
- d) The contractor shall recycle the unused chemical/hazardous wastes such as oil, paint, batteries, and asbestos.
- e) If and when construction debris is taken out of the site, after prior permissions from the Engineer-in-Charge, then the contractor shall ensure the safe disposal of all wastes and will only dispose of any such construction waste in approved dumping sites.

1.2.20 Documentation:

- a) The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer-in-Charge on a monthly basis:
 - i) Water consumption in litres
 - ii) Electricity consumption in 'kwh' units
 - iii) Diesel consumption in litres
 - iv) Quantum of waste (volumetric/weight basis) generated at site and the segregated waste types divided into inert, chemical and hazardous wastes.
 - v) Digital photo documentation to demonstrate compliance of safety guidelines as specified here and in the Appendix on Safety Conditions.
- b) The contractor shall, during the entire tenure of the construction phase, submit the following records to the Engineer in Charge on a fortnightly basis:
 - i) Quantities of material brought into the site, including the material issued to the contractor by the Engineer-in-charge.
 - ii) Quantities of construction debris (if at all) taken out of the site
 - iii) Digital photographs of the works at site, the workers facilities, the waste and other material storage yards, pre-fabrication and block making works, etc as guided by the Engineer-in-Charge.

- c) The contractor shall submit a document after construction of the buildings, a brief description along with photographic records to show that other areas have not been disturbed during construction. The document should also include brief explanation and photographic records to show erosion and sedimentation control measures adopted. (Document CAD drawing showing site plan details of existing vegetation, existing buildings, existing slopes and site drainage pattern, staging and spill prevention measures, erosion and sedimentation control measures and measures adopted for top soil preservation during construction.
- d) The contractor shall submit to the Engineer-in-Charge after construction of the buildings, a detailed as built quantification of the following:
 - i. Total materials used,
 - ii. Total earth excavated
 - iii. Total waste generated,
 - iv. Total waste reused,
 - v. Total water used,
 - vi. Total electricity, and
 - vii. Total diesel consumed.
- e) The contractor shall submit to the Engineer-in-Charge, before the start of construction, a site plan along with a narrative to demarcate areas on site from which soil has to be gathered, designate area where it will be stored, measures adopted for soil preservation and indicate areas where it will be reapplied after construction is complete.
- f) The contractor shall submit to the Engineer-in-Charge, a detailed narrative on provision for safe drinking water and sanitation facility for construction workers and site personnel.
- g) Provide supporting document from the manufacturer of the cement specifying the fly-ash content in PPC used in reinforced concrete.
- h) Provide supporting document from the manufacturer of the cement specifying the fly-ash content in PPC used in cement procured for works other than RCC.
- i) Provide supporting document from the manufacturer of the pre-cast building blocks specifying the fly ash content of the blocks used in an infill wall system.
- j) The contractor shall, at the end of construction of the buildings, submit to the Engineer-in-Charge, submit following information, for all material brought to site for construction purposes, including manufacturer's certifications, verifying information, and test data, where Specifications sections require data relating to environmental issues including but not limited to:
 - k) Indoor Air quality and Environmental Issues: Submit emission test data, sourced from the manufacturers, produced by acceptable testing laboratory listed in Quality Assurance Article for materials as required in each specific Specification section.
 - i. Certifications from manufacturers of Low VOC paints, adhesives, sealant and polishes used at this particular project site.
 - ii. Certification from manufacturers of composite wood products/agro fibre products on the absence of added urea formaldehyde resin in the products supplied to them to this particular site.
 - iii. Submit environmental and pollution clearance certificates for all diesel generators installed as part of this project.
 - iv. Provide total support to Engineer-in-Charge and Consultants appointed by the Engineer-in-Charge in completing all Green Building related formalities, including signing of forms, Providing signed letters in the contractor's letterhead whenever required.

1.2.21 EQUIPMENT

- a) To ensure energy efficiency during and post construction all pumps, motors and engines used during construction or installed, shall be subject to approval and as per the specifications of the Engineer-in-Charge.
- b) In case any of the above condition given here is in conflict of any other condition given in this document elsewhere the later shall prevail.
- c) The contractor is required to execute the work in a befitting manner to suit the above GRIHA rating standards. Nothing extra is payable on above account.

Environment Authority Conditions:

1. The contractor shall not store/dump construction material or debris on metalled road.
2. The contractor shall get prior approval from Engineer-in-Charge for the area where the construction material or debris can be stored beyond the metalled road. This area shall not cause any obstruction to the free flow of traffic/inconvenience to the pedestrians. It should be ensured by the contractor that no accidents occur on account of such permissible storage.
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 precautions that the vehicle are properly cleaned and dust free to ensure that enroute their destination, the dust, sand or any other particles are not released in air/contaminate air.
5. The contractor shall provide mask to every worker working on the construction site and involved in loading, unloading and carriage of construction material and construction debris to prevent inhalation of dust particles.
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 relating 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 compulsorily use jet in grinding and stone cutting.
9. The contractor shall comply all the preventive and protective environmental 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 the DG sets comply emission 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. In cases 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 precaution to ensure that no dust particles are permitted to pollute air quality as a result of such storage.
14. No extra payment will be made for operation/activity mentioned at Sl. No. 1 to 13 above unless and until specified in this tender document.

SPECIAL CONDITIONS (Major component-Civil)

1. The contractor shall execute the whole work in the most substantial and workmanlike manner in strict accordance with the specifications, approved design, drawings, particular specifications, special conditions, additional conditions and instructions of the Engineer-in-Charge.
2. Before tendering, the contractor shall inspect the site of work and structures and shall fully acquaint himself about the conditions prevailing at site, availability of materials, availability of land and suitable location for construction of go-downs, stores, site office, transport facilities, constraints of space for establishing design mix plants, weather condition at site, the extent of leads and lifts involved in execution of work etc., which may affect or influence the tenders. No claim whatsoever on account of above factors shall be entertained.
3. **Labour huts at site shall not be allowed.** The contractor shall make own arrangement on rent or otherwise, outside the IIT campus for labour hutment etc at his own cost.
4. The contractor shall at his own expense and risk arrange land for accommodation of labour.
5. Subject to availability and further with the restrictions as imposed by IIT Kanpur authorities, a small parcel of land may be provided on as is basis to the contractor near the work site (within 1000 mtrs distant from the construction site) for setting up of site office, storage of materials, erection of temporary workshops, small rest room and construction of approach roads to the site of work, including land required for carrying out of all jobs connected with the completion of the work. The contractor shall have to abide by the regulations of the authorities concerned and the directions of the Engineer-in-Charge strictly for use of land available at the site of work. Also if it becomes necessary during construction to remove or shift the stored materials, shed, workshop, access roads, etc to facilitate execution of the work included in this agreement or any other work by any other agency, the contractor shall have remove or shift these facilities as directed by the Engineer-in-Charge and no claim shall be entertained on such account. Also no claim on the basis of inadequacy, unsuitability or any other ground whatsoever regarding land provided shall be entertained.
6. It shall be deemed that the contractor has satisfied himself as to the nature and location of the work, availability of labour, materials, transport facilities, availability and suitability of land for setting up of camp, etc with respect to the work to be executed. The department will bear no responsibility for lack of such knowledge and the consequences thereof.
7. The contractor shall have to make approaches to the site, if so required and keep them in good condition for transportation of labour and materials as well as inspection of works by the Engineer-in-Charge. Nothing extra shall be paid on this account.
8. The contractor shall carry out true and proper setting out of the work in co-ordination with the Engineer-in-Charge or his authorized representatives and shall be responsible for the correctness of the positions, levels, dimensions and alignment of all parts of the structure. If at any time during the progress of the work any error appears or arises in the position, level, dimensions or alignment of any part of the work, the contractor shall rectify such error to the entire satisfaction of Engineer-in-charge. The checking by the Engineer-in-Charge or his authorized representatives shall not relieve the contractor of his responsibility for the correctness of any setting out of any line or level. The contractor shall carefully protect and preserve all bench marks, pegs and pillars provided for setting out of works. Nothing extra shall be paid on this account.
9. All setting out activities concerning establishment of bench marks, theodolite stations, centre line pillars, etc. including all material, tools, plants, equipments, theodolite and all other instruments, labour, etc. required for performing all the functions necessary and ancillary thereto at the commencement of the work, during the progress of the work and till the completion of the work shall be carried out by the contractor and nothing extra shall be paid on this account.
10. The work shall be carried out in such a manner so as not to interfere or adversely affect or disturb other works being executed by other agencies, if any.

11. Any damage done by the contractor to any existing works or work being executed by other agencies shall be made good by him at his own cost.
12. The work shall be carried out in the manner complying in all respects with the requirement of relevant rules and regulations of the local bodies under the jurisdiction of which the work is to be executed and nothing extra shall be paid on this account.
13. The contractor may have to work in two or more shifts for completing the work in time, and no claims whatsoever shall be entertained on this account, notwithstanding the fact that the contractor will have to pay or may have paid to the labourers and other staff engaged directly or indirectly on the work according to the provisions of the labour regulations and the agreement entered upon and/or extra amount for any other reasons.
14. The contractor shall make his own arrangements for electricity including obtaining electric connection required and make necessary payments directly to the State / Central Govt. department concerned. Similarly the Contractor shall make his own arrangement for water and also get the water tested from laboratory approved by the Engineer-in-charge at regular interval as per the CPWD Specifications.
15. The contractor alone shall be responsible for any loss or damage caused by the commencement of work on the basis of any erroneous and or incomplete information.
16. 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.
The works to be undertaken by the contractor shall inter-alia include the following:
 - (i) Preparation of detailed shop drawings and as built drawings wherever applicable.
 - (ii) Obtaining of Statutory permissions where-ever applicable and required.
 - (iii) Pre-commissioning tests as per relevant standard specifications, code of practice, Acts and Rules wherever required.
 - (iv) Warranty obligation for the equipments and / or fittings/fixtures supplied by the contractor. Contractor shall provide all the shop drawings or layout drawings for all the co-ordinated 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 sample for approval of Engineer-in-charge get it approved prior to bulk supply of the material at site.
17. No payment shall be made to the contractor for damage caused by rain, whatsoever during the execution of works and any damage to the work on this account shall have to be made good by the contractor at his own cost.
18. The rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building and nothing extra shall be payable to him on this account.
19. 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 connection, telephone, water etc. required for execution of the work, liaison and pursuing for obtaining various approvals, no objection certificates, completion certificates from local bodies etc, protection works, etc. during execution shall be deemed to be included in rates quoted of the contractor, for various items in the schedule of quantities. 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.
20. No claim whatsoever for idle labour, additional establishments, costs of hire and labour charges for tools and plants, scaffolding etc, would be entertained under any circumstances. Similarly it is term of the contract that if the work gets delayed due to any site hindrance like trees, service lines, or for any other reasonable cause whatsoever only suitable extension of time for the

contract shall be given but no claims whatsoever including claims of idle labour, idle machinery, cost of idle establishment, loss of profit etc on the ground of extension of contract beyond stipulated period shall be entertained even if the Extension is granted without levy of compensation by the Engineer in charge.

21. The Contractor(s) shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing safety nets (Safety to labours in case of fall from height), safety belts etc and other safety norms as specified in the general conditions of contract. In case of any accident of labours/ contractual staffs/third party the 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. The contractor shall be keep the department indemnified against any claim generated on any such account at all times.
22. Contractor shall within two weeks of award of work, submit to the Engineer-in-Charge for his approval, list of measures for maintaining safety of manpower deployed for construction and avoidance of accidents.
23. 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 scaffolding system until specifically got approved otherwise from Engineer in charge , suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection. It shall be designed to take all incidental loads. It should cater to the safety features for workmen. It shall be ensured that no damage is caused to any structure due to the scaffolding. Nothing extra shall be payable on this account.
24. Royalty if any payable and all other incidental expenditure shall have to be paid by the contractor on all the boulders, metal shingle, earth, sand bajri, etc. collected by him for the execution of the work, direct to the concerned Revenue Authority of the State or Central Govt. and the amount paid shall not be reimbursed in any form whatsoever.
25. Other agencies working at site may also simultaneously execute the works entrusted to them and to facilitate their working, the contractor shall make necessary provisions e.g. holes, openings, etc. for laying/burying pipes, cables, conduits, clamps, hooks, etc. as may be required from time to time. Nothing extra over the agreement rates shall be paid for doing this. The required materials/fixtures shall however be provided by department. Similarly other nearby projects may also be in progress in the campus and thus all reasonable coordination and assistance needs to be extended in order to avoid any hindrance to the nearby works. The contractor shall extend full co-operation to other agencies for smooth execution of works by other agencies. The final finishing of the work is to be executed in co-ordination with other agencies as directed by the Engineer-in-Charge.
26. Stacking of materials and excavated earth shall be done as per the directions of the Engineer-in-Charge. Double handling of materials or excavated earth if required shall have to be done by the contractor at his own cost.
27. The amount quoted shall be considered as inclusive of pumping/baling out water, if necessary, and no extra payment shall be made for pumping/baling out water. This includes water from any source such as rain, broken water mains or drains and seepage, surface and sub-soil water, rain etc. and shall apply to the execution in any season.
28. The contractor shall give a performance test of the entire installation(s) as per specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc and nothing extra whatsoever shall be payable to the contractor for the performance test.
29. The steel work in railing includes fish tailing of the section to be embedded in concrete and fixing the same.
30. Some restrictions may be imposed by the State Government on quarrying of sand, stones etc, from certain areas. The contractor shall have to bring such materials from other quarries located elsewhere for timely completion of work and nothing extra shall be paid on this account.

- 31. The contractor shall give ten years guarantee in the prescribed proforma for water proofing items specified in the schedule of quantities. In addition to this, 10% of the executed cost of items shall be retained either in cash /fixed deposit or in the form of bank guarantee, which shall be released after the expiry of ten years from the date of completion if no defects is found in water proofing or the defects are made good. This amount shall be adjusted against the expenses incurred on making good the defects if the contractor commits breach of guarantee.**
32. To facilitate gas connection, holes (if required by the Engineer-in-Charge) including suitable rubber gasket shall be provided in the kitchen platform of RCC slab/granite/marble/ other stone slab etc. Nothing extra will be paid on the account and rates quoted for relevant items are inclusive of making such provision.
33. The contractor shall arrange to keep the premises neat and clean. The rubbish/malba and unserviceable materials shall be removed on day to day basis.
34. The Contractor shall arrange electricity, water and other facilities at his own cost for testing of the various electrical installations, fire pumps, wet riser / fire fighting equipments, fire sprinklers etc. and also testing water supply, sanitary and drainage lines, water proofing of underground sump, over head tanks. Nothing extra shall be payable on this account.
35. Bar Chart
- (i) The contractor shall give scientifically analyzed detailed bar chart for all the activities including man, material, important activity etc of the work within 15 days from the date of issue of letter of acceptance of tender.
 - (ii) While preparing the above detailed bar chart, effort shall be made to take all possible items of work simultaneously.
 - (iii) Similarly bar chart should be prepared separately for arrangement of labour.
 - (iv) The bar chart so finalized and accepted by department should be got reviewed by the department, once in a month regularly. Modified / revised bar chart shall be prepared in the event of not adhering to the targets mentioned in the earlier bar chart. The contractor shall augment additional resources, materials and man power for achieving the targets.
 - (v) In addition to the above bar chart, the contractor shall submit detailed programme of activities CPM and PERT chart using Primavera software. He shall furnish the details both in hard copies as well as soft copies.

SUBMISSION OF PROGRESS REPORTS:

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 1st and 16th 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. Atleast 10 digital photographs showing all the parts of construction site along with atleast 5 minutes video 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 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 all payment received, extra/substituted/deviation items if any, etc.

36. QUALITY ASSURANCE

- (i) The proposed work is a prestigious campus development project and quality of work is of paramount importance. Contractor shall have to engage well-experienced skilled labour and deploy modern T&P's and other equipment in the execution of the work. Many items like specialized flooring work, silicon sealant and backer rod fixing in expansion joints, 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 the set out tolerance limit shall be summarily rejected by the Engineer-in-charge and the 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) In addition to the supervision of work by Institute works Department (IWD) engineers, the Committee of IIT, Kanpur and/or the Consultants deployed by IIT, Kanpur shall also be carrying out regular and periodic inspection of the ongoing activities in the work and deficiencies, shortcomings, inferior workmanship pointed out by them shall be communicated by IWD engineers to the contractor. Upon receipt of instructions from Engineer-in-Charge these are also to be made good by necessary improvement, rectification, replacement up to the complete satisfaction of Engineer-in-charge.
- (iv) **Third party quality assurance.** The department shall engage third party quality assurance system and the contractor shall render all the necessary assistance and make arrangement for the inspection of work similar to various clauses of the agreement.
- (v) The Contractor shall submit, within 15 days after the date of award of work, a detailed and complete method statement for the execution, testing and Quality Assurance, of such items of works, 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 specification and the samples approved by the Engineer-in-charge.
- (vii) The Contractor shall procure and provide all the materials from the manufacturers / suppliers as per the list attached with the tender documents. The equivalent brand 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 contractor for non-availability of the brand specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, material shall be procured only after written approval of the Engineer-in-Charge.
- (viii) All materials shall be got checked by the Engineer-in-Charge or his authorized supervisory staff on receipt of the same at site before use.
- (ix) To avoid delay, contractor should submit all samples well in advance so as to give timely orders for procurement.
- (x) The contractor has to establish field laboratory at site including all necessary equipment for field tests as given in Schedule 'F'. All the relevant and applicable standards and specifications shall be made available by the contractor at his cost in the field laboratory. The contractor shall designate one of his technical representatives possessing required qualification and experience specified in the Schedule F as Quality Assurance Engineer, who shall be responsible for carrying out all mandatory field/laboratory tests. The contractor shall also provide adequate supporting staff at his cost for carrying out field tests, packaging and forwarding of samples for outside laboratory tests and for maintaining test records.
- (xi) 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 shall be regularly reviewed by AE/AEE/EE. Contractor shall be responsible for safe custody of all the registers. The Xerox copy of the same shall be submitted by contractor duly signed by him and representative of Engineer-in-charge along with the bills for review.

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

The necessary tests shall be conducted in the laboratory approved by the Engineer-in-Charge. The samples for carrying out all or any of the tests shall be collected by the Engineer-in-charge or on his behalf by any other officer of IWD. The contractor or his authorized representative shall associate himself in collection, preparation, packing and forwarding of such samples for the prescribed tests and analysis. In case the contractor or his authorized representative is not present or does not associate him in the aforesaid operation the results of such tests and consequences thereon shall be binding on the contractor. The testing of materials shall be carried out in one of the following laboratories as decided by Engineer-In-charge as listed below:-

- a. In any of the IITs,
- b. In any of the NITs,
- c. In any other Government laboratory/college,
- d. In a NABL accredited lab. which has been specifically approved for the work
- e. Any other laboratory as per the approval of the Engineer-in-charge.

(The Engineer-in-charge may inspect the laboratory before according approval to any of the above mentioned laboratory)

- (xv) 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.
- (xvi) In case of concrete and reinforced concrete work, the contractor shall be required to make arrangement for carrying out compressive strength tests at his own cost. He shall render all assistance for the preparation of cubes, safe custody of the same, proper curing and carriage up to the laboratory where the test is to be performed; the cube tests can be performed at any laboratory approved by the Engineer-in-Charge.
- (xvii) The Contractor shall depute Site Engineer & skilled workers as required for the work. He shall submit organization chart along with details of Engineers and supervisory staff. It shall be ensured that all decision making powers shall be available to the representatives of the Contractor at the work site to avoid any likely delays on this account. The Contractor shall also furnish list of persons for specialized works to be executed for various items of work. The Contractor shall identify and deploy key persons having qualifications and experience in the similar works, as per the field of their expertise. If during the course of execution of work, the Engineer-in-Charge is of the opinion that the deployed staff is not sufficient or not well experienced; the Contractor shall deploy more staff or better-experienced staff at site to complete the work with quality and in stipulated time limit. Nothing extra shall be payable on this account.

37. Specialized Agencies to be engaged for specialized items:

The list of specialized items for the major component – civil works which are to be got executed only through specialized agencies are mentioned below:

CIVIL WORKS:

- a. Anti-termite treatment
- b. Acoustic work.

- (i) The main contractor shall submit the credential of specialized agencies 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 credentials and expertise of the specialized agencies in the similar works should be commensurate the quantum and nature of the specialized works as per the guidelines provided in this tender document. The main contractor shall not change the specialized agency without taking prior approval of Engineer-in-Charge. However before making any such change he has to enter into agreement with new agency and 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. The main contractor himself can also execute the specialized work in case he has executed the similar specialized work himself previously, under direct contract or on back to back basis, and submits experience credentials to the satisfaction of engineer in charge in this regard of having executed the specialized work commensurate the quantum and nature of the specialized works as per the guidelines provided in this tender document.
 - (ii) It shall be the responsibility of main contractor to sort out any dispute / litigation with the Agencies without any time & cost overrun to the Department. The main contractor shall be solely responsible for settling any dispute/litigation arising out of his agreement with the Specialized Agencies. The contractor shall ensure that the work shall not suffer on account of litigation/ dispute between him and the specialized agencies / sub- contractor(s). No claim of hindrance in the work shall be entertained from the Contractor on this account. No extension of time shall be granted and no claim what so ever, of any kind, shall be entertained from the Contractor on account of delay attributable to the selection/rejection of the Specialized Agencies or any dispute amongst them.
38. 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 should deploy adequate and suitable 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.

39. INSURANCE POLICIES:

The contractor in his own interest before commencing the execution of work, without in any way limiting his obligations and liabilities under this contract, 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.

40. WARNING / CAUTION BOARDS:

All temporary warning / caution boards / glow signals display such as "Construction Work in Progress", "Keep Away", "No Parking", Diversions & protective Barricades etc. shall be provided and displayed during day time by the Contractor, wherever required and as directed by the Engineer-in-Charge. These glow signals and red lights shall be suitably illuminated during night also. The Contractor shall be solely

responsible for damage and accident caused, if any, due to negligence on his part. Also he shall ensure that no hindrance, as far as possible, is caused to general traffic during execution of the work. These signals 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.

41. **DISPLAY BOARDS:** The Contractor shall provide and erect a display board of size and shape as required, in a legible and workman like manner showing the salient features of the project as directed by the Engineer-in-Charge.

42. Preparation of Sample units:

The contractor shall prepare in actual position sample unit for important items if required by Engineer-in charge and obtain approval of same before execution en masse. Nothing extra on account of preparation of such sample units shall be admissible. The E-in-charge may however solely as per his discretion permit the sample unit to be accounted as main work if the sample unit is found okay to his satisfaction. However if decided otherwise then the same shall be removed by the contractor.

43. Inspection of work:

(i) In addition to the provisions of relevant clauses of the contract, the work shall also be open to inspection by IWD, the committee of IIT, Kanpur constituted for the purpose and the representative of the IIT, Kanpur's 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 IIT, Kanpur: The committee/consultant appointed by IIT, Kanpur may inspect the works including workshops and fabrication factory to ensure that the works in general being executed according to the design, drawings and specifications laid down in the contract. Their observations shall be communicated by the Engineer-in Charge and compliance is to be reported by the contractor to the Engineer-in-Charge.

44. IIT, Kanpur Authorities shall be inspecting the on-going work at site at any time with or without prior intimation. The contractor should keep up-to-date the following:

- 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 clean.
- c) Display layout plan key plan, Building drawings including plans, elevations and sections.
- d) Display of upto date program chart etc prepared in the approved computer software.
- e) Keep details of quantities executed, balance quantities, deviations, possible Extra item, substituted Item etc.
- f) Keep one sets of plastic / cloth mounted building drawings.
- g) Sets of Helmets and safety shoes for exclusive use for officers/dignitaries visiting at site.

45. 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 to the Engineer-in-charge detailed site organization set up diagram. The contractor shall present the programme, target, progress and status at various review meetings as required.

(i) Weekly Review Meetings: Shall be attended by Local Team headed by Project-in-charge of the Contractor and specialized agencies engaged by the Contractor.

Agenda	<ul style="list-style-type: none"> a) Weekly programme v/s actual achieved in the past week and detailed programme for next two week. b) Remedial actions and hold up analysis. c) Any decision on queries raised either by contractor/PMC.
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- (ii) Fortnightly Review Meetings: Shall be attended by Project-in-charge and the Management Representative of the Contractor who can take independent decisions and Management Representative of the specialized agencies engaged by the Contractor as per the contract conditions who is to take decisions.

Agenda	<ul style="list-style-type: none"> a) Progress Status/Statistics v/s program in target. b) Completion Outlook. c) Major hold ups/slippages and remedial action. d) Assistance required. e) Critical issues. f) Any decision on queries raised either by Contractor/PMC. g) Anticipated cash flow, financial progress and monthly requirement for next three months.

- (iii) Apart from the above meeting the Engineer-in-Charge may convene meeting at any time according to the necessity and the Contractor is bound to attend the meeting with his team and specialized agencies with requisite details.

46. Unless otherwise specified, nothing extra whatsoever shall be paid for executing the work as per the above SPECIAL CONDITIONS from serial number 1 to 45.

SPECIAL CONDITIONS FOR CEMENT AND STEEL BROUGHT BY THE CONTRACTOR:

1. CEMENT:

The contractor shall procure Portland Pozzolana Cement conforming to IS: 1489 (Part-I) as required in the work, from reputed manufacturers of cement such as ACC, Ultra-Tech, Vikram, Shree cement, Ambuja, Jaypee cement, Century cement & J.K.Cement. The tenderers may also submit a list of names of cement manufacturers which they propose to use in the work. The tender accepting authority reserves right to accept or reject name(s) of cement manufacturer(s) which the tenderer proposes to use in the work. No change in the tendered rates will be accepted if the tender accepting authority does not accept the list of cement manufacturers, given by the tenderer, fully or partially.

Supply of cement shall be taken in 50 kg bags or bulk container bearing manufacturer's name and ISI marking. The bulk supply of cement shall be accompanied by the manufacturer's certificates giving full details (brand, type, grade and specification along with the requisite test certificate, copy of relevant IS specifications). Samples of cement arranged by the contractor shall be taken by the Engineer-in-Charge and got tested in accordance with provisions of relevant BIS codes. In case 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. Every fresh cement batch should be brought to site at least 30 days before they are to be used / consumed in the work.

- 1.1. The cement shall be brought at site in bulk supply of approximately 100 tonnes or as decided by the Engineer-in-Charge.
- 1.2. The cement go-down of the capacity to store a minimum of 60 days requirement shall be constructed by the contractor at site of work for which no extra payment shall be made. Double lock provision shall be made to the door of cement go-down. The keys of one lock shall remain with Engineer-in-Charge or his authorized representative and keys of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of the cement go-down. The contractor shall facilitate the inspection of the cement go-down by the Engineer-in-Charge or his authorized representatives.
- 1.3. The cement shall be got tested by the Engineer-in-Charge and shall be used on the work only after satisfactory test results have been received. The contractor shall supply free of charge the cement required for testing including its transportation cost to testing laboratories. The frequency and details of the tests shall be decided by the Engineer-in-Charge depending on the quantum of supply in each batch. The cost of tests shall be borne by the contractor / Department in the manner indicated below:
 - a. By the contractor, if the results show that the cement does not confirm to the relevant BIS codes.
 - b. By the Department, if the results show that the cement confirms to relevant BIS codes.
- 1.4. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at rate so prescribed shall be made. In case of excess consumption no adjustment shall be made.
- 1.5. 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.

- 1.6. Damaged cement shall be removed from the site immediately by the contractor on receipt of a notice in writing from the Engineer-in-charge. If he does not do so within 3 days of receipt of such notice, the Engineer-in-charge shall get it removed at the risk and cost of the contractor.
- 1.7. Cement register for the cement shall be maintained at site. The account of daily receipts and issues of cement shall be maintained in the register in the Performa prescribed and signed daily by contractor or his authorized agent.

2. STEEL

- 2.1 The Contractor shall procure IS marked TMT bars of various grades from the steel manufactures or their authorized dealers (as per following selection criteria) having valid BIS license for IS 1786-2008 (Amendment -1 November 2012). Such TMT bars shall be as per the preferred make list of this tender document or should be amongst the preferred makes (part of this tender document).

The procured steel should have following qualities:-

- i. Excellent ductility, bend ability and elongation of finished product due to possible refining technology.
 - ii. Construction of steel should be accurate as per design.
 - iii. Steel should have no brittleness problem in finished product.
 - iv. Steel should carry the quality of corrosion and earthquake resistance.
 - v. Quality steel with achievement of proper level of sulphur and phosphorus as per IS :1786-200b)
- 2.2 The contractor shall have to obtain and furnish test certificates to the Engineer-in-charge in respect of all supplies of steel brought by him to the site of work.
 - 2.3 Samples shall also be taken and got tested by the Engineer-in-charge as per the provisions in this regard in relevant BIS codes. In case the test results indicate that the 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 of written orders from the Engineer-in-charge to do so.
 - 2.4 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.
 - 2.5 For checking nominal mass, tensile strength, bend test, re-bend test, etc., specimen of sufficient length shall be cut from each size of the bar at random, and at frequency not less than that specified in CPWD specification.
 - 2.6 The contractor shall supply free of charge the steel reinforcement required for testing including its transportation to testing laboratories. Tests shall be carried out at Institute Structural Engg Lab. The cost and all passed tests conducted through the Institute labs shall be borne by the Institute and the cost of failed tests shall be borne by the contractor.
 - 2.7 The steel brought to site and steel remaining unused shall not be removed from site without the written permission of the Engineer-in-Charge.

- 2.8 The contractor should submit pre measurement of existing exposed reinforcement to the Engineer-in-charge before taking up any further reinforcement work on the portion and nothing extra shall be paid on this account.
- 2.9 The contractor is at liberty to use lap or couplers in columns, after proper testing of the coupler in one of the IITs/NTH as per the direction of the engineer-in-charge. **The testing charges for coupler shall not be reimbursed to the contractor.**
- 2.10 The measurement for steel shall be as per relevant para of CPWD specifications. **The Contractor has to produce the copy of the cash bills to the Engineer in charge or his representative as and when he brings the cement and steel to the site.**

SPECIAL CONDITIONS FOR RMC AND DMC

1. No land shall be given for installation of the batch mix plant for concrete production inside the IIT Campus. The agency shall procure RMC of appropriate grade/quality from external sources. This concrete shall be manufactured in fully automatic batching plant having capacity of 18 cum /hr or more with print outs facility. The agency is permitted to install his own batching plant outside the Campus at his own cost. However, in due course, if a land is allotted by IIT authorities and the agency requests for installation of his batch mix plant, recovery @ Rs. 150/-per cum of concrete produced, shall be deducted from the bill. The record of the quantity shall be as per the computer output or as per the detailed measurement, whichever is more.
2. The various ingredients for mix design / laboratory tests shall be sent to the structural Engineering lab of IIT Kanpur through the Engineer-in-Charge and the samples of such ingredients sent shall be preserved at site till completion of work or change in Design Mix / Ready Mix whichever is earlier. The contractor is permitted to initiate the job mix design after issue of letter of acceptance if requested by him in writing. The Engineer in charge shall give written permission to such request. The date of start of work shall however be not altered and it shall remain as defined in schedule F. The sample shall be taken from the approved materials which are proposed to be used in the work. The cost of packaging, scaling, transportation, loading, unloading, cost of samples and the mix design charges in all cases shall be borne by the contractor. The concrete should have sufficient workability for pumping through concrete pump (CPWD Specifications and BIS codes to be followed). Admixtures shall be used during concrete production, as per the approved design mix formula.
3. The maximum permitted water cement ratio is 0.50.
4. The concrete shall be transported to site for all leads in transit mixer, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C from transit mixer to site laying.
5. Steel reinforcement for R.C.C. work shall be Thermo-Mechanically Treated bars of grade Fe-500D or higher confirming.
6. Slump required for the work shall be maximum 120 mm at the plant and minimum 80mm during pouring for which contractor is permitted to use approved admixtures confirming to relevant IS codes.
7. For each change of source or quality / characteristic properties of the ingredients during the work, from that approved and used in the concrete mix, a fresh mix design shall be got done by the contractor. Revised trial mix test shall be conducted and shall be submitted by the contractor as per the direction of the Engineer-in-Charge. The cost of revised design mix shall be borne by the contractor.
8. The various ingredients for mix design / Job mix and laboratory tests shall be sent to the lab/ test houses through the Engineer-in-charge and the samples of such aggregates sent shall be preserved at site by the department.
9. All cost of mix designing / Job mix and testing, connected therewith, including charges payable to the laboratory shall be borne by the Contractor including redesigning of the concrete mix / job mix whenever required & as directed by Engineer-In-Charge. The testing charges for this design mix shall not be reimbursed by the engineer-in-charge.
10. The standard deviation to be adapted for design mix shall be for “Good” quality control as per IS code 456.
11. The agency can use nominal mix as per DSR Item no 5.3 for non-structural member like lintels, kitchen plate-form, AAC bands etc, after necessary design of these non-structural concrete member.

12. The printout of computerized batch mix reports of the concrete procured from the RMC/DMC Plants shall be submitted. The concrete from different sources shall not be mixed and shall be used for casting at different location /members.

Conditions related to site restrictions and/or site facilities available for the work:-

1. Arrangement for water shall be the responsibility of the contractor and no claim on this regard shall be entertained. This is also elaborated in the tender documents. However, the contractor may apply to the appropriate authority (as applicable) and to the Executive Engineer for the permission of bore wells. The Executive Engineer shall assist in obtaining the necessary permission from the appropriate authority but does not guarantee for the permission of the bore well or for the water supply from the borewell.
2. Arrangement for electricity shall be the responsibility of the contractor and no claim on this regard shall be entertained. This is also elaborated in the tender documents. However, the contractor may apply to the appropriate authority (as applicable) and to the Executive Engineer for the necessary electricity connection on payment basis. The contractor shall adhere to the applicable terms and conditions related to the electrical connections. The Executive Engineer shall assist in obtaining the necessary permission from the appropriate authority but does not guarantee for the necessary connection.
3. Justified quantum of space within the IIT campus, free of cost, shall be provided for the infrastructure facilities like material stock yard, site office etc. However, labour hutments shall not be allowed inside the campus. Similarly space for batching plant shall not be provided inside the campus.
4. Under normal circumstances, the working hours for labour are 08:00 AM to 06:00 PM. For working beyond 06:00 PM or prior to 08:00 AM, the contractor has to apply to the security personals alongwith the name of labours. Permission is normally granted for the extended hours.
5. It is clarified that normally the entry of vehicles is allowed between 08:00 AM to 10:00 PM. After 10:00 PM the vehicles with materials are not allowed to ply inside the campus. In exceptional circumstance (Procurement of Ready mix concrete or the like) permission can be obtained from the competent authority. However, as detailed in the tender conditions, restrictions on the existing roads of campus may be imposed by the security personals regarding route available, speed, honking, ply timing etc which shall be strictly observed.
6. Barricading shall be provided as detailed in this tender document.
7. The excavated earth shall continuously be dumped/carried to the dumping location as indicated in the tender document. Similarly the earth to be refilled shall be continuously carried from the dumping location as indicated in the tender document for refilling. Contractor is not permitted to stack more than 30 cum of earth excavated/to-be-refilled at the proposed building construction site.

Engagement of agency for specialized Civil works:

1. The Contractor has to engage specialized agencies for specialized items of works. Only those specialized agencies/firms who have satisfactorily executed works as per following criteria during last seven years are eligible for the specialized works-

- 1. Anti termite treatment:**

- (a) Three similar works in building works each having ground floor area of at least 40% of the ground floor area of the proposed building,
Or
- (b) Two similar works in building works each having ground floor area of at least 60% of the ground floor area of the proposed building,
Or
- (c) One similar work in building work each having ground floor area of at least 80% of the ground floor area of the proposed building.
Similar work means “Providing & application of anti termite treatment work in building”.

- 2. Acoustic work.**

- (a) Three similar works in auditoriums/halls and the like, of acoustically treated hall size of 150 Sqm,
or
- (b) Two similar works in auditoriums/halls and the like, of acoustically treated hall size of 200 Sqm,
or
- (c) One similar works in auditoriums/halls and the like, of acoustically treated hall size of 300 Sqm.,
Similar work means “Acoustic treatment on walls”.

Approval of the specialized agencies for each specialized work shall be obtained from the Engineer-in-Charge prior to the start of the specialized work. Even if, such specialized items of work shall be executed by the specialized agencies, the work shall be deemed to be executed by the tenderer for all purposes and the responsibility of the quality of items of works executed etc. shall continue to be that of the tenderer only. The main contractor himself can also execute the specialized work in case he has executed the similar specialized work himself previously and submits experience credentials in this regard of having executed the specialized work commensurate the quantum and nature of the specialized works as per the guidelines provided in this NIT.

SPECIAL CONDITIONS & GENERAL SPECIFICATIONS,

SPECIAL SPECIFICATIONS

The work shall generally be carried out in accordance with relevant CPWD specifications with up to date correction slips issued up to last date of receipt of bid.

CIVIL WORK:

1. CPWD Specifications 2009 Volume- I
2. CPWD Specifications 2009 Volume- II
3. BIS Specifications.
4. CPWD Manual on Accessible Built Environment
5. Safety, Health and Environment Handbook 2019 of CPWD Publication
6. MORTH Specifications, NBC and International codes

ELECTRICAL WORK:

1. CPWD General Specification for Electrical Works Part I Internal – 2013.
2. CPWD General Specification for Electrical Works Part IV Substation – 2013.
3. CPWD General Specification for Electrical Works Part VII DG Sets – 2013.
4. CPWD General Specification for Electrical Works Part V wet riser & sprinkler systems – 2006.
5. General Specification for Heating, Ventilation & Air-Conditioning-2017.
6. General Specification for Electrical Works (Part III Lifts & Escalators)-2003.
7. CPWD General Specification for Electrical Works Part II External – 1994.
8. CPWD General Specification for Electrical Works Part VI Fire Detection and Alarm system – 2018.

SPECIFICATIONS FOR CIVIL WORKS

General Specifications

1. The Building is Ground + 5 storied RCC framed structure with Column/ Shear Wall, Beam, Slab.
2. Various types of finishing work shall be carried out by referring the tender documents and the drawings.

PARTICULAR SPECIFICATIONS & SPECIAL CONDITION OF WORK

1. Scope of work:

Scope of work shall cover, design drawing wherever required execution, preparation of shop drawing, supply, installation, testing, labour & workmanship etc. required to be provided in this said scheme/project. The design of component/ items /scheme where ever required also includes in the scope.

Work shall be executed as per scope and specification and drawing. If any service and item and component and provision required making building/scheme functional/habitable if not specifically mentioned in the scope of this tender, the same shall be deemed to be included within the scope of this tender and nothing extra shall be paid on this account.

The rates quoted in schedule of financial quote shall be inclusive of all material, labour workmanship, all taxes (excluding GST) and other incidental charges (The GST shall be paid along with the running bills at the prevailing rates)

The Contractor shall be fully responsible for the execution and supervision of all works. He shall engage a Professional Engineer and Specialist Professional Engineer to undertake work in accordance with statutory requirements and condition of this contract.

2. Soil Investigation Report:

Soil investigation report/ major characteristic of soil for site has been uploaded separately in PDF.

The Contractor's attention is drawn to the presence of existing services, drain line, sewer line, power cables, boundary wall (@ 120 Meter length with 2.0 m height, at site, and shall make the necessary provision for the removal, due to such encumbrances. The works shall be done on ground as available; therefore, no claim for extra cost or time shall be entertained for this account.

3. Technical specification for construction:

The Contractor shall be responsible to work in accordance to the complete set of Technical Specifications, Architectural Drawings, Interior Finishing drawings and other related drawings of services as per NIT.

The Contractor shall ensure that the quality and workmanship shall be as per CPWD specifications and other specifications mentioned in the tender document.

4. Safety and working Conditions:

The Contractor has to fully comply with all the safety requirements of the latest Factories / Labour Act and all other relevant local Bye-laws, Acts, Regulations, Safety, Health and Environment Handbook 2019, GCC for CPWD 2014 & SCC etc. of the tender. The workmen's compassion policy as per the labour employed at site is to be taken throughout the contract period by the contractor.

The Contractor shall also comply with Authorities' requirements regarding the removal and discharge of any spoil, surplus materials, debris or other materials.

5. Materials:

The quality of the works throughout and workmanship shall be to the satisfaction of Engineer-in-charge or his Representative.

All materials and workmanship shall be comply with the latest relevant Indian standard. However, there may be requirement to use of material & workmanship as per standards of British standard or American Specifications and/or Code of Practice the work and workmanship shall be done and to be used by the contractor without extra payment. The Contractor is deemed to be conversant with the relevant IS, BS, ACI / AISC / ASTM / AWS, and CPWD standards referred to and shall allow for complying therewith. All materials which do not comply with this Contract and BIS code, shall be removed from the Site at the Contractor's own expense.

6. Guarantee Bond:

Three years guarantee for aluminium work & 10 year guarantee for water proofing work in prescribed proforma attached shall be given by the contractor, in token of his overall responsibility. 10% (Ten Percent) of the cost of these items would be retained as guarantee to the performance of the work done. The guarantee against this item of works shall be in addition to the security deposit mentioned elsewhere in the contract form. If any defects or deficiencies are noticed during the guarantee period the same shall be rectified by the contractor within seven days of issue of the written notice by the Engineer-in-charge, failing which the defects/deficiencies would be got removed by the Engineer-in-charge from other agency at the risk and cost of the contractor. However this amount of guarantee can be released in full, if bank guarantee of equivalent amount for the required period is produced and deposited with the department.

Particular Specification

Section-1: CIVIL WORK

Earthwork

1. General:

All types of excavation work shall be done in accordance with CPWD specifications

Volume - I & II with correction slips up to the last date of submission of tender documents.

Any trenching and digging for laying sewer lines / water lines /cables etc. shall be commenced by the contractor only when all men, machinery's and materials have been

arranged and closing of the trench(s) thereafter shall be ensured within the least possible time.

The excavation through the mechanical means shall only be taken after conforming that there are no power cables in that area proposed for excavation

2. Setting Out:

The Contractor shall be responsible for accurately setting out the Works to the specified positions, dimensions, levels, and building lines and also checking the site survey for dimensional and level accuracy and reporting any discrepancies before any commences. Any errors in position, level, dimension or alignment of any part of the Works at any time shall be rectified by the Contractor at his own expense. The Contractor shall provide the Engineer with all facilities, equipment and labour to enable him to check the setting out and levels of the Works at all times. The checking of any setting out point, line or level by the Engineer shall not in any way relieve the Contractor of his responsibility. All setting out points, benchmarks, site rails, pegs and other survey points shall be clearly marked and protected from damage or disturbance during the execution of the Works as per CPWD Specifications.

3. Applicable Standards:

The contractor shall ensure to follow the applicable BIS and IS Standards related to the excavation and local building regulations and statutory regulations.

4. Labour and Equipment:

The Contractor shall provide all labours, equipment, materials and any incidentals necessary to complete all aspects of work included in the drawings and specifications. The Contractor shall submit Earth Management Plan which is to be approved by the Employer or Engineer's Representative before commencing the work.

i. Related work

- a. Clearing, grubbing, and removing all vegetation from the site.
- b. Excavation including getting out and necessary dressing to make surface ready to receive blinding.
- c. Filling and back filling and compaction of fill.
- d. Removal and disposal of surplus material.
- e. Dewatering.
- f. Road and Compound Wall Works

Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas/ foundation trenches including getting out and disposal of excavated earth all leads and lifts upto all heights as per structural drawing, for all kinds of soil including ordinary rock if any, as directed by Engineer-in-charge. Any deviation in earthwork in excavation as per site condition will be ignored and nothing extra shall be paid. Topsoil up to 300mm shall be preserved and used in future landscaping development, as per specification and direction of Engineer-in-charge. Excavation for the foundation depth shall be minimum 2600 mm from below natural ground level (NGL). In case the proposed ground level (PGL) is below the natural ground level, the foundation depth shall be considered w.r.t. PGL. If the PGL is lower than the NGL, the Contractor shall cut the earth upto the PGL all around the building upto 3000mm (from outermost edge of the building in straight line to be considered).

Sub-soil water table at work site is reported to be at approx. 12.9 m. below the general ground level. The contractor shall make at his own cost all necessary arrangements for lowering water level, in the area where works are under execution low enough so as not to cause any harm to the work shall be

considered as inclusive of pumping out or bailing out water, if required, for which no extra payment shall be made. This will include water coming from any source, such as rains, accumulated rain water, floods, leakages from sewer and water mains, subsoil water table being high or due to any other cause whatsoever. The contractor shall make necessary provision of pumping, dredging bailing out water coming from all above sources and excavation and other works shall be kept free of water by providing suitable system approved by the Engineer-in-charge.

All Excavated material including excavated earth declared as surplus and not useful, shall only be removed from the Site by the contractor. The removal of surplus Material shall only be undertaken by the contractor when instructions in this regards are obtained from Engineer in charge.

Dumping shall be made only at the designated place identified by the Engineer-in-Charge. No payment/fees on this account shall be entertained by the department.

Filling available excavated earth (excluding rock) except unsuitable earth (black cotton soil, etc.) in trenches, plinth, sides of foundations, etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, in all lead and lift. If sufficient quantity of suitable filling earth is not available from excavated earth, the contractor shall bring local ganga sand (including royalty) from outside by mechanical transport upto all lead and lifts. The work shall also include ramming and watering in layers not exceeding 20 cm in depth in trenches, plinth, sides of foundation etc. complete as per direction of Engineer-in- Charge. If the proposed ground level is above the natural ground level, the Contractor shall fill local ganga sand upto the PGL all around the building upto 3000mm (from outermost edge of the building in straight line to be considered).

Filling with sand in plinth under floors 150mm depth, and below lifts pit as per drawing, including watering, ramming, consolidating and dressing, complete as per directions of Engineer-in-Charge.

Injecting chemical emulsion for post-constructional anti-termite treatment Bayer Premise (Imidacloprid 30.5% m/m SC (use 1% dilution or as per manufacturer's specification), as under

- a. Along external wall where the apron is not provided using chemical emulsion @ 7.5 litres / sqm of the vertical surface of the substructure to a depth of 300 mm including excavation channel along the wall & rodding etc. complete with as per direction of Engineer-In-Charge
- b. Treatment of soil under floors by flooding over sand filling layer using chemical emulsion @ 15 liters / sqm as per direction of Engineer-In-Charge.

5. Concrete Work:

Plain Cement Concrete / Lean concrete in required thickness as per design shall be laid below the raft and all type foundation works, below kerb stone, under floors or wherever required as per CPWD Specifications Volume - I & II with correction slips up to the last date of submission of tender documents.

Base concrete below the footing, brick foundations, grade beam, grade slab, plinth beam, under floors, below plinth protections, steps, ramps, etc. and wherever specified in structural/ architectural drawings, shall be in 1:4:8 (1 Cement : 4 coarse sand (zone-

III) : 8 graded stone aggregate 40 mm nominal size). Thickness of PCC should not less than 100mm.

The lightweight cement concrete shall be as per the specification for the cement concrete works given in CPWD Specifications except for the material used as coarse aggregate. The coarse aggregate used for the lightweight cement concrete works shall be lightweight aggregates like “Siporex”, or Ultratech or Aerocon or equivalent as approved by the Engineer-in-charge. The grading of the light-weight coarse aggregate shall be the same as that of the specified size of the coarse aggregate. In case of non- availability of the specific or required sizes of the light-weight aggregates, it shall be broken into required sizes by using mechanical crushers or any other method approved by the Engineer-in-charge. The oven dry density of the lightweight aggregate shall not be more than 650 kg / cum for Sunken portions for toilets, kitchen and similar locations above ground shall be filled with Light weight cement concrete 1:5:10 (1 cement : 5 coarse sand : 10 broken block of 20 mm nominal size specific gravity of of light weight aggregate shall not be more than 650 kg/ cum)

Providing and laying damp-proof course 50mm thick with cement concrete 1:2:4 (1 cement : 2 coarse sand(zone-III) : 4 graded stone aggregate 12.5mm, nominal size) mixed with water proofing material in cement concrete in damp-proof course, to be provided below all brick work/ AAC block work at ground floor plinth level and including applying a coat of residual petroleum bitumen of grade of VG-10 of approved quality using 1.7kg per square metre on damp proof course after cleaning the surface with brushes and finally with a piece of cloth lightly soaked in kerosene oil.

Plinth protection and pathways all around the building, should be provided with 25mm thick rough Kotah stone/ flame-finished granite with polished granite band, pattern and locations as per shown on the drawing, over 100mm thick PCC 1:4:8 (1 Cement : 4 coarse sand (zone-III) : 8 graded stone aggregate 40 mm nominal size). The edges of the plinth protection and pathways to be with brickwork 230mm wide and 300mm deep with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5, over 100mm thick PCC 1:4:8 (1 Cement : 4 coarse sand (zone-III) : 8 graded stone aggregate 40 mm nominal size).

a. Reinforced Cement Concrete Work:

The work shall be done as per CPWD specifications Volume - I & II with correction slips up to the last date of submission of tender documents.

- i. If the quantity of cement actually used in the work is found to be more than the theoretical quantity of cement including authorised variation, nothing extra shall be payable to the contractor on this account. In the event of it being discovered even after the completion of the work, the quantity of cement used is less than the quantity ascertained as herein before provided (allowing variation on the minus side as stipulated in clause 42) the cost of quantity of cement so less used shall be recovered from the contractor at the rate as specified in schedule ‘F’. Decision of the Engineer-in-Charge in regard to the quantity of cement which should have been actually used as per the schedule and recovery at the rate specified shall be final and binding on the contractor.
- ii. For non-scheduled items, the decision of the Superintending Engineer, IWD, IIT Kanpur regarding theoretical quantity of the cement which should have been actually used shall be final and binding on the contractor.
- iii. 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.

iv. In case the contractor brings surplus quantity of cement the same after completion of the work will be removed from the site by the contractor at his own cost after approval of the Engineer- in-Charge.

v. Cement register for the cement shall be maintained at site.

Cement bags shall be stored in separate godowns to be constructed by the contractor at his own cost as per sketch (which is only indicative and actual size will depend on the site requirements) given in CPWD specifications with weather proof roofs and walls. Each godown shall be provided with a single shutter door with two locks. The key of one lock shall remain with Engineer-in-charge or his authorized representative and that of the other lock with the authorized agent of the contractor at the site of work so that the cement is issued from the godown according to the daily requirements with the knowledge of both parties and proper account for the same is maintained in the standard Performa.

PROFORMA FOR THE CEMENT REGISTER

PARTICULARS OF RECEIPT

Date of receipt	Quantity received	Progressive total	Date of issue	Quantity issued	Items of work for which issued
1	2	3	4	5	6

PARTICULAR OF ISSUE

Qty. returned at the end of the day	Total issued	Daily balance in hand	Contractor's initial	JE's initial	Remarks (AE/EE's periodical check)
7	8	9	10	11	12

vi. DESIGN MIX CONCRETE:

The contractor shall be required to submit two separate design mix of concrete with and without using plasticizers, separately for machine batched mix concrete & RMC. The decision of the engineer-in-charge to specify the design mix of concrete based on above shall be final.

vii. Coarse aggregate: As per CPWD Specifications

viii. Fine Aggregate: As per CPWD Specifications.

ix. Water: It shall conform to requirements laid down in IS:456 : 2000 and CPWD specifications.

x. Cement: Cement arranged by the contractor will be PPC (in bags) conforming to IS: 1489-Part-I. If for any reasons, cement other than that specified in this para for example OPC of grade 43 or higher grade is brought to site by contractor, the issue, payments rate as well as the quantity to be used in the design mix concrete will remain unchanged.

xi. Slump: Design slump should be clearly specified in the mix design.

xii. Admixtures shall not be used without approval of Engineer-in-charge. Wherever required, admixtures of approved quality shall be mixed with concrete as specified. The admixtures shall conform to IS: 9103. The chlorides content in the admixture shall satisfy the requirements of BS: 5075. The total amount of chlorides admixture

mixed concrete shall also satisfy the requirements of IS: 456. The contractor shall not be paid

- xiii. anything extra for admixture required for achieving desired workability without any change in specified water cement ratio for RCC/CC work
- xiv. Grade of Concrete : The compressive strength of various grades of concrete shall to be given as below:

	Grade designation	Compressive strength on 15 cm cubes min. 7days (N/mm ²)	Specified characteristic compressive strength at 28 days (N/mm ²)	Minimum cement quantity (Kg.per cum. Mtr.)	Maximum water cement ratio
i	M 25	As per design	25	330	0.50
ii	M 30	As per design	30	340	0.45
iii	M 35	As per design	35	350	0.45
iv	M 40	As per design	40	360	0.40

Note

1. In the designation of a concrete mix letter M refers to the mix and number to the specified characteristic compressive strength of 15 cm x 15 cm x 15 cm – cube 28 days expressed in N/mm²
2. The minimum/maximum cement content for design mix concrete shall be maintained as per the quantity mentioned above. In case where the quantity of cement required is higher than the minimum specified above to achieve desired strength based on an approved mix design extra shall become payable to the contractor.
3. Design slump has to be constantly monitored and maintained during placing of concrete through slump tests carried out as per CPWD specification 2009 Vol. 1 for Mortar, Concrete and RCC works, and records maintained accordingly.

The concrete mix design / laboratory tests with and without admixture shall be got done by contractor at his own cost and will be carried out by the contractor through IIT Kanpur laboratory.

The various ingredients for mix design / laboratory tests shall be sent to the test houses through the Engineer-in-Charge and the samples of such aggregate & cement shall be preserved at site by the department.

- xv. The contractor shall submit the mix design report from any of above approved laboratory for approval of Engineer-in-Charge within 30 days from the date of issue of letter of acceptance of the tender. No concreting shall be done until the mix design is approved by the Engineer-in-charge. In case of white portland cement and the likely use of admixtures in concrete with PPC/white portland cement the contractor shall design and test the concrete mix by using trial mixes with white cement and/or admixtures also for which nothing extra shall be payable.
- xvi. In case of change of source or characteristic properties of the ingredients used in the concrete mix during the work, a revised laboratory mix design report conducted at laboratory established at site shall be submitted by the contractor as per the direction of the Engineer-in-Charge.
 - b. The water to be used in concreting is to be tested from Institute lab.

c. APPROVAL OF DESIGN MIX

The mix design for a specified grade of concrete shall be done for a target mean compressive strength $T_{ck} = F_{ck} + 1.65 s$.

Where F_{ck} = Characteristic compressive strength of 28 days

s = Standard deviation which depends on degree of quality control

The degree of quality control for this work is “good” for which the standard deviation (s) obtained for different grades of concrete shall be as bellows:

Grade of Concrete	For “Good” quality of control
M 25	4.00
M 30	5.00
M 35	5.00
M 40	5.00

Of the six specimen of each set three shall be tested at seven days and remaining three at 28 days. The preliminary tests at seven days are intended only to indicate the strength to be attained at 28 days.

- d. All cost of mix designing and testing connected therewith including charges payable to the laboratory shall be borne by the contractor.
- e. The batching plant shall conform to IS:4925. It shall have the facilities of presetting the quantity to be weighed with automatic cutoff when the same is achieved. Concreting at places may have to be resorted to through concrete pump for which nothing extra shall be paid.
- f. All other operations in concreting work like Mixing, Slump, Laying Placing of concrete, compaction curing etc. not mentioned in this particular specification for Design Mix of concrete shall be as per CPWD specification.

g. Work strength test specimen

Work strength test shall be conducted in accordance with IS: 456 on random sampling. Each test shall be conducted on six specimens, three of which shall be tested at 7 days and remaining three at 28 days. Additional samples shall be prepared, if required, as per direction of Engineer in charge for testing samples cured by accelerated method as described in IS: 9103.

h. Test result of sample

The test result of the sample shall be the average of the strength of three specimens. The individual variation shall not be more than 15 percent of the average. If more the test results of the sample are invalid. 90% of the total test shall be done at the laboratory established at site by contractor and remaining 10% in the structural engineering lab at IIT Kanpur.

i. Lot size

The minimum frequency of sampling of concrete of each grade shall be according to the following:-

Quantity of concrete in the work cubic metre per day	Number of samples.
1-5	1
6-15	2
16-30	3
31-50	4

51 & above	4 + one additional sample for additional 50 cubic meters or part thereof.
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Note: At least one sample shall be taken from each shift.

j. Standards of acceptance

- (i) In case the test result of all the samples is above the characteristic compressive strength, the concrete shall be accepted.
- (ii) In case the test result of one or more samples fails to meet the requirement
 - at (i) above, it shall be accepted if both the following conditions are met:
 - a. Any individual test result is not less than $(F_{ck} - 4)$ N/mm²
 - b. The mean of test result from any group of four consecutive samples is more than $(F_{ck} + 4)$ N/mm².
 - (iii) Concrete of each grade shall be accessed separately.
 - (iv) Concrete is liable to be rejected if it is porous or honeycombed, its placing has been interrupted without providing a proper construction joint the reinforcement has been displaced beyond the tolerances specified, or construction tolerances have not been met. However the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction of the Engineer-in-Charge for which nothing extra is payable to the contractor
- k. Only MS centering/shuttering and scaffolding material unless & otherwise specified shall be used for all RCC. Work to give an even finish of concrete surface. However marine ply shuttering in exceptional cases as per site requirement may be used on specific request from contractor on approval by the Engineer-in-Charge.
- l. In case of actual average compressive strength being less than specified strength which shall be governed by para “Standard of Acceptance” as above the rate payable shall be worked out accordingly on prorata basis.
- m. In case of rejection of concrete on account of unacceptable compressive strength governed by para “Standard of Acceptance” as above the work for which samples have failed shall be redone at the cost of contractors. However the Engineer-in-Charge may order for additional test (like cutting cores, ultrasonic pulse velocity test, load tests on structure or part of structure etc.) to be carried out at the cost of contractor to ascertain if the portion of structure wherein concrete represented by the sample has been used, can be retained on the basis of results of individual or combination of these tests. The contractor shall take remedial measures necessary to retain the structure as approved by the Engineer-in-Charge without any extra cost. However for payment the basis of rate payable to contractor shall be governed by the 28 days cube test results.
- n. Necessary arrangements shall be made for field tests and all required equipment’s shall be arrange by establishing field lab by the Agency for mandatory tests of the materials as specified in CPWD specifications or as per direction of Engineer-in-Charge. No extra payment shall be paid on this account.

The foundation shall be with RCC M25 Raft type footing as per structural drawing. Columns are connected by grade beams/ plinth beams below ground/ plinth level as per structural drawing, and, wherever necessary, additional tie beams provided in between grade beams/ plinth beams.

All structural concrete works below plinth level and above the plinth level upto floor VIII level (approx. 26 meter from ground level), are to be ready mixed M-25 grade

concrete for reinforced cement concrete work as per structural drawings, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying, including cost of all centering, shuttering, finishing, reinforcement, admixtures (in recommended proportions as per IS:9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability) as per direction of the Engineer-in-charge.

6. Shuttering / Form Work:-

Formworks material should be in steel with rubberized joints. Centring and shuttering including strutting, propping etc. and removal of form work including cost of de-shuttering and de-centring at all levels, for all heights and depths. The work shall be done in accordance with CPWD Specifications - 2009 - Vol.I& Vol. II with upto date correction slips. Steel shuttering and 12 mm thick BWP grade film faced plywood shuttering to be used by contractor as per direction of engineer in charge. All shuttering should be new/fresh.

- Minimum size of shuttering plates shall be 600mm x 900mm except for the case when closing pieces required to complete the shuttering panels. Dented, broken, cracked, twisted or rusted shuttering plates shall not be allowed to be used on the work.
- The shuttering plates shall be cleaned properly with electrically driven sanders to remove any cement slurry or cement mortar or rust. Proper shuttering oil or debonding compound shall be applied on the surface of the shutter plates in the requisite quantity before assembly of steel reinforcement.
- The joint filler shall be resilient closed cell expanded polyethene and non- tainting as manufactured by Supreme Industries Ltd or equivalent.
- Providing joint filler of required thickness in position to substrate using either double sided foam adhesive tape or neoprene synthetic rubber adhesive. When forming expansion joint with the Board in in-situ concrete, joint sealing slots can be readily formed in the following matter-
 - Before installing, simply cut off a strip of the required depth. Then install the filler flush with the finished surface.
 - Prior to sealing, the top strip can then be pulled easily from the joint to provide an uncontaminated sealing slot ready for preparation and sealing.
- Shuttering surface before concreting should be free from any defect/ deposits and fully cleaned so as to give perfectly straight smooth concrete surface. Shuttering surface should be therefore checked for any damage to its surface and excessive roughness before use.
- Form work including centring, shuttering, propping, staging shall be strong enough to withstand the dead and live loads and forces caused by ramming and vibrations of concrete and other incidental loads, imposed upon it during and after casting of concrete. It shall be made sufficiently rigid by using adequate number of ties and braces, screw jacks or hard board wedges where required shall be provided to make up any settlement in the form work either before or during the placing of concrete.

- Form work shall be properly designed for self-weight, weight of reinforcement, weight of fresh concrete, and in addition, the various live loads likely to be imposed during the construction process (such as workmen, materials and equipment). In case the height of centring exceeds 3.50 meters, the prop may be provided in multi-stages.
- Form shall be so constructed as to be removable in sections in the desired sequence, without damaging the surface of concrete or disturbing other sections, care shall be taken to see that no piece is keyed into the concrete.
- Camber: Suitable camber shall be provided in horizontal members of structure, especially in cantilever spans to counteract the effect of deflection. The form work shall be so assembled as to provide for camber. The camber for beams and slabs shall be 4 mm per metre (1 to 250) or as directed by the E-I-C, so as to offset the subsequent deflection, For cantilevers the camber at free end shall be 1/50th of the projected length or as directed by the E-I-C.
- Tolerance in Finished Concrete - The formwork shall be so made as to produce a finished concrete true to shape, lines, level, plumb and dimensions as shown in the drawings subject to the following tolerance unless otherwise specified in this specification or drawings.

Variation from the Plumb		Upto 3m height
Variation From The Plumb of Conspicuous Liner		Upto 6m height
Variation In The Size Of Wall Openings	(+)15mm (-) 6mm	
Variation In Parapet Wall Thickness Upto 30cm Thickness		

7. LUMN / FINS:-

SLAB, BEAM & GIRDER FORMS:

Variation from the level or from the specified grid for beam soffit before removal of shores

(a) In any 3m	
(b) In any 6m	

All the tolerances mentioned above shall apply to concrete dimensions only, and not to positioning of vertical steel or dowels. The tolerances given above are specified for local aberration in the finished concrete surface and should not be taken as tolerance for the entire structure taken as whole for the setting and alignment of formwork. Any error, within the above tolerance limits, or any other if noticed in any of the structure after part or portion stripping of forms, shall be corrected in the subsequent work to bring back the structure to its true line, level and alignment.

- Workmanship of concrete - Contractor shall account for all material and labour etc. to achieve the required finishes to the satisfaction of the Engineer-in-charge
- Erection of form work may be from pre-moulded, prefabricated, pre-assembled plates or forms reasonable enough to transport and erect at site to correct line and level as set out at site.

Supports shall be firm and maintained in position by nails, cross bracings, tie rods, locking bolts and nuts. It shall be rigid and stiff so as to retain its shape during and after concreting. The tie rods shall be terminated at least 40mm inside the finished surface.

- Joints shall be water-tight, and no cement slurry shall be allowed to slip through. In joints foamed tapes shall be used.
- Prefabricated or site forms shall be assembled, so as to de-shutter without any jerk to the green concrete. For this double wedge shall be used. Wedges shall be nailed, the heads reasonably left out, allowing easy removal while de- shuttering.
- Prefabricated or on site fabricated forms shall be of sufficient thickness and with the required supporting runners in either direction. Supporting runners shall be standardised in size for easy replacement and universal use at site.
- Props shall be of steel only. Size and verticality shall be approved by the E-I-C. Its spacing shall be as per design. It shall be vertical and plumbed. Base shall be a proper steel plate or timber plank, for equal distribution of load.
- In repeated use, panels shall be clearly marked for using at defined locations.
- Successive lift shall be tightened with previous lift by fixing foamed strips at joints to avoid grout leakage.
- In fill pieces and panels shall be well dressed, levelled and jointed with main formwork so as to achieve smooth, even natural finish.
- Props, Soldiers, wallings, Shores, bearers, Clamps, wall & ties etc. shall be at required spacings.
- Props, shores shall be securely braced with firm bearing.
- Provide and fix or fix only inserts pockets, to correct line and level and with sufficient rigidity to keep in position while concrete placing is in progress along with vibration.
- Sloping, brackets, chajjas etc shall be well secured and firmly restrained.
- Adequate access and working platform shall be arranged with required safety to avoid reinforcement displacement, damage to shuttering and easy movement of concrete gang.
- Props and scaffolds are to be erected to correct plumb, line, level and with required tie. Load carrying capacity of props shall be as per table of manufacturer.
- Props and scaffolds shall not be loaded more than allowed by manufacturer of Props /scaffolds.
- Heavy, medium and light duty props shall not be mixed up.
- Beams and slabs shall have camber of 4 mm per metre or as directed by the E-I-C.
- All angles and corners shall be sharp and well defined. In places where concrete edges are permanently exposed and require no further treatment, they shall be chamfered in a triangle of 25x25mm.
- Props of steel shall be provided with adequate horizontal and cross - bracing. Steel props shall use steel pipes and steel couplers. If use of timber is not permitted.

- At the design and erection stage, the following additional points shall be considered and incorporated into the shutters.
 - Openings for cleaning prior to start of concreting.
 - Pouring points shall avoid high drops and provide easy access to vibrator needles.
- Surfaces shall be treated with mould releasing oil or emulsion as approved by the Engineer-in-charge prior to reinforcement laying. The following point shall be observed very carefully:
 - Joints of moulds shall be water-tight & should be checked from bottom to make sure that no light is visible.
 - Props shall be on solid base, plumbed, in one straight line, and braced horizontally and cross.
 - Tie bars in beams, walls and columns shall be at the correct place and fully tight.
 - Wedges shall be fully secured and nailed with head left out for easy removal.
 - All saw dust, dirt, shaving and any other unwanted materials shall be cleaned and hosed out.
 - Provision shall be made for watching form work while concreting and any other platform needed for movement of workers without any disturbance to reinforcement.
- Opening/inserts: All required openings and pockets shall be provided as detailed in the drawing. The contractor shall provide for the required material, labour for fixing and supporting during concreting, in his quoted price. It is imperative that all openings and pockets shall be deshuttered with care and all corners of openings shall be preserved. All openings/pockets shall be in a correct line and level. After concreting, the openings shall be secured by proper covering against any accident and guard rail and warning notice, if any will be incorporated.
- In case of multi-storey building, any upper floor shall be suitably supported on atleast one floor below the same or as approved by the E-I-C. The concreting of upper floor shall be done only after lower floors have attained the strength.

In case of shear walls, lift walls, internal walls, the form work shall be done by removable type tie rods within PVC sleeves. Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete, with Thermo-Mechanically Treated bars of grade Fe-500D or more at all levels. Couplers of approved manufacturers/ brand of suitable length as per structural requirement to be provided for columns reinforcement bars for more than 25mm dia as directed by the Engineer-in-charge. Overlapping of bars should be as per mentioned in structural drawing. Overlapping length should be closed tied with binding wire as per CPWD specification and where there is two layers in beam reinforcement suitable dia spacer bars/ spacer blocks not less than 25mm of between two layers of reinforcement should be provided, as per IS Code SP:34. In case of slab/ raft etc. chairs of dia minimum 12mm dia to 25mm of required length in double mesh portion should be provided @ 1 no. per sq.m.as

directed by the Engineer-in-charge. The dia of chair should be such that they do not bend or buckle under the weight of reinforcement and other incidental load during construction. Bar bending schedule to be prepared and provided by the Contractor, as per structural drawings

- i. Clear overhead space, hoisting hooks, exhaust fan opening, etc. are to be provided, as required for proper commission of lifts, as per manufacturer's specifications and approved shop drawings.
- ii. Form work shall be placed and removed as per time line provided in CPWD- specifications.

Plaster drip course of size 25mm x 12mm in plastered surface or moulding to be provided for all R.C.C. projections/ chajjas, etc

8. MASONRY WORK

a. The work shall be carried out as per the CPWD specifications.

The work shall be done in accordance with CPWD specifications Volume - I & II with correction slips up to the last date of submission of tender documents.

Brick work with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5 (Local first class bricks) in foundation and plinth in cement mortar 1:6 (1 cement : 6 coarse sand) as per drawings

DSR Item No. 6.1.2 : Brick work with common burnt clay F.P.S. (non modular) bricks of 230 mm x 110 mm x 75 mm class designation 7.5 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)

Refer following sections - List of Mandatory tests Page 205, Para 6.1 Page 214, Para 6.2 on Page 219 of CPWD Specifications for Brick work .

Refer BRICKS/BRICK TILES/BRICK BATS/MECHANIZED AUTOCLAVE FLY ASH LIME BRICK

1.0 Material

Bricks used in the masonry may be of the following type.

(a) The Common Burnt Clay

1.1 Dimensions

1.2 Classification

1.3 Sampling and Tests

1.5 Burnt Clay Perforated Building Bricks

1.5.1 General Quality:

1.5.2 Dimensions and Tolerances:

1.5.3 Perforations

1.5.4 Compressive Strength:

1.5.5 Water Absorption:

1.5.6 Efflorescence

1.5.7 Warpage:

2 BRICK WORK

2.1 Classification

2.2 Mortar

2.3 Soaking of Bricks

2.4 Laying

2.5 Joints

2.6 Curing

2.7 Scaffolding

2.8 Measurements

2.9 Rate

DSR Item No. 6.4.2 : Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:6 (1 cement : 6 coarse sand) The relevant specification shall be as per the above item of brickwork except that the work is to be done in superstructure above plinth level for all levels in all shapes and sizes.

DSR Item No. 6.12.2 : Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in : a) Cement mortar 1:4 (1 cement : 4 coarse sand)

DSR Item No. 6.13.2 : Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in Cement mortar 1:4 (1 cement :4 coarse sand)

HALF BRICK WORK

Brick work in half brick walls shall be done in the same manner as described above in brickwork except that the bricks shall be laid in stretcher bond.

The mortar interposed between the reinforcement bars and the brick shall not be less than 5 mm. The mortar covering in the direction of joints shall not be less than 15 mm.

1 Measurements

The length and height of the wall shall be measured correct to a cm. The area shall be calculated in sq.m. where half brick wall is joined to the main walls of one brick or greater thickness and measurements for half brick wall shall be taken for its clear length from the face of the thicker wall.

2 Rate

The rate includes the cost of the materials and labour involved in all the operations described above.

DSR Item No. 6.14 : Extra for half brick masonry in superstructure, above floor V level for every four floors or part thereof by mechanical means.

Bricks shall be stacked in regular tiers as and when they are unloaded to minimize breakage and defacement. These shall not be dumped at site.

Bricks stacks shall be placed close to the site of work so that least effort is required to unload and transport the bricks again by loading on pallets or in barrows. Building bricks shall be loaded or CPWD SPECIFICATIONS 2009 16 unloaded a pair at a time unless palletized. Unloading of building bricks or handling in any other way likely to damage the corners or edges or other parts of bricks shall not be permitted.

Bricks shall be stacked on dry firm ground. For proper inspection of quality and ease in counting the stacks shall be 50 bricks long, 10 bricks high and not more than 4 bricks in width, the bricks being placed on edge, two at a time along the width of the stack. Clear distance between adjacent stacks shall not be less than 0.8 m. Bricks of each truck load shall be put in one stack.

Bricks of different types, such as clay bricks, clay fly ash bricks, fly ash lime bricks, sand lime (calcium silicate) bricks, auto-clave bricks etc. shall be stacked separately. Bricks of different classification and size consideration (such as, conventional and modular) shall be stacked separately. Also bricks of different types, such as, solid, hollow and perforated shall be stacked separately.

Exposed brick to be First class Non-modular, Size -220mmx 102mmx 67mm of antique weathered look, Dry weight should be at least 2.4 Kg/piece, Strength to be above 75Kg/cm² Water absorption to be <12%, Coverage per sq.ft. Joints to be 10mm wide and 12mm deep.

Jaali brick providing and fixing of Terracotta Jaali of Nuvocotto, 200 x 200 x 60 MM of approved design / pattern. Installed using external tile adhesive, for tile to tile joints. MS flats should be provided as stiffeners where ever required for mechanical strength and to counter lateral force. MS stiffeners and tile to be joined with adhesive specifically for it. (E.g. Dry Wall from Weber)

Fixing and installation

This can be fixed using tile adhesives, like brick wall is being constructed. Depends on the span of the wall, precautions must be taken, If the span is more than 3.00 M it is recommended to use 3 mm rods after every 2 rows of Jaalis for lateral support.

MS Fabricated structure can also be used for a bigger area. If using at safety critical areas it is recommend to take advice from Structural Engineer while designing the Jaali Facades and the MS Frame works.

9. **DOOR & WOOD WORK:**

35 mm thick ISI marked flush door shutters to be provided as per architectural drawings, 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, including ISI marked 4 nos. of stainless steel hinges of size 125x64x2.50mm (heavy type) as per approved make, with necessary stainless steel screws. The flush doors shall be finished with both-side factory-pressed 1.5mm thick decorative high pressure laminated sheet of plain/ wood grain in gloss/ matt/ suede finish with high density protective surface layer, glued to shutter with adhesive bonding quality conforming to IS:2046 Type S, as per schedule of finishes/ drawings/ schedule of hardware Lipping with 2nd class teak wood battens 12 mm minimum depth on all edges of all the flush door shutters to be provided Vision panel in flush doors shutters to be provided as per architectural drawings.

Frosted 6mm thick float glass panesto be provided in windows & ventilator shutters for toilets

Bright finished brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete, to be provided in doors as per hardware schedule

Following Stainless steel fittings, ISI marked, with nuts and screws etc. complete, as per approved make, to be provided at all doors & windows, as per hardware schedule and as per directions of the Engineer-In-Charge

- a) Sliding door bolts - 300x16 mm for double leaf doors and 250x16 mm for single leaf doors
- b) Tower Bolt– 250/ 200mm x 10 mm
- c) Handles 125 and 100 mm
- d) Hanging floor door twin rubber stopper, of approved size and shape

75mm transparent rubber buffers with washers and necessary screws etc. complete to be provided as per schedule of finishes (best make of approved quality)

Greenlam Sturdo Classique Grandeur or equivalent Toilet Cubical as per drawings, (of following standard dimension which includes 600mm door size width) made of heat, bacteria, water, chemical, scratch, impact anti-bacterial resistant 18mm thick solid compact laminate panels tested by Shriram Test House. Finish of the compact laminate should be Suede / *Raw Silk, which includes doors, pilasters & intermediate panels finished with approved texture/shade as per the detail drawings & as per IS 2046 (Indian Standard) and as per fire retardant BS-476/97 standard. The product should have Green Guard Certificate. This also includes providing and fixing in position necessary hardware made out of Stainless steel

(Grade 304) as per manufacturer's specifications & Engineer-in-charge instructions like (1) Door Knob, (2) Gravity Hinges, (3) Thumb turn lockset indicator, (4) Coat hook, (5) U-Channels, (6) SS-Shoe Box Plate (7) MS-Base Plate, (8) Rubber noise deafening tape (9) Screws & wall Plugs. All screws will be of 304 Grade in stainless steel with satin finish. All pilasters are supported by MS-Base steel Bottom Cladding with Stainless Steel Shoe Box Plate. The base of the stainless steel shoe box will be anchored to the floor with a clearance height upto 110mm. Fixing of intermediate panels to the wall shall be stainless steel 'L' – Bracket or stainless U-Channel section are fixed into wall with screw inserts.

Acoustic wall Panelling (66 mm) with finishing of 16 mm thick Grooved wooden acoustic panel of size 575mm x 2420 mm, Groove Size 3.2mm at an interval of 28 mm c/c to be provided at seminar hall & stage as per acoustic design / Engineer-in- Charge approval, The wooden acoustic panels to be backed with black acoustic fleece. All joints of wooden acoustic panel should have dowel connection to avoid any sagging /unevenness. All wooden acoustic panels should be fixed on GI 'Z' clamp made out of 1 mm thick GI sheet of size 30 mm x 30 mm collar and 50 mm high to match with the installed GI frame. The grooved acoustic panel laminated in desired shade as per Engineer In charge approval. The 'U' channel grid of size – 50 x 32mm thick made out of GI sheet, 0.5 mm thick, ISI mark. The grid size will be – 600 x 900mm fixed to wall using all screws of Stainless steel. Cavity of grid shall be filled with Tissue fibre paper laminated Rockwool density 64 kg/cum confirming to IS 8183 to achieve the 1.0 NRC value and finally and finally wooden acoustic panel fixed on GI Channel grid as final finish. Panels to be tested as per IS:8225/ISO: 354/ASTM 423C, Test report form OEM to be submitted. All Makes and models of all items/samples should be approved by the Architect prior to the installation.

Compressed Polyester fibre acoustical panels, 9 mm thick acoustic polyester fibre pad pasted on 16 mm thick perforated wooden panels by rubber-based adhesive for rigid fixation to be provided at seminar hall. The Polyester fibre acoustic panels to be backed with black acoustic fleece. Total thickness of the Composite Acoustic panel will be 25 mm. All joints of Polyester fibre acoustic panel should have dowel connection to avoid any sagging /unevenness. All Polyester fibre acoustic panels should be should be fixed on GI 'Z' clamp made out of 1 mm thick GI sheet of size 30 mm x 30 mm collar and 50 mm high to match with the installed GI frame. The edges of the polyester fibre pad to be taper cut by special purpose machine to produce a 'V' joint at all four ends. The Polyester fibre acoustic panel of size 600 mm x 600 mm / 600 x 1200 mm, with a perforated pattern of dia. 08/10 mm or as per acoustic design / Architects approval for better absorption. The polyester fibre to be chemically treated for fire retardancy. The system will be installed with a 42 mm thick acoustic backing of Tissue fibre paper laminated Rockwool density 64 kg/cum, confirming to IS 8183 to achieve 0.9 NRC value. The Panels color and pattern shall be as per approved design. All Makes and models of all items/samples should be approved by Consultant prior to the installation

Fire resistant door frame of section 50 x 60 mm on horizontal side & 35 x 60 mm on vertical sides having built in rebate made out of 1.6 mm thick GI sheet (Zinc coating not less than 120gm/m²) suitable for mounting 120 min Fire Rated Glazed Door Shutters to be fixed in all fire-doors shutters. The frame shall be filled with Mineral wool Insulation having density min 96Kg/m³ . The frame will have a provision of G.I. Anchor fasteners 14 no's (5 each on vertical stile & 4 on horizontal stile of size M10 x 80) suitable for fixing in the opening along with Factory made Template for SS Ball Bearing Hinges of Size 100x89x3mm for fixing of fire rated glazed shutter. The frame shall be finished with an approved fire-resistant primer or powder coating of not less than 30 micron in desired shade as per the directions of Engineer-in-charge.

60 mm thick glazed fire resistant door shutters to be provided in fire doors, of minimum 120 minutes Fire Rating confirming to IS:3614 (Part II) or EN1634- 1:1999, tested and certified as per laboratory approved by Engineer-in-charge, with suitable mounting on door frame, consisting of vertical stiles, top rail & side rail 60 mm x 60 mm wide and bottom rail of 110 mm x 60 mm made out of 1.6mm thick

G.I. sheet (zinc coating not less than 120gm/m²) duly filled mineral wool insulation having density min 96 kg/m³ and fixing with necessary stainless steel ball bearing hinges of size 100x89x3mm of approved make, including applying a coat of approved fire resistant primer or powder coating not less than 30 micron etc. all complete as per direction of Engineer-in-charge.

Glazing in fire resistant door shutters, fixed panels & partitions etc., with G.I. beading made out of 1.6 mm thick G.I. sheet (zinc coating not less than 120 gm/m²) of size 20 x 33 mm screwed with M4 x 38 mm SS screws at distance 75 mm from the edges and 150 mm c/c, including applying a coat of approved fire resistant primer/powder coating of not less than 30 micron on G.I. beading, & special ceramic tape of 5 x 20 mm size etc complete in all respect as per direction of Engineer-in- charge. The glass shall be clear, toughened, interlayered, non-wired fire resistant having 11 mm thickness of approved brand with 120 minutes of fire resistance both integrity & radiation control (EW120) and minimum 15 min of insulation (EI15) and having a sound reduction of 37dB and LT of 86%. Glass shall be compliant to class 2(B)2 category of Impact Resistance as per EN 12600. The glass should be manufactured in UL & TUV audited Facility and including UL-EU Certification. The maximum glazing size shall not be more than 1100 mm x 2200 mm (w x h) or 2.42 sq. mts in total area. The test report for the complete system (Glazed Door or Partition) will be considered valid only if it contains the stamp and signature of the authorized signatory from the glass manufacturer 25mm bright /matt finished Stainless Steel handles as per hardware schedule to be fixed to the fire doors shutters, of approved quality & make with necessary screws etc all complete.

Panic bar/ latch (Double point) as per hardware schedule to be provided at all fire doors/ lab doors, fitted with a single body, trim latch & lock on back side of the Panic Latch of reputed brand and manufacture, to be approved by the Engineer- in- charge, all complete.

Aluminium extruded section body tubular type universal hydraulic door closer (having brand logo and IS:3564 mark embossed on the body) for door weights upto 36 to 80 kg and door widths from 701 to 1000 mm, with double speed adjustment, complete with necessary accessories and screws etc., to be provided at doors as per hardware schedule

120 minutes rated Fire Curtain with Galv. MS Head Top Box (200mm x 200mm minimum dimensions), Powder Coated Side Guides (100mm x 53mm minimum dimensions),Adjustment Channels and Bottom Bars with geared motors for power up operation with Standard Battery backup and operated system Safe fixed into Steel rollers with woven glass fibre fabric, reinforced with stainless steel wire having micronized aluminium polymer coating on each side of the fabric (silver/grey) with its control panel and all installation assemblies & accessories required to complete the installation. The operation shall be suitable for dedicated 230 Volts UPS, 50 Hz AC supply. Complete system tested in accordance with BS EN 1634-1 (for 120 minutes Integrity & tested at 1000°C) to BS 476-22.8 and BS 7346-3 . The Emergency Retract Switch is needed on both side of the curtain. The curtain should reset automatically when Fire Control Panel is reset. Vendor / Manufacturer to submit valid Test Report for the complete systems and not just for fabric from an independent international accredited laboratory.

The automatic smoke or fire curtain control panel require a UPS supply or 220v-240v (Selectable) (AC) 3 core 1.5mm thickness wire supply in order to keep the batteries charged

up. The mains supply does not have any other function apart from keeping the batteries charged-up, this is because the current required for driving the system is taken from the lead-acid cells; however it is advise that the panel should have an uninterrupted mains supply under normal conditions, where possible to ensure correct functionality

of the system. (FC-01)

Accessories per Curtains- Control Box including 12V 2.2/2.3ah battery, override switches, Key Switches on both side and all other accessories required to make the functional.

a. The Fire Curtains including Top box, Side Guides, Curtains, barrel including motor, dummy end and bottom rail

10. **UPVC DOOR & WINDOW WORK:**

i). For UPVC Casement Window SGU-Residential (Ventilators, Small windows, etc.)

Providing and fixing factory made UPVC white colour Colorfast and conform to EN12608 casement/casement cum fixed glazed windows comprising of uPVC multi-chambered frame, sash and mullion (where ever required) . Frame T/M Joint between fixed & openable windows will be 45 & 60mm as per wind-load (Meet wind load requirement as per IS 875 - Part III on Sash / Mullion) extruded profiles duly reinforced with (1.50 to 2.5 , 340mpa) depending upon wind-load) ± 0.2 mm thick galvanized mild steel of Jindal steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, TPE/EPDM gasket, friction hinges, zinc alloy (white powder coated) casement Espag handles with zinc plated mild steel multi point locking having transmission gear, with keeps, G.I fasteners 100 x 8, 80 x 8 mm size for fixing frame to finished wall, pvc packers, pvc caps and necessary stainless steel screws, etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners with a groove finish, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc.

After fixing frame the gap between frame and adjacent finished wall shall be filled with PVC Packer, weather proof silicon sealant over

backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge.

Follow the British Standard (BS EN 12608, UK, CEPT Ahmedabad, tested by Central Building Research Institute, Roorkee & Shriram Institute of Industrial Research, New Delhi.

Casement window with S.S friction hinges (350 x 19 x 1.9) made of (frame 45 x 50mm, sash 45 x 78& mullion 45 x 70mm) all having wall thickness of (1.8 to 2.3) ± 0.2 mm and Single glazing bead of appropriate dimension 5mm toughened/frosted to be considered as per requirement

ii). For UPVC Casement Window SGU-Residential big size windows

Providing and fixing factory made uPVC white colour Colorfast and conform to EN12608 casement/casement cum fixed glazed windows comprising of uPVC multi-chambered frame, sash and mullion (where ever required) . Frame T/M Joint between fixed & openable windows will be 45 & 60mm as per wind-load (Meet wind load requirement as per IS 875 - Part III on Sash / Mullion) extruded profiles duly reinforced with (1.50 to 2.5 , 340mpa) depending upon wind-load) ± 0.2 mm thick galvanized mild steel of Jindal steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, TPE/EPDM gasket, friction hinges, zinc alloy (white powder coated) casement Espag handles with zinc plated mild steel multi point locking having transmission gear, with keeps, G.I fasteners 100 x 8, 80 x 8 mm size for fixing

frame to finished wall, pvc packers, pvc caps and necessary stainless steel screws, etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners with a groove finish, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc.

After fixing frame the gap between frame and adjacent finished wall shall be filled with PVC Packer, weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge.

Follow the British Standard (BS EN 12608, UK, CEPT Ahmedabad, tested by Central Building Research Institute, Roorkee & Shriram Institute of Industrial Research, New Delhi.

Casement window with S.S friction hinges (350 x 19 x 1.9) made of (big series frame 65 x 58 mm, sash 65x 80mm, & mullion 65 x 80mm) all having

wall thickness of $(1.8 \text{ to } 2.3) \pm 0.2$ mm and Single glazing bead of appropriate dimension 5mm toughened/frosted to be considered as per requirement

iii). For UPVC Door with SGU (For all glass doors):

Providing and fixing factory made uPVC white colour Colorfast and conform to EN12608 casement/ Casement cum fixed glazed door comprising of uPVC multi- chambered frame, sash and mullion (where ever required) Frame T/M Joint between fixed & openable windows will be 65 & 80mm as per wind-load (Meet wind load requirement as per IS 875 - Part III on Sash / Mullion)

extruded profiles duly reinforced with $(1.50 \text{ to } 2.5, 340\text{mpa})$ depending upon wind-load) ± 0.2 mm thick galvanized mild steel of Jindal steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, TPE/EPDM gasket, zinc alloy (white powder coated) 3D hinges and one handle on each side of panels along with zinc plated mild steel multi point locking having transmission gear, cylinder with keeps and one side key with hook lock, G.I fasteners 100 x 8, 80 x 8 mm size for fixing frame to finished wall, pvc packers, pvc caps and necessary stainless steel screws, etc. Profile of frame & sash shall be mitred cut and fusion welded at all corners, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with PVC packers weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge. Follow the British Standard (BS EN 12608, UK, CEPT Ahmedabad, tested by Central Building Research Institute, Roorkee & Shriram Institute of Industrial Research, New Delhi.

Casement door with 3D hinges made of (big series frame 65 x 73 mm & sash 65 x 105 mm) both having wall thickness of 2.3 ± 0.2 mm and Single glazing bead of appropriate dimension. 5mm toughened to be considered as per requirement.

iv). For UPVC fixed with SGU (For all door-window):

Providing and fixing factory made uPVC white colour Colorfast and conform to EN12608 fixed glazed windows comprising of uPVC multi-chambered frame, and mullion (where ever required) . Frame T/M Joint between fixed will be 50 & 118mm as per wind-load (Meet wind load requirement as per IS 875 - Part III on Sash / Mullion)extruded profiles duly reinforced with $(1.50 \text{ to } 2.5, 340\text{mpa})$ depending upon wind-load) ± 0.2 mm thick galvanized mild steel of Jindal steel section made from roll forming process of required length (shape & size according to uPVC profile), uPVC extruded glazing beads of appropriate dimension, TPE/EPDM gasket, G.I fasteners 100 x 8, 80 x 8 mm size for fixing frame to finished wall, pvc packers, pvc caps and necessary stainless steel screws, etc. Profile of frame shall be mitred cut and fusion welded at all corners with a groove finish, mullion (if required) shall be also fusion welded including drilling of holes for fixing hardware's and drainage of water etc. After fixing frame the gap between frame and adjacent finished wall shall be filled with PVC Packer, weather proof silicon sealant over backer rod of required size and of approved quality, all complete as per approved drawing & direction of Engineer-in-Charge.

Follow the British Standard (BS EN 12608, UK, CEPT Ahmedabad, tested by Central Building Research Institute, Roorkee & Shriram Institute of Industrial Research, and New Delhi.

Fix window made of (big series frame 118 x 58 mm, & mullion 118 x 58mm) all having wall thickness of $(1.8 \text{ to } 2.3) \pm 0.2$ mm and Dgu glazing bead of appropriate dimension 6mm toughened+15mm airgap+6mm toughened.

v). For Coupler to join all the door and windows:

Providing and fixing factory made uPVC white colour Colorfast and conform to EN12608 uPVC frame, and mullion (where ever required). Frame T/M Joint between fixed will be 65 & 118mm as per wind-load (Meet wind load requirement as per IS 875 - Part III on Sash / Mullion) extruded profiles duly reinforced with (1.50 to 2.5 , 340mpa) depending upon wind-load) ± 0.2 mm thick galvanized mild steel of Jindal steel section made from roll forming process of required length (shape & size according to uPVC profile), Follow the British Standard (BS EN 12608, UK, CEPT Ahmedabad, tested by Central Building Research Institute, Roorkee & Shriram Institute of Industrial Research, New Delhi.

11. STRUCTURAL STEEL WORK:

All the specifications for structural steel works shall be as per CPWD Specifications Volume - I & II with correction slips up to the last date of submission of tender documents.

1mm thick M.S. sheet door to be provided at mumty, with frame of 40x40x6 mm angle iron and 3 mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, Using M.S. angles 40x40x6 mm for diagonal braces with ISI marked oxidised M.S. sliding door bolts, tower bolt, handles, etc. including T-iron frames for doors, of mild steel Tee-sections, joints mitred and welded, along with fixing of 8 nos. of ISI marked oxidised M.S. pressed butt hinges with necessary screws etc. of size 125x65x2.12 mm and applying a priming coat of approved steel primer and two coats of synthetic enamel paint of approved make & shade to the entire doors. Fixing with 15x3 mm lugs 10 cm long embedded in cement concrete block 15x10x10 cm of C.C. 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size), as directed by Engineer-in-charge & as per architectural drawings

Steel work welded in built up sections/ framed work, including cutting, hoisting, fixing in position using structural steel, and applying a priming coat of approved steel primer and two coats of synthetic enamel paint of approved make & shade, as required for gratings, frames, guard bar, ladder, railings, brackets, grills, gates and similar works, as per architectural drawings

MS structural platform in shaft, staircases for mumty roof, water tank etc. to be provided, as per shop drawing if not mentioned in architectural/structural drawing. Shop drawing to be got approved from Engineer-In -Charge

Stainless steel (Grade 304 18/8 composition) railing to be provided as per the architectural / schedule of finishes, 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, cover plates, 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.

Design supply, fabrication and erection of Tubular space-frame structure as per drawing, using check nut system with spherical solid node connectors 75 mm. dia EN 31 forged steel ball and MS struts of suitable dia. 48.30 mm. O.D with 4mm wall thickness on top and bottom grid and 33.7mm O.D with 2.6mm wall thickness for diagonals as per the design . The

cones are to be machined to provide for proper seating of the high tensile bolts and the pipes. The cones are welded to the pipes as per the relevant I.S codes. The dimensions of the cones and the shape are to be determined by the forces being transferred. Bolts to be high tensile bolts as per IS : 1363 of minimum 10.9 grade of Relfa or equivalent approved make. Connector node to be high strength or equivalent duly approved spherical node connectors of approved make manufactured out of C-45 grade of required dimensions and machined to have threaded holes for the bolts in the required position and direction. The sphere is to be machine faced at right angle to each hole for providing proper seating to the bolts. The holes are to be threaded as per IS : 4218 1967 I.S.U metric threads. The item includes the cleaning the surface with one coat of epoxy primer and two coats of epoxy paint of approved make. Grid Size : 987 mm. x 987 mm. Fixing of 600 dia x 16 mm. MS plates with 8 nos of anchor fasteners 16mm dia 400mm long as per structural drawings, including the subframe with MS pipes 50 x 25 x 2.2 mm. and also including one coat of epoxy primer and two coats of epoxy paint

a. All stainless steel sections should be protected against scratching with polyethene wrap stickers till completion of the building/ handover of the building whichever is later. If any damage or scratches are visible in stainless steel sections, the same shall be rectified on contractor's risk and cost.

b. All steel works and SS works shall be executed through approved specialized agency. Approval shall be accorded by the Engineer-in-charge.

All other incidental works not specified herein mentioned but necessary for the satisfactory completion of the works, shall be deemed to be included.

12. **FLOORING** **Specifications for Flooring & Dado**

a) Cladding:

General (applicable for all kinds of flooring and dado / cladding works under this sub-head):

Various types of flooring, skirting, dado and window sill work shall be carried out by the contractor referring the floor finishing layouts as per Architectural drawings. Contractor needs to refer room data sheet / schedule of finishes and material palette attached with tender document.

The work under this sub-head in general shall be carried out as per the CPWD Specifications, as per the architectural drawings and as per the direction of Engineer-in-Charge.

The Engineer-in-Charge or his representative may, if required, visit the source of supply of the various stones to assess the quality as well as availability of the material in the required quantities. The Department shall bear the cost of such visits of the officers of the Department.

Based on the samples approved by the Engineer-in-Charge for various flooring and dado / cladding materials as specified hereinafter, the contractor shall prepare mock up(s) at site of work as specified under relevant flooring and dado / cladding items, for approval of quality of workmanship and material specified. If the quality of the workmanship and the material is as per the required standards and approved by the Engineer-in- Charge, the mock up shall be allowed as part of the work. Otherwise, it shall be dismantled by the contractor as directed by the Engineer-in-Charge and taken away from the site of the work at his own cost. The mock up(s) so made shall be kept till completion of respective works for reference.

The stones / tiles shall be transported to site well packed in boxes or otherwise. These shall be handled carefully to prevent any damage. The various types of stones and tiles, procured shall be free of any surface defect or any edge damage. The damaged stones and tiles shall not be

allowed to be used in the work. So, the contractor shall procure additional quantity of the stone and tiles to cover such contingencies. However, nothing extra shall be payable on this account.

For the skirting in the enclosures with curvilinear profiles, the tiles / stones shall be cut to the required size and the shape to match the profile and/ or the joints as per the architectural drawings. Similarly, the skirting shall be fixed in a manner as to flush or project from the finished face of the wall as per the architectural drawings and as directed by the Engineer – in- Charge. Any chasing of the CC/Brick/AAC masonry works required for such fixing is deemed to be included in the cost of masonry. Nothing extra shall be payable on this account. Proper gradient shall be given to flooring for toilets, verandah, kitchen, courtyard etc. so that the wash water flows towards the direction of floor trap. Any reverse slop if found, these shall be made good by the contractor by ripping open the floor/grading concrete and nothing shall be paid for such rectifications.

The flooring and skirting will be executed as per pattern shown in the architectural drawings. Skirting height shall be 100-150 mm except staircase portion. Skirting height at staircase will be executed as per approved architectural drawings.

Samples of flooring material are to be deposited well in advance to the Engineer-in- Charge for approval. Approved samples should be kept at site with the Engineer-in- Charge and the same shall not be removed except with the written permission of Engineer-in-Charge. No payment whatsoever will be made for these samples.

For flooring work, the joints between the different types of flooring shall be located as per the architectural drawings. Also, the Contractor shall maintain the uniform level of the finished flooring of the different types unless specifically mentioned on the architectural drawings. Nothing extra shall be payable on these accounts.

All the flooring works specified under this sub-head shall be adequately protected by a layer of plaster of paris which shall be laid over a 400 micron PVC film. The protective layer shall be maintained throughout the execution of works and removed just before handing over of the site for which nothing extra shall be payable.

At the time of handing over, flooring & dado / cladding shall be free of any scratches, stains etc. The flooring & dado / cladding shall be properly cleaned before handing over. However, abrasive/acid cleaners shall not be used to clean the marks and other scratches.

Pattern for any type of flooring / dado shall be as per detail drawings submitted. The cost of flooring work is inclusive all material, workmanship, labour, pattern, colour, style, skirting etc. complete. No extra payment on this ground shall be entertained. The joints for all flooring to run in a straight line.

For steps upto 2 metre length, marble/ granite/ kotah stone flooring in treads & riser to be provided in single piece stone

Providing and laying cushioning layer in cement mortar 1:4 (1 cement: 2 coarse sand) for difference of thickness in flooring of granite/ kota stone & vitrified/ rectified tile 8/ 15 mm as directed by the Engineer-in-Charge.

b) Kota Stone Work:

This can be read for Flooring / Skirting / Dado / Steps.

The work to be carried out in areas as mentioned in flooring layouts and material palette and as per the CPWD Specifications Volume I and II with correction slips up to the last date of submission of tender documents. The provision of IS Codes listed in CPWD specifications shall form a part of this document with all latest codes.

22 to 25mm thick 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 mirror polishing complete with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) to be provided as per the drawings/ schedule of finishes 22 to 25mm thick rough 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, with base of cement mortar 1 : 4 (1 cement : 4 coarse sand) to be provided in plinth protection, ramps, paths, etc., as per the drawing/ schedule of finishes Kota stone slabs 22 to 25 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 mirror polishing complete as per drawing/ schedule of finishes.
(Note: only 10% variation in colour allowed)

c) Vitrified / Ceramic Tile Work:

The work shall be carried out in areas as mentioned in Architectural drawings and as per the CPWD Specifications Volume I and II with correction slips up to the last date of submission of tender. The tiles shall be confirming to the related BIS codes up to the latest revisions. The testing shall also be got done from approved labs in accordance with the BIS codes for the various parameters and as referred. Contractor to obtain prior approval of Engineer in charge for tiles make, sizes, shade and color as per Architectural drawings and material palette before bringing it to site.

Vitrified tiles flooring to be provided as per approved make, colour, shade, pattern & size as given in the drawing/ schedule of finishes (thickness to be specified by the manufacturer), conforming to IS: 15622, laid on 20mm thick cement mortar 1:4 (1 cement: 4 coarse sand), jointing with grey cement slurry @ 3.3kg/sqm including grouting the joints with white cement and matching pigments etc., complete with as per direction of the Engineer-In-Charge.

Skirtings and dado of vitrified tiles to be provided as per approved make, colour, shade, pattern & size as given in the drawing/ schedule of finishes (thickness to be specified by the manufacturer), conforming to I.S. 15622 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 @ 3.3kg/sqm including grouting the joint with white cement & matching pigments etc. complete with as per direction of the Engineer-In-Charge.

Properties required for Vitrified tile are as follows:

- A. Glazed vitrified tile (600x600 & 1200x600- heavy duty)
 - 1. Water absorption : < 0.5%
 - 2. Modulus of Rupture, MOR (N/mm²): > 35
 - 3. Thermal Shock : Resistant
 - 4. Resistance to Acid, Alkalies and Chemicals : No visible effect
 - 5. Resistance to Staining: Class 4

- B. Polished Glazed vitrified tile (800x800)
 - 1. Water absorption : < 0.5%
 - 2. Modulus of Rupture, MOR (N/mm²): ≥ 35
 - 3. Thermal Shock : Resistant
 - 4. Resistance to Acid, Alkalies and Chemicals : No visible effect
 - 5. Resistance to Staining: Min Class 4

Ceramic floor tiles (anti-skid/ matt finish) of approved make to be provided as per schedule of finishes (thickness to be specified by the manufacturer), Colour, shade, pattern & size given in the drawing/ schedule of finishes and as approved by Engineer-in-Charge, of 1st quality conforming to IS:15622, laid on 20 mm thick cement mortar 1:4 (1 Cement: 4 Coarse sand),

jointing with grey cement slurry @ 3.3kg/ sqm including grouting the joints with white cement and matching pigments etc., complete.

1st quality ceramic glazed wall tiles conforming to IS:15622 to be provided as per schedule of finishes (thickness to be specified by the manufacturer), of approved make, in any colour, shade & pattern, of any size, as per schedule of finishes and as approved by Engineer-in-Charge, in skirting, risers of steps and dado as the case may be, 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.

Properties required for ceramic tile are as follows:

A.Ceramic tile (300x300 –non rectified & 600x600-rectified)

1. Water absorption : 4.0 - 6.0%
2. Modulus of Rupture,MOR (N/mm²): > 30
3. Thermal Shock Resistant : Resistant
4. Chemical Resistance : Resistant : No visible effect
5. Resistance to Staining: Class 4

B.Ceramic wall tile (450x300 –rectified)

1. Water absorption : 4.0 - 6.0%
2. Modulus of Rupture,MOR (N/mm²): > 30
3. Thermal Shock Resistant : Resistant
4. Chemical Resistance : Resistant : No visible effect
5. Resistance to Staining: Class 4

Ceramic glazed tiles for floor of the overhead RCC water tank to be provided (thickness to be specified by the manufacturer), in 1st quality conforming to IS : 15622 of approved make in White/ Ivory colour, 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 1st quality ceramic glazed tiles for walls of overhead RCC water tank to be provided, conforming to IS : 15622 (thickness to be specified by the manufacturer) of approved make in White/ Ivory colour, of any size as approved by Engineer-in-Charge 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

The contractor shall procure and submit the samples of approved make, shade and thickness of different types of vitrified and ceramic tiles, for the approval of the Engineer-in-charge prior to the execution of the item.

The mock up (one each) shall be prepared for flooring and dado, for vitrified tiles etc.

The entire supply for each type of tiles shall be procured from one manufacturer / authorized dealer, preferably, in one lot to keep variations to the minimum.

The tiling work may be required to be carried out in patterns, design and / or in combination with tiles of different colour and shade and in combination of different stone slabs / tiles for which nothing extra shall be payable. The tiles shall be provided as per the architectural drawings and wastages and incidental costs, if any, shall be deemed to be covered in the cost of the relevant items. Nothing extra shall be payable on this account.

For the flooring portions curved in plan, the tiles (at the edge) shall be cut to the required profile and shape as per the architectural drawings. Nothing extra shall be payable on this

account and any consequent wastages and incidental charges on such accounts shall be deemed to be included in the cost of such items.

The Contractor shall obtain and submit to the Department the manufacturer's test certificate for compliance of various parameters for the material as per the manufacturer's specifications, with each lot of material received at site.

The flooring and dado / cladding should be set out such that the perimeter/ corner tiles are in excess of half a tile so that the edge panels on both the sides are of equal sizes, as far as possible. The tiles shall be cut to required size and shape in a workman like manner but with all precautions, as per the manufacturer's specifications.

For dado / cladding / skirting work, the tiles shall be chamfered at the meeting edges on the corners in a manner that butt edges are not visible. It shall be ensured that the edges shall be ground / filed to chamfer the edges so that the glazing layer at the edges of the tiles is not chipped off otherwise the work shall be rejected and redone by the Contractor at his own cost. All the tiles should be procured only from mother plant of the manufacturer.

d Slate flooring Work:

For Wall Application:

- 1) Base wall should be a cement plaster wall/ Ply Board / Bison panel Board wall.
- 2) Use laticrete or equivalent adhesive for installation. For further information, you can reach us on below mentioned numbers.
- 3) All our CNC designs, hand crafted murals and gold leafing products are pre-sealed so any kind of treatment is not required after installation.
- 4) In case of Normal stones, we advise you to use seal the stone from the back side before installation for avoiding any kind of stains due to moisture and efflorescence.
- 5) In case of normal stones, kindly seal the stone after installation. For any technical assistance, kindly contact on below mentioned numbers.
- 6) Do not use any kind of cement, POP or Acid base material for fixing and cleaning.
- 7) For avoiding any kind of stains, we advise you to cover the stone if your work is in running condition.
- 8) Do not use abro masking tape and brown tape for covering as it tends to leave marks on stone.

For Floor application

- 1) Base should be a Normal concrete surface/ Sand cement bed.
- 2) In case of sand stone kindly seal the stone from the back side before installation for avoiding any kind of stains due to moisture and efflorescence.
- 3) In case of Sand Stone Kindly seal the stone after installation for avoiding any kind of stains.
- 4) Do not use any kind of cement, POP or Acid base material for fixing and cleaning.
- 5) For avoiding any kind of stains, we advise you to cover the stone if your work is in running condition.
- 6) Do not use abro masking tape and brown tape for covering as it tends to leave marks on stone.

13. Granite / Marble stone work

- i.** The Contractor shall procure and submit the samples of different types of granite stones, for the approval of the Engineer-in-charge prior to the execution of the item.
- ii.** The mock up (one each) shall be prepared in staircase, lift wall and lift lobby, kitchen counter and window sill.

iii. The entire supply for each type of granite stone slab shall be procured from one location (in one quarry), and supplied preferably, in one lot to keep variations to the minimum. The Contractor shall also segregate and sort the slabs according to colour, shade, texture and size of grains etc. to keep variation(s) in stones used at any one location to the minimum. Any slab with variation in the colour, shade, texture and size of grains etc., not acceptable to the Engineer-in-Charge, shall not be used in the work and shall be removed and replaced by the Contractor. Nothing extra shall be payable on these accounts. Also no claim of any kind shall be entertained from the Contractor on this account.

iv. Granite stone slabs shall be pre polished (mirror polished) or given any other surface treatment as specified in the item nomenclature, as per the Architectural drawings and as directed by the Engineer-in-Charge.

v. Machine polishing and cutting to required size shall be done with water (as lubricant) only. Sawing shall also be done preferably with water as lubricant but as a special case, the Engineer-in-Charge may permit, at his discretion, oil or kerosene as lubricant subject to all kerosene or oil in the body and surface of tiles / slabs being thoroughly dried in ovens. Tiles / slabs with stains or patches due to the use of oil or otherwise, either before or after installation, shall be rejected and shall be replaced by the Contractor at his own cost. Nothing extra shall be payable on this account.

vi. The stone work may be required to be carried out in patterns, design and / or in combination with granite stones of different colour and shade with or without borders and in combination of different stone slabs / tiles for which nothing extra shall be payable. The stones shall be provided in sizes and shapes as per the architectural drawings and wastages and incidental costs, if any, shall be deemed to be covered in the cost of the relevant items. Nothing extra shall be payable on this account.

vii. For the flooring portions curved in plan, the stone slabs (at the edge) shall be cut to the required profile and shape as per the architectural drawings. Nothing extra shall be payable on this account and any consequent wastages and incidental charges on such accounts shall be deemed to be included in the cost of such items.

viii. The granite slabs used for providing and fixing in the sills, soffits and jambs of doors, windows, ventilators and similar locations shall be in single piece unless otherwise directed by the Engineer-in-Charge. Wherever stone slab other than in single piece is allowed to be fixed, the joints shall be provided as per the architectural drawings and as per the directions of the Engineer-in-Charge. In the cabin areas, the joints in sills shall preferably be provided in line with the partition wall. Depending on the number of joints, as far as possible, the stone slabs shall be procured and fixed in slabs of equal lengths as per the architectural drawings and as directed by Engineer-in-Charge.

ix. The specifications for dressing, laying, curing, finishing, etc. for the granite stone flooring shall be same as that of works for the Marble flooring, skirting and risers of steps under Flooring Sub Head of the CPWD Specifications. The wall lining / veneer work with granite stone shall be as per the CPWD Specifications for Marble work Sub Head.

x. Granite of any colours and shades, 18 mm thick gang-saw cut stones, mirror polished, pre-moulded and pre-polished, machine cut for flooring/ flooring bands to be provided as per the drawings and schedule of finishes, of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.

xi. Granite of any colour, 18 mm thick gang-saw cut, mirror polished, pre- moulded and pre-polished, machine cut for skirting, riser for steps, dado, etc., to be provided as per the drawings and schedule of finishes, of required size, approved shade, colour and texture over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.

xii. Granite of approved colour and shade 18 mm thick gang saw cut, mirror polished, pre-moulded and pre-polished, machine cut for kitchen platforms, vanity counters, window sills, copings, facias to be provided as per the drawings and schedule of finishes, of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) or with epoxy resin based adhesive, joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.

xiii. Flamed-finish/ Leather-finish granite stone slab Jet Black, Cherry Red, Elite, Brown, Cat Eye or equivalent for flooring/ flooring bands in required design and patterns, all complete to be provided as per the architectural drawings/ schedule of finishes 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.

xiv. Edge moulding to be provided for all stones used for counters, vanities, steps, copings etc., including machine-polished edges to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.

xv. Marble/ granite stones, in fascia, jambs and soffits (as per schedule of finishes/ drawings) upto 150 mm wide to be fixed with epoxy resin-based adhesive other shall be fixed with cement mortar 1:3 (1 cement : 3 coarse sand)

xvi. Opening of required size & shape for wash basin/ kitchen sink in kitchen platform, vanity counter, etc., in marble/ granite/ stonework to be provided, including necessary holes for pillar taps etc. and moulding, rubbing and polishing of cut edges etc. complete.

xvii. Granite stone slab of approved shade, with table rubbed, edges rounded and polished, of size 75x50 cm deep and 18 mm thick, fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the chase with epoxy grout or with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 6 mm nominal size) and finished smooth, as per drawing and direction of Engineer-in-charge

NOTES:

1. For Vitrified tiles, Rectified tiles, ceramic tiles and ceramic glazed tiles shall be not less than 10% recycled material content to be used as per GRIHA norms for which necessary certificated to be submitted by contractor.

2. 18mm thick Gang saw Cut Granite slab while bringing to site minimum size should be 2700mm X 900mm and maximum size 3300mm X 2000m. Nothing extra shall be payable towards cutting/ wastage of stone for executing the flooring works as per approved flooring patterns. Less than minimum size and thickness mentioned above shall not be allowed at site

14. **Roofing & False ceiling**

General (applicable for all kinds of roofing works under this sub-head):

- i. The work in general shall be carried out as per the CPWD specifications, as per the manufacturer's specifications, as per architectural drawings and as per directions of Engineer in- Charge.
- ii. Various false ceiling shall be done in different levels in linear and curvilinear pattern in plan and elevation and in combination with other types of false ceiling as specified in schedule of quantities, as per the architectural drawings. However, payment shall be made under respective items.
- iii. The tiles and the suspension system shall be as specified in the item nomenclature. The contractor shall procure and submit the samples of tiles and grid system of approved make, for the approval of the Engineer-in- charge prior to execution of the item.
- iv. The Contractor shall prepare the mock-up at site for approval of material and quality of workmanship by the Engineer-in-Charge. Only after the approval of Mock-up, the Contractor shall start the mass work. If the quality of the workmanship and the material is as per the required standards and approved by the Engineer-in- Charge, the mock up shall be allowed for the work, otherwise, it shall be dismantled by the contractor as directed by the Engineer-in-Charge and taken away from the site of the work at his own cost. The mock up(s) so made shall be kept till completion of respective works for reference. Once the material and mockup are approved, the entire material (tiles as well as grid system) shall be procured from the approved manufacturer or its authorized dealer. The installation shall be got done through an experienced installer, executing similar works.
- v. The material shall be transported to site well packed. The ceiling material procured shall be free of any surface defect, edge damage and any other such defects. The contractor shall ensure careful handling and storage and prevent any rough handling, rolling of cartons or dropping cartons to prevent any edge damage or breakage. The defective / damaged material shall not be allowed to be used in the work. So, the contractor shall procure additional quantity of material to cover such contingencies. However, nothing extra shall be payable on this account.
- vi. Adequate care shall be taken before installation as well as afterwards till completion of the work. It shall be protected from rains, excessive humidity, chemical fumes, vibrations, dust etc. Any tile with edge damaged or crack etc. shall not be allowed to be used in the work and shall be replaced by the contractor at his own cost. Similarly, adequate care shall be taken by the contractor while placing or removing and handling the tiles so as not to cause any damage. The ceiling shall be cleaned as per manufacturer's specifications. Abrasive cleaners shall not be used to clean the marks.
- vii. The Contractor shall obtain and submit to the Department the manufacturer's test certificate / report for compliance of the material to the relevant standards along with each lot of material supplied for the work.
- viii. The suspension system for various types of false ceiling shall be as per manufacturer's specifications. The false ceiling tiles shall be fixed on to coordinated suspension ceiling system with supporting grids system that fully integrates with the ceiling tiles as per manufacturer's specifications. It shall be ensured that the suspension system shall be suitable to take all designed dead, imposed and all incidental loads efficiently and shall not sag. The true line and levels for false ceiling work shall be maintained.
- ix. The luminaries, air grills / diffusers, signages etc. shall be as far as possible independently supported to avoid any over loading of the ceiling system which may result in

excessive deflection or twisting of grids. Any strengthening of grid system by providing additional hangers, fasteners, runners, cross tees etc. or providing additional bracing may be carried out as required for any specific locations or for specific purpose for which nothing extra shall be payable.

The rate for the item of various false ceiling system shall include cost of all inputs of labour, materials, wastage if any, T&P, scaffolding, staging or any other temporary enabling structure / services etc. and all other incidental charges including making necessary cut outs for A.C diffusers, Light fittings, grills, Fire detection, alarm, sprinklers devices and fittings etc.. Also nothing extra shall be payable on account of any wastage in materials. Also nothing extra shall be payable on account of any strengthening of the supporting suspension system for the false ceiling, around the openings in the false ceiling by using additional hangers, fasteners, runners, cross tees, cross channels, etc Gola at roof, 75x75 mm in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 stone aggregate 10 mm and down gauge) to be provided, including finishing with cement mortar 1:3 (1 cement : 3 fine sand) as per standard design in 75x75 mm deep chase

Making khurras 45x45 cm with average minimum thickness of 5 cm cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate of 20 mm nominal size) over P.V.C. sheet 1 m x 1 m x 400 micron, finished with 12 mm cement plaster 1:3 (1 cement : 3 coarse sand) and finally finishing the top surface with broken white glazed tiles with cement and grouting the joints with white cement. and finishing the outlet complete.

1. Providing and fixing of Techzone Suspended ceiling system (Module TZ4) with Dune max Microlook edge tiles 20mmmm thick with 15mm exposed grid system.

The Techzone (Module TZ4) ceiling system has a ceiling module of 1200x1350 and the on centre spacing between two adjacent technical zones is 1350 mm. The techzone orientation is such that the main runners run parallel to the technical zone and hence making this layout compatible with continuous lighting fixtures or air diffusers. Dune max field panel of Armstrong make or equivalent is of size 600x1200x20mm mm. The 150mm wide technical zone formed is where the technical elements like lighting fixtures & air diffusers would be installed. Where there are no technical elements the technical zone would be covered by using dune max or metal technical panels of size 1200mm x150mm in conjunction with a special 150mm long cross tee. The Dune panels should have Humidity Resistance (RH) of 99, NRC 0.7, Light Reflectance $\geq 85\%$, Thermal Conductivity $k = 0.052 - 0.057$ w/m K, color white, fire performance UK Class 0 / Class 1 (BS 476 pt. - 6 &7), suitable for Green Building application, with Recycled content of 63%.

The panels shall be laid on Suprafine/exposed tee 38 with 15 mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main Runner & 1200 mm Cross Tees with a web height of 38mm. The T Sections have a Galvanizing of 90 grams per M2 with pull out strength of minimum 100 Kgs and need to be installed with suspension system of approved make.

INSTALLATION: Technical zones to be formed by using 2 main runners which run parallel to each other at a distance of 150mm and thus forming a Technical zone of 150mm. The on centre spacing between two adjacent technical zones to be 1350mm. Thus we get a module of 1200x1350mm where 1350 is the on centre spacing between the adjacent technical zones.

To lay the field panel of size 600x1200mm, flush fitting 1200mm long cross tees to be interlocked between main runners at 600mm centre.

The technical zone where there are no technical elements can be covered using the technical panels of size 1200mm x 150mm. These technical panels to be laid in the technical zone using a special 150mm long cross tee interlocked at every 1200mm in the technical zone.

Perimeter trim to be wall angles of size 3000x19x19mm, secured to walls at 450 mm maximum centres. Installation to be carried out by Trained Installation team & Installation should be carried out as per recommended procedure.

SUSPENSION SYSTEM accessories manufactured and supplied by approved make consisting of M6 Anchor Fasteners with Vertical Hangers made of galvanized steel of size 26 x 26 x 25 x 1.2mm with a galvanized thickness of 80gsm, a pre Straightened Hanger wire of dia – 2.5 mm of 1.8 m length., thickness of 80gsm and a tensile strength of 344-413 MPa, along with Adjustable hook clips of 0.8mm thick, galvanized spring steel for 2.5 mm with a minimum pull strength of 110 kg. The adjustable clip also consists of a 3.5 mm aquiline wire to be used with the main runner.

2. GUIDE SPECIFICATION FOR SOFT FIBRE ACOUSTICAL SUSPENDED CEILING SYSTEM WITH MICRO LOOK EDGE TILES WITH 15MM EXPOSED GRID:

The tiles should have Humidity Resistance (RH) of 95%, NRC 0.9 - 1.0, Light Reflectance $\geq 85\%$, Colour White, Fire Performance UK Class 0 / Class 1 (BS 476 pt - 6 &7) in module size of 600 x 600 x 15mm, suitable for Green Building application, with Recycled content of 66% GW & 74% RW.

The tile shall be laid on exposed Tee- 38MM with 15 mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees with a web height of 32 mm and a load carrying capacity of 10 Kgs/M2 with a minimum pull out strength of 100 kgs. The T Sections have a Galvanizing of 90 grams per M2 and need to be installed with Suspension system of Armstrong make or equivalent.

The Tile & Grid system used together should carry a 10 year warranty.

INSTALLATION: To comprise main runner spaced at 1200mm centres securely fixed to the structural soffit using Armstrong suspension system or equivalent (specifications below) at 1200mm maximum centre. The First/Last Armstrong suspension system or equivalent at the end of each main runner should not be greater than 450mm from the adjacent wall.

Flush fitting 1200mm long cross tees to be interlocked between main runners at 600mm centre to form 1200 x 600 mm module. Cut cross tees longer than 600mm require independent support. 600 x 600mm module to be formed by fitting 600mm long flush fitting cross tees centrally between the 1200 mm cross tees.

Perimeter trim to be Armstrong or equivalent wall angles of size 3000x19x19mm, secured to walls at 450 mm maximum centres.

Installation to be carried out by Trained Installation team & Installation should be carried out as per manufacturer's recommended procedure.

SUSPENSION SYSTEM accessories manufactured and supplied by Armstrong World Industries or equivalent consisting of M6 Anchor Fasteners with Vertical Hangers made of Galvanised steel of size 26 x 26 x 25 x 1.2mm with a Galvanised Thickness of 80gsm, A pre Straightened Hanger wire of dia – 2.5 mm of 1.8 m length., thickness of 80gsm and a tensile strength of 344-413 MPa, along with Adjustable hook clips of 0.8mm thick, galvanised spring steel for 2.68 mm with a minimum pull strength of 110 kg. The adjustable clip also consists of a 3.5 mm aquiline wire to be used with the main runner.

3. GUIDE SPECIFICATION FOR CELLIO OPEN CELL 150MM CELL SIZE 'LAY-IN' ALUMINIUM CEILING WITH EXPOSED TEE 15MM GRID

Providing and fixing in true horizontal level Cellio Open cell Aluminium lay-in ceiling tiles with border panels forming flush-regular edge of size 600x600x38mm having Fire Performance CLASS A as per GB 8624-2012. The tile shall be powder coated to white color having powder coat thickness ranging from 60-80 microns.

The tile with cell size of 150x150mm shall be laid on Suprafine/exposed tee 38 with 15 mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main

Runner, 1200 mm & 600 mm Cross Tees with a web height of 38mm and a load carrying capacity of 12.5 Kgs/M² & pull out strength of 100Kgs. The T-Sections have a galvanizing of 90 grams per M² and need to be installed with suspension system of approved make.

INSTALLATION: To comprise main runner spaced at 1200mm securely fixed to the structural soffit using suspension system (specifications below) at 1200mm maximum. The First/Last suspension system at the end of each main runner should not be greater than 450mm from the adjacent wall.

Flush fitting 1200mm long cross tees to be interlocked between main runners at 600mm to form 1200 x 600 mm module. Cut cross tees longer than 600mm require independent support. 600 x 600mm module to be formed by fitting 600mm long flush fitting cross tees centrally between the 1200 mm cross tees.

Perimeter trim to be wall angles of size 3000x19x19mm, secured to walls at 450 mm maximum.

Installation to be carried out by trained Installation team & Installation should be carried out as per recommended procedure.

SUSPENSION SYSTEM accessories manufactured and supplied by approved make consisting of M6 Anchor Fasteners with hanger hole, pre Straightened Hanger wire of dia – 2.5 mm of 1.80 m length having a tensile strength of 344-413 MPa and a minimum pull strength of 110 kgs. (Adjustable hook clips of 0.7mm thick, galvanized spring steel can also be used for installation purpose as an additional accessory. The adjustable clip also consists of a 4 mm aquiline wire to be used with the main runner).

4. GUIDE SPECIFICATIONS FOR G21 (LG1012) CHANNELED WOODWORKS WALL PANNELLING OF SIZE: 192X2400X15MM

Providing and Fixing approved Channeled Woodworks perforated panels of width 192mm, thickness of 15mm and length 2400 mm or as required by the Architect/ approving engineer, made of Moisture Resistant fibre board with minimum 595 Kg/M³ density substrate with a laminated facing as per the approved shade & finish and a melamine balancing layer on the reverse side. The boards shall have a special perforation pattern where the visible surface has a “Helmholtz” fluted perforation of 3mm width and 21mm of visible panel each. The edges of the panels shall be “tongue-and-grooved” to receive special clips for installation. The back of the perforated panel shall have sound absorbing non-woven acoustical fleece having NRC of 0.52. The panels shall be mounted on special aluminium splines using clips of approved make as approved by the Architect/ Engineer-in-Charge.

INSTALLATION:

Install wooden battens (provided by others) of section 50x50mm or as approved by the Architect on the solid wall horizontally using screws and plugs at spacing of 600mm centre-to-centre. Screw the aluminium extruded keel for channeled woodworks provided by approved make over the lowest and second wooden batten at an on-centre distance of 600mm. Install the skirting (provided by others) of width 50mm or more as required by the Architect/ Engineer-in-Charge and insert the tongue end of the panel in the skirting. Place the inside clip on the groove end of the panel along the Al keel and then place the tongue end of the next panel. Continue installing rows of panels by inserting the tongue into the groove of the earlier inserted panel and progressively installing inside clips into the next keel till the actual height is achieved. Finish off the edges using wooden moulding of matching colour (provided by others). Installation to be carried out by trained installation team & installation should be carried out as per approved make recommended procedure.

5. GUIDE SPECIFICATIONS FOR GI METAL CEILING LAY-IN:

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 24x38mm made from 0.30 mm thick (minimum) sheet, spaced at 1200mm center to center and cross "T" of size 24x25 mm made of 0.30mm thick (minimum) sheet, 1200 mm long spaced between main "T" at 600 mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600 mm and size 24x25 mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600 mm panel to form grids of 600x600 mm and wall angle of size 24x24x0.3 mm and laying false ceiling tiles of approved texture in the grid including, required cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x 1.6 mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4 mm GI adjustable rods with galvanized 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.

GI Metal Ceiling Lay in plain Tegular edge Global white color tiles of size 595x595 mm, and 0.5 mm thick with 8mm drop; made of G I sheet having galvanizing of 100 gms/sqm (both sides inclusive) and electro statically polyester powder coated of thickness 60 microns (minimum), including factory painted after bending.

6. GUIDE SPECIFICATIONS FOR “WOODWORKS 600mm X 600mm (MICRO LOOK) EDGE TILES OF R3 PERFORATION WITH XL 15 mm EXPOSED GRID” SYSTEM

Providing & Fixing of Wooden finishes Suspended Ceiling System With Woodworks (Micro Look) Edge Tiles With XI 15 Mm Exposed Grid.

The Tile with perforation pattern R3 with approved laminate (US Maple, Royal Cherry, Maple, Dark Walnut) / Wood Veneer (Maple, Dark Bamboo, Red beech, US Cherry) finish would have an NRC of 0.5, Humidity Resistance (RH) of 90%, Fire Performance Class 1 (BS - 476) in module size of 600mm x 600mm x 12mm and density of 830 Kgs/M3.

The grid should be of approved make with 15mm wide T - section flanges color white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees with a web height of 38mm and a load carrying capacity of 14 Kgs/M2. The T Sections have a galvanizing of 90 grams per M2 and pullout strength of 100kg. Suspension system for grid to be of approved make.

INSTALLATION: To comprise main runner spaced at 1200mm centers securely fixed to the structural soffit using suspension system (specifications below) at 1200mm maximum centre. The First/Last suspension system at the end of each main runner should not be greater than 450mm from the adjacent wall.

Flush fitting 1200mm long cross tees to be interlocked between main runners at 600mm centre to form 1200 x 600 mm module. Cut cross tees longer than 600mm require independent support. 600 x 600mm module to be formed by fitting 600mm long flush fitting cross tees centrally between the 1200 mm cross tees. Installation to be carried out by trained installation team & installation should be carried out as per approved make recommended procedure.

Perimeter trim to be approved make wall angles of size 3000x19x19mm, secured to walls at 450 mm maximum centres.

SUSPENSION SYSTEM accessories manufactured and supplied by approved make consisting of M6 anchor fasteners with vertical hangers made of galvanized steel of size 26 x 26 x 25 x 1.2mm with a galvanized thickness of 80gsm, a pre straightened hanger wire of dia – 2.65 mm of 1.8 m length., thickness of 80gsm and a tensile strength of 344-413 MPa, along with adjustable hook clips of 0.8mm thick, galvanized spring steel for 2.68 mm. The adjustable clip also consists of a 3.5 mm aquiline wire to be used with the main runner.

7. GUIDE SPECIFICATIONS FOR GYPSUM CEILING:

Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval, including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering upto 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with 12.5 mm thick tapered edge gypsum moisture resistant board.

8. GUIDE SPECIFICATIONS FOR CALCIUM SILICATE FALSE CEILING:

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 (galvanizing @ 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 drywall screws @ 230 mm interval and laying 15 mm thick densified edges calicum 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 G.I. 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 Tsections shall be pre-painted with polyster baked paint, for all heights, as Z 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 calciumsilicate 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.

In all the false ceilings, trapdoor/ inspection door in false ceiling for services inspection shall be provided. For location & size of trap door, shop drawing to be provided by the contractor for approval by Engineer-In- Charge.

The contractor shall prepare coordinated shop drawing/s for false ceiling, taking into consideration lights, HVAC grilles, fire sprinkler, smoke detector, etc. For seminar hall, interior & acoustic works shall also be considered and the scheme shall be prepared in totality, for approval of Engineer in charge.

15. FINISHING WORK:

The work shall be done in accordance with CPWD specifications Volume - I & II with correction slips up to the last date of submission of tender documents.

Wherever directed by the Engineer in Charge, all joints between concrete frames and masonry in filling shall be expressed by a groove cut in the plaster. Where grooves are not called for, the joints between concrete members and masonry in filling shall be covered by 24-gauge 8 mm size galvanised chicken wire mesh of approved width to be provided at all the junctions of concrete and brick work and other locations called for including necessary laps and U shape galvanised wire nails, complete as per direction of the Engineer-In-Charge, at all heights Smooth finishing of the exposed surface of R.C.C. work with 6 mm thick cement mortar 1:3 (1 Cement : 3 fine sand) at all heights 20 mm cement plaster in external walls mixed with waterproofing compound in recommended proportion, as per manufacturer's instructions, on the rough/ fair side of single or half brick wall/ AAC block wall, columns & beams of mix : 1:4 (1 cement: 4sand, which should be 50% coarse fine sand & 50% fine sand) at all heights 12 mm cement plaster in internal walls on the side of ACC block wall, parapets walls, columns & beams of mix :1:6 (1 cement: 6 sand, which should be 50% coarse fine sand & 50% fine sand).

Distempering (two or more coats) over cement primer, and including water- thinnable priming coat, with 1st quality acrylic distemper (ready mixed) having VOC content less than 50 gms/litre, of approved manufacturer, of required shade and colour complete as per schedule of finishes and as per manufacturer's specification.

Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade (two or more coats applied @ 1.43 litre/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm) as per schedule of finishes Wall painting with acrylic emulsion paint of approved brand and manufacture to give an even shade, two or more coats, as per schedule of finishes Painting with synthetic enamel paint of approved brand and manufacture of required colour to give an even shade, two or more coats over an under coat of suitable shade with ordinary paint of approved brand and manufacture as per drawing and schedule of finishes.

All the cement plastering to be added with Synthetic Polyester triangular fibre of length 6mm of approved brand and manufacturer, effective diameter 10-40 microns and specific gravity of 1.34 to 1.40 in cement plaster/mortar by using 125 gms. of synthetic Polyester triangular fibre for 50 Kgs cement used in cement mortar as per directions of Engineer-in-Charge.

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 to be provided as per schedule of finishes.

All the external surfaces of the building to be finished with texture paint finish (as specified in schedule of finish). This stone texture coating ceramic stone finish, consisting of water based Natural fine ceramic stone material which is highly abrasion & scratch resistant, with 6 coat system & PU Based clear topcoat which shall be highly water repellent, anti-algae & anti-

fungal in nature. The coating shall also cover hairline cracks with application method which includes Surface Preparation, 2 coats of two component silicate based primer (a two-component silicate-based inorganic polymer undercoat), Making groove, 2 coats of Fine Ceramic Stone finish (wet on wet) & 2 coats of PU based clear top coat (Turpen-based, mild solvent, super-dirt resistant NAD type two pack polyurethane clear topcoat) complete as per direction of the Engineer-In-Charge.

24-gauge 8 mm size galvanised chicken wire mesh of approved width to be provided at all the junctions of concrete and brick work and other locations called for including necessary laps and U shape galvanised wire nails, complete as per direction of the Engineer-In-Charge, at all heights 18 mm thick granite, gang-saw cut, mirror polished, pre-moulded and pre-polished, machine cut for coping, etc., to be provided as per the drawings and schedule of finishes, of required size, approved shade, colour and texture over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels.

16. **ALUMINIUM WORKS:**

The work shall be done in accordance with CPWD specifications Volume - I & II with correction slips up to the last date of submission of tender documents.

Aluminium work for doors, windows, ventilators and partitions to be provided as per schedule of finishes and drawings, with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixed with dash fasteners of required dia and size, including filling/ sealing the junctions at top, bottom & 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, hardwood subframe, all complete as per architectural drawings and the directions of Engineer-in-charge.

a. For fixed portion: Powder coated aluminium (minimum thickness of powder coating 50 micron)

b. For shutters of doors, windows & ventilators including providing and fixing friction stay, turn handles, and making provision for fixing of fittings wherever required including the cost of EPDM rubber/ neoprene gasket required for powder coated aluminium (minimum thickness of powder coating 50 micron).

Filling the gap 5mm depth and 5mm width between aluminium frames and adjacent RCC/ Brick/ ACC work by providing weather silicon sealant over backer rod of approved quality as per direction of Engineer-in-charge complete.

2 nos. of stainless steel (SS 304 grade) adjustable friction windows stays of size 255X19mm, of approved quality with necessary stainless-steel screws etc. and one no UPVC tern handles are to be provided at each side/ top hung windows shutter as per schedule of hardware. Float glass panes of 6 mm thickness (weight not less than 14.96kg/ sqm) to be provided in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber/ neoprene gasket etc. complete as per schedule of finishes and directions of Engineer-in-charge.

Double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thick clear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and

secondary sealant) etc. to be provided as per schedule of finishes/ specifications, drawings and direction of Engineer-in-charge.

2 nos powder coated minimum thickness 50-micron aluminium tubular handlebar 32 mm outer dia, 3.0 mm thick & 300 mm long with SS screws etc. to be provided for each aluminium door shutters, complete as per direction of Engineer-in-Charge.

Brass 100mm mortice latch and lock with 6 levers without pair of handles (best make of approved quality) to be provided for each aluminium door including necessary cutting and making good etc.

Double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body/ plate with double spring mechanism and door weight upto 125 kg, for doors, including cost of cutting floors, embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. to be provided as per schedule of hardware, complete as per the direction of Engineer-in-charge. Stainless steel cover plate minimum 1.25 mm thickness to be provided Anodized aluminium louvered panels to be provided at plumbing/ service shaft, fabricated out of extruded sections conforming to IS 733 and wall thickness not less than 2 mm of specified size and shape with powder coating not less than 50 micron, including supplying and fixing the frame with expansion bolts/ screws, hardwood subframe, and providing and fixing fixed powder coated aluminium louvres 1.45 to 1.7 mm thick and of approved make and profile within the panels, in accordance with the drawings etc. complete, as directed by the Engineer-In- Charge, at all heights. This would include providing and fixing anodized aluminium openable louvered panels alongwith hinges, handles, locking arrangement, etc. as per drawings and as per direction of Engineer-In-Charge.

UniStone SAFS ALWOOD non-combustible Extruded Aluminium Batten System in approved solid shades to be provided at building elevation as per drawing/ schedule of finishes, in minimum thickness from 2.2mm to 3.5mm as per approved design in profile size of 50mm X 50mm (50mm gap between the battens) with corner radius and aluminium End Caps and 7-8mm male-female system for fixing support mechanism using extruded grooved rail profile in minimum 3mm thickness and aluminium cleats on sub-frame allowing linear thermal expansion and contraction. The battens, cleats and support rail and all flashings and starter etc. must be 6063 in T6 temper supported with MTC. The wooden texture/colour on aluminium plank shall be done using Super Durable Powder coating and heat film transfer up to 80micron and warranted for minimum 15 years in exterior conditions to meet or exceed qualicoat/AAMA 620 specifications.

All Aluminium sections should be protected against scratching with polyethene wrap stickers till completion of the building/ handover of the building whichever is later. If any damage or scratches are visible in aluminium sections at handing over, the same shall be rectified on contractor's risk and cost.

The polyethene wrap stickers are compulsorily to be removed upon completion, before use of the building.

All aluminium works shall be executed through approved specialized agency. Approval shall be accorded by the Engineer in charge.

Aluminium Louvered door:

Providing and fixing aluminium glazed/louvered doors, windows fixed/sliding duly powder coated in regular RAL Colours using 8mm clear toughened glass in Entrance glazed doors

and aluminium z- louvers in doors and windows sized @65mm c/c. as specified using high strength to weight aluminium section of grade 63400 WP confirming IS:733 and IS: 1285 complete including necessary hardwares such as handles, rollers, hinges locking system etc as specified in schedule of hardwares and provision of floor spring in entrance glazed door. The fabrication shall be done with all joints, mitred, the outer fram, mullion and shutter frame jointed with heavy duty aluminium joineries. Appropriate profiles of EPDM gaskets shall be inserted between aluminium frames/beading and glass both ionside and outside to make the glazing tight.

17. WATER PROOFING & MSCCELLANEOUS WORKS:

General

The Contractor shall be responsible for the water proofing design, proper installation and performance of waterproofing systems to make the sub grade and superstructure completely watertight.

The Contractor shall engage a qualified waterproofing specialist sub-contractor, preferably manufacturer authorized applicator to install or supply & install the waterproofing system, all in accordance with the manufacturer's recommendations & approved water proofing details. For the Quality assurance and quality of workmanship, waterproofing specialist applicator should be proficient in handling and installing water proofing membrane and the applicator shall be approved by CPWD qualification criteria.

Waterproofing specialist applicator should have the proven track record, technical reliability, capability and agreement to supply full technical assistance, expert supervision during installation and performance guarantee. The Contractor shall submit the name of his Specialist waterproofing contractor (waterproofing applicator) for approval along with work experience certificate of satisfactorily completion of similar nature of three works each costing not less than 40% of estimated cost of water proofing work or two works or one work each costing not less than 60% or 80% respectively of estimated cost of water proofing work. The determination of estimated cost of water proofing work under this item shall be done by the Engineer-in-charge on prevailing market rates whose decision shall be final in binding on the contractor.

All waterproofing system to be Green Certified product.

1. TERRACE WATERPROOFING & INSULATION SYSTEM

Providing and applying waterproofing and insulation system for terraces by following methods as per the specifications listed below and testing of treatment as per the requirements:-

The First Part: shall consist of all surface area should cleaned up with wire brush & air blower.

The Second Part: consisting of providing thermal insulation laying 50mm thick "EFYOS XPS" of Soprema or equivalent, ovens coating, Texsa, Dow extruded polystyrene XPS should have compressive strength of 300 KPa (as per EN 826). XPS shall be mechanically fastened to substrate using telescopic type fastner of EJOT/KLIMAS/OMG.

The Third Part: consisting of supply & installing modified polyolefin 1.2mm thick BBA approved with life expectancy of 30 years Flagon TPO synthetic membrane reinforced by a polyester mesh shall be fixed with 3mm pre punctured bar at perimeter and terminated over the parapet top using 3mm thick flagon termination bar , sealed with PU sealant. The overlaps of the joint to be minimum 80 mm, to be sealed using Leister hot air automatic welding machiene. TPO membrane shall be asbestos free, and should have CE marking. Flagon Energy plus EP/PR TPO membrane shall have following minimum properties,

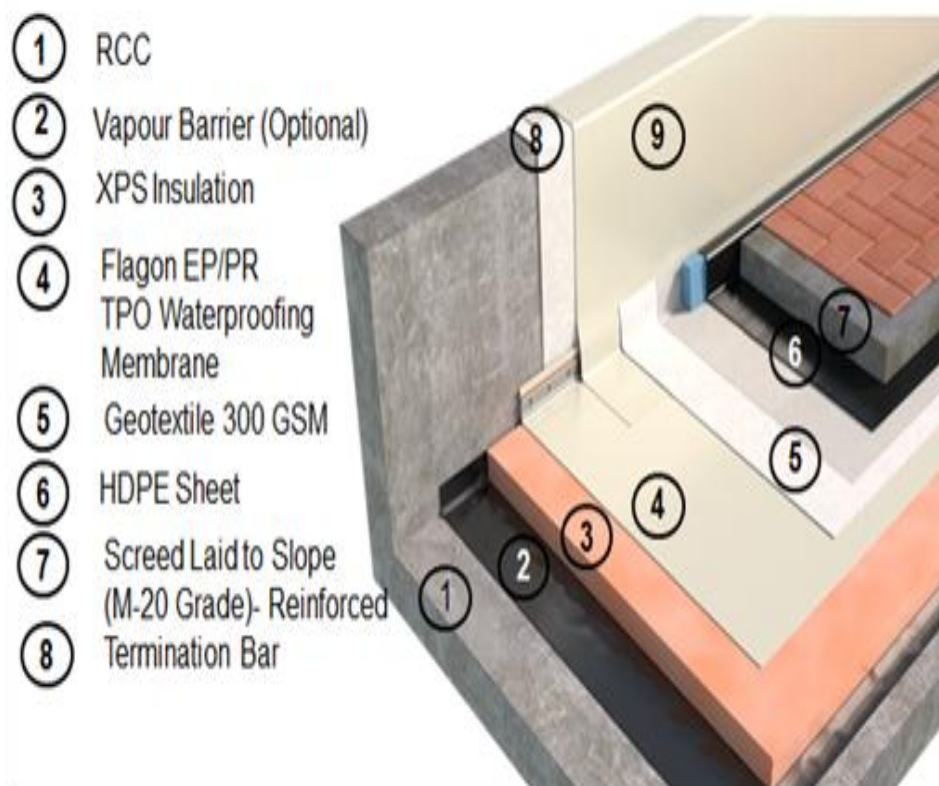
- (i) Thickness: 1.5 mm as per EN 1849-2,
- (ii) Tensile Strength > 1100 N/5 cm as per EN 12311-2
- (iii) Elongation of > 15 % as per EN 12311-2
- (iv) Tear Strength > 300 N/mm as per EN 12310-2,
- (v) Cold bending of minimum < -40 deg as per EN 495-5
- (vi) Fire classification – Class E as per En 13501-1 & EN ISO 11925-2,
- (v) Static Puncture Resistance - > 20 kg as per EN 12730.

Approved Product- Flagon EP/PR of Soprema, Urdin Mp of Syntec, Texsalon MP of Texsa, BASF

Fourth Part: Providing and laying 300 GSM geotextile with 100mm overlaps.

Fifth Part: Providing and laying minimum 65mm thick M20 Grade protection screed of minimum 1:150 Slope (Payble extra) -

Note : Screed shall be laid in the presence of waterproofing application agency. Agency shall be approved by manufacturer and all materials including insulation, membrane, termination strips shall be sourced by a single manufacturer.



2. TREATMENT OF SUNKEN AREAS

Shall consist of providing and applying roller applied a high performance, low odour, one-part, fast curing, high solids, cold applied polyurethane elastomer waterproof membrane over uniform surface after cleaning the substrate, sealing of cracks followed by applying minimum 1.8 kg/sqm including wastage, application in coving and sealing cracks to achieve a DFT of Minimum 1.2mm in two coats. The material shall be pure polyurethane elastomer. It should not contain bitumen or tar and should not bleed or stain and should have following minimum properties:

- i) Solid % Vol: 85
 - ii) Tensile Strength > 2 MPa
 - iii) Elongation > 500%
 - iv) Chemical Resistance - Excellent
- shall be applied as per manufacturer specification

Vertical Membrane: Additional silica sand broadcasting over wet membrane layer for sand road casting to enable bond of tiles with adhesive.

3. TREATMENT OF WATER TANKS

First Part: The cleaning and preparation of the substrate on which the waterproofing coating is applied. Surface shall be free of laticence, dust, loose particles.

Treatment of Honey Combing: Chipping the loose concrete followed by patch repair using polymer modified mortar (Cement: Sand: SBR Polymer in ratio 50:150:10). Similarly all construction joints must be raked and treated with non-shrink mortar. Use of SBR bonding agent is required

Treatment of Cracks: Cracks shall be treated with non-shrink plasticised expanding admixture to be mixed with cementitious system to impart shrinkage compensation, flow ability waterproofing

Second Part: Food Grade epoxy coating: Providing and applying food grade epoxy coating using a protective high build epoxy resin specifically developed to protect concrete. Supplied as a two-component system comprising pigmented base and a hardener 400 microns two component solvent free, 100% solid content, 0% VOC, high build, food grade epoxy coating in two coats. The product must be approved by reputed institute such as CFTRI for use in contact with potable water.

Consumption: 1kg to cover 1.5-1.6 Sqm.

4. TREATMENT OF ETP AND STP TANKS

First Part: The cleaning and preparation of the substrate on which the waterproofing coating is applied. Surface shall be free of laticence, dust, loose particles.

Treatment of Honey Combing: Chipping the loose concrete followed by patch repair using polymer modified mortar (Cement: Sand: SBR Polymer in ratio 50:150:10). Similarly all construction joints must be raked and treated with non-shrink mortar. Use of SBR bonding agent is required.

Treatment of Cracks: Cracks shall be treated with non-shrink plasticised expanding admixture to be mixed with cementitious system to impart shrinkage compensation, flow ability Waterproofing.

Second Part: Coal tar epoxy coating: Providing and applying food grade epoxy coating using a protective high build epoxy resin specifically developed to protect concrete. Supplied as a two-component system comprising pigmented base and a hardener 300 microns two component solvent free, 100% solid content, 0% VOC, high build, pitch modified epoxy coating in two coats with high chemical resistance.

Shall consist of providing and applying roller applied a high performance, low odour, one-part, fast curing, high solids, cold applied polyurethane elastomer waterproof membrane over uniform surface after cleaning the substrate, sealing of cracks followed by Apply minimum 1.8 kg/sqm including wastage, application in coving and sealing cracks to achieve a DFT of Minimum 1.2mm in two coats. The material shall be pure polyurethane elastomer. It should not contain bitumen or tar and should not bleed or stain and should have following minimum properties:

i) Solid % Vol: 85

ii) Tensile Strength > 2 MPa

iii) Elongation > 500%

iv) Chemical Resistance - Excellent

shall be applied as per manufacturer specification

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 top surface with broken white glazed tiles with cement and grouting the joints with white cement.

i. 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

ii. Water proofing treatment in balconies, usable terraces, sunken portion of WCs, bathroom etc., by applying cement slurry mixed with waterproofing cement compound consisting of applying :

iii. First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/ sqm. This layer will be allowed to air cure for 4 hours.

iv. Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours.

v. Third layer 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.

vi. The above works includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry.

vii. Orange colour safety foot rest to be provided at overhead water tanks during casting of concrete, maximum distance between foot rest not more than 300mm c/c at each manhole opening, of minimum 6 mm thick plastic encapsulated as per IS : 10910, on 12 mm dia steel bar conforming to IS: 1786, having minimum cross section as 23mm x 25mm and over all minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing.

viii. C.I. cover with frame 455x610 mm rectangular C.I. cover (light duty) not less than 15 kg the weight of the cover to be not less than 23 kg to be provided at overhead water tank. Two nos. of cover should be provided at each RCC overhead water tank

NOTE: All Waterproofing works shall be executed through approved specialized agency / Authorised applicator of Water Proofing material manufacturing company.

18. STAINLESS STEEL RAILING

1). Flat Baluster System (Floor mount system) : Supply and installation of approved make AISI 316 Grade Stainless Steel Knock Down railing system comprising Ø 38mm Handrail fixed on 10x50 mm S.S. flat baluster placed at maximum 1200mm c/c along with 3 Nos. Ø 16 mm mid rails connected at the side of baluster with fixtures. The balustrade would be fixed onto floor with casted base plate of minimum 180x10x8mm thickness. Base plate shall be concealed with suitable S.S. 316 grade cover Cap so that the mounting anchor fasteners are not visible after installation. Wall thickness of all Pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Railing height to be taken @ 1000mm from floor level.

2). Flat Baluster System with 10mm Toughened Glass (Floor mount system): Supply and installation of approved make AISI 316 Grade Stainless Steel Knock Down railing system comprising Ø 38mm Handrail fixed on 10x50 mm S.S. flat baluster with glass holding accessories (including top bracket to hold hand railing), placed at maximum 1200mm c/c

along with 10mm thick toughened glass connected with baluster with special glass holding fixtures. The Glass height should be taken as minimum 650mm. The balustrade would be fixed onto floor with casted base plate of 180x10x8mm thickness. Base plate shall be concealed with suitable S.S. 316 grade cover Cap so that the mounting anchor fasteners are not visible after installation. Wall thickness of all Pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Railing height to be taken @ 1000mm from floor level.

3). Flat Baluster System (Side mount system) : Supply and installation of approved make AISI 316 Grade Stainless Steel Knock Down railing system comprising Ø 38mm Handrail fixed on 10x50 mm S.S. flat baluster placed at maximum 1200mm c/c along with 3 Nos. Ø 16 mm mid rails connected at the side of baluster with fixtures. The balustrade would be fixed On the side of Steps with base plate of minimum 180x10x8mm with 3 anchors. Wall thickness of all Pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Railing height to be taken @ 1000mm from floor level.

4) Flat Baluster System with 10mm Toughened Glass (Side mount system): Supply and installation of approved make AISI 316 Grade Stainless Steel Knock Down railing system comprising Ø 38mm Handrail fixed on 10x50 mm S.S. flat baluster with glass holding accessories (including top bracket to hold hand railing), placed at maximum 1200mm c/c along with 10mm thick toughened glass connected with baluster with special glass holding fixtures. The Glass height should be taken as minimum 650mm. The balustrade would be fixed on the Side of Steps with base plate of minimum 180x10x8mm thickness. Wall thickness of all Pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Railing height to be taken @ 1000mm from floor level.

5). Wall Mounted Handrail system : Supply and installation of approved make AISI 316 Grade Stainless Steel Knock Down Wall mounted Railing system comprising Ø 38mm Handrail mounted on the wall through Ø 22mm X1.5 Thk. Pipe Wall Brackets & anchor fasteners which will be placed at maximum 1200mm c/c distance and as per site requirement. Wall thickness of all Pipes shall be taken as 1.5mm along with all visible components developed in High Grade S.S. and whenever required, joints to be filled with bushings for extra strength. Wall Handrail height to be taken @ 1000mm from floor level.

19. **STAMPED CONCRETE:**

Providing, Applying and finishing the top surface of concrete, in accordance with sprinkling of color hardener at the rate of 0.390 kg. /sq. ft., floating the surface with different types of floaters, application of release agent at the rate of 0.013 kg. /sq. ft., stamping the concrete with stamping tools, cleaning the surface with water and application of acrylic based sealer for finishing. Complete for parking areas, compound flooring, podium, basement flooring, external roads etc.

CONCRETE: Providing RMC (Ready Mix Concrete) / Site mixing concrete plain of M30 grade 75mm (3inches) including, curing at the time of stamping at site etc.

JOINTS: Treatment of construction joints by groove cutting of size 4 mm x 25 mm in panel size approximately 3 mtr x 3 mtr as per site.

FORMWORK: Form work and shuttering material will be required as per site.

20. **TERRA-COTTA FAÇADE TILE:**

Providing and fixing terracotta cladding of U-Value 0.8 & R value of 1.25 and dimension 304*594*16 mm with modules of 300*600 with Q3** resistance to impacts (classification as per French standards) with wind resistance to positive/ negative pressure 7000 / 5500 Pa, weight of 27.13 kg per m2 which conform to standard NF EN 539-2, water absorption to be

between 3% - 5% conforming to EN ISO 10545-3 § 5.1.1, bending strength not to exceed 1503 Newton conforming to EN ISO 10545-4. Installation of terracotta panels to be done by securing to the vertical T-shaped aluminium profile using the fixing clips fastened with 2 self-tapping stainless steel screws. Vertical aluminium T-shaped profiles are to be pre-punched hole with vertical spacing of 25mm. The terracotta tile is to be well-supported on four points by the clips and on its two smaller sides by the rubber gasket so as to have a very good wind load resistance of more than 7000 PA positive wind load pressure and a negative wind load pressure of 5500 PA and flexural strength of 150 da N. The total thickness cladding system is not to be more than 110 mm. The quantity of products per sq.m are to be 5.56 tiles, with quantity of profiles per main course sq.m to be 1.67 lm/m², with quantity of clips to be 11.11 nos. per sq.m. Not made in China.

Framing & installation: Vertical spacing of 600mm to be set between vertical aluminium T-shape profiles. Horizontal and vertical lines to be drawn as fixing references. Supporting brackets to be set up and fixed in a staggered way along T-shape profiles' fixing line. The vertical T-shape profiles to be fixed with their rubber gasket in the brackets and profiles' to be adjusted vertically so all profiles are to be on same vertical plan. Minimum gap between the back face of the tile and the wall is to 70mm. Fixing clips to be screwed on the T-shaped profiles. The terracotta panel is to be positioned between the rubber gaskets and panel's back face grooves to be inserted onto the clips. Panel installation to be done from bottom to top.

21. **TERRA-COTTA LOUVRE:**

Tender Specifications Terracotta Louvers:-

Providing and fixing of terracotta sunscreen louvers, with a standard dimension of 50 x 980 x 50 mm (H x L x W), with nominal internal dimensions of 31 x 31 mm, weight per linear meter is 3.2 Kg. The product is certified under following tests by Centre of Scientific and Technical Building Organization - (CSTB - France) - Worksheet 3194, Worksheet 3316, Worksheet 3422, CSTB Technical Approval 2/08-1330, CSTB Test Report # CL02-130, CSTB Test Report # CL05-118, CSTB Test Report N° ES 552 05 1178. Association Française De Normalization (AFNOR) - NF P 08.301 - Vertical building elements. Impact resistance tests, Impact bodies. Any equivalent product cannot be considered for the sun control purpose unless and until it follows all these test procedures. The amount of light controlled will depend upon the centre to centre distance, starting from 100 mm it can vary up to 300 mm.

22. **ROADS AND PARKING.**

250 mm thick Vacuum dewatered cement concrete M25 laid to required slope and camber including consolidation, finishing and tamping complete, over 100mm thick PCC 1 : 4 : 8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size) over 100mm thick stone soling under roads including packing with smaller stones and consolidation with road roller including spreading and consolidation of blinding material, moorum or earth etc. consolidation of sub grade with power road roller of 8 to 12 tone capacity after excavating earth to an average of 22.5 cm depth, dressing to camber and consolidating with road roller including making good the undulations etc. and re-rolling the sub grade. Hard drawn steel wire fabric 100mm c/c both ways, 3.15mm dia, reinforcement should be provided in cement concrete pavements.

De-vacuumization shall be done for removing the voids. The whole concrete surface shall be leveled, compacted by ramming and trowelling. Prepared surface shall be allowed to set. Excessive trowelling shall be avoided. After the initial set, further compaction shall be done by steel trowelling. Final brushing where required (to achieve desired surface finish) shall be made before the floor top becomes too hard. Curing shall be done as per CPWD Specifications

25mm Mild steel dowel/tie bars including greasing, PVC pipe of approved make and size, etc. to be provided in concrete pavements as per drawing/ direction of Engineer-in-charge. Bitumen impregnated fibre board conforming to IS: 1838 including primer, sealing compound with polysulphide sealant to be provided in expansion/construction joints of roads/ parkings/ concrete pavements as per drawing/ direction of Engineer-in-charge.

Exposed precast cement concrete factory made kerbs of size 150mm x 300mm in design mix M25, set in cement mortar 1:3 (1 cement : 3 coarse sand) and finished smooth over 150mm thick PCC1 : 4 : 8 (1 cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size) as per drawing/ direction of Engineer-in-charge. Thickness of joints except at sharp curve shall not to more than 5mm. The works including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge.

23. PLUMBING WORK

Section – 1

General Requirements

The general character and the scope of work to be carried out under the contract is illustrated in Specification, Drawings, Specifications and Schedule. The Contractor shall carry out and complete the said work under this contract in every respect in conformity with the contract documents and with the direction of and to the satisfaction of the Engineer-in-charge. The contractor shall furnish all labour, materials and equipment as listed under Schedule F and specified otherwise, transportation and incidental necessary for supply, installation, testing and commissioning of the complete Plumbing and Fire Protection system described in the Specifications and as shown on the drawings. This also includes any material, equipment, appliances and incidental work not specifically mentioned herein or noted on the Drawings/Documents as being furnished or installed, but which are necessary and customary to be performed under this contract.

Work shall be executed as per drawing, latest CPWD specifications, relevant IS code of latest addition, NBC -2016 and other local bye laws whichever is stringent.

1.0 Scope of work

Work under this Contract shall consist of furnishing all labour, materials, equipment and appliances necessary as required to finish the job. The Contractor is required to completely furnish all the plumbing and other specialized services as described hereinafter and as specified in the plumbing specifications of quantities and/or shown on the plumbing drawings.

1.1 Plumbing Works includes:

i) Sanitary Fixture and CP Fittings:

- Supply and fixing of Sanitary Fixtures
- Supply and fixing of C.P. fittings
- Testing and commissioning of Sanitary fixture and C.P. fittings

ii) Water supply hot and cold water:

- Internal Water supply piping treated water and potable water.
- Connection of building water supply connection to the existing external mains and water meter including inspection chambers for both STP treated water and potable water.

iii) Soil, Waste & Vent Water Piping:

- CI Hubless pipes conforming to IS 15905 and fitting for Vertical and horizontal Soil, Waste and Vent pipe.
- PP vertical and horizontal pipes for laboratory waste.
- R.C.C. NP2 pipes for sewage external piping on site level till nearby existing sewer line.
- HDPE external piping for laboratory waste on site level till ETP/Holding tank.
- Floor traps, floor drain, clean out plug inlet fittings rainwater roof drain as per IS codes.
- Testing of all pipes for water tightness.
- Waste-water pipes GI Class B connections from all fixtures e.g. wash basin, sinks.

iv) Storm Water drainage system:

- Rainwater – UPVC Vertical pipe up to first catch basin and R.C.C. NP2 pipes for storm water external piping on site level till nearby existing drain line.

v) Water Supply:

- Potable Water: Main Inlet line from valve chamber shall be with 50mm dia GI pipe, exposed on wall/shaft domestic supply with 50mm dia connection to overhead tank including water meter.
- Flushing Water: Main Inlet line from valve chamber shall be with 25mm dia GI pipe, exposed on wall/shaft flushing supply with 25mm dia connection to overhead tank.

vi) Drinking Water:

- Standalone Water fountain including RO and online chiller.

2.0 APPLICABLE CODES AND STANDARDS:

The following codes of practice and design manuals are being referred for designing the Sanitary Plumbing and Fire Fighting Systems:

- National Building Code 2016
- Handbook on Water Supply & Drainage (with Special Emphasis on Plumbing), Bureau of Indian Standards SP-35
- Manual on Water Supply & Treatment (Ministry of Urban Development)
- Manual on Sewerage & Sewage Treatment (Ministry of Urban Development)
- CPWD Specifications

3.0 QUALITY ASSURANCE AND QUALITY CONTROL:

3.1 The work shall conform to high standard of design and workmanship, shall be structurally sound and aesthetically pleasing. Quality standards prescribed shall form the backbone for the quality assurance and quality control system.

3.2 At the site, the Contractor shall arrange the materials and their stacking/ storage in appropriate manner to ensure the quality. Contractor shall provide material and manpower to test continuously the quality of material, assemblies etc. as directed by the Engineer-in-charge. The test shall be conducted continuously, and the result of tests maintained. In addition, the Contractor shall keep appropriate tools and equipment for checking alignments, levels, slopes and evenness of surface at site.

3.3 The Engineer-in-charge shall be free to carry out such tests as may be decided by him at their sole direction, from time to time, in addition to those specified in this Document. The Contractor shall provide the samples and labour for collecting the samples. Nothing extra shall be payable to the Contractor for samples or for the collection of the samples.

3.4 The test shall be conducted at Standard Laboratory approved by Engineer-in- charge. Contractor shall keep the necessary testing equipment such as hydraulic testing machine, smoke testing machine, gauges and other necessary equipment required at site.

3.5 In case of any testing required on the direction of Engineer-In-Charge, the Contractor's representative shall transport the samples to the laboratory.

3.6 Testing charges shall be borne by the Contractor.

Section – 2: Sanitary Fixtures and Fittings:

1.0 Scope:

Work under this section shall consist of transportation, providing, installation, testing and commissioning and all labour as necessary as required to completely install all sanitary pipes, fixtures, brass and chromium plated fittings and accessories as mentioned in plumbing schedule.

General Requirements

1.1 All fixtures and fittings shall be fixed with all such accessories as are required to complete the item in working condition mentioned in drawings.

1.2 All fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per architectural designed requirements. Wherever necessary the fittings shall be centered to dimensions and pattern desired.

1.3 Fixing screws shall be half round head chromium plated brass with C.P. washers as per requirement.

1.4 All fittings and fixtures shall be fixed in a neat workmanship manner true to levels and heights shows on the drawings in accordance with the manufacturer's recommendations, care shall be taken to fix all inlet and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, wall surfaces shall be made good at Contractors cost.

1.5 All fixtures of the similar materials shall be by the same manufacturers.

1.6 All fittings shall be of the chromium plated materials.

1.7 Without-restricting to the generally of the foregoing the sanitary fixtures shall include all sanitary fixtures, C.P. fittings and accessories etc. necessary and required for the building.

1.8 For the installation of the CP fittings, teflon tape shall be used.

2.0 Sanitary Fixtures & C.P Brass Fittings

Plumbing fixtures, Chrome Fittings and accessories will be as per IS: 781-1984. Porcelain fixtures of fairly high quality as given below:

Sanitary Fixtures	
1.	Providing and fixing white vitreous china white type water closet (European type) with seat and lid 10 litre low level white vitreous china flushing cistern & C.P. flush bend with fittings & C.I brackets 40mm flush bend, overflow arrangement with special of standards make and mosquito proof coupling of approved municipal design complete, including of fittings and brackets, cutting and making good the walls floors wherever required :
	W.C. pan with ISI marked white solid plastic seat and lid
2.	Providing and fixing stainless steel A ISI 304 (18/8) Kitchen sink as per IS: 13983 with CI bracket and stainless steel plug 40 mm including painting of fittings and brackets, cutting and making good the walls wherever required:
	Kitchen sink with drain board of Size 500 x 1040 mm bowl depth 225 mm
3.	Providing and fixing white vitreous china laboratory sink with C.I. brackets, C.P. brass chain with rubber plug, 40 mm C.P brass waste and 40mm C.P. brass trap <u>with necessary C.P. brass unions complete,</u>
	including painting of fittings and brackets, cutting and making good the wall wherever required:
	Size 450x300x150 mm
4.	CP Brass 32mm size Bottle Trap of approved quality & make and as per the direction of Engineer-in-charge for wash basin.
5.	CP Brass sink mixer for kitchen sink with wall flange, extended operating lever, swinging spout and surgical purpose handle complete with all accessories as required and making good the walls wherever required
	(a) 15 mm nominal dia
6.	600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.
7.	Toilet paper holder:
	CP Brass
8.	Trap of self-cleansing design with screwed down or hinged Stainless Steel grating with or without vent arm complete, including cost of cutting and making good the walls and floors:
	100 mm inlet and 100 mm outlet Hubless centrifugally cast (spun) iron epoxy coated inside & outside as per IS:15905
9.	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.
10.	Providing and fixing of Soap Dispenser with all accessories as required and making good the walls wherever required.

11.	Health Faucet ABS with double lock 1.2 m long 8mm dia and SS flexible hose and wall hook including CP flange. 15mm dia.
12.	White vitreous china under counter washbasins, specially fabricated CI / MS brackets, painted with two or three coats of enamel paint of approved shade over a coat of primer, 32 mm CP brass waste fitting, mixer, pipe to wall with CP brass flange and rubber adopter for waste connection complete including filling gap between counter and wash basin with approved type poly sulphide sealant, cutting and making good the walls wherever required.
	White vitreous china wash basin.
13.	Supply, installation, testing & commissioning of 15mm CP brass single lever emergency shower with adjustable type arm with wall flange with slip fit connection & hand shower with flexible pipe with bracket complete as required by the engineer in charge.
14.	Providing and fixing solid state, sensor based fully hygienic hand drier of approved shade with single blower, with time delay, summer & winter control, ON/OFF controls including providing necessary brackets, cable from drier to Plug, Plug top key and lock etc, complete as required.
15.	Providing and fixing uplasticized connection pipe with brass union:
	45 m lenth with 15 mm nominal bore
16.	Providing and fixing C.P. brass long nose bib cock of approved quality conforming to IS standards and weighing not less than 810 gms. conforming to IS standards and weighing not less than 810 gms.
	15 mm nominal bore
17.	Coat Hook of 400mm length size.
18.	C.P. brass bib cock with C.P. wall flange as required.
19.	White vitreous china battery based infrared sensor operated urinal of approx. size 375 x 315 x 620mm with sensor having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge.
20.	SS 316 grab bar 600 mm long complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour.
21.	Grab Bar Vertical Swing, complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour.
22.	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931
	15 mm nominal bore
23.	Supply of wall hanging drinking online water cooler with bottle filler facility, made by stainless steel top and heavy duty galvanized steel frame. With cooling capacity, ADA Compliant, size 472 mm Depth X 447mm width, flexible bubbler guard , operated between 50 to 120 PSI, Chiller unit Suitable to R134a Refrigerant, Adjustable thermostat control, suitable for 220-230v/50-60 hz A/C Supply Complete with all accessories which include MD-CU29, which is an EPA registered antimicrobial copper that fights off microorganisms which include MRSA and e-coli. The water Fountain shall possess NSF-USA, Green building, energy star saving certification, and to be placed at different location of buidling. installing the Water Fountain for proper functioning and aesthetic view as directed by the engineer-in-charge without any extra cost.
24.	Neo sense Filter-10" X 2.5" Dia, Resin filter-10" X 2.5" Dia, Carbon Filter-10" X 2.5 " Dia, Activated Carbon Block Filter, Booster Pump To Pressurize 300 GPD – 2 Nos, Membrane 300 GPD – 2 Nos, Pressure Meter-1 Nos, Auto Flushing Solenoid

	Valve -1 Nos, Production Rate-Up to 50-60 Lph. Feed Water 1000 ppm. Max. (Raw Water) Recovery Appx. 60%, Power Consumption 24 Volt DC -1 Nos 60 ltr pressure tank Pressure wave enclosed tank Single diaphragm, NSF Certified, virgin polypropylene liner, tow part polyurethane, epoxy primed paint finish, leak free, o ring sealed air valve cap. UV Light Alfa uv light
25.	Providing and fixing of electric geysers with all accessories as required and making good the walls wherever required.
	25 litres capacity.

3.0 Sample Toilet and Trial Assembly:

The contractor shall assemble at least one set of each of the sanitary fixtures and fittings for determining the required supply and disposal connections on the basis of plumbing drawings and specifications approved in sample toilet by Engineer- in charge. The installation shall also be as per the relevant instructions from the manufacturers of the fittings/fixtures.

The sample toilet shall be made as per the actual final layout, to determine the exact location of puncture holes, holding devices etc. The sample toilet shall be subject to final approval by Engineer - in charge.

4.0 Supporting and Fixing Devices:

The fixing devices to install the sanitary fixtures securely in position shall be provided in drawing. The fixing devices shall be rigidly anchored into the building structure and shall be fixed in a neat and uniform manner, so as not to present unsightly appearance in the final assembly. The fixing devices shall be rust proof for durability. Wherever aesthetics demands, the Architect may instruct the tenderer to provide chromium plated finished fixing devices, complete with appropriate vibration isolation pads, gaskets and washers etc.

5.0 Final Installation:

The approved sample toilet and the approved Plumbing drawings shall form the basis for final installation of all sanitary fixtures. The installation shall be complete with supply and waste connections and the proper unions/flanges shall be provided for easy removal/replacement of sanitary fixtures without disturbing the piping system. All flanges/unions shall match in appearance with exposed fittings. All the fixtures shall be rigid mounted, plumb and in alignment.

The possibility of movement and settlement shall be kept in mind while mounting the fixtures. The outlets of water closet and similar appliances shall be examined to ensure that outlet ends are butting on receiving pipes before making the joints. Checks shall be made to ensure that necessary anchoring devices have been provided for supporting water closets, wash basins, sinks and other appliances. Proper overflow connections shall also be ensured.

6.0 Every necessary precaution shall be taken by the Contractor to protect all sanitary fixtures against damage, misuse, pilferage, cracking, staining, chipping etc., by proper

wrapping and locking arrangement till completion of the installation. The fixtures shall be cleaned, disinfected and polished prior to handing over. Any fixtures found with any of the damage outlined above, or any other defect/damage shall be removed and new fixtures free from any defects installed at no extra cost, to complete the installation.

Rate for providing and fixing of sanitary fixtures, accessories, should be include all items and operations stated in the respective specifications, and nothing extra is payable.

Rates for all items under specifications para above shall be inclusive of cutting holes and chases and making good the same, C.P. screws, nuts, bolts and any fixing arrangement required.

Section – 3: WATER SUPPLY (COLD /HOT WATER)

1.0 SCOPE:

Work under this section consists of furnishing all labour, materials equipment and appliances necessary and required to completely install the water supply system as required by the drawings.

Without restricting to the generality of the foregoing, the water supply system shall include the following: -

- i. Pipe protection.
- ii. Connections to all plumbing fixtures, tanks etc.
- iii. Control valves.
- iv. Internal water supply piping inside the toilets shaft/terrace.
- v. Testing all line and fixtures as specified.
- vi. Connection from existing external to the building riser including valve chamber and water meter.

2.0 GENERAL REQUIREMENTS:

- All materials shall be new of the best quality and shall be furnished, delivered, erected, connected and finished in every detail conforming to specifications and subject to the approval of Engineer – in -charge/Client.
- Pipes and fittings shall be fixed truly vertical, horizontal as required in a neat workmanlike manner.
- Short or long bends shall be used on all main pipelines as far as possible. Use of elbows shall be restricted for short connections.
- Pipes shall be fixed in a manner as to provide easy accessibility for repair, maintenance and shall not cause obstruction in shafts, passages etc. and shall be selected and arranged so as to fit properly into the allocated building space.
- Pipes shall be securely fixed to walls by suitable clamps at intervals as specified in CPWD specifications.
- Valves and other appurtenances shall be located to provide easy accessibility for operation, maintenance and repairs.
- As per site requirement shaft size can be increased for easy maintenance purpose.
- All pipes running in sunken area has to be provided with desired slope.

- Sanitary fixtures & fittings may be re-located as per site requirement without paying additional cost.
Unions:

Contractor shall provide adequate no. of unions on all pipes to enable dismantling later and for servicing. Union shall be provided near each valve.

3.0 INTERNAL WORKS: GI PIPES & FITTINGS

- Potable Water: Main Inlet For domestic water Supply from valve chamber to RCC over head tank should be with 50mm GI pipe on exposed on wall /Shaft.
- Flushing water: Main Inlet for Flushing water Supply from valve chamber to RCC over head tank should be with 25mm GI pipe on exposed on wall /Shaft.
- All terrace water supply pipe should be 25 mm to 100mm dia GI Insulated pipe as per drawing.
- From RCC over head terrace tank to individual toilets shall be GI pipe with 100mm/80mm/65mm/50mm/40mm/32mm/25mm exposed on wall as per drawing.
- Internal water supply line shall be with 15mm/20mm/25mm/32m GI pipe concealed on wall as per drawing.

DESCRIPTION

GI Pipe shall be tough, rigid, corrosion resistant, chemical resistant, low thermal expansion, lower bacterial growth, superior installation, hot & cold water compatible, no scale, pit or leach formation, low pressure loss, higher flow rates & unaffected by chlorine in the water.

4.0 JOINTING PIPES & FITTINGS

4.1 CUTTING:

In order to make proper and neat joint, measure the pipe length accurately and make a small mark. Ensure that the pipe and fittings are size compatible. CPVC pipes can be easily cut with a wheel-type plastic tubing cutter, a hack or other fine-toothed hand or power saws. Use of ratchet cutter cutters is permitted, provided blades are sharpened regularly. A miter box should be used to ensure a square cut when using saw. Cutting tubing as squarely as possible provides optimal bonding area within joint.

4.2 DEBURRING & BEVELLING:

Burrs and fillings can prevent proper contact between tube and fittings during assembly and should be removed from outside and inside of the pipe. Debarking tool, pocked knife or files are suitable for this. A slight bevel on the end of the tubing will ease entry of the tubing into the fitting socket and minimize the chances of pushing solvent cement to the bottom of the joint.

4.3 FITTING PREPARATION:

Using a clean, dry rag, wipe dirt and moisture from the fittings socket and tubing end. The tubing should make contact with socket wall 1/3 to 2/3 of the way into the fitting socket. At this stage, tubing should not bottom out in the socket.

4.4 PRIMER & CLEANER APPLICATION:

Primer or cleaner is applied for thrust Block as per CPWD specifications.

5.0 TESTING:

After laying and jointing, the pipes and fittings shall be inspected under working condition of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost. Use of any compound or stop leak compound will not permitted.

The pipes and fittings after they are laid shall be tested to hydraulic pressure of 1.5 times the working pressure or 7.5 Kg/Sq.cm whichever is more. The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw of taps and stop cocks shall then be closed and specified hydraulic pressure shall be applied gradually. Pressure gauge must be accurate and preferably should have been recalibrated before the test. The test pump having been stopped, the test pressure should be maintained without loss for at least twenty four hours. The pipes and fittings shall be tested in sections as the work of laying proceeds, having the joints exposed for inspection during the testing.

6.0 Hot Water System (Electrical Water heaters and Piping on pantry area only) General

This chapter details Supply, Installation, Testing & Commissioning requirements for Hot Water System. Hot water shall be executed as per drawing. Entire Hot Water Requirement of the building shall be met from Energy Efficient Electric Geysers (for Electrical Geyser provision only) (min. BEE 3 star Rated).

Hot Water Piping and Insulation.

Piping shall be similar of water supply specified above. Insulation material for Pipe insulation shall be closed cell cross linked polyethylene foam. Thermal conductivity shall not exceed 0.038 W/m K or 0.0313 Kcal / Mhr C or 0.212 BTU / (Hr-ft²-F/inch) at an average temperature of 40°C. The product shall have temperature range of -40 C to 105

C. Density of material shall not be less than 0.06 gm/cm³. The insulation shall have fire performance such that it passes minimum CLASS 1 as per BS476 part 7 for surface spread of flame. Water vapor permeability shall not exceed 0.024 per inch (3 x 10⁻¹⁴ Kgs / m.sec.Pa). The material shall have approval from the Chief Fire Officer.

Thickness of the insulation shall be as specified for the individual application. Each lot of insulation material delivered at site shall be accompanied with manufacturer test certificate for thermal conductivity values. Samples of insulation material from each lot delivered at site may be selected by Owner’s site representative and gotten tested for

Thermal conductivity and density at Contractor’s cost all joints shall be sealed properly with adhesive, which shall provide similar vapor barrier as the original insulating material.

All hot water piping shall be insulated in the manner specified herein. Before applying insulation, all pipe shall be brushed and cleaned. Thermal insulation shall be applied as follows or as specified in drawings or schedule of quantity:

Pipe size (mm) Thickness of Nitrile rubber insulation

15 mm to 25 mm 9 mm

7.0 R.O. Water System

This chapter details Supply, Installation, Testing & Commissioning requirements for R.O. Water System. R.O. water shall be executed as per drawing. The R.O. system consists of 50 LPH capacity along with 60 litres of pressure tank including online chiller. Entire R.O. Water Requirement of the building shall met from individual Drinking water fountains at required points in the building as per drawings. The water fountain shall possess NSF-USA, Green building, energy saving certification.

8.0 VALVES:

8.1 Butterfly Valves:

All the isolation valve 50mm and above on the equipment and water lines, where specified or shown on drawings shall be wafer type butterfly valves. They shall be designed to fit without gaskets, the watertight seal being obtained by Nitrile Rubber seat projection at the faces compressed between the flanges. The valves shall be supplied inclusive of M.S. pipe flanges and high tensile steel bolts of dimensions recommended by suppliers of valves. The valves shall comply with following specifications:

- a) Type : Body 24 Bar seat 16 bar

- b) Valve Component : Material of Construction
 - i) Body : Cast Iron,
 - ii) Disc : SS 304
 - iii) Seal : Nitrile
 - iv) Rating : PN 16

Installation:

Valve shall be installed in a manner that allows future removal and service of the valve. Packing and gasket shall not contain asbestos.
The valve shall be of the same size as the pipe to which they are install.

8.2 Ball Valves

Ball Valves shall be of IS 9890, Bronze with screwed female ends to IS 554, flanged ends to ASME B 16.5.

Provide full bore, quarter turn, lever operated ball valves with S/S ball and SS (AISI 410) spindle with Teflon seating and gland packing. All ball valves shall have locking handles to allow servicing and removal of equipment.

Provide lever handle with plastic sleeve on all ball valves unless otherwise noted. Provide extension stem for all ball valves to be installed on insulated piping

8.3 Pressure Reducing Valve Set:

Pressure Reducing Valve Sets are required where the pressure in the system is more than the pressure required to operate those fittings. To regulate the required pressure the pressure reducing valves shall be provided at appropriate locations or as per drawing where operation and maintenance can be done.

Pressure reducing valve set shall be complete with pressure reducing or pressure regulating valve comprising of isolation valve on outlet, pressure gauges on inlet and outlet, pressure relief valve on inlet and outlet and filter on inlet to remove the foreign materials from the water to protect the pressure reducing valve from damages or malfunctioning.

Pressure reducing valve shall contain loading neoprene diaphragm and full floating, self aligning ignition resistant seat and shall be of the single stage, pressure reduction type with provision for manually adjusting the delivery pressure. Pressure should be adjusted as per site and as per NBC 2016 norms with satisfaction of Engineer-in-charge.

Pressure reducing valve set shall be capable of operating and maintaining automatically the respective delivery pressure and flow rate as specified and shall not be liable to creep. Pressure reducing valve set shall also be capable of maintaining the pre-set down stream pressure under static condition.

The filter provided on inlet of pressure reducing set shall be of replaceable porous sintered metal type.

The pressure relief valve provided on outlet of the pressure reducing set shall be fully enclosed type and fitted with hand easing gear.

Pressure relief valve in a pressure reducing set shall be of the same flow capacity for which the pressure reducing set flow.

Pressure gauges provided on inlet and outlet of the pressure reducing set shall be constructed of die cast aluminum and stove enameled. Pressure gauge shall be of weatherproof with an IP SS enclosure and shall be a stainless steel Bourdon tube type pressure gauge with a scale range from 0 – 16kg/sq.cm and shall be constructed as per IS :3524. Pressure gauge shall have a siphon tube connection. The shut of arrangement shall be by Ball Valve.

8.4 Testing:

All valves shall be tested while installed in pipe by hydrostatic pressure of 1.5 time of the working pressure 7.5 Kg/Sq.cm whichever is more.

8.5 Valve Chamber:

This chapter details construction of masonry Chamber 90x90x100 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with surface box with locakable arrangement, i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per approved drawing with common burnt clay F.P.S.(non modular) bricks of class designation 7.5.

Section – 4: Internal Drainage (Soil, Waste, Vent and Rainwater Pipes & Fittings)

1.0 SCOPE:

Work under this section shall consist of furnishing all labour, materials, equipment and appliances necessary and required to completely install all soil, waste, vent and rainwater pipes as required in drawings. Without restricting to the generality of the foregoing, the soil, waste, vent and rainwater pipes system shall include the followings: -

- i. CI Hubless vertical and horizontal soil, waste, vent and along with all necessary fittings, joints clamps and connections to fixtures.
- ii. PP vertical and horizontal waste pipe in every laboratory area and along with all necessary fittings, joints clamps and connections to fixtures.
- iii. UPVC vertical and horizontal rainwater pipes and along with all necessary fittings, joints clamps and connections to fixtures.
- iv. Waste Pipe.
 - G I Class B Wash basin, Sink to Floor trap 40mm dia.
 - G I Class B Floor Drain to Floor trap 50mm dia.
- v. CI Hubless Floor traps, GI floor drain with SS Grating clean out plugs and GI inlet fittings and rainwater roof drain.
- vi. Testing of all pipes.
- vii. Connection of up to manhole.

2.0 GENERAL REQUIREMENTS

- 2.1 All materials shall be new of the best quality conforming to specifications and subject to the approval of Engineer – in – Charge.
- 2.2 Pipes and fittings shall be fixed truly vertical, horizontal or in slopes as required in a neat workmanlike manner.
- 2.3 Pipes shall be fixed in a manner as to provide easy accessibility for repair and maintenance and shall not cause obstruction in shafts, passages etc.
- 2.4 Pipes shall be securely fixed to walls by suitable clamps at intervals in are specified in drawing or chart mention below.
- 2.5 Access doors for fittings and cleanouts shall be so located that they are easily accessible for repair and maintenance.
- 2.6 All works shall be executed as per drawing.

3.0 CI HUBLESS PIPES & FITTINGS

Soil, waste, vent and anti-siphonage pipes shall be CI pipes with socket and spigot. All pipes shall be straight and smooth and inside free from irregular bore, blow holes, cracks and other manufacturing defects. Pipes shall be centrifugally spun iron soil pipes conforming to 15905.

- 3.1 Tolerance

Acceptable tolerance for pipes to IS: 15905 shall be as follows: -

- a) Wall thickness -15%
- b) Length \pm 20 mm
- c) Weight \pm 10%

3.2 Fittings

Fittings shall conform to the corresponding Indian Standard as for pipes. Contractor shall use pipes and fittings of matching specification.

Access door shall be secured air and water tight with 3mm thick insertion rubber washer and white lead. The bolts shall be lubricated with grease or white lead for easy removal. Wherever soil and waste pipes are connecting to vertical stack, fittings with access door has to be provided.

3.3 Jointing:

All soil, waste and vent pipes including fixture connections between traps and soil pipes shall be jointed with shielded S.S 304 graded coupling conforming to IS:27-1977 with EPDM rubber gasket.

3.4 Pipes, Hangers, Supports, Clamps, Brackets etc.:

All vertical soil and waste pipes shall be fixed by M.S. Clamps of approved design and size as directed by Engineer-in-charge and painted with synthetic enamel paint with approved primer truly vertical while all individual rainwater pipes and PVC pipes shall be fixed by

G.I. Clamps. Branch pipes shall be connected to the stack at the same angle as that of the fittings. No collars shall be used on vertical stacks. Each stack shall be terminated at top with a cowl (terminal guard).

Inclined pipes running along ceiling shall be fixed on GI of approved design and size adjustable hangers of special design shown on the drawings or as directed. Pipes shall be laid to uniform slope and the hangers adjusted to the proper levels so that the pipes fully rest on them.

M.S. clamps shall be of approved design and fabricated from M.S. flat 40mm x 3mm x 3mm thick. They shall be painted with two coats of synthetic enamel paint with approved primer.

Structural clamps shall be fabricated from M.S. structural members e.g. rods, angles, channels, flats, as per detailed drawing or as directed. Contractor shall provide all nuts, bolts, welding and paint the clamps with one coat of red oxide. Wooden saddles shall be provided free of cost.

Slotted angle/channel supports on walls shall be provided shown in drawings or as required. Angles/channels shall be fixed to brick walls and bolts embedded in cement concrete blocks and to RCC walls with suitable anchor fasteners. Holes required in RCC walls shall be neatly drilled by electric drills and no manual chiseling will be allowed. The spacing of supports horizontally shall not exceed 2 M.

Wherever M.S. clamps are required to be anchored directly to brick walls, concrete slabs, beams or columns, nothing extra shall be payable for clamping arrangement and for making good with cement concrete 1:2:4 (mix 1 cement :2 coarse sand :4 stone aggregate 20mm nominal size) as directed by the Client's Representative. Bottom bend shall be supported by concrete block as per required shape & size as directed by Engineer-in-charge.

3.5 Testing:

All pipe work shall be tested before connecting any appliances and then again after connection of appliances. Pipe shall be tested after installation by one of the test given below as directed by Consultant/Client.

Before use at site, all C.I. soil pipes shall be tested by filling up with water for at least 10 minutes at 3 meter head. After filling, pipes shall be struck with a hammer and inspected for blow holes and cracks. All defective pipes shall be rejected and removed from the site within 48 hours.

3.6 Water Test:

Pipes shall be tested after installation by filling up the stack with water. All openings and connections shall be suitable plugged. The total head in the stack shall however not exceed 3 M. The level of water in the stack shall not drop within 24 hours. If there is a drop in level of water the leak shall be detected and rectified and test shall be re-conducted until satisfactory result is achieved.

3.7 Smoke Test:

Contractor may test all soil and waste stacks by a smoke testing machine. Smoke shall be pumped into the stack after plugging all inlet and outlet connections.

The stack shall then be observed for leakages and all defective pipes and fittings removed or repaired as directed by the Engineer-in-charge.

4.0 UPVC Pipes and Fittings:

The pipes shall be round and shall be supplied in straight lengths with socketed ends. The internal and external surfaces of pipes shall be smooth, clean, free from grooving and other defects. The ends shall be cleanly cut and square with the axis of the pipe. The pipes shall be designated by external diameter and shall conform to IS:13592. The pressure of the pipe shall be 4kg/square cm.

4.1 Fittings:

Fittings shall be of the same make as that of pipes, injection moulded and shall conform to Indian Standard.

4.2 Laying and Jointing:

The pipes shall be laid and clamped to wooden plugs fixed above the surface of the wall. Alternatively, GI clamps of suitable designs shall be preferred. Provision shall be made for the effect of thermal movement by not gripping or disturbing the pipe at supports between the anchors for suspended pipes. The supports shall allow the repeated movements to take place without abrasion.

Jointing for UPVC pipes shall be made by means of EPDM gasket for horizontal lines and 'O' rubber ring for vertical line. The type of joint shall be used as per site conditions.

4.3 Supports:

UPVC pipes require GI clamp supports at close intervals. Recommended support spacing for unplasticised PVC pipes is 1400 mm for pipes 50 mm dia and above. Pipes shall be aligned properly before fixing them on the plugs with clamps. Even if the wooden plugs are fixed using a plumb line, pipe shall also be checked for its alignment before clamping, piping shall be properly supported on, or suspended from clamps, hangers as specified and as required. The Contractor shall adequately design all the brackets, saddles, anchors, clamps and hangers and be responsible for their structural sufficiency. Pipe supports shall be primer coated with rust preventive paint. Bottom support of shoe shall be concrete block of required shape & size as directed by Engineer-in-charge for all water pipes.

4.4 Repairs:

While temporary or emergency repairs may be made to the damaged pipes, permanent repairs should be made by replacement of the damaged section. If any split or chip out occur in the wall of the pipe, a short piece of pipe of sufficient length to cover the damaged portion of the pipe is cut. The sleeve is cut longitudinally and heated sufficiently to soften it so that it may be slipped over the damaged hard pipe.

4.5 Testing:

All lengths of PVC rain water pipes shall be fully tested for water tightness by means of water test maintained for not less than 30 minutes. All pipes shall be subjected to a test pressure of at least 1.5 metre head of water head. The test pressure shall, however, not exceed 6 meter head at any point. The pipes shall be plugged preferably with standard design plugs with rubber plugs on both ends. The upper end shall, however, be connected to a pipe for filling with water and getting the required head.

5.0 Waste Pipe from Appliances:

- i) Waste pipe from appliances e.g. wash basins, sinks, shall be of galvanised iron (Class - B) conforming to IS:1239.
- ii) Waste pipe from laboratory sinks shall be of Polypropylene pipes.
- iii) All pipes shall be fixed in gradient towards the outfalls of drains. Pipes inside a toilet room shall be in chase or as per drawings.

6.0 Painting

Soil, waste, vent and rainwater pipes in exposed location, in shafts and pipe spaces shall be thoroughly cleaned to remove dirt, rust and other contamination, and painted with two or more coats of synthetic enamel paint to give an even shade.

Waste pipes in chase shall be thoroughly cleaned to remove dirt, rust and other contamination, and painted with two coats of bitumen paint, covered with polythene tape and a final coat of bitumen paint. Exposed pipes shall be painted with two or more coats of synthetic enamel paint.

7.0 Fastenings

Fasten equipment to building in using expandable metal fasteners.

Where weight applied to the attachment points is 45 kg or less, conform to the following as a minimum:

1. Concrete and solid masonry Bolts and expansion shields
2. Solid metal Machine screws in tapped holes or with welded studs.

Wall mounted equipment may be directly secured to wall by means of steel fasteners.

8.0 Cleanout Plugs

Clean out plug for soil, waste or rain water pipes laid under floors shall be provided near pipe junctions bends, tees, “Yes” and on straight runs at such intervals as required as per site conditions. Clean out plugs shall terminate flush with the floor levels. They shall be cast brass suitable for the pipe dia. With screwed to a G.I socket. The socket shall be joined to the pipe with drip seal/pipe seal.

9.0 TRAPS:

9.1 Floor Traps:

Nahani traps or floor traps shall be cast iron, deep seal with an effective seal of 50 mm. The trap and waste pipes shall be set in cement concrete blocks firmly supported on the structural floor. The blocks shall be in 1:2:3 mix (1 cement: 2 coarse sand: 4 stone aggregate 20 mm nominal size) mixed with waterproof compound and extended to 40 mm below finished floor level. Contractor shall provide all necessary shuttering and centering for the blocks. The trap shall be installed at lowest point ensure no ponding occurs at perimeters of the drain. or as per drawing.

Floor Trap Inlet

inlet Bathroom traps and connections shall ensure free and silent flow of discharging water. Where specified, the Contractor shall provide a galvanized class –B of 100mm dia fitting without or with one, two or three inlet sockets to receive the waste pipe. Joint between waste and fitting shall be connected to ‘P’ trap with at least 50mm seal.

9.2 Stainless Steel Cockroaches Trap:

Floor and traps shall be provided with round Stainless steel cockroaches trap grating as per drawing with rim, of approved design and shape.

10.0 Puddle Flange:

G.I pipe class - C, puddle flanges for FIRE, domestic OHTs, sizes shall be as per drawing.

Section – 5: External Building Drainage

1.0 SCOPE:

Work under this section consists of furnishing all labour, materials and appliances necessary and required to completely install the drainage system as required per the drawings.

- Sewer and Waste including lab waste
 - a. RCC pipe for sewerage including GTs, manholes and of sizes as per drawings.
 - b. HDPE Pipe for Laboratory waste including manholes and of sizes as per drawings.
- Storm – RCC pipe for storm including manholes and of sizes as per drawings

GENERAL REQUIREMENTS:

All materials shall be new of the best quality conforming to specifications. Drainage lines shall be laid to the required gradients and profiles.

2.0 RCC PIPES:

- 2.1 All underground storm water drainage pipes and sewer lines shall be RCC pipes NP2. Pipes shall be true and straight with uniform bore throughout. Cracked, warped pipes shall not be used on the work. All pipes shall be tested by the manufacturer and the Contractor shall produce, prior to use on site, a certificate to that effect from the manufacturer.

All pipes shall be true to shape, straight, perfectly sound and free from cracks and flaws. The external and internal surface of the pipes shall be smooth and hard. The pipes shall be free from defects resulting from imperfect grading of the aggregate mixing or molding. The pipes shall be R.C.C. pipes NP2.

2.2 Laying:

R.C.C. spun pipes shall be laid on cement concrete bed or cradles as specified and shown on the detailed drawings. The cradles may be pre-cast and sufficiently cured to prevent cracks and breakage in handling. The invert of the cradles shall be left 12mm below the invert level of the pipe and properly placed on the soil to prevent any disturbance.

2.3 Sewer Appurtenances:

2.3.1 Inspection Chambers and Manholes:

- i. Size of Chambers/Manholes:
The size for the chambers, manholes, GTs given in drawings shall be internal finished sizes. The work shall be done strictly as per drawing and following specifications.
- ii. Bed Concrete:
Shall be in 1:4:8 cement concrete 230 mm thick.
- iii. Brick Work:
Brick work shall be with best quality bricks in 1:6 cement mortar with non-modular class designation 7.5
- iv. Plaster:
Inside of the walls of chamber/manhole shall be plastered with 12/15 mm thick cement plaster 1:3 (1 cement :3 coarse sand) and finished smooth with a floating coat of neat cement. Manholes shall be plastered from outside as above but with rough plaster.
Water proofing compound as approved by the Consultant/client shall be added in the cement sand mortar ratio as specified by manufacturer.

- v. Manhole Covers and Frames:
Medium duty S.F.R.C. manhole covers for sewage having Load bearing capacity of 10 MT.

2.3.2 Catch Basin:

The location given in drawings shall be internal finished size. The work shall be done strictly as per drawing and following specifications.

I. Bed Concrete:

Shall be in 1:4:8 cement concrete 230 mm thick).

II. Brick Work:

Brick work shall be with best quality bricks in 1:6 cement mortar with non-modular class designation 7.5

III. Plaster:

Inside of the walls of chamber/manhole shall be plastered with 12 mm thick cement plaster 1:3 (1 cement: 3 coarse sand) and finished smooth with a floating coat of neat cement. Manholes shall be plastered from outside as above but with rough plaster.

IV. Catch Basin Covers and Frames:

R. C. C. perforated Cover and SFRC Frame having Load bearing capacity of 10 MT.

2.3.3 Foot Rests:

All manholes deeper more than 0.6 m shall be provided with plastic foot rests (Polypropylene is injection moulded around a 12mm dia steel reinforcing bar). These shall be embedded 20cm, deep with 20 x 20 x 10cm blocks of cement concrete 1:2:4 (1 cement :2 coarse sand :4 graded stone aggregate 20cm, nominal size). The block with plastic foot rest placed it's centre shall be cast in situ along the masonry and surface finished with 12mm thick cement plaster 1:3 (1 cement :3 coarse sand) finished smooth.

All cast iron and Mild Steel items shall be provided with two coats of bitumastic paint.

2.3.4 Gully Trap:

Gully traps shall be fixed in cement concrete 1:5:10 mix and a brick masonry chamber 30 x 30cms C.I. sealed cover and frame weighting not less than 7.3 Kgs to be constructed as per standard drawings. Where necessary, sealed cover shall be replaced with C.I. grating of the same size (1

Cement: 5 coarse sand : 10 stone aggregate : 40mm nominal size).

Gully traps shall be including all excavation, foundation, concrete, brick masnory, cement plaster inside and outside, CI grating and sealed cover and frame.

3.0 HDPE PIPES:

- 3.1 All underground laboratory sewer lines shall be HDPE pipes. Pipes shall be true and straight with uniform bore throughout. Cracked, wraped pipes shall not be used on the work. All pipes shall be tested by the manufacturer and the Contractor shall produce, prior to use on site, a certificate to that effect from the manufacturer.

All pipes shall be true to shape, straight, perfectly sound and free from cracks and flaws. The external and internal surface of the pipes shall be smooth and hard. The pipes shall be free from defects resulting from imperfect grading of the aggregate mixing or moulding.

3.2 Laying:

H.D.P.E spun pipes shall be laid on cement concrete bed or cradles as specified and shown on the detailed drawings. The cradles may be pre-cast and sufficiently cured to prevent cracks and breakage in handling. The invert of the cradles shall be left 12mm below the invert level of the pipe and properly placed on the soil to prevent any disturbance.

4.0 Rain Water Harvesting:

Rain water harvesting pit of 3m dia and of total minimum effective water volume of 20 m³ with 3m water depth per structure including all earth work in excavation, back filling with available excavated earth, with disilting and oil trap , necessary compaction and shifting of surplus earth outside by mechanical means as directed by the Engineer-in-charge, including drilling with RC/DC/Calyx rig having 400/450mm dia bore size in all kind of strata except hard rock, PCC 1:5:10 , 200mm thick foundation concrete, brick work in cement mortar 1:4 (1 cement : 4 coarse sand)/RCC as per structural design to be approved PVC coated safety steel foot rest of 12mm dia MS bars grouted rigidly in cement concrete 1:2:4 @300mm c/c, 200mm thick RCC tank cover slab in cement concrete M20 i/c providing and placing necessary steel raft, bars and to keep the provision of removable slab of approx. 1 m x 1m size, filling 300mm, 300mm & 300mm thick of 40-65mm nominal size graded stone aggregate, small stone and sand layer respectively, 100mm dia CI vent pipe, 250mm dia uPVC slotted pipes 6Kg./sq cm working pressure, filling around the slotted pipes and packing 3mm to 6mm sized graded and screened rounded pea gravel duly washed fabricating and placing grating at the mouth of pipes, placing 2 nos. 560mm dia SFRC manhole cover with frame etc. i/e all necessary materials and equipments required for all relevant operations. The depth of drilling and slotted pipes shall be approximately to terminate above the underground aquifer.

5.0 **Material for Sanitary Faucet and Accessories**

Sanitary ware Catalogue no. and make for reference of quality and cost. Contractor may offer any of the makes specified, within the cost for approval.

Three years guarantee for aluminium work & 10 year guarantee for water proofing work in prescribed proforma attached shall be given by the contractor, in token of his overall responsibility. 10% (Ten Percent) of the cost of these items would be retained as guarantee to the performance of the work done. The guarantee against these item of works shall be in addition to the security deposit mentioned elsewhere in the contract form. If any defects or deficiencies are noticed during the guarantee period the same shall be rectified by the contractor within seven days of issue of the written notice by the Engineer-in-charge, failing which the defects/deficiencies would be got removed by the Engineer-in charge from other agency at the risk and cost of the contractor. However this amount of guarantee can be released in full, if bank guarantee of equivalent amount for the required period is produced and deposited with the department.

Sl. No.	Sanitary Fixture	Hindware	Jaquar	Kohler
		MODEL NUMBER		
1	Floor Mount, EWC with cistern	92512	CNS-755 SN, CSN-207	K-1939 IN –S-O
2	Sink (Jayna	SBSD 06 Matt	Cobra	Nirali
3	Sink Mixer	F-110027	CON-309KN	K-5243 IN-4-CP
4	Wash Basin	91062	NS-WHT-807	K-2764T-1-0
5	Bottle trap	F850003	ALD 769L250x190	
6	Emergency Shower	F-160044	OHS-1989	K-75924 IN-CP
7	Health Faucet	F-160068	ALD-563	K-98100 IN-O
8	Shop Dispenser	F840006	ACN-1135N	K-10712D-CP
9	Bib Cock	F150018	LYR-38041	K-37342IN-4-CP
10	Glass Shelf	F840011	ACN-1171N	K-5636IN-CP
11	Coat hook	F840007	ACN-1161N	
12	Braided Hose Connection		ALD-805B	

Material for Sanitary Faucet and Accessories

24. FIRE FIGHTING SYSTEM

1.0 General

This chapter details Supply, Installation, Testing & Commissioning requirements of Fire Fighting Works. Fire Fighting system shall comprise of hose reel System, Fire Extinguishers, Fire Brigade Inlet Connection set. Suitable size shafts, cut-outs, Niche, openings etc shall be provided to facilitate installation of Pipelines etc. in all floor slabs of various buildings for various service areas, as required. All shafts, cut-outs, Niche, openings etc provided on floor slabs shall be suitably closed after laying of services lines as per fire safety norms as per NBC 2016. Doors shall be provided for all shafts at all floors as per fire safety norms as per NBC 2016. The ratings and capacities of various equipment's are based on NBC 2016 Part - IV and subject to revision during detailed designing stage.

The fire-fighting system is proposed on basis of type of occupancy as per NBC 2016

Part

-IV and building Height. First Aid Hose reel at regular intervals according to type of building. The distribution system will be finally connected to ring main system for firefighting.

Work should be executed as per drawing, latest CPWD specification, relevant IS code of latest addition, NBC -2016 and other standard specification. Expect otherwise mentioned in bidding document.

The following standards, bye-law, manual has been followed in designing the firefighting system: -

- Relevant IS codes published by Bureau of Indian Standards.
- National Building code Part IV for fire Protection System 2016.
- Pumps, Valves and Accessories shall be of UL listed and FM approved
- CPWD General Specifications for Electrical Works-part V (Wet Riser & Sprinkler System-2006)
- NFPA/UL/FM certifications & TAC for guidance.

2.0 Water Requirements:

Water services for hose reel and hydrant system shall be stored in overhead tanks.

Overhead storage fire tank: -

Overhead fire water tanks on the terrace will be provided for hose reel system and as supplementary fire storage as per NBC -2016 requirement/ Bye laws.

3.0 System Description: -

The Fire Fighting System shall consist of hose reel system with terrace pumps, Pressure vessel, associated instruments, cabling, piping (internal & external), valves, Fire Brigade inlet connections, fire signage's, extinguishers. has to be provided as per NBC 2016 requirements.

Shafts & Cut Outs Provisions: -

Minimum size of shafts to be provided to accommodate down comer /drainpipes etc. will be 1200 X 600 MM (approx.) and to be provided at suitable locations as per specified in drawings or to be provided per relevant codes & standards, whichever is stringent.

Shafts & Inspection doors shall be minimum of 120 minutes fire rated or as desired by relevant codes.

4.0 Pumps & related Equipment/Piping & Related Accessories: -

- Fire booster pump of capacity shall be installed as per drawings.
- Fire pumps shall be with positive suction arrangements.
- Capacity of fire pump terrace fire pump 900 lpm with 35 meter head.
- All Foundation (PCC/RCC) for Equipment including foundation bolts & vibration isolation springs/pads to be provided.
- Mild steel 'C' pipes confirming to IS: 1239/3589 including all fittings like bends, elbows, tees, anchor fasteners, couplings etc. shall be used in Fire Fighting system.
- Suspenders, Brackets & Floor/Wall supports for suspending / supporting pipes to be provided.
- Suction dia. & discharge dia. Of pumps shall be as per pump discharge as per OEM standards.
- The entire pipe work (above ground), pump etc. shall be painted with one coat of primer & two or more coat of red color shade no. 536 of IS:5 (synthetic enameled red paint) as per directions of Engineer-in-Charge.
- At terrace level hydrant, minimum 3.5 kg/sqcm pressure shall be maintained.
- All pipes below ground will be protected against soil corrosion by wrapping & coating material as per IS: 10221.

- Pipes of 150 mm dia. & below, will conform to IS: 1239. Pipes of 200 mm dia. & above will conform to IS: 3589.
- All necessary valves of PN 16 rating (min.) like butterfly/ globe/ gate/ non return/ sluice, Y/Pot Strainers, pressure gauges etc. to be considered as per requirement (controlling flow/ isolating/one-way flow etc.) & meeting the functionality.
- Pressure vessels shall be provided with terrace booster pumps.
- Vibration Isolators/Anti Vibration Pads needs to be provided for all pumps to absorb vibration at source.
- Air cushion tanks with air release valves needs to be provided for all risers of hydrant pipes.

5.0 Hose Reel

- It shall consist of swinging type First Aid hose reel in red colour drum with 36 mtr long and 20 mm dia. heavy duty rubber water hose, 20 mm dia. globe valve stop cock, terminating with G.M. Coupling & nozzle of 5mm outlet with shut off valve, 63mm dia. and suitable size of MS door made up of 16 gauge MS Sheet capable of accommodating

fire hose reel. The door shall have a front glass with lock and key arrangement & shall be painted with one coat of primer & two coat of finished stove enameled post office red colour paint & "Hose Reel" written on front.

- One no. pressure gauge to be provided in each hose reel at per floor.
- No. of risers/floor in each building shall be governed by the max. Travel distance as specified in NBC 2016.
- Fire Brigade Inlet Connections.
- 2 Way Fire Brigade Inlet connection complete with all accessories (sluice valve/NRV etc.) shall be provided for connection to down comer system.

6.0 Portable Fire Extinguishers: -

- The quantity as per drawings of portable/trolley mounted type fire extinguishers (Gas Based stored pressure type CO2 type /Ammonium Phosphate Type/ Mechanical Foam etc.) shall be provided at all levels of the building, plant room, basement, substation etc. at strategic locations as per requirements, generally to follow NBC-2016 and IS – 2190: 1992 to extinguish fire of class A, B ,C. As per requirement.
- Location of the Fire Extinguishers shall be considered near all the fire hose reel, LT Panel Room, Lift Machine Room, Fire Control Room, Room etc.
- All Fire Extinguishers shall be Holon Free.

7.0 Fire Signage: -

- Various types of signage are proposed in the complex as per NBC 2016 Part - 4. Material of signage shall be of acrylic/aluminum of required dimensions. At every floor near Lift landing diagram showing stairways shall be provided mentioning instructions - 'IN CASE OF FIRE USE STAIRS UNLESS INSTRUCTED OTHERWISE'. The signage shall be above call push button in Lift Lobby. Floor Signage will be provided in each floor within the staircase & should easily readable. Each corridor of every floor will have directional signage indicating Fire Escape route. These Signage shall be with photo

Luminescent paint as per requirement & directions of E-I.C so that they will be visible in dark in case of power failure.

8.0 Electrical Works related to Fire Fighting System: -

- Power cabling of suitable size from fire-fighting panel/Isolator to fire pumps to be laid. Control cabling from fire pumps to firefighting panel & firefighting panel to pressure switch to be done. All detailed cable sizes and isolator sizes are covered in electrical specification document.
- Suspenders and/or cable trays for laying cables to be used.
- Motor shall be TEFC squirrel cage AC induction type. The motor shall be suitable for continuous duty & rating necessary to drive the pump at 150% of its rated discharge with at least 65% rated head. Motor shall be with class F insulation & IE-2 class efficiency. DOL/star delta starter to be provided as per H.P rating of motors.
- Adequate no. of NO/NC contacts for interlocks, indicating lamps, remote operation etc. shall be provided on starter/contactor.
- Metallic body of all motors, medium voltage equipment etc. shall be connected by 2 separate & distinct earth conductors to the earth stations of the installations. Looping of such body earth conductors is acceptable from one equipment to another.

9.0 Indicative Fire Fighting Parameters to be provided:

Fire -fighting requirement to be provided as per NBC 2016 Part-4 and as mentioned in the drawings.

Table-7 (NBC)	Building Classification – Educational Building under Group-B Category Subdivision B-2	
	TYPES OF INSTALLATION	NBC - Requirement
1	Fire Extinguishers	To be Provided as per drawing.
2	Hose Reel	To be Provided as per drawing
3	Down Comer	To be Provided as per drawing
4	Manually Operated Electric Fire Alarm Systems	To be Provided as per drawing
5	Overhead Fire Static Tank	To be Provided as per drawing
6.	Fire Fighting Pumps at Terrace	To be Provided as per drawing

Note:-

The Tables provided above has been prepared considering Buildings as per present scope of work. The requirements indicated in the column “Deliverable” are minimum to be provided by the EPC Contractor.

Notwithstanding anything mentioned in above table above, additional firefighting provision specifically contained in the Bye laws, if any, shall have to be additionally provided.

Any building not appearing in the above table shall be dealt with as per NBC 2016 norms & Bye law’s provisions.

I.S. CODES AND REFERENCE STANDARDS.

- A. Codes and reference standards referred to in the contract shall be understood to form a part of the contract.
- B. Alternative reference standards produced by different standards authorities may be specified in a Section. Standards of any of the specified authorities may be acceptable, however, materials specified in the Section shall be incorporated in the works from only one of the specified standard authorities to ensure compatibility in the performance of the materials.
- C. The contractor shall be responsible for adherence to reference standard requirements by subcontractors and suppliers.
- D. Where edition date is not specified, consider that reference to manufacturer's and published codes, standards and specifications are made to the latest edition (revision or amendment) approved by the issuing organization current at issue date of the Tender.
- E. Reference standards and specifications are quoted in the specification to establish minimum standards. Works of quality or of performance characteristics that exceed these minimum standards will be considered to confirm.

Should regulatory requirements or the contract conflict with specified reference standards

Or specifications, the more stringent in each case shall govern.

- F. Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing, erection, applying or other matters concerning the materials pertinent to their use in the works and their relationship to materials with which they are incorporated.

G. LIST OF CODES (INDIAN STANDARD CODES)

Standards, specifications, associations, and regulatory bodies are generally referred to throughout the specifications by their abbreviated designations. The materials workmanship shall be in accordance with the requirement of the appropriate CP, I.S code wherever applicable together with any building regulations or byelaws governing the works.

The following list is included for guidance only and the omission of any CP, I.S. codes from the list does not relieve the contractor from compliance therewith:

The more important Codes, Standards and Publications applicable to this section are listed hereinafter:

General

SP : 6 (1) Structural Steel Sections

IS : 27 Pig Lead

IS : 325 Three Phase Induction Motors

IS : 554 Dimensions for pipe threads where pressure tight joints are required on the threads.

IS : 694 PVC insulated cables for working voltages upto & including 1100 V.

- IS : 779 Specification for water meters (domestic type).
- IS : 782 Specification for caulking load.
- IS : 800 Code of practice for general construction in steel
- IS : 1068 Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium.
- IS : 1172 Code of Basic requirements for water supply drainage and sanitation.
- IS : 1367 (Part 1) Technical supply conditions for threaded steel fasteners: Part 1 introduction and general information.
- IS : 1367 (Part 2) Technical supply conditions for threaded steel fasteners: Part 2 product grades and tolerances.
- IS : 1554 (Part 1) PVC insulated (heavy duty) electric cables: Part 1 for working voltages upto and including 1100 V.
- IS : 1554 (Part 2) PVC insulated (heavy duty) electric cables: Part 2 for working voltages from 3.3 KV upto and including 11 KV.
- IS : 1726 Specification for cast iron manhole covers and frames.
- IS : 1742 Code of practice for building drainage.
- IS : 2064 Selection, installation and maintenance of sanitary appliance code of practice.
- IS : 2065 Code of practice for water supply in buildings.
- IS : 2104 Specification for water meter for boxes (domestic type)
- IS : 2373 Specification for eater meter (bulk type)
- IS : 2379 Colour code for identification of pipe lines.
- IS : 2629 Recommended practice for hot dip galvanizing on iron and Steel.
- IS : 3114 Code of practice for laying of cast iron pipes
- IS : 4111 (Part 1) Code of practice for ancillary structures in sewerage system: Part 1 manholes.
- IS : 4127 Code of practice for laying glazed stoneware pipes.
- IS : 4853 Recommended practice for radiographic inspection of fusion welded butt joints in steel pipes.
- IS : 5329 Code of practice for sanitary pipe work above ground for buildings.
- IS : 5455 Cast iron steps for manholes.
- IS : 6159 Recommended practice for design and fabrication of material, prior to galvanizing.
- IS : 7558 Code of practice for domestic hot water installations.
- IS : 8321 Glossary of terms applicable to plumbing work.
- IS : 8419 (Part 1) Requirements for water filtration equipment: Part 1 Filtration medium sand and gravel.
- IS : 8419 (Part 2) Requirements for water filtration equipment: Part 2 under drainage system.
- IS : 9668 Code of practice for provision and maintenance of water supplies and fire fighting.
- IS : 9842 Prefomed fibrous pipe insulation.
- IS : 9912 Coal tar based coating materials and suitable primers for protecting iron and steel pipe lines.
- IS : 10221 Code of practice for coating and wrapping of underground mild steel pipelines.
- IS : 10446 Glossary of terms relating to water supply and sanitation.
- IS : 11149 Rubber Gaskets
- IS : 11790 Code of practice for preparation of butt-welding ends for pipes, valves, flanges and fittings.
- IS : 12183 (Part 1) Code of practice for plumbing in multistoried buildings : Part 1 water supply.
- IS : 12251 Code of practice for drainage of building basements.
- IS : 5572 Code of practice for sanitary pipe work.

- BS : 6700 Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages
- BS : 8301 Code of practice for building drainage.
- BSEN : 274 Sanitary tap were, waste fittings for basins, bidets and baths. General technical specifications.

2. Pipe and fitting
- IS : 458 Specification for precast concrete pipes (with and without reinforcement)
- IS : 651 Salt glazed stone ware pipes and fittings.
- IS : 1239 Mild steel, tubes, tubular and other wrought steel fittings
- IS : 1536 Centrifugally cast (spun) iron pressure pipes for water, gas and sewage.
- IS : 1537 Vertically cast iron pressure pipes for water, gas and sewage.
- IS : 1538 Cast Iron fittings for pressure pipes for water, gas and sewage.
- IS : 1729 Sand Cast iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.
- IS : 1879 Malleable cast iron pipe fittings.
- IS : 1978 Line pipe
- IS : 1979 High test line pipe.
- IS : 2643 Dimensions for pipe threads for fastening purposes
- IS : 3468 Pipe nuts.
- IS : 3589 Seamless or electrically welded steel pipes for water, gas and sewage (168.3 mm to 2032 mm outside diameter).
- IS : 3989 Centrifugally cast (sun) iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.
- IS : 4346 Specifications for washers for use with fittings for water services.
- IS : 4711 Methods for sampling steel pipes, tubes and fittings.
- IS : 6392 Steel pipe flanges
- IS : 6418 Cast iron and malleable cast iron flanges for general engineering purposes.
- IS : 7181 Specification for horizontally cast iron double flanged pipe for water, gas and sewage.
3. Valves
- IS : 778 Specification for copper alloy gage, globe and check valves for water works purposes.
- IS : 780 Specification for sluice valves for water works purposes (50 mm to 300 mm size).
- IS : 1703 Specification copper alloy float valves (horizontal plunger type) for water supply fittings.
- IS : 2906 Specification for sluice valves for water works purposes (350 mm to 1200 mm size)
- IS : 3950 Specification for surface boxes for sluice valves.
- IS : 5312 Specification for swing check type reflux (non return) valves
- IS : 12992 Safety relief valves, spring loaded
- IS : 13095 Butterfly valves for general purposes.
4. Pumps & Vessels
- IS : 1520 Specification for horizontal centrifugal pumps for clear cold fresh water.
- IS : 2002 Steel plates for pressure vessels for intermediate and high temperature service including boilers.

IS : 8418 Specification for horizontal centrifugal self-priming pumps.

5 Fire Fighting Equipment

- NFPA : 12 , 1993 Standards on Carbon Dioxide Extinguishing System IS : 884
Specification for first aid hose reel for fire fighting.
- IS : 901 Specification for couplings, double male and double female, instantaneous pattern for fire fighting.
- IS : 902 Suction hose couplings for fire fighting purposes.
- IS : 904 Specification for 2-way and 3-way suction collecting heads for fire fighting purposes.
- IS : 908 Specification for fire hydrant, stand post type.
- IS : 910 Specification for portable chemical foam fire extinguisher.
- IS : 2171 Specification for portable fire extinguishers dry powder (cartridge type)
- IS : 2190 Selection, installation and maintenance of first aid fire extinguishers – Code of practice.
- IS : 2878 Specification for fire extinguishers, carbon dioxidetype (portable and trolley mounted).
- IS : 3844 Code of practice for installation and maintenance of internal fire hydrants and hose reel on premises.
- IS : 5290 Specification for landing valves.
- IS 5714 Specification for coupling, branch pipe, nozzle, used in hose reel tubing for fire fighting.
- IS : 8423 Specification for controlled percolation type hose for fire fighting.
- IS : 10658 Specification for higher capacity dry powder fire extinguisher (trolley mounted).
- IS : 3989 Centrifugally cast (sun) iron spigot and socket soil, waste and ventilating pipes, fittings and accessories.
- IS : 11149 Rubber Gaskets

LIST OF PREFERED MAKES/AGENCIES

FOR WORKS COVERED UNDER THIS CONTRACT

- 1) All materials and products used in the work shall conform to the relevant standards/ specifications and shall be of approved make and design. Lists of approved manufacturers / vendors for Plumbing works, Fire fighting, are given herein below. The approval of a manufacturer/ vendor shall be given only after review of the sample/specimen by the Engineer-in-charge. The complete system and installation shall also be in conformity with the "Applicable Codes Standards and Publications".
- 2) The Engineer- In-charge/consultant reserves the right to select any of the brands indicated in the list of approved make. The tenderer shall quote his rates on the basis of price of best quality product of the brand/make stipulated in the items of works as described in specifications as well as in the list of approved make. The contractor cannot claim anything extra if the Engineer In-charge/ Client changes the make but within the list of approved make.
- 3) When certain makes are missing in the below list, the make will be decided as per the approval of consultant/Engineer In-charge.

List of Makes for Civil Works		
The following brand makes/ manufacturer's makes listed below may be used with prior approval of the Architect. In case it is established that any material as listed below is not available in the market, approved equivalent materials and finishes of any other specialized brand names/ manufacture's makes may be used as per approval of the architect or EIC.		
S.NO.	ITEM DESCRIPTION	MAKE/BRAND
1	CEMENT(OPC/PPC/ PORTLAND SLAG)	ACC/L&T/ JK CEMENT/ BIRLA/ULTRA TECH /GUJARAT AMBUJA/JP/VIKRAM/AMBUJA
2	WHITE CEMENT & PUTTY	JK WHITE / BIRLA
3	STEEL, TOR STEEL (REINFORCEMENT FE 500D) & STRUCTURAL	SAIL/TATA STEEL/JINDAL STEEL/JSW/RINL
5	EXPOSED BRICKS	JAY JALARAM BRICKS/PIONEER BRICKS/JINDAL MECHANO BRICKS
7	WHITE CEMENT PUTTY	BIRLA WHITE/ ASIAN/ WALPLAST
8	BITUMEN	IOCL/TIKI TAR INDUSTRIES/ JUNO BITUMIX PVT. LTD
9	CEMENT ADMIXTURE/PLASTICIZER	FOSROC/SIKA/PIDILITE/CICO/BASF
10	ANTI-TERMITE TREATMENT CHEMICAL	BAYER/GIBRALTOR/BASF/GIBRALTOR
FLOOR/WALL FINISHING		
11	1ST QUALITY ACRYLIC DISTEMPER, ACRYLIC/ PLASTIC EMULSION , SYNTHETIC ENAMEL PAINT, ACRYLIC EXTERIOR PAINT, EPOXY PAINT	ASIAN PAINTS/ DULUX / NEROLAC
12	TEXTURED PAINTS -EXTERIOR	ACRO PAINTS/ UNISTONE/ SPECTRUM/HERITAGE
13	STEEL PRIMER (RED OXIDE ZINC CHROMATE PRIMER)	ASIAN PAINTS, NEROLAC, BERGER, ICI

14	RECTIFIED CERAMIC TILES, CERAMIC TILES, VITRIFIED TILES, HEAT RESISTANCE TILE (VITRIFIED TILES TO BE DOUBLE CHARGED MANUFACTURED FROM MOTHER PLANT)	FIRST QUALITY NITCO/ KAJARIA/ SOMANY/ JOHNSON/RAK OF APPROVED DESIGN, COLOR AND SHADE
15	BRICK PAVERS	JAY JALARAM BRICKS/PIONEER BRICKS/JINDAL MECHANO BRICKS
16	P.O.P	SRIRAM NIRMAN/ BIRLA WALL PUTTY/ JK
17	CEMENT PRIMER	NEROLAC/BP WHITE (BERGER)/DECOPRIME-WT (ASIAN)/WHITE PRIMER (ICI)
18	FIRE RETARDANT PAINT	NIPPON PAINT/BERGER/ASIAN PAINTS/SHALIMAR PAINTS
CEILING AND PANELLING		
19	FALSE CEILINGS	
A	GYPSUM CEILING	USG BORAL/SHERA/GYPROC
B	METAL CEILING (CLIP-IN AND LAY-IN)	ARMSTRONG/ ECOTONE/USG BORAL
C	OPEN CELL CEILING	ARMSTRONG/USG BORAL/HUNTER DOUGLAS
D	CALCIUM SILICATE BOARDS/TILES	HILUX (RAMCO INDUSTRIES LTD.)/AEROLITE/GYPROC
E	ACOUSTIC FALSE CEILING	ARMSTRONG/ EARCONS/ ECOTONE/ECOPHON
F	ACOUSTIC WALL PANEL	ARMSTRONG/ EARCONS/ ANUTONE/ECOTONE/ECOPHON
WOOD WORK		
20	FLUSH DOOR, BLOCK BOARD, PLYWOOD	DUROPLY INDUSTRIES LTD., GREEN PLY, CENTURY,NATIONAL, KITPLY PRODUCTS
21	DECORATIVE LAMINATE	FORMICA/ GREENLAM/ MERINOLAM/DURO
DOORS AND WINDOWS		
22	FIRE DOORS	NAVAIR INTERNATIONAL PVT. LTD./ HORMANN/SUKRI/ENVIROTECH SYSTEM PVT.LTD.
23	UPVC DOORS & WINDOWS	FENESTA/ ALUPLAST/DECEUNINCK
24	ALUMINIUM EXTRUDED PROFILES	HINDALCO/ JINDAL/INDAL
25	ALUMINIUM LOUVRED DOOR	DOMAL/ ETERNIA/ AGV AFLAB/ADITYA BIRLA
26	WINDOW TURN HANDLES, FRICTION HINGES	IPSA, DORMA, EBCO, DORMA, HETTICH, GEZE
27	HERMETICALLY-SEALED DOUBLE INSULATED GLASS	SAINT GOBAIN/AIS ASAHI INDIA GLASS LTD./GSC TRUTUF
28	FLOAT GLASS, MIRRORS	SAINTGOBAIN /TRUTUF/AIS ASAHI INDIA GLASS LTD/ MODIGUARD
29	FLOOR SPRING, FRAMELESS	DORMA/HETTICH/OZONE/DOORSET
30	STRUCTURAL GLAZING/ SPIDER GLAZING	KALCO/CONSOLIDATED GROUP/ALUMAX INDIA/DOMAL/AASTHA ALUMINA PVT. LTD.

31	STAINLESS STEEL FIRE RATED HARDWARE	DORMA,GEZE,HAFELE
32	SS HANDLES, TOWER BOLTS, HINGES, ALDROP, FLOOR STOPPER, CASEMENT STAY, SAFETY CHAIN, MAGNETIC DOOR CATCHER, MAGIC EYE, DRAWER GLIDES, FLOOR STOPPER, PANIC BAR/ PUSH BAR	HAFELE/ DORMA/ GEZE/ HETTICH/ OZONE/KICH
33	PATCH FITTINGS	HETTICH/DORMA/GEZE/HAFELE/OZONE/KICH
MISC ITEMS		
34	SS RAILING (SS AISI 304 GRADE/ SS AISI 316 GRADE)	KICH/OZONE
35	TERRACOTTA TILE	TERREAL/PARAGRID/WIENERBERGER/TERRACLAD
36	TERRACOTTA LOUVERS	TERREAL/PARAGRID/TERRACLAD
37	GLASS BRICKS	KOCHHAR GLASS PVT. LTD. /IMPORTED ITALIAN MAKE AS PER APPROVED SAMPLE BY ARCHITECT
38	AAC BLOCK ADHESIVE	PIDILITE/FERROUSCRETE/LATICRETE
39	GLUE	FEVICOL/DUNLOP/VEMICOL/ ARALDITE
40	BLINDS	VISTA/DECOREX/ELEGANT DÉCOR
41	FIRE CURTAIN	ORIENT FIRE CURTAINS INDIA PVT. LTD
42	SILICON SEALANT	GE BAYER SILICONE/ SIKA/BECKER/DOW CORNING
43	TILE ADHESIVES/EPOXY GROUT/SILICONE SPRAY/POLYSULPHIDE SEALANT	LATICRETE/ROFFE/PIDILITE
44	WATER PROOFING	SOPREMA/FOSROC/BASF
45	ANTITERMITE PAINT	NOCIL/PYRAMID/TRISUL/MONTARI INDUSTRIES
46	FASTENERS/CRAMPS	FISCHER/HILTI/BOSCH/CANON
47	THERMAL INSULATION/ROCKWOOL/GLASS WOOL/MINERAL WOOL/PUF	TWIGA/POLYGLASS/OWENS CORNING
48	JAALI BRICK	BANGALORE TILES/BHAKTI BRICKS/AFFA TILE COMPANY
49	CORTEN STEEL	UNISTONE/JINDAL STEEL
50	TILE ADHESIVES, EPOXY GROUT, SILICONE SPRAY, POLYSULPHIDE SEALANT	LATICRETE, ROFFE, PIDILITE

PHE				
S. NO.	ITEM	PROPOSED MAKE		
1	SANITARY FIXTURES AND CP FITTINGS	JAQUAR	KOHLAR	HINDWARE
2	WC CONNECTOR	ASTRAL	SUPREME	
3	LOW FLOW CISTERN	GEBERIT	SCHELL	VIEGA
4	KITCHEN/PANTRY SINK	KINGSTON	NIRALI	JAYNA
5	HAND DRIER	EURONICS	UTEC SYSTEM	KOPAL
6	PAPER TOWEL DISPENSER	EURONICS	UTEC SYSTEM	KOPAL
7	UPVC PIPES AND FITTINGS	SUPREME	ASTRAL	
8	SOAP DISPENSER	EURONICS	UTEC SYSTEM	KOPAL
9	PRESSMATIC TAP	EURONICS	UTEC SYSTEM	KOPAL
10	URINAL SENSORS	EURONICS	UTEC SYSTEM	KOPAL
11	COCKROACH PROOF GRATING AND SS GRATING	CHILLY	VIKING	
12	G. I. PIPES AND ACCESSORIES	TATA	JINDAL-HISSAR	PRAKASH SURYA, NVR
13	PVC PIPES AND FITTINGS	SUPREME	ASTRAL	
14	HDPE DWC (SN-8)	HINDUSTAN	SUPREME	
15	INSULATION	ARMACELL	SUPREME	THERMAFLEX
16	LEAD FREE BALL VALVE	LEHRY	L&T	HONEYWELL
17	BALL VALVE	L&T	ZOLOTO	AIP
18	BUTTERFLY VALVE	L&T	ZOLOTO	AIP
19	NON RETURN VALVE	L&T	ZOLOTO	AIP
20	Y-STRAINER	L&T	ZOLOTO	AIP
21	MOTORIZED VALVE	HONEYWELL	DANFOSS	AIP
22	PRESSURE REDUCING VALVE	L&T	ZOLOTO	AIP
23	AUTO AIR VENT	L&T	ZOLOTO	AIP
24	RCC PIPES	PRANALI	JAIN SPUN	INDIAN HUME PIPE
25	ANTI VIBRATION MOUNTING AND FLEXIBLE CONNECTOR	DUNLOP	RESISTOFLEX	EASYFLEX
26	MECHANICAL SEAL AND COUPLING	BURGMANN	SEALOL	LOVEJOY
27	PRESSURE GAUGE	H GURU	FIEBEG	WIKA
28	RO MEMBRANE	OASIS	EUREKA FORBES	ION EXCHANGE
29	ULTRAVIOLET UNIT	ALFA UV	EUREKA FORBES	PENTAIR
30	PIPE SUPPORT AND CLAMPS	CHILLY	EUROCLAMP	GRIPPLE
31	RUBBER EXPANSION JOINT	DUNLOP	RESISTOFLEX	EASYFLEX
32	WATER METER	KROHNE	ROCKWIN	ADEPT
33	SS PIPES	J-STEEL	VS METAL	
34	DRINKING WATER FOUNTAIN	OASIS	MURDOCK	FILTRINE
35	Centrifugally Cast Iron Spun Pipes & Fittings	NECO	HEPCO	SKF, RIF

FIRE PROTECTION				
S. NO.	ITEM	PROPOSED MAKE		
1	MS PIPE	JINDAL HISSAR	SURYA	TATA
2	MS FITTING	VS	DRP	UNIK
3	PAINT	BERGER	ASIAN PAINTS	SHALIMAR PAINTS
4	LANDING VALVE	NEWAGE	MINIMAX	KALPES
5	FIRE BRIGADE INLET CONNECTION	NEWAGE	MINIMAX	KALPES
6	DRAWOUT CONNECTION	NEWAGE	MINIMAX	KALPES
7	HOSE REEL	NEWAGE	MINIMAX	KALPES
8	BRANCH PIPE	NEWAGE	MINIMAX	KALPES
9	FIREMAN AXE	NEWAGE	MINIMAX	KALPES
10	HOSE BOX	NEWAGE	MINIMAX	KALPES
11	HOSE REEL DRUM	NEWAGE	MINIMAX	KALPES
12	SPRINKLER (QUICK RESPONCE)	HD	TYCO	GETECH
13	SPRINKLER FLEXIBLE DROP	HD	TYCO	GETECH
14	ALARM CONTROL VLAVE (ICV)	NEWAGE	TYCO	HD
15	VIBRATION ELIMINATORS	EASY FLEX	RESISTOFLEX	
16	BALL VALVE	L&T	AMBIT	AIP
17	BUTTERFLY VALVE	L&T	AMBIT	AIP
18	NON RETURN VALVE	L&T	AMBIT	AIP
19	Y-STRAINER	L&T	AMBIT	AIP
20	SLUICE VALVE	L&T	AMBIT	AIP
21	GATE VALVE	L&T	AMBIT	AIP
22	SOLENOID VALVE	TYCO	VIKING	VICTAULIC
23	FLEXIBLE HOSE PIPE	TYCO	VIKING	SPAGO
24	PRESSURE GUAGE	H GURU	FIEBEG	WIKA
25	FIRE EXTINGUISHERS	NEWAGE	SPAGO	CEASE FIRE
26	PUMP	KSB	KIRLOSKER	MATHER&PLATE
27	CABLES	KEI	POLYCAB	RALLISON
28	END TERMINATIONS	COMET	DOWELL	JAINSON
29	CABLE TRAY	MEM	RMCON	LS POWER

SCHEDULE OF HARDWARE

S.no.	Item	SS Handle	Alu. Handle	Push bar	SS butt Hinges	Tower bolt		SS Sliding bolt	Lock	Bright Finished brass Door stopper	Hydraulic Door Closer	Number of Shutter	Item	Number of items
						100 MM	250 MM							
ALU FRAME+FLUSH DOOR														
1	D1	1			4	1		2	0	0	0	1	D1 (750X2100)	52
2	D2	1			4		1	2	1	1	1	1	D2 (900X2400)	50
3	D3	1			4		1	2	1	1	1	1	D3 (1000X2400)	40
5	D4	1			4		1	2	1	1	1	1	D4 (1200X2400)	3
6	D5	2			8		2	4	1	2	2	2	D5 (1500X2400)	3
7	D5A	2			8		2	4	1	2	2	2	D5a (1500X2400)	13
ALUMINIUM DOOR														
8	D6	2	2		8		2	4				2	D6 (1800X2400)	10
9	SH	1	1		4		1	2				1	Sh (750x1800) -Alu+Louvre	10
10	SH1	1	1		4		1	2				1	Sh1 (680x1800) Alu+Louvre	8
11	SH2	1	1		4		1	2				1	Sh2 (750x1800) Alu+fros glass	26
12	SH3	1	1		4		1	2				1	Sh3 (1000x1800) Alu+fros glass	2
13	SH4	2	2		8		2	4				2	Sh4 (1500X1800) Alu+Louvre	7
14	SH5	2	2		8		2	4				2	Sh5 (1350x1800) (alu+double louvred door)	12
15	FD1	2	2		8		2	4				2	FD1 (1335X2100) Alu+Fire hydrant glass door)	12
16	S1	2	2		8		2	4				2	S1 (1500X2400) sliding	6
UPVC														
16	W3											1	W3 (750X1500) UPVC	36
17	W4											2	W4 (1350X1500) UPVC	12
18	W5											1	W5 (1800X1500) UPVC	2
19	W5a											0	W5A (1750X2100) UPVC	2
20	W8											2	W8 (3450X2400) UPVC	6
21	W9											0	W9 (3485X2400) UPVC	2
22	W11											0	W11 (3800X2400) UPVC	23
23	W12											0	W12 (4235X2400) UPVC	2
24	W14											0	W14 (7200X2400) UPVC	4
25	W16											0	W16 (3825X2400) UPVC	8
26	W17a											0	W17a 1080x1200 UPVC	24
27	V1											1	V1 (600X900) UPVC	8
28	V1A											1	V1A (640X900) UPVC	12
29	V2											0	V2(2825X600)-GLASS BRICK	20
30	V4											0	V4 (680X1800) UPVC	12
UPVC VENT														
31	DW2											1	DW2 (1300X2400) UPVC Glass Door-Win	3
32	DW3											2	DW3 (1675X2400) UPVC Glass Door-Win	9
33	DW3A											1	DW3A (1675X2400) UPVC Glass Door-Win	1
34	DW4											1	DW4 (1800X2400) UPVC Glass Door-Win	10
35	DW5											2	DW5 (1800X2400) UPVC Glass Door-Win	10
36	DW6											2	DW6 (1850X2400) UPVC Glass Door-Win	1
37	DW7											1	DW7 (1800X2400) UPVC Glass Door-Win	2
38	DW7a											2	DW7a (2000x2400) UPVC Glass Door-Win	2
39	DW7b											2	DW7b (1900x2400) UPVC Glass Door-Win	7
40	DW8											2	DW8 (2150X2400) UPVC Glass Door-Win	12
41	DW9											1	DW9 (2100X2400) UPVC Glass Door-Win	21
42	DW9a											2	DW9a (2100x2400) UPVC Glass Door-Win	5
43	DW9b											1	DW9b (2195x2400) UPVC Glass Door-Win	1
44	DW9c											1	DW9c (2375x2400) UPVC Glass Door-Win	1
45	DW10											1	DW10 (2310X2400) UPVC Glass Door-Win	1
46	DW11											2	DW11 (2570X2400) UPVC Glass Door-Win	2
47	DW12											1	DW12 (3080X2400) UPVC Glass Door-Win	7
48	DW13											2	DW13 (3520X2400) UPVC Glass Door-Win	7
49	DW14											1	DW14 (3800x2400) UPVC Glass Door-Win	23
50	DW14a											2	DW14a (3800x2400) UPVC Glass Door-Win	14
51	DW14b											2	DW14b (3250x2400) UPVC Glass Door-Win	14

SCHEDULE OF FINISHES

S.No.	Space	Flooring (Design as per drawing)	Walls	Misc.	Ceiling (Design as per drawing)
	Working/Usable Spaces				
1	Office Space (Big/Small Hall)	Vitrified flooring (600x1200)-Grigio Neve, Nitco make or equivalent	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1. Techzone ceiling dunemax microlook edge tile (600x1200x20mm) 20mm thk with. 15mm suprafine exposed grid system, NRC 0.70 2.Gypsum ceiling in Periphery.
2	Individual Office	Vitrified flooring (600x1200)-Grigio Neve, Nitco make or equivalent	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1. Techzone ceiling dunemax microlook edge tile (600x1200x20mm) 20mm thk with. 15mm suprafine exposed grid system, NRC 0.70 2.Gypsum ceiling in Periphery.
3	Student's interaction space	Vitrified tile flooring (800x800mm)-Marfil crème, Nitco make or equivalent	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make, Gypsum board in periphery.
4	Meeting Room(First floor)	Vitrified flooring (600x1200) – Michigan bronze, Nitco make or equivalent.	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) 2. Acoustical Wall Paneling- optra, Armstrong or equivalent of size- 600X600 (25%) and 600X1200 (75%) -on 2 sides of room , Panel at a height of 900mm from ffl.till 2100mm.	Free standing Columns/ walls-Acrylic emulsion paint	1. Techzone ceiling dunemax microlook edge tile (600x1200x20m m) 20mm thk with. 15mm suprafine exposed grid system, NRC 0.70 2.Gypsum ceiling in periphery.
5	Council/Conf. Room (Third floor)	Vitrified flooring (600x1200) – Michigan bronze, Nitco make or	11.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and	Free standing Columns-	1. Techzone ceiling dunemax microlook edge

		equivalent.	white cement- based putty) 2.Acoustical Wall Paneling-optra, Armstrong or equivalent of size-600X600 (25%) and 600X1200 (75%) -on 2 sides of room , Panel at a height of 900mm from ffl till 2100mm.	Acrylic emulsion paint	tile (600x1200x20mm) 20mm thk with. 15mm suprafine exposed grid system, NRC 0.70 2. Gypsum ceiling in periphery.
6	QIP Room (Cap.50 Students) (Third Floor)	Vitrified flooring (600x1200) – Michigan bronze, Nitco make or equivalent.	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) 2.Acoustical Wall Paneling-optra, Armstrong or equivalent of size-600X600 (25%) and 600X1200 (75%) -on 3 sides of room , Panel at a height of 900mm from ffl.and end point at 2100mm	Free standing Columns-Acrylic emulsion paint	1. Techzone ceiling dunemax microlook edge tile (600x1200x20mm) 20mm thk with. 15mm suprafine exposed grid system, NRC 0.70 2. Gypsum ceiling in periphery.
7	Student's waiting area (Third Floor)	Vitrified tile (600x600mm)-Vega Silver, Nitco make or equivalent.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent, 2. Gypsum board in periphery.
8	Video Conference room (Fourth Floor)	Vitrified flooring (600x1200) – Michigan bronze, Nitco make or equivalent.	. Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) . Acoustical Wall Paneling-optra, Armstrong or equivalent of size- 600X600 (25%) and 600X1200 (75%) -on 3 sides of room , Panel at a height of 900mm from ffl till 2100mm.	Free standing Columns-Acrylic emulsion paint	1. Microlook and vector (wooden grid ceiling)(600x600x18 mm) 2. Gypsum ceiling in periphery.
9	Meeting Room - 20Cap.(Fifth floor)	Vitrified flooring (600x1200) – Michigan bronze, Nitco make or equivalent.	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) 2.Acoustical Wall Paneling-optra, Armstrong or equivalent of size-600X600 (25%) and 600X1200 (75%) -on 2 sides of room , Panel at a height of 900mm from ffl till 2100mm.	Free standing Columns-Acrylic emulsion paint	1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent, 2.Gypsum board in periphery.

10	Meeting Room - 15Cap.(Fifth floor)	Vitrified flooring (600x1200) – Michigan bronze, Nitco make or equivalent.	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) 2.Acoustical Wall Paneling-optra, Armstrong or equivalent of size-600X600 (25%) and 600X1200 (75%) -on 3 sides of room , Panel at a height of 900mm from ffl till 2100mm.	Free standing Columns-Acrylic emulsion paint	Techzone ceiling dunemax ml (600x1200x20mm) metal lay-in tile, NRC 0.70 along 2. Gypsum ceiling in periphery.
11	Board Room -50-70 cap.(Fifth floor)	Vitrified flooring (600x1200)– Michigan bronze, Nitco make or equivalent.	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) 2.Acoustical Wall Paneling-optra, Armstrong or equivalent of size-600X600 (25%) and 600X1200 (75%) -on 2 sides of room , Panel at a height of 900mm from ffl till 2100mm.	Free standing Columns-Acrylic emulsion paint	1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent, 2.Gypsum board in periphery
12	Pre-function to board room	Vitrified tile (600x600mm)-Vega Silver, Nitco make or equivalent.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent, 2.Gypsum board in periphery
Director's Floor					
13	Director's Room	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1. Microlook and vector (wooden grid ceiling)(600x600x18 mm) 2. Gypsum ceiling in periphery.
14	Director's Toilet	Antiskid vitrified tile (600x600mm)- Breton stone moccasin, Nitco make or equivalent	1. Bottom: Granite cladding upto 1200mm from ffl. (Coffee brown) 2.Top: Textured paint over 12/ 15mm thick Cement Plaster 1:6 and white cement-based putty)	Free standing Columns-Acrylic emulsion paint	Metal clip-in ceiling (595x595mm) 2.5 mm dia holes with 16% open area square pitch.
15	Dy. Director's Room	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1. Microlook and vector (wooden grid ceiling)(600x600x18 mm) 2. Gypsum ceiling in periphery.

16	Dy. Director's Toilet	Antiskid vitrified tile (600x600mm)- Breton stone moccasin, Nitco make or equivalent	1. Bottom: Granite cladding upto 1200mm from ffl. 2.Top: Textured paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	Metal clip-in ceiling (595x595mm) 2.5 mm dia holes with 16% open area square pitch.
17	Secretariat area	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent, 2.Gypsum board in Periphery.
18	Waiting area	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1. Microlook and vector (wooden grid ceiling)(600x600x18 mm) 2. Gypsum ceiling in Periphery.
19	Conference Room - 50 Cap. (Fifth floor)	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	1. Microlook and vector (wooden grid ceiling)(600x600x18 mm) 2. Gypsum ceiling in periphery.
20	R&D Office space (open hall)	Vitrified tile flooring (800x800mm)-Marfil crème, Nitco make or equivalent	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Free standing Columns-Acrylic emulsion paint	. Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent, 2. Gypsum board in periphery.
	Common Entrance Areas				
21	Covered walkway area	Slate flooring	Exposed brick in patterns and Jaali		Exposed Concrete
22	Entrance -Double height	Granite flooring- Polished Chida white granite (20%) and Ruby Red granite (80%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Columns-Acrylic emulsion paint	1. G21 woodworks channeled size 192x2400x15mm, NRC 0.50 2.Gypsum Board in periphery.
23	Full height atrium including passage connecting core area	Granite flooring- Polished Chida white granite (20%) and Ruby Red granite (80%)	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Columns-Acrylic emulsion paint	Acrylic emulsion paint over 6mm thick Cement Plaster 1:3 and

		combination			white cement-based putty
	Core areas				
24	Core central lobby	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Columns- Acrylic emulsion paint	1.G21 woodworks channeled size 192x2400x15mm, NRC 0.50 2. Gypsum board in periphery.
25	Lift lobby	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Granite cladding upto 3 meter over Lift wall, Acrylic emulsion paint on rest portion		Open cell ceiling (150X150 MM) white color. 2. Distempering with 1st quality acrylic distemper (White shade of Asian Paints or equivalent) over 6mm thick Cement Plaster 1:3
26	Corridors around atrium	Vitrified tile (600x600mm)-Vega Silver, Nitco make or equivalent.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Columns- Acrylic emulsion paint	1. Open cell ceiling (150X150 MM) white color 2. Distempering with 1st quality acrylic distemper (White shade of Asian Paints or equivalent) over 6mm thick Cement Plaster 1:3
27	Corridors between Departments and Central core	Vitrified tile (600x600mm)-Vega Silver, Nitco make or equivalent.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Columns- Acrylic emulsion paint	1.G21 woodworks channeled size 192x2400x15mm, NRC 0.50 2.Gypsum board in periphery.
28	Core-Toilet (M/F)	Antiskid vitrified tile (600x600mm)- Breton stone moccasin, Nitco make or equivalent 2. Ceramic tile (300x300mm) in W.C. area -Cotto ocean BI Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 2400mm from ffl.- Crust Grigio venzo look, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Counter top: Polished Granite(Coffee brown)+150mm facia	Calcium silicate false ceiling 595x595mm tiles 15 mm thick tegular edged & Acrylic emulsion paint (White colour of Asian Paints or equivalent)
29	Core-Toilet (H)	Antiskid vitrified tile (600x600mm)- Breton stone moccasin, Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 2400mm from ffl.- Crust Cemento look, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Counter top: Polished Granite(Coffee brown)+150mm facia	Calcium silicate false ceiling 595x595mm tiles 15 mm thick tegular edged & Acrylic emulsion paint (White colour of Asian Paints or equivalent)

30	Core-Toilet : Corridor	Granite flooring- Polished Chida white granite (80%) and Ruby Red granite (20%) combination	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	--	Metal lay-in ceiling (595x595mm) without perforations.
31	Core-Drinking water	Antiskid vitrified tile (600x600mm)- Breton stone moccasin, Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 2400mm from ffl.- Crust Grigio venzo look, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Counter top: Polished Granite (Coffee brown)+15 0mm facia	Metal lay-in ceiling (595x595mm) without perforations.
32	Core-Store room	1.Ceramic tile (300x300mm) -Cotto ocean BI Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 1500mm from ffl.- Crust Grigio venzo look, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	--	Distempering with 1st quality acrylic distemper (White shade of Asian Paints or equivalent) over 6mm thick Cement Plaster 1:3
33	Core-Water-Cooler room	1.Ceramic tile (300x300mm) -Cotto ocean BI Nitco make or equivalent	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	--	Distempering with 1st quality acrylic distemper (White shade of Asian Paints or equivalent) over 6mm thick Cement Plaster 1:3
34	Core -AHU	Polished Kota Stone Primarily military green (only 10% variation in colour allowed)	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	--	Distempering with 1st quality acrylic distemper (White shade of Asian Paints or equivalent) over 6mm thick Cement Plaster 1:3
35	Core- Electrical room/Electrical panel room	Polished Kota Stone Primarily military green (only 10% variation in colour allowed)	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	--	Distempering with 1st quality acrylic distemper (White shade of Asian Paints or equivalent) over 6mm thick Cement Plaster 1:3
	Department areas				
36	Department-Toilet (M)	1. Antiskid vitrified tile (600x600mm) –Breton stone moccasin, Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 2400mm from ffl.-Crust cement, Nitco make or equivalent	Counter top: Polished Granite+15	Calcium silicate false ceiling 595x595mm tiles 15 mm thick tegular

		2. Ceramic tile (300 x300mm) in W.C. area. – Cotto ocean BI, Nitco make or equivalent	2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	0mm facia- Coffee brown	edged & Acrylic emulsion paint (White colour of Asian Paints or equivalent)
37	Department-Toilet (F)	1. Antiskid vitrified tile (600x600mm) –Breton stone moccasin, Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 2400mm from ffl.-Crust cement, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Counter top: Polished Granite+150mm facia- Coffee brown	Calcium silicate false ceiling 595x595mm tiles 15 mm thick tegular edged & Acrylic emulsion paint (White colour of Asian Paints or equivalent)
38	Department-Pantry	1. Antiskid vitrified tile (600x600mm) –Breton stone moccasin, Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 2400mm from ffl.-Crust cement, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Counter top: Polished Granite+150mm facia- Coffee brown	Calcium silicate false ceiling 595x595mm tiles 15 mm thick tegular edged & Acrylic emulsion paint (White colour of Asian Paints or equivalent)
39	Department-Toilet/pantry : Corridor	Vitrified tile (600x600mm)-Vega Silver, Nitco make or equivalent.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)		Metal lay-in ceiling (595x595mm) without perforations.
40	Department- Water-Cooler room	1.Ceramic tile (300x300mm)-Cotto ocean BI, Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 1500mm from ffl.- Crust Grigio venzo look, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)		Acrylic emulsion paint over 6mm thick Cement Plaster 1:3 and white cement-based putty)
41	Department-Drinking water	Antiskid vitrified tile (600x600mm)- Breton stone moccasin, Nitco make or equivalent	1. Bottom: Ceramic wall tile (450x300) upto 1500mm from ffl.- Crust Grigio venzo look, Nitco make or equivalent 2.Top: Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	Counter top: Polished Granite+150mm facia- Coffee brown	Metal lay-in ceiling (595x595mm) without perforations.
42	Department-Corridor	Vitrified tile (600x600mm)-Vega Silver, Nitco make or equivalent.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)		1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent 2. Gypsum

					Ceiling in periphery.
43	Department-Waiting lounge	Vitrified tile (600x600mm)-Vega Silver, Nitco make or equivalent.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty		1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent, 2. Gypsum board in periphery.
Common facility					
44	Record room	Polished Kota Stone Primarily military green (only 10% variation in colour allowed)	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) 2.Glass bricks	--	1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent 2. Gypsum Ceiling in periphery.
45	Store Room/Hub Room/Server room	Polished Kota Stone Primarily military green (only 10% variation in colour allowed)	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	--	1.Grid ceiling Optra microlook (600x600x15mm), NRC 0.90 Armstrong make or equivalent 2. Gypsum Ceiling in periphery.
Staircase & Balcony					
46	Internal Staircase	Tread, landing and floor: Polished Granite (Ruby Red), Riser: Polished granite (Chida white)	1.Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty)	--	Acrylic emulsion paint over 6mm thick Cement Plaster 1:3 and white cement-based putty)
Chamfered edge for tread nosing					
Railing shall be SS AISI-304 grade, Outer SS railing shall be floor mounted with round bars connecting balusters as specs.					
Inner SS railing around well shall be side mounted with round bars connecting balusters as specs.					
Lift					
	13 passenger and 20 passenger lift	Polished Granite (Chida white with ruby red borders)			
47	External Staircase	Tread, landing and floor: Kota stone (only 10% variation in colour allowed) Riser: Kota stone(only 10% variation in colour allowed)	Wall: Exposed Concrete		Waist slab: Exposed Concrete
Chamfered edge for tread nosing					
Railing shall be SS AISI-316 grade, Outer SS railing shall be side mounted with toughened glass connecting balusters as specs.					
Inner SS railing around well shall be side mounted with round bars connecting balusters as specs.					
48	Balcony	Flooring, Skirting & Parapet top: Kota stone.	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white	Exterior textured paint over	Exposed Concrete ceiling

			cement- based putty)	columns	
	Exterior finish				
49	External Wall finish	Textured paint- Two types: a) Ceragranite from Acro paints or equivalent b)granitetone from Acro paints or equivalent			
		Terra-cotta tile cladding			
		Terra-cotta louvres			
		Jaali bricks			
		Exposed brick in patterns and Jaali			
		Exposed concrete (in ceiling and walls) wall over staircase block			
	Parapet wall- Interior portion	Acrylic emulsion paint over 18 mm thick Cement Plaster 1:6 and white cement- based putty)			
	Bottom protection	600mm high granite band all over the periphery for stain protection			
	Interior finish				
	Interior Finish	Acrylic emulsion paint over 12/ 15mm thick Cement Plaster 1:6 and white cement- based putty) with each floor with one white shade and 1 different shade on one wall in all rooms			

GUARANTEE BOND TO BE EXECUTED BY CONTRACTORS FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS

The Agreement made this day of two thousand and between son of of (hereinafter called the Guarantor of the one part) and the BOARD OF GOVERNORS (hereinafter called Government of the other part). WHEREAS this agreement is supplementary to a contract (hereinafter called the Contract) dated..... and made between the GUARANTOR of the one part and the Government of the other part, whereby the Contractor, inter alia, undertook to render the buildings and structures in the said contract recited completely water and leak-proof.

AND WHEREAS GUARANTOR agreed to give a guarantee to the effect that the said structures will remain water and leak-proof for five years from the date of giving of water proofing treatment. NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak-proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date after the maintenance period prescribed in the contract. Provided that the guarantor will not be responsible for leakage caused by earthquake or structural defects or misuse of roof or alteration and for such purpose:

- (a) Misuse of roof shall mean any operation which will damage proofing treatment, like chopping of firewood and things of the same nature which might cause damage to the roof;
- (b) Alteration shall mean construction of an additional storey or a part of the roof or Construction adjoining to existing roof whereby proofing treatment is removed in parts;
- (c) The decision of the Engineer-in-Charge with regard to cause of leakage shall be final. During this period of guarantee the guarantor shall make good all defects and in case of any defect being found, render the building water-proof to the satisfaction of the Engineer-in-Charge at his cost, and shall commence the work for such rectification within seven days from the date of issue of the notice from the Engineer-in-Charge calling 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 GUARANTOR fails to execute the water proofing or commits breach there under then the GUARANTOR will indemnify the Principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by him by reason of any default on the part of the GUARANTOR in performance and observance of this supplementary agreement. As to the amount of loss and/or damage and/or cost incurred by the Government the decision of the Engineer-in-Charge will be final and binding on the parties.

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

Signed, sealed and delivered by OBLIGOR in the presence of—

- 1.
- 2.

Signed for and on behalf of BOARD OF GOVERNORS by In the presence of—

- 1.
- 2.

PERFORMA: G2

GUARANTEE BOND FOR ANTITERMITE TREATMENT

(For Guarantee to be executed by contractors for removal of defects of anti-termite treatment works after maintenance period)

This agreement made this _____ day of _____ two thousand _____ between _____ M/s. _____ (hereinafter called "the Guarantor of the one part) and the BOARD OF GOVERNORS (hereinafter called "the Government"of the other part.)

Whereas this agreement is supplementary to the contract (hereinafter called "the Contract") dated _____ made between the Guarantor of the one part and Government of the other part, whereby the Contractor, inter-alia, undertook to render the buildings and structure in the said contract recited, completely termite proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said structure will remain termite proof for Five years to be reckoned from the date after the maintenance period prescribed in the contract expires.

NOW THE GUARANTOR hereby guarantees that the anti-termite treatment provided by him will render the structures completely termite proof and the minimum life of such anti-termite treatment shall be ten years to be reckoned from the date of after the maintenance period prescribed in the contract expires.

Provided that the Guarantor will not be responsible for damages caused due to structural defects or misuse of premises/area.

a) Misuse of premises shall mean any operation which will disturb the chemical barrier like excavation under floors, breaking of walls at G.L. disturbing the treatment already carried out.

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

During this period of guarantee the guarantor shall make all the arrangements to do the post constructional anti-termite treatment in all the buildings in case of any termite nuisance being found in the building, to the satisfaction of the Engineer-in-Charge at the cost of guarantor and shall commence the work for such treatment within seven days from the date of calling upon him to rectify the defects, by the Engineer-in-Charge, 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 anti-termite treatment or commits breaches hereunder then the Guarantor will indemnify the principal and his successors against all loss, damage, cost, expense or otherwise which may be incurred by the Department by reason of any default on the part of the GUARANTOR in performance and observance of this supplemental agreement. As to the amount of loss and/or damage and/or cost incurred by the Government, the decision of the Engineer-in-Charge will be final and binding on the parties.

IN WITNESS WHEREOF these presents have been executed by the Obligor _____ and by _____ and for and on behalf of the BOARD OF GOVERNORS on the day, month and year first above written.

SIGNED, sealed and delivered by OBLIGOR in the presence of

- : 1.
- 2.

SIGNED FOR AND ON BEHALF OF THE BOARD OF GOVERNORS BY

.....i n the presence of:

- 1.
- 2.

PERFORMA: G3

TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF ALUMINIUM WORK, WINDOWS VENTILATORS, STRUCTURAL GLAZING & STRUCTURAL STEEL WORKS

The agreement made this _____ day of _____ Two Thousand and _____ between _____ son of _____ (hereinafter called the GURANTOR of the one part) and the BOARD OF GOVERNORS (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 work in the said contract recited structurally stable, leak proof and sound material, workmanship, anodizing, colouring, sealing.

AND WHEREAS THE GURANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable, leak proof and guaranteed against faulty material and workmanship, defective anodizing, colouring, sealing and finishing for 5 (Five) years to be reckoned from the date after the expiry of maintenance period prescribed in the contract.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable, leak proof and guaranteed against faulty material and workmanship, defective anodizing, colouring, sealing and finishing for two 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 defects shall be final.

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

That if the guarantor fails to make good all the defects 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 BOARD OF GOVERNORS on the day, month and year first above written.

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

- 1. _____
- 2. _____

SIGNED FOR AND ON BEHALF OF THE BOARD OF GOVERNORS BY _____ in the presence of:

- 1. _____
- 2. _____

PERFORMA: G4

TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER SUPPLY AND SANITARY INSTALLATIONS

The agreement made this _____ day of _____ Two Thousand and _____ between _____ son of _____ (hereinafter called the GUARANTOR of the one part) and the BOARD OF GOVERNORS (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 work in the said contract recited structurally stable workmanship, finishing and use of sound materials.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said work will remain structurally stable and guaranteed against faulty workmanship, finishing, manufacturing defects of materials and leakages, etc.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable after expiry of maintenance period prescribed in the contract for the minimum life of 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.

During this period of guarantee, the guarantor shall make good all defects 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 make good all the defects commits breach thereunder, 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 BOARD OF GOVERNORS on the day, month and year first above written.

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

1. _____ 2. _____

SIGNED FOR AND ON BEHALF OF THE BOARD OF GOVERNORS BY _____ in the presence of:

1. _____ 2. _____

PERFORMA: G5

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF FIRE CHECK DOORS ASSEMBLY

The agreement made this..... day of (Two Thousand _____ only) betweenS/o (hereinafter called the GUARANTOR of the one part) and the BOARD OF GOVERNORS (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 work under said contract structurally stable to fulfill its intended purpose, sound, free from workmanship defects and use of only specified, certified material only.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the affect that the said work will remain structurally stable to fulfill its intended purpose, sound, and guarantee against faulty workmanship, material and finishing.

NOW THE GUARANTOR hereby guarantee that work executed by him will remain structurally stable, sound and fulfill its intended purpose for the minimum life of Five years to be reckoned from the date of completion of work.

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 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 rectify the defects and 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

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

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

- 1.
- 2.

SIGNED FOR AND BEHALF OF THE BOARD OF GOVERNORS BY in the presence of :-

- 1.
- 2.

Form of Performance Security (Guarantee)

Bank Guarantee Bond

In consideration of the Board of Governors (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between.....and (hereinafter called "the said Contractor(s)") for the work..... (hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs. (Rupees only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

- 1. We, (hereinafter referred to as "the Bank") hereby undertake to pay to the Government an amount not exceeding Rs. (Rupees..... Only) on demand by the Government.*
- 2. We,(indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupeesonly)*
- 3. We, the said bank further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.*
- 4. We, (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in- Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.*
- 5. We, (indicate the name of the Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) 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(s) 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(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) 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. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).*

7. *We, (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing.*
8. *This guarantee shall be valid up tounless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. (Rupees) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee all our liabilities under this guarantee shall stand discharged.*

Dated theday offor(indicate the name of the Bank)

*Form of Earnest Money Deposit
Bank Guarantee Bond*

WHEREAS, contractor..... (Name of contractor) (hereinafter called "the contractor") has submitted his tender dated (date) for the construction of (name of work) (hereinafter called "the Tender")

KNOW ALL PEOPLE by these presents that we (name of bank) having our registered office at (hereinafter called "the Bank") are bound unto (Name and division of Executive Engineer**) (hereinafter called "the Engineer-in-Charge**") in the sum of Rs. (Rs. in words) for which payment well and truly to be made to the said Engineer-in-Charge the Bank binds itself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this day of 20... . THE CONDITIONS of this obligation are:

- (1) If after tender opening the Contractor withdraws, his tender during the period of validity of tender (including extended validity of tender) specified in the Form of Tender;
- (2) If the contractor having been notified of the acceptance of his tender by the Engineer-in-Charge:
 - (a) Fails or refuses to execute the Form of Agreement in accordance with the Instructions to contractor, if required;

OR

- (b) Fails or refuses to furnish the Performance Guarantee, in accordance with the provisions of tender document and Instructions to contractor,

We undertake to pay to the Engineer-in-Charge either up to the above amount or part thereof upon receipt of his first written demand, without the Engineer-in-Charge having to substantiate his demand, provided that in his demand the Engineer-in-Charge will note that the amount claimed by him is due to him owing to the occurrence of one or any of the above conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date* after the deadline for submission of tender as such deadline is stated in the Instructions to contractor or as it may be extended by the Engineer-in-Charge, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

DATE

SIGNATURE OF THE BANK

WITNESS

SEAL

(SIGNATURE, NAME AND ADDRESS)

*Date to be worked out on the basis of validity period of 4 months from last date of receipt of tender.

** - Note The Bank Guarantee shall be in favour of the "Director, IIT Kanpur".

