TENDER DOCUMENT

Name Of Work*:* Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur.

NIT No: -44/Composite/D3/2024-25

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 and 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 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 respects 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 11/03/2025 at 11:00 AM as detailed in this document
Note-7	The construction work is to be carried out at IIT Kanpur campus.

Name of work:- Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur.

This NIT amounting to Rs. 32,29,02,306/- contains 190 pages numbered from 01 to 190.

Executive Engineer (C) **Executive Engineer (E)**

Superintending Engineer

INDIAN INSTITUTE OF TECHNOLOGY KANPUR
INSTITUTE WORKS DEPARTMENT
CENTRAL OFFICE
Notice Inviting e-Tender - 44/Composite/D3/2024-25

The Superintending Engineer, IWD, IIT Kanpur on behalf of the Board of Governors of IIT Kanpur invites online percentage rate open bids from eligible firms/contractors of repute in two bid system (Eligibility cum Technical & Financial Bids) for the following work:

Sl No.	Name of Work	Estimated Cost	Earnest money	Period of completion
1	Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur.	Rs. 32,29,02,306/- i/c Civil works: Rs. 27,50,38,596/- Electrical & Lift works: Rs. 4,78,63,710/-	Rs. 42,29,023/-	20 Months

Last date & time of submission of bid on 24.03.2025 upto 5.00 PM. All details are available on website, https://eprocure.gov.in/eprocure/app & www.iitk.ac.in/iwd/tenderhall.htm. The bids can only be submitted online at https://eprocure.gov.in/eprocure/app. Any corrigendum regarding this tender will be published only on above mentioned websites.

No. IWD/CO/2024-25/ 74 Dated: 03.03.2025

Superintending Engineer
Phone No. 0512-259-7604

Section-A

Technical BID

(Eligibility Bid)

Name of work: Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur

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

INDIAN INSTITUTE OF TECHNOLOGY,
KANPUR INSTITUTE WORKS DEPARTMENT
Notice Inviting e-Tender

The Superintending Engineer, IWD, IIT Kanpur on behalf of Board of Governors of IIT Kanpur invites online percentage rate bids form eligible firms/contractors of repute in two bid system (Eligibility cum Technical & Financial Bids) for the following work:

1	Name of organization	:	Indian Institute of Technology, Kanpur
2	NIT No.	:	44/Composite/D3/2024-25
3	Location	:	Indian Institute of Technology, Kanpur
4	Tender / Quotation type (open / limited /EOI / Auction / Single	:	Open
5	Tender / Quotation category (services / works	:	Works
6	Type of Contract (work / supply / auction/ service / buy / empanelment / sell	:	Works
7	Form of contract (CPWD-7/8)	:	CPWD-7
8	Work Category (civil / electrical / fleet / management / computer system	:	Composite (Civil & E&M works)
9	Is multi-currency allowed?	:	No
10	Date of publishing / issue / start	:	As per CPP portal
11	Document download start date	:	As per CPP portal
12	Document download end date	:	As per CPP portal
13	Date & time of pre-bid meeting	:	**11.00 AM on 11/03/2025**
14	Venue of pre-bid meeting	:	**Office of SE, IWD, IIT Kanpur**
15	Last date & time of uploading of bids	:	As per CPP portal
16	Date & time of opening of Technical bids	:	As per CPP portal
17	Bid Validity Days	:	90 days after opening of technicalbid
18	Earnest Money Deposit (EMD)	:	**Rs. 42,29,023/-**
19	No. of Bids / Covers (1 / 2 / 3 / 4)	:	2
20	Address for communication	:	Office of Superintending Engineer, IWD, IIT Kanpur-208016 Contact no. 0512-259-7604
21	Email address	:	seiwd@iitk.ac.in

1. **The bidder should carefully read the milestones (Appendix- II) and conditions.**
2. Contractors who fulfill the following requirements shall be eligible to apply. **Joint ventures and Special Purpose Vehicles are not allowed to participate** .
3. Should have satisfactorily completed the works as mentioned below during the last seven years ending the **previous day of the last date of submission of tenders.**

(i)	Three similar works each costing not less than Rs. **1292 lacs**
	OR
(ii)	Two similar works each costing not less than Rs. **1937 lacs**
	OR
(iii)	One similar work costing not less than Rs. **2583 lacs**

AND

One completed work costing not less than Rs. 1292 lacs with some Central government department/ state government department/ Central autonomous body/ Central public sector undertaking.

Similar work shall mean works of **"Construction of building in RCC framed structure having minimum one building of 8 storied or completing balance construction work of one building (including structural work) minimum up to eight storey including Internal water supply, Sanitary installation, Drainage and Internal electrical installations all executed under single agreement. The eight storied building should have a firefighting system & Fire alarm system or lift 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 storey. Mumty and machine room will not be counted as storey for this purpose.
2. One building of the specified storeys, as mentioned in the definition of similar work constructed in each work of the financial magnitude as specified above.

(a) Complete set of TDS certificate (form 16A) shall be uploaded in case the similar work is executed for a private body, which shall form basis for establishing the completion cost of work executed.
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.
In private works shown in support of eligibility, certified copy of the tax deducted at source TDS certificate (form 16 A and 26 A) shall be submitted along with the experience certificate and the TDS amount shall tally with the actual amount of work done. Otherwise, the amount that tally with TDS shall only be considered for eligibility.

(b) Should have had average annual financial turnover of Rs. **969 lacs** on construction works during the last three years ending 31st March 2024.

(c) The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during the last five consecutive years balance sheets (standalone financial statement), duly certified and audited by the chartered accountant, ending **31st March 2024**

(d) Should have net worth certificate of minimum Rs. **1292 lacs** issued by a certified Chartered Accountant.

(e) Should have a solvency of Rs. **1292 lacs.**

(f) Should have the calculated bidding capacity equal to or more than the estimated cost of the work.

(g) 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 Executive Engineer 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

6. Applicant has to deposit earnest money of **Rs. 42,29,023/-** 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 the Director IIT Kanpur) along with tender document.**

7. **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 "The 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 in envelop mentioning "EMD for the work" on or before 27.03.2025 up to 3.30 PM.**

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 https://eprocure.gov.in/eprocure/app.

within the period of bid submission. **However, hard 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 all bidders on or before 27.03.2025 up to 3.30, physically in the office of tender opening authority.**

Online technical bid documents submitted by intending bidders shall be opened only of those bidders whose duly signed and stamped Integrity Pact and 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.

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

9. On opening date, the contractor can login and see the bid opening process. After opening of bids, he will receive the competitor bid sheets.

10. Contractor can upload documents in the form of **JPG** format and **PDF** format.

11. **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 or for the period as specified in the bid document and further details if required may be asked from the contractor after opening of technical bids 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.

12. **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.**

13. 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.

14. **Pre-Bid Meeting** shall be held either in the office of Superintending Engineer IWD, IIT Kanpur **at 11.00 AM on 11-03-2025** to clear the doubt of intending bidders/ associates , if any. For physical attendance in pre bid meeting only one representative of firm shall be allowed to maintain the physical distance. Bidders are advised to send their quarries/ doubts by email to the Superintending Engineer on email id seiwd@iitk.ac.in at least one day prior to the pre-bid meeting. A bidder can send multiple mails with different quarries/doubts in each mail. The bidder may also raise query on the date of pre-bid 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.

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

16. 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.

17. **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.**

18. 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.

19. Online technical bid documents submitted by intending bidders shall be opened only of those bidders who have deposited Earnest Moneyand duly signed Intrigity pact with date and seal.

20. 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.

21. The bid submitted shall become invalid if:

(i) The bidder is found ineligible.

(ii) The bidder does not deposit original EMD to the office of the Superintending Engineer, IWD IIT Kanpur.

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

(iv) If a bidder quotes nil rates against each item in scheduled of quote of tender or does not quote any rate in any section/sub head in rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

20. 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.

21. Intending Bidders are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the ground and sub- soil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A bidders shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a 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.

22. 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.

23. The contractor shall not be permitted to bid for works in the IWD in which his near relative is posted as a Divisional Accountant or as an officer in any capacity between the grades of Superintending Engineer and Junior Engineer (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any officer in the Institute Works Department IIT Kanpur.

24. 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.

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 & 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 (scan copy of the EMD is to be uploaded and original copy of EMD shall be deposited to the office of SE, IWD before the last date & time of opening of technical bid as specified in the bid document)
2	**The scanned copy of duly signed Integrity Pact with date and seal**
3	Letter of transmittal
4	Certificate of Financial Turnover for the last five years from a Charted Accountant **(Form 'A')**.
5	Bank Solvency Certificate from a Scheduled Bank **(Form 'B')**.
6	Net worth certificate of minimum **1292 lacs** issued by a certified Chartered Accountant. **(Form 'B1')**.
7	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')**
8	Details of Projects under execution **(Form 'C-1')** .
9	Performance report of works referred to in Form 'C' **(Form 'D').**
10	Performance report of works referred to in Form 'C-1' **(Form 'D1').**
11	Structure of Organisation (**Form 'E')**.
12	Details of works in progress or works awarded as on the last date of submission of tenders **(Form 'F')**.
13	Affidavit as per provision of CPWD-6 **(Form 'G')**.
14	GST Registration Certificate of the State in which the work is to be taken up, if already obtained by the bidder. If the bidder has not obtained GST registration in the State in which the work is to be taken up, Or as required by GST authorities then in such a case bidder shall furnish undertaking as given in **Form- 'H'**
15	Declaration about site inspection **(Form 'J')**
16	Permanent Account Number (PAN) as issued by the Income Tax Department
17	Copy of Registration of the concern department.
18	Copy of EPF & ESIC registration.

Superintending Engineer

SECTION- I

BRIEF PARTICULARS OF THE WORK

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

Sl. No	Name of work	Estimated Cost	Period of completion
1	Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur	**Civil works:** Rs.:27,50,38,596/- **Electrical and lift works:** Rs. 4,78,63,710/-	**20 months**
	Total	Rs. 32,29,02,306/-	

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 covers construction of Ground floor (stilt) + 10 floors RCC framed structure, which has total 80 flats.

The building consists of electrical panels, DBs, raceways, conduits, wirings, lifts and fire-fighting system.

Above details and status are only indicative but not exhaustive. The intending bidder shall inspect the site and fully acquaint with nature of work and site condition and assess/ satisfy himself before quoting and submission of his bid. He is also advised to inspect the indicative drawings attached with this tender document to acquaint with other details about the building.

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

Civil Works:

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:

- Liasioning and obtaining approval from Local Authorities prior & post installation for operation of equipment's (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, 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.

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 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.

E& M Works:

i) The scope of Electrical, Mechanical Services & Lifts have been provided in Part 'C' of NIT documents.

ii) Work shall be executed according to General Conditions of Contract 2023 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 available on website www.cpwd.gov.in. THE GCC 2023 with its upto date amendments shall be the part of the Contract Agreement

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 Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur.**

1.2 It is a very prestigious and 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 Overwriting 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, IIT Kanpur, 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 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 must 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 himself collect all information that he considers necessary for proper assessment of the prospective assignment.

7.0 Initial criteria for eligibility

7.1 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. 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.

(i) Three similar works each costing not less than Rs**. 1292 lacs**

OR

(ii) Two similar works each costing not less than Rs. **1937 lacs**

OR

(iii) One similar work costing not less than Rs. **2583 lacs**

AND

One completed work costing not less than Rs. 1292 lacs with some Central government department/ state government department/ Central autonomous body/ Central public sector undertaking.

Similar work shall mean works of "Construction of building in RCC framed structure having minimum one building of 8 storied or completing balance construction work of one building (including structural work) minimum up to eight storey including Internal water supply, Sanitary installation, Drainage and Internal electrical installations all executed under single agreement. The eight storied building should have a firefighting system & Fire alarm system or lift 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. Mumty and machine room will not be counted as storey for this purpose.

2. One building of the specified storeys, as mentioned in the definition of similar work constructed in each work of the financial magnitude as specified above.

   Complete set of TDS certificate (form 16A) shall be uploaded in case the similar work is executed for a private body, which shall form basis for establishing the completion cost of work executed.

   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.

   In private works shown in support of eligibility, certified copy of the tax deducted at source TDS certificate (form 16 A and 26 A) shall be submitted along with the experience certificate and the TDS amount shall tally with the actual amount of work done. Otherwise, the amount that tally with TDS shall only be considered for eligibility

7.2 The bidder should have had average annual financial turn over(gross) of Rs**. 969 lacs** on construction work (Civil/Electrical) during the last three consecutive years **balance sheets duly audited by Charted Accountant.** Year in which no turnover is shown would also be considered for working out the average.

7.3 Should have net-worth certificate of minimum **Rs. 1292 lacs** issued by a certified Chartered Accountant.

7.4 The bidder should have a solvency of Rs. **1292 lacs** certified by his Bankers

7.5 Should have the calculated bidding capacity equal to or more than the estimated cost of the work and shall provide the data required in soft copy for calculating the bidding capacity.

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.

7.6 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**.

8.0 Evaluation criteria

8.1 The detailed 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 on the basis of inspection of ongoing and completed work carried out by the scrutiny committee duly constituted the Director, IIT Kanpur.

(a)	Financial strength **(Form 'A' , 'B' & 'B1')**	Maximum 20 marks
(b)	Experience in eligible similar nature of work during last **seven** years **(Form 'C' & 'C1')**	Maximum 20 marks
(c)	Performance on works **(Form 'D') – Time over run**	Maximum 20 marks
(d)	Performance on works **(Form 'D" &'D-1') – 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- The average value of performance of works for time over run and quality for completed works shall be taken on the basis of performance report and on the basis of inspection of ongoing and completed work carried out by the scrutiny committee duly constituted by the Director, IIT Kanpur of the eligible similar works.

9.0 Evaluation of performance

Evaluation of the performance of contractors for the eligibility shall be done by the scrutiny committee. All the eligible Similar Works executed and submitted by the bidders may be got inspected by the committee. The marks for the quality shall be given based on this inspection, if inspection is carried out. Scoring method of evaluation: The scoring for evaluation mentioned in these columns shall be done as given in Annexure-1.

10.0 Financial information

Bidder should furnish the following financial information:
Annual financial statement for the last five year in (**Form "A")** and solvency certificate in (**Form "B")** and networth certificate in **(Form- B1)**

11.0 Experience in works highlighting experience in similar works

Bidder should furnish the following:

(a) List of eligible similar nature of work successfully completed during the last seven years in (**Form "C**") and ongoing works as well in (**Form-C-1**).

(b) Performance report of works referred in form "C" (In **Form "D**") signed by officer not below the rank of Executive Engineer /Project Manager or equivalent. 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 firefighting 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).

12.0 Organization information

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

13.0 Letter of transmittal

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

14.0 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. The bid shall remain valid for **90 days from the date of opening of Technical (eligibility) bid.**

15.0 Award criteria

15.1 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.

15. 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. Canvassingof ny kind is prohibited.

SECTION- III

INFORMATION REGARDING ELIGIBILITY LETTER OF TRANSMITTAL

The Superintending Engineer
IWD, IIT Kanpur
Kanpur.

Subject: Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works 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 I** and accompanying statement are true and correct.

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

3. I/we submit the requisite certified 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:

5.

Sl. No.	***Name of work***	***Certificate from***
1		
2		
3		

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

Enclosures:

Date of submission: Seal of bidder

Signature(s) of Bidder(s).

FORM 'A'

FINANCIAL INFORMATION

Financial Analysis – Details to be furnished duly supported by figures in balance sheet/ profit & loss 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

Year	2019-20	2020-21	2021-22	2022-23	2023-24
Gross Annual turnover on construction works					
Profit (Afer 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 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

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) Banker's 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 CERTIFICTE 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 01.04.2024 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 **01.04.2024."**

Signature of Chartered Accountant

……

Name of Chartered Accountant

……

Membership No. ICAI

Date and Seal

FORM 'C'

DETAILS OF ELIGIBLE NIT 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	Date of commenc ement as per contract	Stipulated date of completion	Actual date of completio n	Litigation/ arbitration cases pending /in progress with details*	Name and address /telephone number of officer	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

(Works with estimated cost put to tender more than Rs. 20.00 Crore)

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 officers 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)

FORM 'D'

PERFORMANCE REPORT OF WORKS REFERRED TO IN FORMS "C"

1.	Name of work/project & location	
2.	Agreement no.	
3.	Estimated cost	
4.	(i) Tendered cost	
(ii) Value of work done		
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	
(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 Behaviour	Outstanding/Very Good/Good/Poor

Dated: **Executive Engineer or Equivalent**

Note: ***If Name of Work is not clearly defining scope of work as specified in the definition of similar work, bidders are advised to upload copy of Agreement/ final bill or any other relevant document in support of their proposed completed work conforming to the definition of similar work.***

FORM 'D-1'

Assessment of Quality for Completed as well as Ongoing Works

Name of work :
Date of Inspection :
Date of submission of report :

A.	**General observations & Operational Aspects**	**Yes/No**
1.	Availability of approval from local bodies in case of Construction of Private Buildings.	
2.	Availability of approved structural drawings.	
3.	Observation on seepage/leakage in the building.	
4.	Whether Line & level maintained.	
5.	In case of basement, observation on seepage, if any.	
6.	Any Structural defects/ distress observed, if yes give details.	
7.	Whether safety measures adopted at site as per CPWD safety code of Govt. guidelines are adequate or not.	
8.	Whether the welfare facilities provided to labour as per Clause- 19H of GCC for CPWD works / and or Govt. guidelines are adequate or not	
9.	Whether AHU getting automatically switched off and fire damps closed in case of fire signal	
10.	Whether thimbles used for termination of wires in DBs, EBDs and panels	
B.	**Quality of work**	**Marks Assessed**
1.	Quality of plaster / finishing	
2.	Quality of RCC / CC work	
3.	Quality of Flooring	
4.	Quality of Wood Work	
5.	Quality of Steel work / Aluminum Work	
6.	Quality of Plumbing and Sanitary Installation	
7.	Quality of Workmanship	
8.	Quality of Water Proofing	
9.	If cladding done, observation on efficiency / quality of cladding / brick work	
10.	Quality of internal electrification work	
11.	Quality of DBs, EBDs & Panels	
12.	Quality of E&M 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 assessed on each attribute mentioned at B above).

Note: -

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

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)

Organisation/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 PROJECTS UNDER EXECUTION OR AWARDED

Sl No.	Name of work/project and location	Owner of sponsoring organization	Cost of work in crore 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 to be made	Remarks
1	2	3	4	5	6	7	8	9	10

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)

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.100/- (Scanned copy of this notarized affidavit to be uploaded at the time of submission of bid)

Signature of Notary with seal

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

FORM "H"

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

lf 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 IWD, IIT Kanpur 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 Institute or GST department in this regard.

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

Signature of Notary with seal

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

FORM ` I'

Declaration about Site Inspection

(By Bidder)

To
The Executive Engineer,
IWD, IIT,
Kanpur

Subject: Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur**.**

Dear Sir/Madam,

It is hereby declared that as per terms and conditions of this tender document, **I/** We the bidder inspected and examined the subject site and its surrounding and satisfy myself / ourselves as to the nature of the ground and sub-soil (so far as is practicable), the forms and nature of the site./ ourselves before submitting the bid, the accommodation which may require and all necessary information as to risks, contingencies and other circumstances which may influence or affect our bid have been obtained. I/We the bidder shall have full knowledge of the site and no extra charge consequent upon any misunderstanding or otherwise shall be claimed in later date. I /We bidder shall be responsible for arranging and maintaining at own cost all materials,tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by me/us implies that I **/** We have read this notice and all other contract documents and has made myself /ourselves aware of the scope and specifications of the work to be done and local conditions and other factors having a bearing on the execution of the work.

Sincerely

(Duly authorized signatory of the Bidder)

ANNEXURE- 1

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

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.

Attributes	Sub attributes	Marks	Evaluation Criteria		
Financial Strength		20 marks	60% marks for minimum eligibility criteria. 100% marks for twice the minimum eligibility criteria or more Pro-rata basis between (i) & (ii)		
	Average Annual Turnover	16 Marks			
	Solvency Certificate	2 marks			
	Net worth Certificate	2 marks			
Experience in Similar Works	Experience in Similar Class of Works	20 Marks	60% marks for minimum eligibility criteria. 100% marks for twice the minimum eligibility criteria or more Pro-rata basis between (i) & (ii)		
Performance on Works	If TOR=	1	2	3	>3.5
	(i) Without levy of compensation	20	15	10	10
	(iii) With Levy of compensation	20	5	0	-5
	(iii) Levy of compensation not decided	20	10	0	0

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

SECTION-B

PART-A

FINANCIAL BID

CPWD-6 FOR e-Tendering

The Superintending Engineer, IWD IIT Kanpur invites on behalf of Board of Governors, online percentage rate bids from eligible firms/contractors of repute in two bid system (Eligibility cum Technical bid & Financial Bid) for the work of - Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur.

1. The work is estimated to cost **Rs. 32,29,02,306/-.** This estimate, however, is given merely as a rough guide.

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

Should have satisfactorily completed the works as mentioned below during the last seven years ending **previous day of last date of submission of tenders.**

(i) Three similar works each costing not less than Rs**. 1292 lacs**

OR

(ii) Two similar works each costing not less than Rs. **1937 lacs**

OR

(iii) One similar work costing not less than Rs. **2583 lacs**

AND

One completed work costing not less than Rs. 1292 lacs with some Central government department/ state government department/ Central autonomous body/ Central public sector undertaking.

Similar work shall mean works of **"Construction of building in RCC framed structure having minimum one building of eight storeys or completing balance construction work of one building (including structural work) minimum up to eight storey including Internal water supply, Sanitary installation, Drainage and Internal electrical installations all executed under single agreement". The eight storied building should have firefighting system or lift or Fire alarm system 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 stirey. Mumty and machine room will not be counted as storey for this purpose.
2. One building of the specified storeys, as mentioned in the definition of similar work constructed in each work of the financial magnitude as specified above.

a. Complete set of TDS certificate (form 16A) shall be uploaded in case the similar work is executed for a private body, which shall form basis for establishing the completion cost of work executed. 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.
In private works shown in support of eligibility, certified copy of the tax deducted at source TDS certificate (form 16 A and 26 A) shall be submitted along with the experience certificate and the TDS amount shall tally with the actual amount of work done. Otherwise, the amount that tally

with TDS shall only be considered for eligibility.

b) Should have had average annual financial turnover of Rs. **969 lacs** on construction works during the last three years ending 31st March, 2024.

c) The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during the last five consecutive years balance sheets (standalone financial statement), duly certified and audited by the chartered accountant, ending 31st March 2024

d) Shouls have net worth certificate of minimum Rs. **1292 lacs** issued by a certified Chartered Accountant.

e) Should have a solvency of Rs. **1292 lacs**

f) Should have the calculated bidding capacity equal to or more than the estimated cost of the work.

g) 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. 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 & https://eprocure.gov.in/eprocure/app, but the bids can only be submitted online through, https://eprocure.gov.in/eprocure/app. his rates including all applicable taxes but **excluding GST** as per various terms and conditions of the said modified form which will form part of the agreement.

3. The time allowed for carrying out the work will be **20 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. i) The site for the work is available.

ii) The architectural, structural & Electrical drawings are available. Further details if any shall be made available in phased manner as per requirement of the same as per approved programme of completion submitted by the contractor after award of work.

5. The bid document consisting of plans, specifications to be executed and the set of terms and conditions of the contract to be complied with and other necessary documents except Standard General Conditions of Contract Form can be seen on website www.iitk.ac.in/iwd/tenderhall.htm, https://eprocure.gov.in/eprocure/app free of cost but the bids can only be submitted online through, https://eprocure.gov.in/eprocure/app**.**

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 of one or more item(s) any number of times (he need not re-enter rate of all the items) but before last time and date of submission of bid as notified.

8. This bid is invited in two bid system.

9. a) Applicant has to deposit earnest money of Rs. 42,29,023**/- 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.**

i) **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 the Director, IIT Kanpur) shall be scanned and uploaded to the e-Tendering website within the period of bid submission.**

ii) **The original EMD shall be submitted in the hard copy to the office of the Superintending Engineer upto 3.30 PM on or before 27.03.2025.**

iii) **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 lacs, 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

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.

Online qualification bid documents submitted by intending bidders shall be opened only of those bidders who have deposited Earnest Money, processing fee & Intigrity pact.

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 technical (eligibility) bid submitted shall be **opened at 03:30 PM on 27.03.2025.**

whether he inspects it or not and no extra charge consequent on any misunderstanding or otherwise shall be allowed. The bidders shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a bid by a 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.

8. The competent authority on behalf of the Board of Governors, 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 bidders shall be summarily rejected.

9. 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.

10. The competent authority on behalf of Board of Governors, 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.

11. **The bid for the works shall remain open for acceptance for a period of Ninty (90) days from the date of opening of technical bid.** If any bidders withdraws his bid before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the bid which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the bidders shall not be allowed to participate in the rebidding process of the work.

12. 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 22 days from the stipulated date of start of the work, sign the contract** consisting of:-

(a) The Notice Inviting Bid, all the documents including additional conditions, specifications and drawings, if any, forming part of the bid as uploaded at the time of invitation of bid and the rates quoted online at the time of submission of bid and acceptance thereof together with any correspondence leading thereto.

(b) Standard C.P.W.D. Form 7 i/c upto date amendments and duly modified for Percentage rate contract work or other Standard C.P.W.D. Form as applicable.

13. For Composite Bids

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

18.1.2 The financial bid document will include the following components: **Volume-I**

Part A:- CPWD-6, **CPWD-7** including schedule A to F for the major component of the work, Standard General Conditions of Contract 2023 for PERCENTAGE RATE CONTRACT projects, as amended/modified up **to as specified in schedule F.**

Part B:- General / specific conditions, specifications applicable to major component of the work.

Part C:- Schedule A to F for minor component of the work. General/specific conditions, specifications applicable to minor component(s) of the work.

Part D:- Schedule of financial quote

Volume-II – Details of Part C

Volume- III – Tender Drawings

18.1.3 The bidders must associate himself, with agencies of the appropriate class eligible to bid for each of the minor component individually as per details given in respective minor component.

18.1.4 The eligible bidders shall quote rates after considering all the major as well as minor components.

18.1.5 After acceptance of the bid by competent authority, the SE in charge of the work shall issue letter of award on behalf of the Board of Governors, 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's of minor components. One such signed set of agreement shall be handed over to EEs of minor component(s). EE of major component will operate **Part A** and **Part B** of the agreement. EEs of minor component(s) shall operate **Part C** along with **Part A** of the agreement.

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

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

18.1.8 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).

18.1.9 In case the main contractor intends to change any of the above agency/agencies during the operation of the contract, he shall obtain prior approval of Engineer-in- charge of minor component. 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.

18.1.10 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 EEs 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.

18.1.11 The requirement of technical staff given in various specialized works in Part-C (Electrical works) is in addition to the requirement given in clause 32 in section- B of NIT. The actual deployment of these technical staff will be as per execution of work and direction of Suprintending Engineer, IWD, IIT Kanpur.

18.1.12 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.

18.1.13 A. **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**.

18.1.13 B.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.

Superintending Engineer

CPWD-7

INDIAN INSTITUTE OF TECHNOLOGY, KANPUR
INSTITUTE WORKS DEPARTMENT
CENTRAL OFFICE

Percentage Rate Composite Tender & Contract for Works

Tender for the work of: **Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works 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 24.03.2025**

(ii) Time and Date of opening of technical bid in presence of tenders who may be present on **3.30 PM on or before 27.03.2025** 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, Schedule of Rate & other documents and Rules referred to in the conditions of contract and all other contents in the tender document for the work.

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

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

A sum of Rs. **42,29,023/-** 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 Board of Governor, IIT Kanpur 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 and 12.3 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 therefrom to any person other than a person to whom I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Dated: Signature of Contractor

Witness: Postal Address

Address: Occupation:

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for an on behalf of the Board of Governors, IIT 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

(Separate Performa for Civil, and Elec. Works in case of Composite Tenders) (Operative Schedules to be supplied separately to each intending tenderer)

SCHEDULE 'A'

Schedule of financial quote in Part E of NIT

SCHEDULE 'B'

Schedule of materials to be issued to the contractor.

S. No.	Description of item	Quantity	Rates in figures & words 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

S. No.	Description	Hire charges per day	Place of Issue
1	2	3	4
---------NIL----------			

SCHEDULE 'D'

Extra schedule for specific requirements/document for the work, if any. NIL

SCHEDULE 'E'

Reference to General Conditions of contract : General condition of contract for CPWD-23 for Construction works (with amendments up to pervious date of last date of receipt of tender including extension, if any) .

Name of Work: Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur.

Estimated cost of the work:	**Civil Items of Work-**	Rs. 27,50,38,596/-
	Electrical & Lift Items of Work-	Rs. 4,78,63,710/-
	Total	Rs. 32,29,02,306/-
Earnest money	Rs. **42,29,023/-** (To be returned after receiving performance guarantee)	
Performance Guarantee	5% of the tendered value of the work	
Security Deposit	2.5% of the tendered value of the work	

SCHEDULE 'F' GENERAL RULES & DIRECTIONS

Officer inviting tender	**Superintending Engineer, IWD, IIT Kanpur**

Definitions:

2(v)	**Engineer-in-Charge**	
	For Civil items of work	**Executive Engineer (Civil), IWD, IIT Kanpur**
	For Electrical items & Lift items of work	**Executive Engineer (Elect.) IWD, IIT Kanpur**
2(viii)	Accepting authority	Superintending Engineer on behalf of Board of Governors.
2(x)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(xi)	Standard Schedule of Rates:	
	Civil Items of Work	DSR 2023 & Market Rates of Non DSR items
	Electrical & Lift Items of Work	DSR 2022 & Market Rates of Non DRS items
All the above with correction slips upto the last date of submission of tender including extension, if any		
2(xii)	Department	Institute Works Department, IIT Kanpur
9(ii)	Standard CPWD contract Form	CPWD Form 7 of GCC for CPWD-2023 for Construction works (with amendments up to previous date of last date of receipt of tender, including extension, if any). The following condition pertains to GST of clause **33 and 34** of general Condition of Contracts and corresponding amendments should be read as follows: a) The quoted rates should be exclusive of GST b) The GST as applicable shall be paid extra.

Clause 1	i) Time allowed for submission of Performance Guarantee ,Programme chart (Time and Progress) and applicable labour licenses, registration with EFPO,ESIC and BOCW from the date of issue of letter of acceptance	10 Days
	ii) Maximum allowable extension **with late fee @ 0.1% per day of Performance Guarantee amount beyond the period as provided in (i) above**	5 Days

Clause1A	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	**No**
Clause 5	Number of days from the date of issue of letter of acceptance for reckoning date of start	**15 Days**
Clause 5.2	**Nature of hindrance register** (either Physical or Electronic)	**Physical**

Clause 5.4

Schedule of rate of recovery for delay in submission of the modified programme in terms of delay days		
S. No.	***Contract Value***	*Recovery*
1	***More than Rs. 20 Crores***	*Rs 50,000/-*

Mile stone/Bar Chart(s)- As per construction programme on **ANNEXURE-II**

Time allowed for execution of work **20 Months**

Authority to decide

(i) Extension of time :	**S**uperintending Engineer, IWD IIT Kanpur
(ii) Rescheduling of mile stone:	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

Clouse6,6A	Clause applicable	**Clause 6 A**
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.125 lacs
Clause 7A	Whether clause 7A shall be applicable No running account bill shall be paid for the work till the applicable labour licence, BOCW registration is submitted to the Engineer In charge .	Yes
Clause 8A	Authority to decide compensation on account if the contractor fails to submit completion plans	Superintending Engineer
Clause 10A	List of testing equipment to be provided by the contractor at site lab.	As per **ANNEXURE-IV**
Clause 10 B(ii)	Whether clause 10-B(ii) shall be applicable.	**No**
Clause 10 B(iii)	Whether clause 10-B(iii) shall be applicable	**No**
Clause 10 C	Component of labour expressed as percentage of value of work	**Not Applicable**
Clause 10 CC		**Applicable**

For Civil Component

Sl.No.	**Relevant component of material/ labour for price escalation**	**% of total value of civil work**
1.	Component of Cement	10%
2.	Component of Labour	20%
3.	Civil component of other construction materials	50%
4.	Reinforcement steel bars/TMT bars /Structural steels	20%
Total		100%

For E&M Component

Sl. No.	**Relevant component of material/ labour for price escalation**	**% of total value of E & M work**
1.	Component of Labour	15%
2.	E&M Component of construction materials	85%
Total		100%

Clause 11	Specification to be followed for execution of work**:**	
For Civil items of work	CPWD Specifications 2019 Vol. 1 and Vol. 2 with correction slips up to the last date of receipt of tenders (Hereinafter called CPWD specifications also)	
For Electrical items of work	As per electrical component	
Clause 12		
Type of work	Project and original work	
12.2	Extra/ substitute item	Applicable
	Deviation limit	100% for all items

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 the complete work
Clause 18	List of mandatory machinery, tools & plants to be deployed by the contractor at site.	**Appendix-III**
Clause 19C		Applicable
1.	Non-compliance against deployment of Safety Officer by Contractor on month-wise basis	
	(a) Daily absenteeism of one safety Officer upto a maximum of 3 days in a month	Rs. 800/- per day
	(b) For 4 to 7 days absenteeism of one safety Officer in a month	Rs. 1200/- per day
	(c) More than 7 days absenteeism of one safety Officer in a month	Rs. 2000/- per day
Clause 25	**Constitution of Dispute Redressal Committee (DRC)**	**Competent Authority to appoint DRC**
	DRC shall constitute one Chairman and two members	Director, IIT Kanpur

Place of Arbitration:	Kanpur
Clause 31/31-B – Clause 31	(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 tubewell at site and pumping arrangement at his own cost. The contractor shall have to seek permission digging tube well etc for water arrangement from the Engineer –in -charge). No water charges shall be recovered.

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 with MBA IN ADVANCE CONETRUCTION MANAGEMENT. (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 Sixty Thousand only per month per person
3	Graduate Engineer Or Diploma Engineer	1+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+1	Ten Year in major Construction/ Infrastructure Project.	Safety Manager	Rs.60000/- pm Per person	Rupees Sixty 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 Schedule of Rates	Delhi Schedule of Rates 2023 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 2023.
	(e)	Any other item viz fire rated paint etc.	As per manufacturer specification

ANNEXURE - II

Milestone chart

Sl. No.	Description of mile stone	Period for completion from date of start	Withheld amount for non achievement of mile stone.
1	**A- Activity Completion of Civil Work:** (a) RCC of Foundation upto plinth level **B- Activity completion of E&M work:** a) Submission of eligibility documents of associate agencies for E&M works as per eligibility condition. (b) Submission of shop / layout drawings for conduits / equipments of EI, Fire fighting, Lift, CCTV etc. as required for all E&M services. **or** Gross value of work done not less than 5 % of the accepted tendered value.	2 months	0.5 % of the accepted tendered value.
2	**A- Activity completion of Civil Work:** (a) RCC slab upto floor level 3 (b) Brick work upto floor level 1 **B- Activity completion of E&M work:** (a) Slab conduiting upto floor level 3 (b) Wall conduiting upto floor level 1 **or** Gross value of work done not less than 25 % of the accepted tendered value.	06 months	0.5 % of the accepted tendered value.
3	**A- Activity completion of Civil Work:** (c) RCC slab upto floor level 7 (d) Brick work upto floor level 4 (e) Sample flat at first floor i/c all complete **B- Activity completion of E&M work:** (c) Slab conduiting upto floor level 7 (d) Wall conduiting upto floor level 4 (e) Sample flat at first floor with all wiring, switch, Socket, fan, fitting etc installed & complete **or** Gross value of work done not less than 40 % of the accepted tendered value.	09 months	0.5 % of the accepted tendered value.

4	**A- Activity completion of Civil Work:** (a) RCC slab upto floor level 10 (b) Brick work upto floor level 7 (c) Internal work i/c flooring upto floor level 2 (d) Water proofing of toilets, internal plumbing work, upto floor level 2 **B- Activity completion of E&M work:** (a) Slab conduiting upto level 10 (b) Wall conduiting, socket boxes and DBs upto level 7 (c) Making of holes in toilets, labs/rooms, lift lobby, lift shaft, etc. pressurization, fire fighting and exhaust etc. upto level 7 **or** Gross value of work done not less than 55% of the accepted tendered value.	12 months	0.5 % of the accepted tendered value.
5	**A- Activity completion of Civil Work:** (a) RCC , slab upto floor 11 ,Over Head water tank, Machine room Complete (b) Brick work upto floor level 9 (c) Internal work i/c flooring upto floor level 5 (d) Water proofing of toilets, internal plumbing work, upto floor level 5 **B- Activity completion of E&M work:** (a)Slab conduiting upto level 11 (b)Wall conduiting, socket boxes and DBs upto level 9 © Making of holes in toilets, labs/rooms, lift lobby, lift shaft, etc. pressurization, fire fighting and exhaust etc. upto level 9 **or** Gross value of work done not less than 70 % of the accepted tendered value.	15 months	0.5 % of the accepted tendered value.

6	**A- Activity completion of Civil Work:** (a) Brick coba complete (b) Completion of Brick work (c) Toilet work including internal plumbing work, wall tiling work upto level 11 (d) completion of all Flooring work etc upto level 10 **B- Activity completion of E&M work:** Submission of inspection call at OEM premises for all major materials such as panels, lift, UPS, equipments, cables etc. and any other materials as required. (a) Wall conduiting, socket boxes and DBs of all floors (b) Making of holes in toilets, labs/rooms, lift lobby, lift shaft, etc. pressurization, fire fighting and exhaust etc. upto all floors (c) Wiring, laying of raceway work completed. **Or** Gross value of work done not less than 85% of the accepted tendered value.	18 months	0.5 % of the accepted tendered value.
7	**Completion of all works in all respect including testing and commissioning**	20 Months	

ANNEXURE -III

LIST OF BASIC MINIMUM REQUIRED MACHINERY, TOOLS & PLANTS TO BE DEPLOYED BY THE CONTRACTOR AT SITE

Sl. No.	Name of Equipment	Numbers
1	Excavators (JCB 3D)	2 Nos.
2	TOWER CRANE	1 Nos.
	Equipment for Concrete work	
3	Automatic weight batching plant	1 Nos.
4	Concrete mixer (electrical)	1 Nos.
5	Needle vibrator (electrical)	5 Nos.
6	Needle vibrator (petrol)	5 Nos.
7	Surface and Plate vibrator	2 Nos.
	Equipment for Building work	
8	Bar bending Machine	2 Nos.
9	Bar cutting machine	2 Nos.
10	Drilling machine	2 No.
11	Welding machine i/c transformer	2 Nos.
12	Cube testing machines automatic (Digital 100 MT)	1 No.
13	Steel shuttering +Ply Shuttering	3000 sqm+1000 Sqm.Ply Shuttering
14	M.S. pipes/telescopic props and other accessories.	As per requirement for the shuttering area given at s.no. 17 above.
15	Steel scaffolding system (cup lock type)	As per requirement of the project and milestones.
16	Grinding/polishing machines	2 No.
	Equipment for transportation	
17	Tippers	As per requirement of the project and milestones.
18	Trucks	As per requirement of the project and milestones.
	Pneumatic equipment	
19	Air compressors (diesel)	Nil
	Dewatering equipment	
20	Pump (diesel)	As per requirement of project
21	Pump (electric) (Desirable)	As per requirement of project
	Power equipment	
22	Diesel generator (to meet requirement at site for uninterrupted work)	As per requirement of project

23	Ultra pulse velocity test	1 No.
24	Rebound hammer test	1 No.
25	Tractor with Trolley	1No.
26	Earth Compactor	1No.

Note: The above list is only indicative and not exhaustive and contractor shall deploy plant and machinery as per actual requirement of the work so that the progress of the work is adequately maintained. However, No damages/compensation shall be payable on account of idle plant and equipment etc. for whatever reason.

ANNEXURE-IV

a) **Balances:**
- i) 7 kg to 10 kg capacity, semi-self indicating type – Accuracy 10 gm.
- ii) 500 gm capacity, semi-self indicating type Accuracy 1 gm.
- iii) Pan Balance- 5 kg Capacity- Accuracy 10 gm.

b) **Ovens-** Electrically operated, thermostatically controlled upto 1100C- Sensitivity 10C.

c) **Sieves:** as per IS: 460

i) IS Sieves – 450 mm internal dia of sizes 100 mm, 80 mm, 63 mm, 50 mm, 40 mm, 25 mm, 20 mm, 12.5 mm, 10 mm, 6.3 mm, 4.75 mm, complete with lid and pan.

ii) IS Sieves – 200 mm internal dia (brass frame) consisting of 2.36 mm, 1.18 mm, 500 microns, 425 microns, 300 microns, 212 microns, 150 microns, 90 microns, 75 microns with lid and pan.

d) Sieve shaker capable of 200 mm and 300 mm dia sieves, manually operated with timing switch assembly.

e) Equipment for slump test- slump cone, steel plate, taping rod, steel scale, scoop.

f) Equipment for concrete testing

i) Concrete cube moulds 15x15x15cm.	18 Nos.
ii) Pruning Rods 2Kg weight length 40cm and ramming face 25mm	2 No.
iii) Extra Bottom plates for 15cm cube mould	6 Nos.
iv) Standard Vibration table for cubes	1 No
v) Dial gauges 25 mm travel- 0.01 mm/division Least count-	1 No.
vi) Automatic compression testing machine of 100 tonne capacity.	1 No.

Superintending Engineer

Details of Electrical Contractor

(**To be submitted before award of work**)

i. Name of Electrical Contractor: M/s .....
ii. Address:.....
iii. Class of Licence:.....
(A Class government approved)
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**
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 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

INTEGRITY PACT

The contractor shall download the Integrity Pact, which is a part of tender documents, affix his signature & seal in the presence of a witness and upload the same while submitting the online bids. In absence of duly signed integrity pact the bids shall not be considered for technical evaluation.

Superintending Engineer

PART–B

GENERAL CONDITIONS AND MATERIAL AND QUALITY ASSURANCE

GENERAL REQUIRMENTS FOR THE TENDER

Name of Work: "**Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur"**

1 The tenderer is advised to read and examine the tender documents for the work and the set of drawings available with Engineer-in-charge. He should inspect and examine the site and its surroundings by himself before submitting his tender.

2 Separate conditions & specification and scope are included in this tender. The contractor shall quote the amount/rates lump-sump in figures and words accurately in schedule of financial quote so that there is no discrepancy in figures and words.

3 Time allowed for the execution of work is **20 months**.

4 The contractor(s) shall submit a detailed program of execution in accordance with the **master programme/milestone within fifteen days** from the date of start of the work.

5 Quality of the project is of utmost importance. This shall be adhered to in accordance with the provisions of CPWD specifications and guidelines given in the relevant paras.

6 Temporary Electric connection (Single/ Three phase) shall be provided by the Institute from its distribution network and the charges shall be realized prevalent commercial tariff of the institute presently recovery rate is **Rs. 9.19 Per unit on the basis** of actual consumption through the separate meter under the control of Engineer-In-Charge. If the rates are revised in future the same shall be applicable to the contractor. The contractor at his own cost shall arranged the cables for the service connection and the sub meter.

7 No labour huts/jhuggies shall be allowed to construct in the campus except for the security persons at work site with proper sanitation arrangements after due approval of Superintending Engineer.

8 The contractor has to appoint qualified safety officer for proper adhering safety requirements during the entire period of contract.

9 In case of any serious accident at work site, the Institute may cause an enquiry/ investigation into the accident and depending on the outcome of such enquiry/ investigation, the Institute may take such action against the contractor as may be deemed fit and appropriate in the discretion of the Director, which may also lead to termination of the contract, and/ or the contractor may be debarred from applying for further works in the campus for a specified period.

10 Cement shall be arranged by the contractor himself.

11 Steel Reinforcement shall be arranged by the contractor himself.

12 Contractor has to engage specialized agencies for specialized items of works such as water proofing, aluminium & glazing works, fire doors and fittings, plumbing work, all type of false ceiling, expansion joint system and other specialized items as mentioned in the tender documents. Only those specialized agencies/firms who have satisfactorily executed works as per following criteria during last seven years are eligible for the specialized works-

(a) Three works each costing not less than 40% of estimated cost for concerned sub head.

Or

(b) Two works each costing not less than 60% of estimated cost for concerned sub head.

Or

(c) One work costing not less than 80% of estimated cost for concerned sub head.

The value of specialized 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 of specialized work to upto one month of award of this work.

Estimated cost of the specialized item/work for various items/schemes shall be determined by Engineer-in-charge based on market rate. The decision of Engineer-in- charge shall be final and binding on the contractor. The various specialized items of works under this agreement in respect of civil construction are evolved as water proofing treatment, plumbing/sanitary work, Aluminum works etc.

11. Approval of the specialized agencies for each specialized work shall be obtained from the Engineer-in-Charge within one month of award of 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.

12 Contractor has to deploy basic minimum required machinery on the project to complete the work in time as stipulated in the tender in annexure -III.

13 The contractor shall submit the running bills in the shape of the computerised MB in pages of A-4 size as per the standard format of department and shall act as per modified Clause 6 A of CPWD-7

14 Contractor has to provide reinforcement cover blocks made of approved proprietary pre packed free flowing mortars (Conbextra as manufactured by M/s Fosroc Chemical India Ltd. or approved equivalent) of high early strength.

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 me within two weeks of the award of work. The quality assurance program me 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 other materials, not specified elsewhere in the document, 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 approved, he shall stick to it.

3. The contractor shall submit shop drawings of staging and shuttering arrangement, aluminum & glazing work, fire doors and fittings, plumbing 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 :

B) 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. ***In case of delay in estabilshment of Lab at site, an non refundable recovery of Rs. 5000/- per day shall be made from Running account bill of the contractor for each delayed days.***

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.

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 external laboratories.
However, for the tests to be carried out through the Institute structure lab, the contractor shall supply free of charge all the materials required for testing, including transportation.
The cost of the all tests to be conducted shall be borne by the the contractor.

C) Other Laboratories :

The all such tests which are not available in the Institute lab but required to be carried out from outside Institute laboratories the cost of such tests shall be borne by the contractor i/c all arrangements for conducting such tests.

D)* 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 BIS 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. Any sub-standard material/work beyond set out tolerance limit shall be summarily rejected by the Engineer-in-Charge.

iii BIS marked materials except otherwise specified shall be subjected to quality test at thediscretion 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.

C6 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.

C7 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 by the Jr. Engineer/Assistant Engineer - in-Charge of work and which shall be duly signed by the contractor or his authorised 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 Cement register showing the receipt of the PPC shall be maintained at site. The contractor shall construct godown for storage of 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 2019 Vol. 1 & 2 the higher of the two frequencies of testing shall be adopted.

11 **Maintenance of Registers*:***

(i) All the register of tests to be carried out at construction site or in outside laboratories shall be maintained by the contractor which shall be issued to the contractor by Engineer-in-Charge in the same manner as being issued to IWD field staff.

(ii) The test registers to be issued to the contractor are :

a) Materials at site account register such as steel, bricks, AAC blocks, coarse aggregates etc.

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 JE/AE/EE.

(iv) Contractor shall be responsible for safe custody of all the test registers.

(v) Submission of copy of all test registers, material at site register along with each alternate running account bill and final bill shall be mandatory. These registers should be duly checked by Engineer-in-Charge.

13 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.

14 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.

ADDITIONAL CONDITIONS FOR CEMENT

1 The contractor shall procure 43 grade Portland Pozzolana Cement conforming to IS: 1489 (Part-I) as required in the work, from reputed manufacturers of cement, such as A.C.C., Ultratech, 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 made in 50 kg. bags bearing manufacturer's name and ISI marking. Samples of cement arranged by the contractor shall be taken by the Engineer- in-Charge and got tested in accordance with provisions of the relevant BIS codes. In case the test results indicate that the cement arranged by the contractor does not conform to the relevant BIS code 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.

2. The cement shall be brought at site in bulk supply of approximately **50 tonnes** or as decided by the Engineer-in-Charge. The cement godown of the capacity to store a minimum of **1000** bags of cement shall be constructed by the contractor at site of work for which no extra payment shall be made.

3. Double lock provision shall be made to the door of the cement godown. The keys of one lock shall remain with the Engineer-in-charge or his authorized representative and the key of the other lock shall remain with the contractor. The contractor shall be responsible for the watch and ward and safety of the cement godown. The contractor shall facilitate the inspection of the cement godown by the Engineer-in-Charge at any time.

4. 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 test laboratories. 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 conform to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

b) By the department, if the results show that the cement conforms to relevant CPWD Specifications / BIS code or specification mentioned elsewhere in the documents.

5. The actual issue and consumption of cement on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of cement shall be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by conditions laid therein. In case the cement consumption is less than theoretical consumption including permissible variation, recovery at the rate show prescribed shall be made. In case of excess consumption no adjustment need to made.

6. The cement brought to site and the cement remaining unused after completion of the work shall not be removed from site without the written permission of the Engineer-in- Charge.

7. The damaged cement shall be removed from the site immediately by the contractor on receipt

of a notice in writing from the Engineer-in-Charge. If he does not do so within three days of receipt of such notice, the Engineer-in-Charge shall get it removed at the cost of the contractor.

8. Wet curing period shall be enhanced to a minimum of 10 days or its equivalent. In hot & arid regions, the minimum curing period shall be 14 days or its equivalent.

9. Till the time, BIS makes it mandatory to print the % age of fly ash on each bag of cement, the certificate from the PPC manufacturer indicating the same shall be obtained and permission obtained from Engineer-in-Charge before use of such cements in works.

10. The contractor may use OPC in place of PPC only after written permission of Engineer-in-Charge. In such case, no extra payment shall be made in any form to the contractor by the Department.

ADDITIONAL CONDITIONS FOR STEEL REINFORCEMENT

1 The contractor shall procure TMT bars of **Fe 500D/Fe 550D** grade (the grade to procured is to be specified) from primary steel producers such as **SAIL, Tata Steel Ltd, RINL, Jindal Steel & power Ltd., and JSW Steel Ltd.** or any other producer as approved by CPWD who are using iron ore as the basic raw material/input and having crude steel capacity of 2.0 million tonnes per annum and above.

1.1 The TMT bars procured from primary producers shall conform to manufacture's specifications.

1.2 TMT bars procured from primary producers, the specifications shall meet the provisions of IS 1786: 2008 pertaining to **Fe 500 D/Fe 550D** grade of steel.

2. The contractor shall have to obtain vouchers and furnish test certificates to the Engineer-in-charge in respect of all supplies of steel brought by him to the site of work.

3. Samples shall also be taken and got tested by the Engineer-in-charge as per the provisions in this regard in the relevant BIS codes. In case the test results indicate that the steel arranged by the contractor does not conform to the specifications as defined under para 1.1 and 1.2 above, the same shall stand rejected and it shall be removed from the site of work by the contractor at his cost within a week time of written orders from the Engineer-in-charge to do so.

4. The steel reinforcement shall be brought to the site in bulk supply as directed by the Engineer-in-charge.

5. The steel reinforcement bars shall be stored by the contractor at site of work in such a way as to prevent distortion & corrosion, and nothing extra shall be paid on this account. Bars of different sizes and lengths shall be stored separately to facilitate easy counting and checking.

6. For checking nominal mass, tensile strength, bend test, re-bend test etc. specimens of sufficient length shall be cut from each size of the bar at random at frequency not less than that specified below:

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

7. The contractor shall supply free of charge the steel required for testing including its transportation to testing laboratories. The cost of the all passed tests conducted through the Institute labs shall be borne by the Insttute & the cost of failed tests shall be borne by the contractor.

8. The actual issue and consumption of steel on work shall be regulated and proper accounts maintained as provided in clause 10 of the contract. The theoretical consumption of steel shall

be worked out as per procedure prescribed in clause 42 of the contract and shall be governed by the conditions laid therein. In case the consumption is less than theoretical consumption including permissible variations recovery at the rate so prescribed shall be made. In case of excess consumption no adjustment need to be made.

9. The steel brought to the site and the steel remaining unused shall not be removed from site without the written permission of the Engineer-in-charge

10. Steel bars brought by the contractor for use in the work shall be got checked from the Engineer-in-Charge or his authorized representative of the work on receipt of the same at site before use. The contractor shall supply free of charge the steel required for testing including its transportation to testing laboratories. The cost of the all passed tests conducted through the Institute labs shall be borne by the Institute & the cost of failed tests shall be borne by the contractor.

11. If the quantity of steel actually used in the work is found to be more than the theoretical quantity of steel including authorized variation, nothing extra shall be payable to the contractor on this account. In the event of it being discovered that after the completion of the work the quantity of steel 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 steel so less used shall be recovered from the contractor at rate as specified in schedule 'F'. Decision of the Engineer-in- Charge in regard to theoretical quantity of steel which should have been actually used and recovery of the rate specified shall be final and binding on the contractor.

12. In case the contractor brings surplus quantity of steel 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.

13. Reinforcement including authorized spacer bars and lappages shall be measured in length of different diameters, as actually (not more than as specified in the drawing) used in the work, nearest to a centimeter. Wastage and unauthorised overlaps shall not be measured.

14. The standard sectional weights referred to as in Table 5.4 under para 5.3.4 in CPWD specifications for works 2019 Vol. 1 will be considered for conversion of length of various sizes of MS bars, Tor steel bars and TMT bars into standard weight.

15. Records of actual sectional weight shall also be kept dia-wise & lot-wise. The average sectional weight for each diameter shall be arrived at from samples from each lot of steel received at site. The decision of the Engineer-in-Charge shall be final for the procedure to be followed for determining the average sectional weight of each lot. Quantity of each diameter of steel received at site of work each day will constitute one single lot for the purpose. The weight of steel by conversion of length of various sizes of bars based on the actual weighted average sectional weight shall be termed as derived actual weight.

16. If the derived weight as in para 15 above is lesser than the standard weight as in para 14 above, the derived actual weight shall be taken for payment.

    If the derived actual weight is found more then the standard weight then the standard weight as worked out in para 14 above shall be taken for payment. In such case nothing extra shall be paid for the difference between the derived actual weight and the standard weight.

17. Mixing of different type of steel/different grades of steel shall not be allowed in the same structural members as main reinforcement to satisfy clause 26.1 of IS:456.

18. Tolerances on Nominal Mass (individual sample) shall be as under:-

Sl. No.	Nominal size mm	Tolerances on the Nominal Mass, percentage
1	Upto and including 10	-8%
2	Over 10 upto & including 16	-6%
3	Over 16	-4%

GENERAL TERMS AND CONDITIONS

1 In the case of discrepancy between the specifications and / or the drawings, the following order of preference shall be observed:-

i) Nomenclature of items as per schedule of quantities.
ii) Particular specification and special condition, if any.
iii) Architectural Drawings
iv) CPWD specifications.
v) Indian standard specifications of B.I.S.
vi) Sound Engineering Practice
vii) Decision of Engineer-in-Charge.

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

2 Except for the items, for which particular specifications are given 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 upto date corrections slips (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 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.

4 The proposed building is a prestigious project and quality of work is paramount importance. Contractor shall have to engage well experienced skilled labour and deploy modern T&P and other equipment to execute the work. Many items like, stone flooring, aluminium, glazing, stainless steel, & plumbing work and other specialized works will specially require engagement of skilled workers having experience particularly in execution of such items.

5 a) The contractor (s) shall inspect the site of work before tendering and acquaint himself with the site conditions and no claim on this account shall be entertained by the department.

b) The contractor (s) shall get himself acquainted with nature and extent of the work and satisfy himself about the availability of materials from kiln or approved quarries for collection and conveyance of materials required for construction.

6 The contractor (s) shall study the soil investigation report for the site, available in the office of the Engineer-in-Charge and satisfy himself about complete characteristics of soil and other parameters of site. However, no claim on the alleged inadequacy or incorrectness of the soil data shall be entertained.

7 The tenderer shall see the approaches to the site. In case any approach from main road is required by the contractor, the same shall be made good, improved and maintained by the contractor at his own cost. No payment shall be made on this account.

8 The contractor shall take all precautions to avoid accidents by exhibiting necessary caution boards day and night speed limit boards red flags, red lights and providing barriers. He shall be responsible for all dangers and incidents caused to existing / new work due to negligence on his part. No hindrances shall be caused to traffic during the execution of the work.

9 Contractor shall provide permanent bench marks and other reference points for the proper execution of work and these shall be preserved till the end of work. All such reference points shall be in relation to the levels and locations, given in the Architectural and plumbing drawings

10 Other agencies doing works related with this project may also simultaneously execute their works and the contractor shall afford necessary facilities for the same. The contractor shall leave such necessary holes, openings etc. for laying/burying in the work, pipes cables, conduits, clamps, boxes and hooks for fan clamps etc. as may be required for the other agencies. Nothing extra over the Agreement rates shall be paid for doing these.

11 Some restrictions may be imposed by the security staff etc. on the working and for movement of labour, materials etc. The contractor shall be bound to follow all such restrictions/instructions and nothing extra shall be payable on account of the same.

12 The contractor shall fully comply with all legal orders and directions of the Public or local authorities or municipality 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.

13 The building work shall be carried out in the manner complying in all respects with the requirements of the relevant bylaws and regulations of the local body under the jurisdiction of which the work is to be executed or as directed by the Engineer-in-charge and nothing extra shall be paid on this account.

14 The contractor shall give a performance test of the entire installation(s) as per standing specifications before the work is finally accepted by making his own arrangements for water supply, electricity etc. and nothing extra whatsoever shall be payable for the same.

15 Huts for labour are not to be erected at the site of work, the contractor shall be required to provide such accommodation at a place as is acceptable to the local body and nothing extra shall be paid on this account.

16 It shall be ensured by the contractor that no electric live wire is left exposed or unattended to avoid any accidents in this regard.

17 The structural and architectural drawings shall at all times be properly co-related before executing any work.

18 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.

19 The entire royalty at the prevalent rates shall have to be paid by the contractor on all the boulders, metals, shingle sand, earth etc. collected by him for execution of the work, directly to the Revenue authority or authorized agents of the State Government concerned or the Central Government, as the case may be.

20 Defects Liability Period (DLP)

20.1 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.

20.2 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.

20.3 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.

20.4 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 blots, 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.

20.5 **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.

20.6 **Maintenance during DLP:**

20.6.1 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.

20.6.2 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".

20.6.3 **Day to Day Maintenance:**

20.6.3.1 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.

20.6.3.2

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).

20.6.3.3 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 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. 000 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. 2000 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.

21 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

22 PROGRAMME CHART

The contractor shall submit a Detailed construction program me (Time and Progress Chart) for execution of work in stipulated period of completion considering each mile stone within 15 days of date of issue of letter of acceptance. The Engineer-in-charge may within 30 days thereafter, if required modify, and communicate the programme approved to the contractor failing which the programme submitted by the contractor shall be deemed to be approved by the Engineer-incharge. The work programme shall include all details of balance drawings and decisions required to complete the contract with specific dates by which these details are required by contractor without causing any delay in execution of the work. The chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in- charge and the Contractor within the limitations of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given in Schedule "F".

In case of non submission of construction programme by the contractor the program approved by the Engineer-in-charge shall be deemed to be final.

The approval by the Engineer-in-charge of such programme shall not relieve the contractor of any of the obligations under the contract.

The contractor shall submit the Time and Progress Chart and progress report using the mutually agreed software or in other format decided by Engineer-in-charge for the work done during previous month to the Engineer-in-charge on or before 5th day of each month.

The program chart should include the following: -

a) Descriptive note explaining sequence of various activities.

b) BAR CHARTS prepared in mutually agreed software or in other format decided by Engineer-in-charge which will indicate resources in financial terms, manpower and specialized equipments for every important stage.

c) Program for procurement of materials by the contractor.

d) Program for arranging and deployment of manpower both skilled and unskilled so as to

achieve targeted progress.

e) Program of deployment of machinery / equipments having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.

f) Programme for achieving milestones.

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

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

The proposed work is time bound and allowed to be carried out in two shifts upto maximum of 10PM on each day. No additional claim for payment in this regard shall be entertained.

24 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. 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.

25 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.

26 Any cement slurry added over base surface for continuation of concreting for better bond is deemed to have been built in the items and nothing extra shall be payable for extra cement considered in consumption on this account.

27 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.

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.

29 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 there of 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.

30 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.

31 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 submittals along with material sample for approval of Engineer-in-Charge prior to delivery of material at site.

32 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.

33 PREVENTION OF NUISANCE AND POLUTION 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 viechels 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.

34 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.

35 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.

36 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

37 Wherever required for the execution of work, all the scaffolding shall be provided and suitably fixed, by the Contractor. It shall be provided strictly with steel double scaffolding system, suitably braced for stability, with all the accessories, gangways, etc. with adjustable suitable working platforms to access the areas with ease for working and inspection. 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.

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 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-inCharge.

39 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.

40 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.

41 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.

42 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.

43 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.

44 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.

45 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.

46 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.

47 Cleanliness at 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.

48 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.

49 Insurance Policy

(i) 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 entire execution period of the work. **The labour license shall also be submitted immediately and same shall be kept valid till the entire completion period of the work including the extensions ,if any.**

(ii) 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 accounts.

50 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.

51 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.

52 Personal Safety Measures for Labour

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).

53 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.

54 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.

1. 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.

2. 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.

3. Noise emission from compactors (rollers) front loaders, concrete mixers, cranes (movable), vibrators and saws should be less than 75 dB(A).

4. 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.

5. Construction Vehicles, Equipment and Machinery

a. All vehicles, equipment and machinery to be procured for construction shall conform to the relevant Bureau of India Standard (BIS) norms.

b. Emission from the vehicles must conform to environmental norms.

c. Dust produced from the vehicular movement and other site activities is to be mitigated by sprinkling of water.

d. Noise limits for construction equipments 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.

55. 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 municipality 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.

56. 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.

a. 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.

b. 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.

c. 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.

d. The contractor shall ensure the following:

(i) Covering stockpiles of dusty material with impervious sheeting.
(ii) Covering dusty load on vehicles by impervious sheeting before they leave the site.
(iii) Transferring, handling/storing dry loose materials like bulk cement and dry pulverized fly ash inside a totally enclosed system.

(iv) 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.

e. 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).

f. 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.

g. 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.

h. 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.

i. 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.

j. 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.

k. 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.

l. 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).

m. All lighting installed by the contractor around the site and the gowdons, offices shall be of LED lights of the appropriate illumination levels. This condition is a must, unless specifically prescribed otherwise.

57. No extra payment will be made for operation/activity mentioned at Sl. No. 1 to 1.20 above unless specifically mentioned otherwise

58. 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 othe rallied 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 relatable 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 protetive 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 lagre 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 constructon 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.

(xvi) No extra payment shall be made for operation/activity mentioned at Sl No. 33 i to xvi above.

59 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.

60. **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.

PART-B1

GENERAL CONDITIONS FOR WORK

Scope of Work

1	The work shall be executed in accordance with the percentage rate contract basis to completion and handing over in fit condition ready for occupation.
2	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.
3	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.
5	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.
6	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.
7	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.
8	Complete leveling/dressing including filling of earth, its supply, disposal of surplus earth is to be completed as directed by the Engineer-in-charge.
9	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.
10	**Defects liability period shall be 36 months from the date of recording of completion certificate by the competent authority.**
11	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 borned by the agency.
12	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.

13	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 civil, electrical, lifts, water supply, fire fighting, fire alarm & site development works complete as per direction of Engineer-in-charge.
14	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.
15	**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/ramps, as per area norms are in the scope of work.
15.1	Detailed planning and execution to complete for Internal Electrification, Fire Alarm System, Fire-fighting system, , CCTV/LAN, Point wiring, Lifts with all equipment's and external lighting, and any other external and internal 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.
16	**Local Body Approvals**
16.1	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.
16.2	Approvals/NOC/permissions etc if any other than mentioned above shall be obtained by the contractor at his own level.

No.	**Details**	**Remarks**
1	Department of Fire services (DFS)	All required details to get the provisional NOC shall be provided by the Architect and the same shall be submitted by the Institute to the fire department to get the provisional fire NOC. The final fire NOC shall be taken by the contractor prior to the handing over the building.

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.

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.

d) 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 at site.

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, 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.

e) 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.

f) Provide supporting document from the manufacturer of the cement specifying the fly-ash content in PPC used in reinforced concrete.

g) 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.

h) 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.

i) 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:

j) 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.

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 relatable to dust emission.
7. The contractor shall ensure that C&D waste is transported to the C&D waste site only and due record shall be maintained by the contractor.
8. The contractor shall 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 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.

15. 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. The safety engineer/officer must be appointed immediately for the training of manpower and ensuring the daily safety compliances at site. No work shall be allowed to be carried out at site without the availability of the safety officer.

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 contactor for non-availability of the brand specified and also subject to independent verification by the Engineer-in-Charge. In exceptional cases, where such approval is required, 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:

(a) Anti-termite treatmen
(b) Water Proofing
(c) Aluminium work
(d) Fire Fighting 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. **All risk insurance policy shall be submitted by the contractor to the Institute with in 15 days from the award 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	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.

(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.

(iii)

Agenda A p a r t f r o m t h e a	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.

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.

47. Unless otherwise mentioned in the respective item, all the works are up to terrace level. The terrace level means G+10 floor building with its mumty, machine room top and over head tank top.
48. RMC carriage for all lead.
49. Ceramic glazed wall tiles size will be 450x 300mm.
50. Kota stone flooring means P/F pre polished kota with specified thickness.
51. Plaster of paris covering along with plastic sheet relevant items for protection of newly laid tiles. No extra extra cost shall be payable on this account.

52. FORMWORK

Shuttering / Form Work - Formworks material should be in steel with rubberized joints. Centering and shuttering including strutting, propping etc. and removal of form work including cost of de-shuttering and de-centering at all levels, for all heights and depths. The work shall be done in accordance with CPWD Specifications - 2019 - Vol. I& Vol. II with up to 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.

i. 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.
ii. 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 de-shuttering compound shall be applied on the surface of the shutter plates in the requisite quantity before assembly of steel reinforcement.
iii. The joint filler shall be resilient closed cell expanded polythene and non- tainting as manufactured by Supreme Industries Ltd or equivalent.
iv. 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-
v. 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.
vi. 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.
vii. Form work including centering, 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.
viii. The agency shall provide and fix the Exposed shuttering in suspended floors, roofs, Landings ,balconies ,and access platforms with water proof ply 12 mm thick or wherever exposed quality of R.C.C is mentioned or desired by the Engineer-in-charge. The ply shuttering used for Exposed quality shall be used maximum for 2 castings.

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 centering exceeds 3.50 meters, the prop may be provided in multi-stages. Extra for additional height in centering, shuttering wherever required with adequate bracing , propping etc including cost of de shuttering at all levels ,

over a height of 3.5 m for every additional height of Im nothing extra shall be paid

i. 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.

ii. 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 meter (1 to 250) or as directed by the Engineer-in-charge, 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 Engineer-in-charge.

iii. 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 Plumb	+-6 mm	Up to 3 m Height
Variation from the plumb of conspicuous liner	+-6 mm	Up to 6 m Height
Variation in the size of wall openings	(+)15mm (-) 6mm	

COLUMN/ FINS: SLAB, BEAM & GIRDER FORMS:
Variation from the level or from the specified grid for beam soffit before removal of shores,

In any 6/3m span	+-6mm
In 10m span	+-10mm

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

i. Erection of form work may be from pre-molded, 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, to de-shutter without any jerk to the green concrete. For this double wedge shall be used. Wedges shall be nailed, the headsreasonably left out, allowing easy removal while de-shuttering .

ii. Prefabricated or on-site fabricated forms shall be of enough thickness and with the required supporting runners in either direction. Supporting runners shall be standardized in size for easy replacement and universal use at site. Props shall be of steel only. Size and verticality shall be approved by the Engineer-in-charge. 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.

iii. 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, walling's, Shores, bearers, Clamps,

wall & ties etc. shall be at required spacings. Props, shores shall be securely braced with firm bearing.

iv. Provide and fix or fix only inserts pockets, to correct line and level and with enough rigidity to keep in position while concrete placing is in progress along with vibration.

v. 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.

vi. 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.

vii. 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 meter or as directed by the Engineer-in-charge.

viii. 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 25×25mm.

ix. Props of steel shall be provided with adequate horizontal and cross - bracing. Steel props shall use steel pipes and steel couplers use of timber is not permitted.

At the design and erection stage, the following additional points shall be considered and incorporated into the Shutters**-**

i. Openings for cleaning prior to start of concreting.

ii. 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:

i. Joints of moulds shall be water-tight & should be checked from bottom to make sure, that no light is visible.

ii. Props shall be on solid base, plumbed, in one straight line, and braced horizontally and cross.

iii. Tie bars in beams, walls and columns shall be at the correct place and fullybtight.

iv. Wedges shall be fully secured and nailed with head left out for easy removal.

v. All saw dust, dirt, shaving and any other unwanted materials shall be cleaned and hosed out.

vi. Provision shall be made for watching form work while concreting and any other platformneeded 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 de-shuttered 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 at least one floor below the same or as approved by the Engineer-in-charge. The concreting of upper floor shall be done only after lower floors have attained the strength.

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 Engineer-in-charge, 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 Engineer-in-Charge.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.
iii. Plaster drip course of size 25mm × 12mm in plastered surface or moulding to be provided for all R.C.C. projections/ chajjas, etc.

Formwork design shall consider the following:

i. Dimensional tolerance
ii. Demountable without shock, disturbance or damage to concrete
iii. All construction joints in beams and slabs shall be provided as shown in drawings.
iv. Ties shall be provided where required
v. Props / supports of extra ceiling height shall be specially designed.

Formwork: - Form work shall be placed and removed as per timeline provided in CPWD specifications.

SPECIAL CONDITIONS FOR RMC AND DMC

1. 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 may be added by the contractor in the concrete to increase the workability, but the design mix of concrete shall be done, taking into account the admixture proposed. Quality control shall be considered "good" while making design mix for standard deviation. Under no circumstances shall the water cement ratio be increased beyond the permissible limit. The cement content considered for RCC work of grade M-25 is 330kg/cum. If required, extra cement may be used by the contractor to get the desired quality of concrete, which shall be paid extra. But, if the cement consumption increases beyond 360kg/cum of concrete, for M-25 grade concrete, the payment for extra cement shall be restricted as concrete with cement content of 360kg/cum of concrete.

   Similarly, the cement content considered for RCC work of grade M-30 and M-35 is 340kg/cum and 350kg/cum respectively. If required, extra cement may be used by the contractor to get the desired quality of concrete of M-30 and M-35 grade, which shall be paid extra. But, if the cement consumption increases beyond 375kg/cum of concrete for M-30 grade concrete, the payment for extra cement shall be restricted

as concrete with cement content of 375kg/cum of concrete for M30 grade and similarly if cement consumption increases beyond 395kg/cum of concrete for M-35 grade concrete the payment for extra cement shall be restricted as concrete with cement content of 395kg/cum of concrete.

2. The maximum permitted water cement ratio is 0.50.
3. 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.
4. Steel reinforcement for R.C.C. work shall be Thermo-Mechanically Treated bars of grade Fe-500D or higher confirming.
5. 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.
6. 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 bourne by the contractor.
7. 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.
8. 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.
9. The standard deviation to be adapted for design mix shall be for "Good" quality control as per IS code 456.
10. 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.
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.
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 working in presence of safety officer & site Engineer.

5. Barricading shall be provided as detailed in this tender document.

6. 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.

PART-B2

List of Preferred Makes for Civil Works

S.No.	MATERIAL DESCRIPTION	PREFERRED MANUFACTURER/BRAND NAME
1	Cement	(PPC) Ambuja, Vikram, J.K, Ultra tech, ACC ,JaypeeCement,Shri cement & centurycement or any other make approved bythe ADG(NR-2)/CE(NZ-2), CPWD,Lucknow
2	White Cement	Birla White, J.K. White, or equivalent
3	Plastisizer/ admixture	Fosroc Chemicals (India) Ltd., CICO Tec.Ltd, Sika,BASF or any other make asrecommended by the manufacturer of thecement being used in RCC
4	Anti-carbonation paint	Berger, Asian, Nerolac, BASF, ICI
7	TMT Bars-Fe 500D	SAIL, TATA , JSW ,RINL,JSPL orany other make approved by theCE(CSQ), CPWD upto the last date ofsubmission of e-bids
8	Structural Steel	SAIL, TATA, JSW, JSPL, RINL
9	M.S. Pipes	Tata, Jindal, TT Swastik
10	Structural Tubular Sections	TATA , SAIL, JSPL, JSW, RINL
12	Ceramic /glazed Tiles(tiles manufactured from mother plant)	Kajaria, Johnson, RAK, Nitco, Restile, Somany
13	Vitrified / Industrial tile (Vitrified tiles to be double chargedmanufactured from mother plant)	First quality of RAK, Johnson, Kajaria, Nitco, Restile, Somany
14	Tile adhesive/Grout	Latecrete, Pidilite, balendura, ferrouscrete
15	Block Board	Greenply / Kitply / Century/Greenlam /Novapan / Marino
16	Flush door shutters	Green ply/ Kutty / Century/Kit ply/Jayna /National/Marino
17	Paper / Metallic Laminate	Greenlam , Century,Decolam,Kitply,Kutty Merino
18	Calcium Silicate Tiles	Hilux, Aerolite, Gyproc
19	Aluminum Section	Hindalco, Jindal, Indian Aluminum co. NALCO
20	Pe-Al-Pe pipes	Kitec, Jindal,Vectus
21	Floor Spring /Door Closer	Dorma , Gaze, Hafele
22	Aluminum Fittings	Nulite, Earl Behari
23	Stainless steel Locks & Hardware's	Dorma , Hafele, Gaze,EarlBihari, Dormakaba, Ozone, Kitch, Golden, Connect metallic India
24	Stainless steel ball bearing hinges	Dorma , Hafele, Gaze,Hettich,EBCO
25	Friction Stay	Hettich, Hafele, EBCO, Earl Bihari
26	Stainless steel handles	Dorma , Hafele, Gaze,
27	Window handles	LGF Sysmac (I) Pvt. Ltd, PEGO
28	Screws	Nettlefold, Paragon,GKW
29	Float Glass, Clear glass,heat reflective glass	Saint- Gobain , Modi Guard, Asahi,AIS/Glaverbel,Pilkington, PPG
30	Mirror Glass	Modi Guard, Saint Gobain,AIS,Pilkington,Atul
31	Hermetically sealed performance glass, Toughened glass, DGU,SGU,toughened laminated glass	Authorized Toughners of (Saint-Gobain), Modi Guard, ASAHI , PILKINGTON, AIS/Glaverbel, PPG
32	Rubber seals	Enviroseals, AnandReddiplex
33	Brush Strips	Enviroseals, AnandReddiplex
34	Deleted	Deleted

35	Gypsum Board	Saint Gobain(Gyproc) , Laffarge(LAGYP), India Gypsum
36	Metal Tile ceiling	Armstrong, Hunter Douglas, Gyproc Saint Gobain, Durlum
37	Thermal Insulation/Rockwool/ glass wool/Mineral wool/Puf	Twiga, Owens Corning, M/S LLOYD Insulations India Limited, Polyglass equivalent
38	Cement Primer	Decoprime WT(Asian), Delux, White primer (ICI), Nerolac,
39	Acrylic Distemper	Asian, ICI, Nerolac, Indigo
40	Synthetic enamel	Asian,ICI, Nerolac, Indigo
41	Acrylic/ Plastic Emulsion	Asian ICI, Nerolac, Indigo
42	Cement Paint	SnowcemPlus,Durocem Extra, Asian
43	Premium Acrylic Smooth ExteriorPaints with silicon additive	Asian Paint (Apex Ultima) Nerolac: XL Total. ICI-Dulux: Weather Shield max.
44	Dash Fasteners /Anchor Fasteners	Hilti, Fischer, Bosch,Canon
45	Sealant	DowCorning, G.E., Wacker, BECKER, SIKA
46	Water Proofing Compound	Fosroc, Pidiproof, CICO, Sika, WEBER
47	Norton Tape (Double sided) Adhesivetape	Norton, Supreme ,3m
48	Extruded Polystyrene	Supreme, Texsa, Owens Corning
49	Anti-termite	Dursban, Bayer,Osolin,ESSARCHLORO, GIBRALTOR,or equivalent
50	UPVC pipes & fittings conforming toIS:13592	Supreme, Finolex,Kisan, Ashirwad,Astral, Prayag
51	Pavers &Kerb stone	Unistone, Koncrete Product Co., K.K. Manhole & Gratings
52	S.S. Railing	Kich, Rinox, Dorma
53	Fire Check Doors and frames/ Metal doors and its fire rated hardware.	Shakti mate Hormann , Navair ,Promat International, SUKRI
54	Steel Primer(Red Oxide Zinc Chromate Primer)	Asian Paints,Nerolac, ICL
55	Wash Basin and W.C.Pan&CP BrassFittings& accessories	Jaquar,Kohler, Grohe,Roca, Essco
56	G.I.Pipes and accessories	Tata,Jindal-Hissar,PrakashSurya,NVR
57	Centrifugally Cast Iron Spun Pipes	NECO,HEPCO,SKF,RIF &Fittings
59	Cement Admixture/Plasticizer	FOSROC,SIKKA,PIDILITE,CICO, BASF
60	Stainless steel Hardware(other thanfire rated)	DORMA,EARL BIHARI, GEZE,HAFELE
61	Thermal insulation for water pipe	M/S Lloyd Insulations Limited India,Armacell,Thermaflex or equivalent
62	EPDM Gasket	Hanu ,Osaka,Alps
63	Crystalline water proofing admixtureand compound	Penetron ,Kryton, Pidilite, Fosroc
64	Floor Hardener	IRONITE, FERROK, HARDONATE
65	Stainless Steel Sink	Neelkanth,Nirali,Prayag,Parryware
66	Stainless Steel fire rated Hardware	Dorma,GEZE,Hafele,Shaktimet-Horman
67	Stoneware Pipes&Fittings/Accessories	Perfect,Parry,Burn

68	Gun metal valve/brass gate valve/Ballvalve/Butterfly valve	Zoloto,Sant,Leader
69	Stainless Steel water supply Pipes	Jindal,Swastik,RAMPART

FIRE FIGHTING

S. NO.	ITEM	PREFERRED MAKE		
1	MS PIPE	JINDAL HISSAR	SURYA	TATA
2	MS FITTING	VS	DRP	UNIK
3	PAINT	DULUX	ASIAN PAINTS	NEROLAC
4	LANDING VALVE	NEWAGE	MINIMAX	SAFEGUARD
5	FIRE BRIGADE INLET CONNECTION	NEWAGE	MINIMAX	SAFEGUARD
6	DRAWOUT CONNECTION	NEWAGE	MINIMAX	SAFEGUARD
7	HOSE REEL	NEWAGE	MINIMAX	SAFEGUARD
8	BRANCH PIPE	NEWAGE	MINIMAX	SAFEGUARD
9	FIREMAN AXE	NEWAGE	MINIMAX	SAFEGUARD
10	HOSE BOX	NEWAGE	MINIMAX	SAFEGUARD
11	HOSE REEL DRUM	NEWAGE	MINIMAX	SAFEGUARD
12	BALL VALVE	L&T	AMBIT	DRP
13	BUTTERFLY VALVE	L&T	AMBIT	DRP
14	NON RETURN VALVE	L&T	AMBIT	DRP
15	Y-STRAINER	L&T	AMBIT	DRP
16	SLUICE VALVE	L&T	AMBIT	DRP
17	GATE VALVE	L&T	AMBIT	DRP
18	SOLENOID VALVE	TYCO	VIKING	VICTAULIC
19	FLEXIBLE HOSE PIPE	TYCO	VIKING	SAFEGUARD
20	PRESSURE GUAGE	H GURU	FIEBEG	WIKA
21	FIRE EXTINGUISHERS	NEWAGE	MINIMAX	SAFEGUARD
22	PUMP	GRUNDFOSS	XYLEM	LUBI
23	CABLES	KEI	POLYCAB	RALLISON
24	END TERMINATIONS	COMET	DOWELL	JAINSON
25	CABLE TRAY	MEM	RMCON	LS POWER
26	GI Pipe	Jindal	Apollo	TATA

PART-B3

Proforma *(Water proofing, aluminum and bank guarantee)*

TO BE EXECUTED BY CONTRACTOR FOR REMOVAL OF DEFECTS AFTERC OMPLETION IN RESPECT OF WATER PROOFING WORKS

GUARANTEE BOND FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF WATER PROOFING WORKS

(TOILETS & BATHROOMS/HAND WASH AREA/UNDER GROUND TANK/OVERHEAD TANKS/ROOF)

The Agreement made this_____day of_____ Two thousand and_____between _____ son of _____(hereinafter called the Guarantor on the one part) and the PRESIDENT OF INDIA (hereinafter called the Government on 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 contract recited completely water and leak-proof.

AND WHEREAS THE GUARANTOR agreed to give a guarantee to the effect that the said structures will remain water and leak-proof for 10 (Ten) years to be reckoned from the date Completion of the building.

NOW THE GUARANTOR hereby guarantees that water proofing treatment given by him will render the structures completely leak proof and the minimum life of such water proofing treatment shall be ten years to be reckoned from the date Completion of the building.

Provided that the Guarantor will not be responsible for the 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/seepage 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 the 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 done by the department by some other agency 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 guarantor fails to make good all defects or commits breach there under then the Guarantor will indemnify the principal and his successors against all loss, damage, cost expense 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 Obliger_____and by_____and for and on behalf of the PRESIDENT OF INDIA on the day, month and year first above written SIGNED, SEALED AND delivered by OBLIGOR in the presence of :

1. …….
2. …….

SIGNED FOR AND ON BEHALF OF THE PRESIDENT OF INDIA BY _____in the presence of:

1. …….
2. …….

GUARANTEE BOND TO BE EXECUTED BY THE CONTRACTOR FOR REMOVAL OF DEFECTS AFTER COMPLETION IN RESPECT OF ALUMINIUM DOORS,W INDOWS, VENTILATORS & STRUCTURAL GLAZING WORKS

The agreement made this _____day of _____Two Thousand and _____ between _____ son of _____ (hereinafter called the GURANTOR on the one part) and the PRESIDENT OF INDIA (hereinafter called the Government on 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 3 (Three) years to be reckoned from the date Completion of the building 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 3 (Tthree) years to be reckoned from the date Completion of the building.
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 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 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 ON BEHALF OF THE PRESIDENT OF INDIA BY _____ in the presence of :

1. _____
2. _____

Form of Performance Security (Guarantee)

BANK GUARANTEE BOND

In consideration of the President of India (hereinafter called " the Government") having agreed under the terms and conditions of agreement No._____dated -_____made between_____and_____(hereinafter called "the contractor(s)")_____for the work_____(hereinafter called "the said agreement") having agreed to production of a irrevocable Bank Guarantee for ₹_____ (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, we _____ (Indicate the name of the Bank) (hereinafter referred to as "the Bank") hereby undertake to pay to the Government an amount not exceeding _____ (Rupees_____only)

2. We_____do hereby undertake to pay the amounts due and payable (Indicate the name of the Bank) under this Guarantee without any demure, merely on a demand from the Government stating that the amount claimed is required to meet the recoveries due or likely to be due from the said contractor(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 ` _____ (Rupees _____only).

3. We, the said bank further undertake to pay to 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 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 _____ further agree with the Government that the
Government (Indicate the name of the Bank)
shall have the fullest liberty without our consent and without effecting in any manner our obligations 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 forebear 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 _____ lastly undertake not to revoke this guarantee except
with (Indicate the name of the Bank)
the previous consent of the Government in writing.

8. This guarantee shall be valid up to _____, unless extended on demand by Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to ₹_____(₹_____only) 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 the _____ day of _____

for _____
(Indicate the name of the Bank)

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.

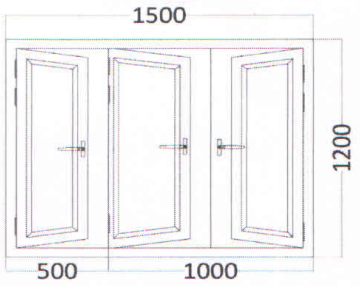
DATE ..... SIGNATURE OF THE BANK

WITNESS ..... SEAL

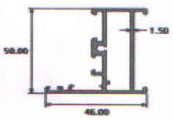
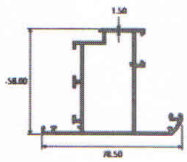
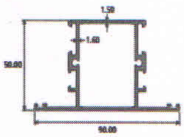
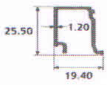
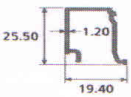
(SIGNATURE, NAME AND ADDRESS)
*Date to be worked out on the basis of validity period of 6 months from last date of receipt of tende

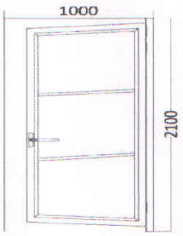
PART-B4
List of Drawings

Construction of Type II Apartment At IIT Kanpur.
System Door and Window section details

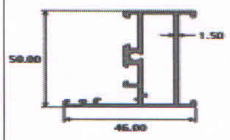
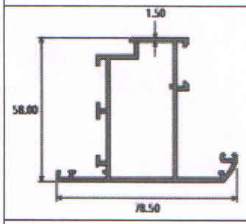
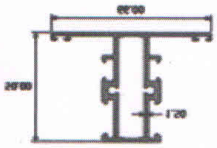
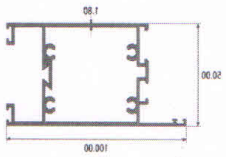
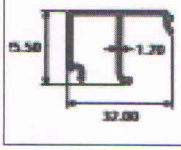


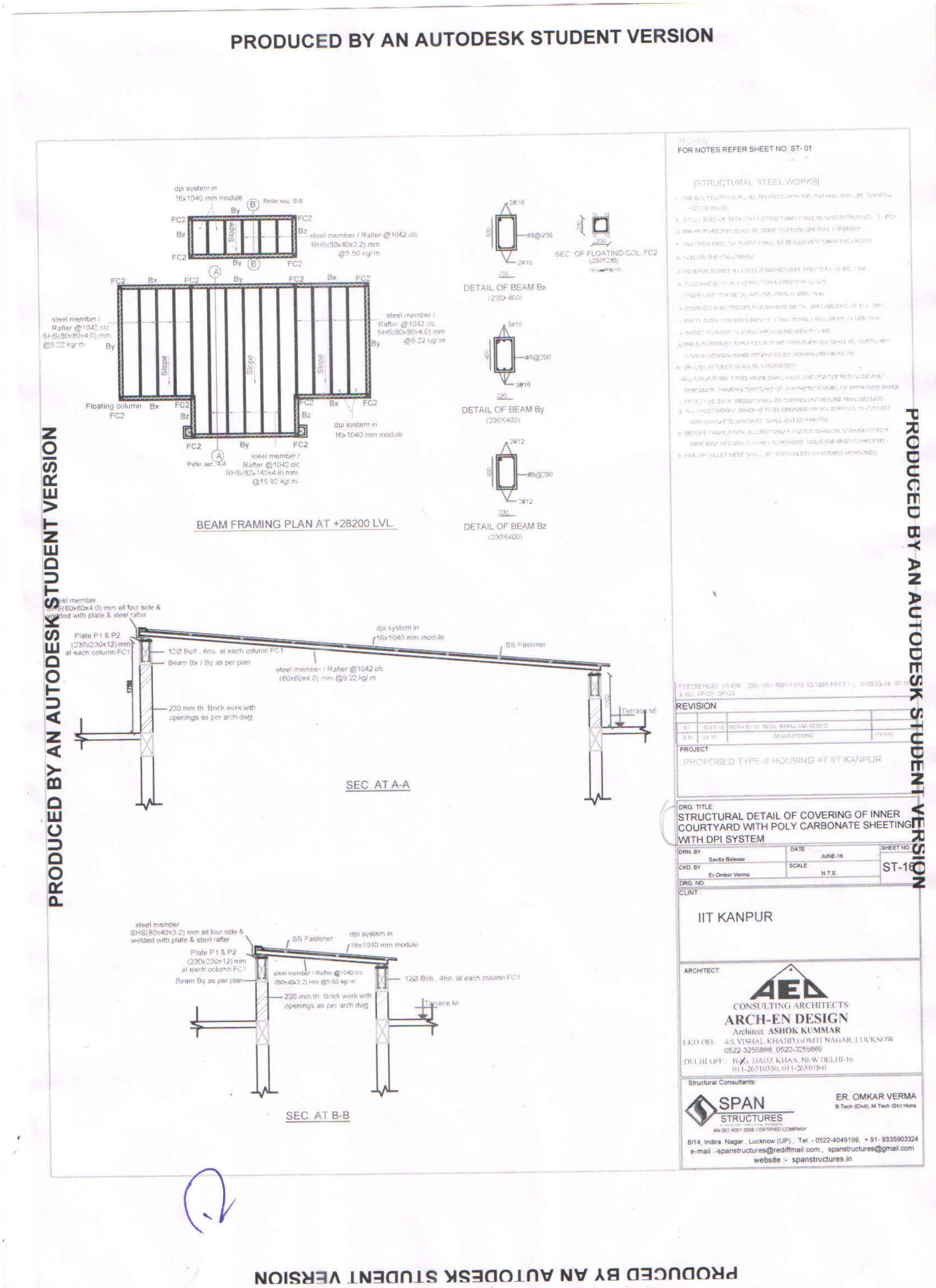
Wiremesh/Glazed window

Section of window	Particulars details	Approx. wt. of section per Meter
	Casement Outer	0.818
	Casement Shutter	1.138
	Casement Mullion	1.235
	25mm Sq Tube 1x1	1.235
	38*63 mm Tube	0.3
	DGU Clip	0.29
	Single Clip	0.305



Wiremesh Door

Section of door	Particulars details	Approx. wt. of section per Meter
	Casement Outer	0.818
	Casement Shutter	1.138
	Casement Mullion	1.235
	Door Bottom	1.766
	25mm Sq Tube 1x1	0.3
	Single Clip	0.305


PRODUCED BY AN AUTODESK STUDENT VERSION
FOR NOTES REFER SHEET NO. ST- 01
[STRUCTURAL STEEL WORKS]
BEAM FRAMING PLAN AT +28200 LVL.
DETAIL OF BEAM Bx (230X400)
DETAIL OF BEAM By (230X400)
DETAIL OF BEAM Bz (230X400)
SEC. OF FLOATING COL. FC2 (230X230)
SEC. AT A-A
SEC. AT B-B
dpi system in 16x1040 mm module
steel member / Rafter @1042 c/c RHS(80x40x3.2) mm @5.50 kg/m
steel member / Rafter @1042 c/c SHS(80x80x4.0) mm @9.22 kg/m
steel member / Rafter @1042 c/c RHS(82x145x4.8) mm @15.92 kg/m
Floating column FC2
SS Fastener
Plate P1 & P2 (230x230x12) mm at each column FC1
12Ø Bolt , 4no. at each column FC1
Beam Bx / By as per plan
230 mm th. Brick work with openings as per arch dwg
Terrace lvl
REVISION
PROJECT
PROPOSED TYPE-II HOUSING AT IIT KANPUR
DRG. TITLE:
STRUCTURAL DETAIL OF COVERING OF INNER COURTYARD WITH POLY CARBONATE SHEETING WITH DPI SYSTEM
DRN. BY Savita Balewar
DATE JUNE-16
CKD. BY Er.Omkar Verma
SCALE N.T.S.
SHEET NO. ST-16
CLINT : IIT KANPUR
ARCHITECT:
CONSULTING ARCHITECTS
ARCH-EN DESIGN
Architect ASHOK KUMMAR
Structural Consultants:
SPAN STRUCTURES
ER. OMKAR VERMA
8/14, Indira Nagar , Lucknow (UP) , Tel. - 0522-4049199, + 91- 9335903324
e-mail :-spanstructures@rediffmail.com , spanstructures@gmail.com
website :- spanstructures.in

LIST OF DRAWINGS		
S.No.	**Drawing Title**	**Drawing No.**
ARCHITECTURAL		
1	IIT KANPUR SITE PLAN	
2	IIT KANPUR_TYPE-II RESIDENCE_KITCHEN DETAIL_01	
3	IIT KANPUR_TYPE-II RESIDENCE_TOILET DETAIL_01	
4	IIT KANPUR_TYPE-II RESIDENCE_TOILET DETAIL_02	
5	KANPUR IIT(10122024)_01	
6	KANPUR IIT(10122024)_02	
7	KANPUR IIT(10122024)_03	
8	KANPUR IIT(10122024)_04	
9	KANPUR IIT(10122024)_05	
10	KANPUR IIT(10122024)_06	
11	KANPUR IIT(10122024)_07	
12	KANPUR IIT(10122024)_08	
13	KANPUR IIT(10122024)_09	
14	KANPUR IIT(10122024)_10	
15	KANPUR IIT(10122024)_11	
16	KANPUR IIT(10122024)_12	
17	KANPUR IIT(10122024)_13	
18	KANPUR IIT(10122024)_14	
19	KANPUR IIT(10122024)_15	
20	KANPUR IIT(10122024)_16	
21	KANPUR IIT(10122024)_17	
22	KANPUR IIT(10122024)_18	
23	KANPUR IIT(10122024)_19	
24	KANPUR IIT(10122024)_20	
25	KANPUR IIT(10122024)_21	
26	KANPUR IIT(10122024)_22	
27	KANPUR IIT(10122024)_23	
28	KANPUR IIT(10122024)_DOOR WINDOW SCHEDULE	
ELECTRICAL		
1	IITKANPUR SITE PLAN ELE 01	
2	IIT KANPUR_TYPE-II RESIDENCE_FOR TENDER ELE 01	
3	IT KANPUR TYPE-II RESIDENCE FOR TENDER ELE 02	
4	IIT KANPUR_TYPE-II RESIDENCE_FOR TENDER ELE 03	
5	IT KANPUR TYPE-II RESIDENCE FOR TENDER ELE 04	
6	IT KANPUR TYPE-II RESIDENCE FOR TENDER ELE 05	
7	IT KANPUR TYPE-II RESIDENCE FOR TENDER ELE 06	
8	IITKANPUR WPE-II RESIDENCE FOR TENDER ELE 07	
9	IT KANPUR TYPE-II RESIDENCE FOR TENDER ELE 08	
10	IITKANPUR TYPE-II RESIDENCE FOR TENDER ELE 09	
11	IITKANPUR TYPE-II RESIDENCE FOR TENDER ELE 10	
12	IT KANPUR TYPE-II RESIDENCE FOR TENDER ELE 11	
13	IITK.ANPUR TYPE-II RESIDENCE FOR TT-NDER ELE 12	
Plumbing		
1	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 01	

2	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 02	
3	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 03	
4	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 04	
5	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 05	
6	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 06	
7	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 07	
8	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 08	
9	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 09	
10	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 10	
11	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 11	
12	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 12	
13	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 13	
14	PF - IITKANPUR TYPE-II RESIDENCE PLANS PL 14	
Structural		
1	TYPE -II (NEVO- IIT KANPUR MAILED (FOR ESTIMATE)_STR_01	
2	TYPE -II (NEW)- IIT KANPUR_STR_02	
3	TYPE -II (NEW)- IIT KANPUR_STR_03	
4	TYPE -II (NEW)- IIT KANPUR_STR_04	
5	TYPE -II (NEW)- IIT KANPUR_STR_05	
6	TYPE -II (NEW)- IIT KANPUR_STR_06	
7	TYPE -II (NEW)- IIT KANPUR_STR_07	
8	TYPE -II (NEW)- IIT KANPUR_STR_08	
9	TYPE -II (NEW)- IIT KANPUR_STR_09	
10	TYPE -II (NEW)- IIT KANPUR_STR_10	

PART-B5

The bill of quantity for Civil work is uploaded separately containing page no. from 01 to 47 is part of contract agreement.

PART- C

[ELECTRICAL COMPONENT]

Name of work :- **Construction of Type-II Apartments (G+10, 80 Nos) including Water supply, Sanitary installation, Internal Electrical installations, Fire Fighting, Fire Alarm system, Lifts and development works at IIT Kanpur make the building functional on Percentage Rate Contract basis at IIT Kanpur**

1. Eligibility Criteria for associated contractor

Name of Work:	**Construction of Type-II Apartment (G+10, 80Nos) including water supply sanitary installation, Internal Electrical Installation, firefighting, fire alarm system Lifts and development works at IIT Kanpur .**

Eligibility condition for Associate agency for execution of Internal Electrical Installation works.

1. The eligible agency should have "'Ä" class valid electrical licence. They should have successfully completed works, as mentioned under during seven years ending previous day of last date of submission of tender

i) Three similar works each of value not less than Rs. 1,91,45,484/-

OR

ii) Two similar works each of value not less than Rs. 2,87,18,226/-

OR

iii) One similar work each of value not less than Rs. 3,82,90,968/-

Similar works mean Internal Electrical installation works

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.

2. The main contractor / agency has to submit detail of such associate agency to Engineer-In charge (Internal Electrical Installation works) within one months from date of start of work. (The associate agency shall be approved by Executive Engineer (Elect.) .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 Executive Engineer (Elect.). The new agency / agencies shall also have to satisfy the laid down eligibility criteria. In case Executive Engineer (Elect.) is not satisfied with the performance of any agency, he can direct the main contractor to change the agency executing such items of work and this shall be binding on the contractor.

PROFORMA OF SCHEDULES

(SH: Internal Electrical Installation works)
(Operative schedules shall be supplied separately to each intending tenderer)
SCHEDULE 'A' Internal Electrical Installation works
Schedule of Quantities (as per CPWD-3) As per separate sheet attached for electrical items of works.
SCHEDULE 'B'
Schedule of materials to be issued to the contractor:

S.No	Description of item	Quantity	Rates in figure & words 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

S.No	Description	Hire charges per day	Place of issue
1	2	3	4
..... NIL.....			

SCHEDULE 'D'
Schedule for specific requirement / document for the work if any: As attached in tender form
SCHEDULE 'E'
Reference to General condition of contract- GCC 2023, CPWD form 7 modified and corrected up to last date of receipt of tender. Moreover, any modifications in clauses of GCC-2023 issued by CPWD on account of GST regime in future i.e after the receipt of tender and upto the actual date of completion of the work of the present contract shall also be applicable for this contract.

Name of work: Construction of Type-II Apartment (G+10, 80Nos) including water supply sanitary installation, Internal Electrical Installation, firefighting, fire alarm system Lifts and development works at IIT Kanpur.

Estimated cost of work: Electrical Items of works Rs. 4,78,63,710/- (Excluding applicable GST)

Earnest Money — Included on schedules of civil components

ii) Performance Guarantee: — As per major components

iii) Security deposit

General Rules of & Directions: — Officer inviting tender;
Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with major component.

SCHEDULE 'F
Definitions:
2 (v) Engineer-in-charge — Executive Engineer (Elect), IIT Kanpur
2 (vii) Accepting Authority — As per major component
2 (x) Percentage on cost of materials and labour to cover all overheads and profits — 15%

2(xi) Standard schedule of Rates: — Schedule of rates-2022 & MR
2 (xii) Department: — Institute Works Department
9(ii) Standard CPWD contract form: — As per Major Components
Remaining applicable clauses are as per major component.

Annexure-I (Internal Electrical Installation works)

List of mandatory machinery, tools and plants & testing equipment to be deployed by the contractor at site.

1.	Steel/ Aluminium Ladder m to 8m.	2 Nos.
2.	Chase cutting machines	2 Nos.
3.	Electrical wire drawing equipment	2 Set
4.	Torque wrench for nut/ bolt/ screw	2 Nos.
5.	Conduit die set	2 Set
6.	Pipe vice	1 Nos.
7.	Bench vice	1 No.
8	L.T. Meggar 500/1000 Volts	1 No.
9.	Tong Tester	1 No.
10	Multi meter	1 No.
11	Hydraulics operated & hand operated crimping machine	1 No.
12	Earth tester	1 No.
13	Portable ordinary drilling machine	2 Nos.
14	Portable Hammer drilling machine	2 Nos.
15	Overhead conduit puller.	1 No.
16.	Welding machine	1 No.
17	Metal Grinding machine (hand held)	1 No.
18.	Drill machine	1 No.

2.0 MEMORANDUM OF UNDERSTANDING [M.O.U] BETWEEN

1. M/s Name of the firm with full address
   Enlistment status
   Valid upto:
   Henceforth, called associated contractor
   And
2. M/s Name of the firm with full address
   Enlistment status
   Valid upto:
   Henceforth, called associated contractor

Name of work: Construction of Type-II Apartment (G+10, 80Nos) including water supply sanitary installation, Internal Electrical Installation, firefighting, fire alarm system Lifts and development works at IIT Kanpur.
[Electrical component only] as per schedule, specifications, terms and conditions of the tender.

We state that M.O.U between us will be treated as an agreement and has legality as per Indian Contract Act (amended upto dated) and the department (IWD) can enforce all the term and conditions of the agreement for execution of the above work. Both of us shall be responsible for the execution of work as per the agreement to the extent of this MOU allows. Both the parties shall be paid consequent to the execution as per agreement to the extent this MOU permits.

We have agreed as under:

1. The associated contractor shall be liable for disciplinary action if he failed to discharge the action (s) and other legal action as per agreement besides forfeiture of the security deposit.

2. All the material, machinery and equipment's, tools and tackles required for execution of the electrical works. As per agreement shall be responsibility of the associated contractor.

3. The site staff required for the electrical work shall be arranged by the associated contractor as per terms and conditions of the agreement.

SIGNATURE OF THE MAIN CONTRACTOR
Date
Place

SIGNATURE OF ASSOCIATED_____
CONTRACTOR
Date
Place

COUNTERSIGNED
EXECUTIVE ENGINEER (ELECT)

3.0 WILLINGNESS CERTIFICATE

Name of work: Construction of Type-II Apartment (G+10, 80Nos) including water supply sanitary installation, Internal Electrical Installation, firefighting, fire alarm system Lifts and development works at IIT Kanpur.

I will execute the work as per specification and conditions for the agreement and as per direction of the Executive Engineer (Elect.). Also I will employee full time technically qualified supervisor for the works. I will attend inspection of officers of the department as and when required.

I/ We undertake and confirm that eligible similar works (s) has / have not been got executed through contractor on back basis. further that, if such a violation comes to the notice of Department, then I/We shall be debarred for tendering in IWD contracts in future forever".

I have also read the complete tender conditions and I am aware that PART-A(civil tender) of this tender document is applicable to me also"

Date: Signature of Contractor

4.0 SPECIAL CONDITIONS OF THE WORK

1. The contractor is advised to visit the site of work to have an idea of the execution of work failure to do so shall not absolve their responsibility to do the work as specified in agreement.

2. Rates:

a) The work shall be treated as on works contract basis and the rates tendered shall be for complete items of work (except the materials, if any, stipulated for supply by the department) inclusive of all taxes (excluding GST, if any), duties, and levies etc. and all charges for items contingent to the work, such as packing, forwarding, insurance, freight and delivery at site for the materials to be supplied by the contractor, watch and ward of all materials (including those supplied by the department, if any) for the work at site etc.
b) Prices quoted shall be firm.

3. Mobilization Advance: No mobilization advance shall be paid for the work, unless otherwise stipulated in tender papers for any individual works composite work.

4. Completeness of Tender: All sundry fittings, assemblies, accessories, hardware items, foundation bolts, termination lugs for electrical connections as required, and all other sundry items which are useful and necessary for proper assembly and efficient working of the various components of the work shall be deemed to have been included in the tender, whether such items are specifically mentioned in the tender documents or not.

5. Works to be done by the contractor: Unless and otherwise mentioned in the tender documents, the following works shall be done by the contractor, and therefore their cost shall be deemed to be included in their tendered cost:-

a) Foundations for equipment's and components where required, including foundations bolts.
b) Cutting and making good all damages caused during installation and restoring the same to their original finish.
c) Sealing of all floor openings provided by him for pipes and cables, from fire safety point of view, after laying of the same.
d) Painting at site of all exposed metal surfaces of the installation other than pre-Painted, items like fittings, fans, switchgear I distribution gear items, cubicle switch board etc. Damages to finished surfaces of these items while handling and erection, shall however be rectified to the satisfaction of the Executive Engineer (Elect.).
e) Testing and commissioning of completed installation.
f) Storage space for all equipment's, components and materials for the work.

6. Storage and Custody of Materials: The contractor has to make his own arrangement for the storage of the material at site and necessary watch and ward of the electrical installation during the execution of work till the same is handed over to the department. No extra payment will be made on this account. The main contractor shall arrange for proper storage of the electrical fans and fittings at site and that double lock system shall be arranged for the fans and fittings after receipt at site until the time they are taken for installation. The contractor shall however be responsible for proper storage and safe custody of the same till their installation and handing over to the department.

7. Electric Power Supply and Water Supply: Power and water supply will be arranged by the contractor at the site for installation purpose. However, for testing purpose after complete installation of the electrical items, electricity supply will be made available free of cost to the contractor. Contractor will take due care to ensure safety of electrical installation during execution of work.

8. Tools for handling and Erecting: All tools and tackles required for handling of equipments and materials at site of work as well as for their assembly and erection and also necessary test instruments shall be the responsibility of the contractor.

9. Payment Terms: Payment shall be made as per the relevant clauses of form C**PWD** 7 forming part of the tender documents.

10. Co-ordination with other agencies: The contractor shall co-ordinate with all other agencies involved in the building work so that the building work is not hampered due to delay in his work. Recessed conduit and other works, which directly affect the progress of building work. should be given priority.

11. Care of buildings: Care shall be taken by the contractor to avoid damage to the building during execution of his part of the work. He shall be responsible for repairing all damages and restoring the same to their original finish at his cost. He shall also remove, at his costs, all unwanted and waste materials arising out of his work, from the site.

12. Structural Alterations to Buildings:

a. No structural member in the building shall be damaged/ altered, without prior approval from the competent authority through the Engineer-n-charge.
b. Structural provisions like openings, cutouts, if any, provided by the department for the work, **shall be** used. Where these required modifications or fresh provisions are required to be made, contingent works shall be carried out by the contract at his cost.
c. All such openings in floors provided by thedepartmentshallbe closed by the after installing the cables/conduits/rising mains etc. as the case may be, by any suitable means as approved by the Engineer-in-charge without any extra payment.

13. All chases required in connection with the electrical works shall be provided and filled by the at his own cost to the original architectural finish of the buildings.
14. Work in occupied building:

a) When work is executed in occupied buildings, there would be minimum of inconvenience to the occupants. The work shall be programmed in consultation with the Engineer-in-charge and the occupying department. If so required the work may have to be done even before and after the office hours.
b) The contractor shall be responsible so work by the regulations or restrictions set in regard to entry into, and movement within the premises.
c) The contractor shall not tamper with any of the existing installations including their switching operations or connections there to without specific approval from the Engineer-in-charge.
15. Drawings:
a) The work shall be carried out in accordance with the drawings and the tender documents and also in accordance with modification thereto from time to time as approved by the Engineer-in-charge.
b) All wiring diagrams shall be deemed to be 'Drawings' within the meaning of the term as used in Clause 11 of the conditions of contract **(CPWD 7).** They shall indicate the main switch board, the distribution boards (with circuit numbers controlled by them), the runs of various mains and sub mains and sub mains and the position of all points with their controls.
c) All circuits shall be indicated and numbered in the wiring diagram and the points shall be given the same number as the circuit to which they are electrically connected.
d) After award of the work, the firm will be required to submit the drawings for the proposed work including layout plan, conduit routes etc. Work will be carried out as per the approved drawings.

16. Quality of material: All materials and equipments supplied by the contractor shall be new. They shall be of such design, size and materials as to satisfactorily function under the

rated conditions of operation and to withstand the environmental conditions at site.

17. Inspection of materials and equipments:

a. Materials and equipments to be used in the work shall be inspected by the departmental officers. Such inspection will be of following categories.

i. Inspection of material/ equipments to be witnessed at the Manufacturer's premises in accordance with relevant BIS/Agreement Inspection Procedure.
ii. To receive materials at site with Manufacturer's Test Certificate(s).
iii. To inspect materials at the authorized dealer's go downs to ensure delivery of genuine materials at site.
iv. To receive materials after physical inspection at site.

b. Adequate care to ensure that only tested and genuine materials of proper quality are used in work shall be ensured by firm. The firm shall ensure that:

1. Material will be ordered & delivered at site only with the prior approval of the department to ensure timely delivery.
11. As and when the order is placed for the fittings/ fixtures, cables, switchgears, poles, rising main, other main items etc, its copy shall be endorsed to the Engineer-in-charge.

iii. The firm will be required to procure material like exhaust fans, MCB's & DB's, switches & sockets, wires & cables, conduits and switchgears etc directly from the manufacturer/ authorized dealers to ensure genuineness & quality and as per the approved makes only. Proof in this regard shall be submitted by the contractor if required by the department.
iv. Inspection at factory or at go down of the manufacturer, as required, shall be arranged by the firm for a mutually agreed date. Certificate for genuineness of the fittings shall have to provided duly signed by the manufacturer's officer not below the rank of Regional Manager.
v. Delivery of material shall be taken up only with the consent of department, after clearance of the material.
vi. Department shall reserve the right to waive inspection in lieu of suitable test certificate, at its discretion.

c. Similarly, for fabricated equipment's, the contractor will first submit dimensional detailed drawings for approval before fabrication is taken up in the factory. Suitable stage inspection at factory also will be made to ensure proper use of materials, workmanship and quality control.

18. Ratings of components:

a. All components in a wiring installation shall be of appropriate ratings of voltage, current and frequency, as required at the respective sections of the electrical installations in which they are used.
b. All conductors, switches and accessories shall be of such size as to be capable of carrying the maximum current, which will normally flow through them, without their respective ratings being exceeded.

19. Conformity to standards:

a. All components shall conform to relevant Indian Standard Specifications wherever existing. Materials with ISI certification mark shall be preferred.
b. Relevant Indian Standards including amendments or revisions thereof up to the date

of tender acceptance shall be applicable in the respective contracts for respective items, firm to ensure its compliance.

20. Interchangeability: Similar parts of all switches, lamp holders, distribution fuse boards, Switch gears, ceiling roses, brackets, pendants, fans and all other fittings of the same type shall be interchangeable in each installation.

21. Workmanship:

a) Good workmanship is an essential requirement to be complied with. The entire work of manufacture / fabrication, assembly and installation shall conform to sound engineering practice.

b) Proper supervision/skilled workmen. The contractor shall be a licensed electrical contractor of appropriate class suitable for execution of the electrical work. He shall engage suitably skilled/licensed workmen of various categories for execution of work supervised by supervisors I

Engineer of appropriate qualification and experience to ensure proper execution of work. They will carry out instruction of Executive Engineer (Elect.) and other senior officers of the Department during the progress of work.

C. Use of quality materials: Only quality materials of reputed make as specified in the tender will be used in work.

d. Fabrication in reputed workshop : Switch boards and LT panels shall be fabricated in a factory /workshop having modern facilities like quality fabrication, seven taken process, powder/ epoxy paint plant, proper testing facilities, manned by qualified technical personnel. These shall be as per make / item approved.

22. Testing: All testes prescribed in this General Specification, to be done before, during after installation, shall be carried out, and the test results shall be submitted to Executive Engineer (Elect.) in prescribed performa, forming part of the completion certificate.

23. Commissioning of completion: After the work is completed, it shall be ensured that the installed is tested and commissioned.

24. Completion plan and completion certificate:

a. For all works completion certificate after completion of work as given in Appendix-E of CPWD specification shall be submitted to the Executive Engineer (Elect.).

b. Completion plan drawn to a suitable scale in tracing cloth with ink indicating the following along with three blue print copies of the same shall also be submitted.
i. General layout out the building.
ii. Locations of main switchboard and distribution boards, indicating the circuit numbers controlled by them.
iii. Position of all points and their controls.
iv. Types of fittings, viz fluorescent, pendants, bracket, bulk head, fan, exhaust fans etc.
v. Name of work, job number, tender reference, actual date of completion, names of Division/ Sub-division and name of the firm who executed the work with their signature.

25. **Guarantee: The installation will be handed over to the department after necessary testing and commissioning. The installation will be guaranteed against any defective design/ workmanship. Similarly, the materials supplied by the contractor will be guaranteed against any manufacturing defect, inferior quality. The guarantee period will be for a period of 36 months from the date of handing over to the department. Installation / equipment's or components thereof shall be rectified/ repaired to the satisfaction of the Executive Engineer (Elect.). The firm will be required to submit guarantee of fans and fittings from the manufacturer to the department. Nothing extra shall be paid on this account.**

26. Supply of fittings, fixtures & other material: The procurement of material for the works will be programmed as per the progress of work in consultation with Executive Engineer (Elect.). The firm will be required to submit a detailed programme and prior to the procurement will seek approval of the department. The direction of the department regarding timing & necessity of getting such material will be final & binding on the firm.

27. All materials to be used on this work shall be ISI marked & shall be got approved from the Technical sanctioning authority / Executive Engineer (Elect.) before installation at site unless otherwise not covered under ISI.

28. The work shall be carried out according to approved drawings/ details which shall be subsequently issued to the successful tenderer for execution of work and as per instructions of Executive Engineer (Elect.) who will have the right to change the layout as per requirement at site and the contractor shall not have any claim due to change in layout. The work shall be executed by skilled person Licensed by the approved authorities.

29. All damages done to the building during execution of electrical work shall be the responsibility of the contactor and the same will be made good immediately at his own cost to the satisfaction of Executive Engineer (Elect.). Any expenditure incurred by the department in this condition shall be recovered from the contractor and decision of the Engineer-in-charge about recovery shall be final.

30. The bad workmanship will not be accepted and defects shall be rectified at contractor's cost to the satisfaction of the Engineer-in-charge. The programme of electrical works is to be co-ordinated in accordance with the building work and no claim for idle labour shall be entertained.

31.All the debris of the electrical works should be removed and the site should be cleared by the contractor immediately after the accruing of debris. Similarly any rejected material should be immediately cleared off from the site by the contractor.

32.The contractor or his representative is bound to sign the site order book as and when required by the Engineer-in-charge and to comply with the remarks therein.

33. The size of conduit and wiring shall be got approved from the Executive Engineer (Elect.) before taking up the execution.

34. The contractor shall make his own arrangement at his own cost for electrical / general tools and plants required for the works.

35. Main Board and Main Distribution Board: The work shall be carried out according to the drawings / details are as approved by the Engineer-in-charge. The contractor shall have to get the samples approved before the whole lot is brought to site and it shall include all inter connections etc. All termination of electrical cables in panel / feeder pillars DB's, cable-looping box etc. shall have to be done with proper thimbles/ lugs using crimping process. Copper thimbles/ reducer shall be used for copper cable and Aluminium cable nothing extra will be paid for the same.

36. All materials shall be supplied and used in items of works by the contractor should be of standard and approved quality. They should be got approved from the Engineer-in-charge or his authorized representative before installation otherwise no payment will be made for an unapproved or rejected material used on the works and the same be removed at his cost from site or work.

37. The contractor shall have to prove bonafides of the make of materials by producing necessary documentary evidence. They are advised to obtain prior approval of Executive Engineer (Elect.) for proposed make of material, before bringing material to site work.

38. Location of Light fixtures, cable routes etc, should be got approved from the Engineer-in-charge before execution.

39. All interconnection in the panel, DB, cable-looping boxes shall be carried out with suitable cable commensurate with current carrying capacity of incoming and outgoing cables complete with thimbles etc. as required for which nothing extra shall paid.

40. All panels, DB's, cable-looping boxes will be numbered and marked with paint / name plate and nothing extra will be payable on this amount.

41. All MCB, MCCB, MCB DB's, RCBO's RCCB with DB's shall be of same make / manufacturer.

42. Modular Switch /Socket's / Plates / Computer outlet / Telephone outlet and all accessories shall be of the single make only be provided. The contractor shall have to make the edges around the boxes wherever required shall have to be made by the contractor for which nothing extra shall be paid. The galvanized metal

box shall be of the standard thickness as the GI boxes besides other requirement.

43. All the material should be ISI Marked unless otherwise clarification is not available.

44. All concealed work shall have to be done in the presence of Executive Engineer (Elect.) or his authorized representative.

45. The entire installation shall be at the risk and responsibility of the contractor until these are tested and handed over to the department.

46. Notwithstanding the schedule of quantities, all items of interrelated works considered necessary to make the installation complete and operative are deemed to be included shall be provided by the contractor at no extra cost.

47. The connection, inter connection, earthing shall be done by the contractor wherever required and nothing extra shall be paid on this account. All repairs & patch work shall be neatly carried out to match with the original finish & all damaged caused to the building installation during the execution of work shall have to be made good by the contractor immediately at his own cost to the entire satisfaction of Executive Engineer (Elect). In case contractor fails to comply with the instructions of the Executive Engineer (Elect.) shall be at liberty to get the work done by any other agency and recover such amount as paid to the other agency from the bill(s) of the contractor. Contractor shall have no claim, whatsoever, on the extent of such amount.

48. The contractor shall have to provide the fish wire after removing the choking of the conduit. Even if subsequently the conduits are found chocked, the choking will be get removed and / or the new conduit shall be provided at the risk and cost of the contractor.

49. The makes of material have been indicated in the list of acceptable makes. No other make will be acceptable. The materials to be used in the work shall be got approved from Executive Engineer (Elect.) before at site The Executive Engineer (Elect.) shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specifications.

50. No material shall be brought to site without the approval of Executive Engineer (Elect). All fixtures and fittings shall be procured just before the installation.

51. Wherever ceiling rose are not required to be provided in the light / fan / exhaust fan points, due site conditions, the contractor shall use suitable three pin connectors for which nothing extra shall be paid. wiring shall carried out with FR wires.

52. Contractor shall provide polythene / PVC plastic cover for all MDB's/SDB/DB's, panels, feeder pillars etc. to protect them from rust/ damages, during execution of work till the work is actually completed and handed over the department.

53. Makes of all items that are not covered in the schedule of work / additional specifications shall be got approved from Executive Engineer (Elect) and shall confirm to relevant Indian Standard as applicable.

54. The contractor shall ensure that the staff employee by him for execution of the electrical work posses the valid electrical license issued by competent authority. Consequences arising due to the default of the contractor in not complying with the above condition shall be the responsibility of the contractor.

55. Copper lugs shall be provided for terminating copper / aluminium / GI earth wire to all switch boards for which nothing extra shall be paid. All multistoried /standard wires shall be terminated through copper lugs.

56. All concealed work and earthing shall be done in the presence of Executive Engineer (Elect or his authorized representative.

57. The schematic diagram / dimensional drawings of the various electrical cubical panels shall be got approved from the The Executive Engineer (Elect.) before fabrications and shall comply with CPWD specifications and Indian Electricity Rules. The panels shall be confirm to IS: 8623/1993. All panels shall be powder coated inside out, in shade approved by The Executive Engineer (Elect.).

58. All floor mounted panels shall be mounted on 75 mm x 40 mm x 5m m thick M.S channel on the sides. It shall have a continuous earth bus of the same size and materials as the main phase running continuously

along the length of the panel extending on either side for earth connection.

59. The doors of all cubical panels shall be hinged type including those bus bars chambers and cables alleys. The locking shall be with chrome plate metal key locks. All doors shall be earthed with copper conductor wire as approved by The Executive Engineer (Elect.)

60. The work shall be carried out according to drawing approved by The Executive Engineer (Elect.) The lay out once approved can only changed by the Executive Engineer (Elect.) as per requirement at site it shall be the responsibility of contractor to plan the layout and get the approval from the Executive Engineer (Elect.). before laying the conduit etc.

61. All MCB DB shall be pre wired.

62. The MCB should be of the same make as that of MCB DB's and having a minimum breaking capacity of 10KA. Contractor shall obtain approval of The Executive Engineer (Elect.) before procurement of MCB DB's.

63. All model of modular accessories required for the work shall be got approved from The Executive Engineer (Elect.) from among the approved makes. The base plate shall be preferably in sheet steel or otherwise in unbreakable polycarbonate. The cover plates shall be screw less type in shade approved by The Executive Engineer (Elect.)

64. Contractor shall have to check the Site Order Book for any instructions of The Executive Engineer (Elect.)or his authorized representative and sign the site order book. He shall be bound to ensure compliance with the instruction recorded therein.

65. MCCB's shall be used with terminal spreaders and all terminals shall be shrouded to avoid direct contract.

66. All measuring indicating instruments shall be protected through MCB's and isolating switches .

67. General arrangement drawing of the switch board shall be got approved from The Executive Engineer (Elect.) before commencement of manufacturing.

68. For the items like LT panels, feeder pillar and accessories , etc. the firm shall arrange for inspections in the factory provide for all facilities for testing. The cost of the visit of The Executive Engineer (Elect.) or his representative shall be borne by department. However, firm will be responsible for arranging the inspection as required.

69. Conduit layout as per switching arrangement shall be prepared by contractor and got approved from The Executive Engineer (Elect.) before lab casting.

70. Conduit and termination to SDB and main board adopter box i/c connections, wires to MCB's inter connections between SDB and main board etc shall be included in the tendered rats and nothing extra shall be paid for the same.

71. The contractor shall provide junction boxes/ looping boxes of required sizes and such boxes shall be measured as part of conduit / batten wiring without any extra payment.

72. M.S dash fastener shall be used for installation of fittings and fixtures in ceiling and for providing suspenders for the angle support, conducting cable tray etc. for which nothing extra shall be paid.

73. All CI/metal boxes & junction boxes should be cleaned properly and panted from inside before wiring &fixing the accessories.

74. **The contractor has to submit 3 years on site replacement warranty for LED luminaries from manufacture, THD of the LED luminaries should be less than 10%. The contractor shall be submit LM79 report of LED Luminaries supplied at site (from the manufacturer).**

75. General Description:

a) These specifications together with the Engineer's plans cover the Electrical System works for Internal & External Electrical works.

b) This specification states the requirements for the supplying, assembling, fixing in position, connecting, inspecting, testing and leaving in working order new, modified or additional electrical installations.

c) The work shall comprise the whole of labour and unless otherwise indicated all the materials necessary to from a **'complete installation'** and such tests, adjustments and commissioning as are prescribed in subsequent clauses and as may otherwise be required to give an effective working installation to satisfaction of The Executive Engineer (Elect.).

d) The word 'compete installation' shall mean not only the items of electrical equipment conveyed by these specification, but all the incidental sundary components necessary for the complete execution of works and for proper operation of the installation, whether or not these sundry components are mentioned in detail in tender document issued in connection with the contract.

e) Adequate protection of equipment during transit shall be provided by manufactures and the contractor shall ensure adequate protection on site. The contractor shall advise The Executive Engineer (Elect.) of any damage that occurs to equipment including finishes and shall carry out repairs as directed by The Executive Engineer (Elect.).

76. Drawings:

a) Drawing have been prepared by the consultants , for all the above items of work. The renderer shall submit his quotation strictly in accordance with these specification and drawings.

b) drawings and documents shall be provided by the consultant. The rearrangement of the equipments shall be done by the Contractor with the approval of The Executive Engineer (Elect.) if necessary. The shop drawings shall be prepared by the Contractor and got them approved by the consultant or The Executive Engineer (Elect.).

77. Regulations: Each installation shall comply with all the relevant statutory requirements and regulations including the following:

a) Regulation under the Electricity Acts:
b) Factories Acts and Regulation:
c) Health and Safety at work etc. Act and regulation:
d) "Regulation of all the appendices contained therein and referred to herein as the "IEE wiring Regulation".

e) Regulations and requirements of Indian Telecom and the local electricity, gas and water Undertakings.

78. Standards:

a. The complete installation shall comply with all relevant Indian Standards, Indian Codes of Practice, where indicated, with other.

b. Standards and specifications and all amendments thereto. The relevant issues shall be those current three months before the date for return of tender, unless alternative dates are indicated.

c. Where practicable, each item of equipments shall be clearly and indelibly marked to indicate the standard with which is complies. Alternative a certificate of compliance shall be provided.

d. Where equipment or services are indicated to be manufactured of provided under a particular certification, licensing or quality assurance scheme, the manufacturer or supplier shall be a current participant in the relevant scheme. A certificate of compliance shall be provided.

e. Equipment not manufactured in the India shall be of a standard, which ensures its compliance with all appropriate IS standard.

79. Approval: The Executive Engineer (Elect.) approval shall not relive the contractor of his contractual responsibilities and obligation. The contractor shall be responsible for discrepancies, errors or omissions on drawing or other documentation supplied by him, whether they have been approved by The Executive Engineer (Elect.) or not due to incorrect information given writing by The Executive Engineer (Elect.). The contractor shall be responsible for ensuring that equipment complies with the specified requirements.

80. The contractor has to weld / hang the conduit with suitable hanger wherever required during the work. Nothing extra shall be paid on this account.
81. Electricity connection shall be provided by IIT at one point near the site. The Contractor shall make is own arrangement for tapping at multiple locations and distribution network for which nothing extra shall be paid.

Note:
The requirements, conditions, appendices, etc. stated in any other bid documents shall apply to and shall be considered as a part of this specification as if bound together. In case of any discrepancy between conditions specified in any other volume and this volume, the requirements, decision of Engineer-In- Charge is final.

5.0 ADDITIONAL CONDITIONS FOR INTERNAL ELECTRICAL INSTALLATION WORKS

a. Specification: The work shall be executed as per CPWD General
b. Specifications for Electrical works Part-I Internal -2023 & Part-II - External 2023, CPWD General Specifications for electrical works IV substation-2013. The additional specifications are to bread with above and in case of any variations, specifications given along with tender shall apply, However, if the specification detailed herein is not manufactured, the standard practice for reputed manufacturers shall be adopted.

2. Location: The work is to be executed at IIT Kanpur campus, Kanpur. The contractor is advised to visit the site before submission of their tender.

3. The contractor of his representative is bound to sign and the site order book as and when required by the engineer in charge and to comply with remarks therein.

4. Before the start of the work and prior to procurement of materials the contractor shall submit the drawing and schematic layout as per the schedule of quantity for approval of the engineer in charge.

5. Test Certificate Test certificate for the work carried out shall also be submitted.

6. Quantities indicated in schedule of work are only indicative. The contractor shall consult the engineer-in-charge or his authorized representative before procurement. Payment shall be made only for the quantities actually executed and measured.

7. The makes for items shall be as per list attached. The material in required quantity to be used in the work shall be got approved from the engineer in charge before is use at site. The Engineer-in-charge shall reserve the right to instruct the contractor to remove the material which, in his opinion, is not as per specification.

8. Contractor shall preserve the copies of invoices, test certificates, gate passes etc., The responsibility of procurement of genuine material shall rest with the contractor.

9. No inspection outside the country is permissible. If required so , the same will be deemed to waived off and necessary test reports shall be submitted before the dispatch of equipment. The contractor shall be fully responsible for such items of materials.

10. Successful bidder shall offer IITK for necessary pre dispatch inspection of electrical equipment/fixtures etc IIT Kanpur shall reserve the right to waive off the pre dispatch inspection and shall clear the equipment/fixtures by reviewing test reports submitted.

11. Successful bidder shall submit all relevant reports for LED lighting fixtures before dispatching of material at site. All tests shall be carried as per IES approved methods defined (LM-82) as suggested by Manufacturer.

12. IIT Kanpur shall reserves the right of rejecting any items/equipment/fixtures supplied by the contractor other than the approved makes specified in the tender.

6.0 GENERAL ELEECTRAL SPECIFICATION

1.00.00 Cable Trays, Racks, perforated and associated Material

1.01.00 Cable Trays / Support

1.01.01 All cable trays shall be ladder type and shall be supported and laid in accordance with the 'layout drawings'.

1.01.02 Cable trays shall be ladder type and dip galvanized after fabrication.

1.01.03 Cable tray supports shall be cantilever type for easy installation. All supports and hardware shall be hot dip galvanized.

1.01.04 Standard cable tray width shall be 600 mm. However reduced width of 300 mm shall be used in some place where specifically required.

1.01.05 Trays in general shall be supported at a distance of 1.5 m horizontal run.

1.01.06 All welds for cable trays shall have a minimum throat thickness of 60mm.

1.01.07 Jointing of cables trays shall be done by welding only.

1.01.08 Damaged galvanized surfaces shall be cleaned and coated with two (2) coats pf red oxide primer followed by two (2) coats of cold galvanized paint.

1.02.00 Earthing of cable Trays.

1.02.01 Cable trays shall be electrically continuous and grounded. Earthing of cable trays shall be ensured by separate connection with the weld.

1.03.00 Cable Tray Installation

1.03.01 All relevant layout drawings enclosed shall be followed except shaft obvious interference occurs. In such case the coating shall be damaged as directed and / approved by the owner.
Twenty (20%) spare space shall be provided in cable tray.

2.00.00 Cabling

2.01.01 Adequate space will be provided to facilitate installation of cable system and to allow routine inspection and modification after installation.

2.01.02 Different voltage grade cable shall be laid in separate trays when the tray are run in tier formation. Generally power cable will be on bottom trays and control cables system with non-inflammable materials.

2.01.03 Cables for redundant equipment / system shall be run in separate trays.

2.01.04 All opening in the floor and wall for cable access shall be sealed after installation of the cable system with non-inflammable materials.

3.00.00 Grounding

3.01.00 All grounding work shall be carried but as per guidelines specified in 'Grounding notes and details along with the typical grounding drawings enclosed with this specification.

3.02.00 Main grounding grid shall be laid 1 M below ground level. This shall be comprising of 40mm dia MS rod and earth pit. This earthing system will also be interconnected to the existing system.

3.03.00 Tapped riser of 50 x 6 mm 6.5 mtr from main grounding grid running along tray, building structural steel shall be used as ground continuity conductor.

3.04.00 Building structural steel wherever available shall be directly connected with main ground grid. In no case runner angle of cable tray, building structural steel shall be used as ground continuity conductor.

3.05.00 All equipment under this package shall be directly connected to main grounding grid/ ground continuity conductor running along cable tray.

3.06.00 The riser shall be bolt connection at equipment end. In case the rise length is not adequate, separate equipment ground conductor shall be used which will be welded to the riser at one end and bolt connector to the equipment at other end.

3.07.00 All ground conductor shall be painted black after connection to guard against weathering and easy identification.

Equipment ground connection after checked and tested by the Authority shall be coated with anti-corrosive paint/ old compound.

3.08.00 All ground connection shall be made by electric arc welding unless otherwise specified.

3.09.00 Electrical equipment shall be provided with two separate and all sealed grounding pads, each complete with tapped hole galvanizing spring washer for connection to main ground grid.

4.00.0 Tests

4.01.0 Upon completion system and equipment shall be subjected to standard tests for checking the acceptability of the system with reference to relevant IS and IE rules.

4.02.0 Six (6) copies of Routine tests Certificate shall be submitted for approval prior to the dispatch of the concerned equipment from works.

4.03.0 Approval & Inspection: All manufacturing drawings including single line drawing and GA drawing shall be subject to approval. All bought items shall be subject to approval. The Board shall be subject to pre-dispatch inspection by representative of IITK, where-in, conformity to specifications, functional tests, di-electric withstand test, and painting, etc. shall be verified.

GROUNDING NOTES

1. Grounding work shall conform to the requirements of the following latest standard, statutory provision is amended upto date:

   IS : 3043 – 1987 –Code of practice for earthing.
   Indian Electricity Act 2003
   Indian Electricity Rules – 1956
   Contract Specifications
   Enclosed grounding drawings
2. The ground shall be connected with main grid available in the yard.

3. The earth pit shall be as per enclosed drawing and connected to the ground grid conductor.

4. Riser / pig tail from the ground grid conductor shall be as per typical details shown in the enclosed drawing .

5. All ground connection below the grade shall be made by Electric arc welding with low hydrogen content electrode Bonding of the conductor where necessary shall be done by gas heating.

6. The ground conductors shall be interconnected between them and top the main ground grids through risers.

7. All electrical equipments and associated non-current carrying metal works, supporting structures, building columns, fence, and system neutrals lightening mast / arrestors shall be connected to the ground grid system.

8. Two separate and distinct ground connections shall be provided for earthling of electrical equipment frame work in compliance with I.E. rules.

9. Misc. devices such as push button stations, lockout switches and cable end boxes etc. shall be grounded effectively whether specifically shown or not.

10. For ground connections, the conductor sizes shall be as listed below:

Equipment	G.I. Steel flats / wires
a. 33 / 11 KV equipment	1 No. 50 x 6mm
b. Structures, cable trays etc.	1 No. 50 x 6mm
c. LT/HT panels	1 No. 50 x 6 mm

11. Ground conductor connection above the grade shall be generally made by electric arc welding.

12. Bolted connections shall be made only for grouting equipment devices and removable structures. The contact surface shall be thoroughly cleaned before connection to ensure good electrical contact.

13. A continuous 50x6mm GI flats ground c conductor shall be installed on one bank of vertical/horizontal trays and securely attached to such tray section, forming a solidly grounded trays system.

Before installing 50x6mm GI flats ground conductor along the cable tray run the cable trays welding joints in cable to ground tray supports shall be painted as specified.

14. Where two or more trays run together in one bank either vertically/ horizontally provide a continuous conductor on the top tray only on taps to each section of to other tray at 10M interval.

15. Fence within the ground grid shall be bounded the palmily at regular interval not exceeding ten (10) Meters. Fence generally separately grounded with flexible connection before type

16. Earth pit shall be provided at connection

17. All welding joints in ground conductor above the ground shall be coated with two coats of cold galvanizing anti-cursive paint after welding.

SPECIFICATION FOR POWER AND CONTROL CABLES

1.00.00 DESIGN CRITERIA

1.01.00 The cable will be used for connection of power and control circuits of the owner's electrical system.

1.02.00 Cable will be either laid on ladder type trays or directly buried in ground.

1.03.00 For continuous operation at specified rating, maximum conductor temperature shall be limited to the permissible value as per relevant standard and/or this specification.

1.04.00 The insulation and sheath materials shall be resistant to oil, acid and alkali and shall be enough to withstand mechanical stresses during handling.

1.05.00 Armoring shall be single round wire of galvanized steel for multicore cables and aluminium for single core cable.

1.06.00 Core identification for multicore cable shall be provided by colour coding.

2.00.00 SPECIFIC REQUIREMENTS

2.01.00 L.V. Power cables

1100 Volt grade, heavy duty armoured power cables with stranded aluminium conductors, XLPE insulation and extruded PVC overall sheath.

2.02.00 Control Cables

1100 Volt grade, 70°C rating, control cables with standard copper conductor, PVC insulation, round wire armour and extruded PVC overall sheath.

2.03.00 Drum Length & Tolerance

Each size of the control cable shall be supplied in one length.

2.04.00 Cable Identification

Cable identification shall be provided by embossing on the outer sheath the following :

a. Manufacture's name or trade mark
b. Voltage grade
c. Year of manufacture
d. Type of insulation e.g. PVC etc.

3.00.00 Joints and Termination

Material of construction for joints / termination shall perfectly match with the dielectric chemical and physical characteristics of the associated cables. The material and design concept shall incorporate a high degree of operating compatibility between the cable and the joints. The protective outer covering (jacket) used on the joints / terminations shall have the same qualities as that of the cable oversheath in terms of ambient / operating temperature and fire retardant properties withstand capability and resistance of hazardous environment and corrosive elements.

4.00.00 TESTS

4.01.00 Shop tests

The cables shall be subject to shop tests in accordance relevant standards to prove the design and general qualities of the cables as below:-

4.01.01 Routine tests on each drum of cables

4.01.02 Acceptance tests on each drum s chosen at random for acceptance of the lot.

4.01.03 Type tests on each type of cable, inclusive of measurement of armour D.C resistance of power cables.

4.02.00 Test witness

Tests shall be performed in presence of engineer-in-charge if so desired by the Institute. The contractor shall give at least thirty (30) days advance notice of the date when the tests are to be carried out.

4.03.00 Test Certificates

4.03.01 Certified reports of all the tests carried out at the works shall be furnished in six (6) copies for approval of the owner

4.03.02 Test reports shall be completed with all details and shall also contain IS specified limit values, wherever applicable to facilities review.

4.03.03 The cable shall be dispatched from works only after receipt of owner's written approval of the test reports.

5.00.00 SPECIAL TOOLS & TACKLES

5.01.00 A set of special tools and tackles which are necessary or convenient for splicing, jointing and termination of different types of cables.

5.02.00 These special tools and tackles shall includes but not limited to:-

a. Splice-cum-insulation remover for control cable 1 No
b. Hand operated compression tools with a set of dies for different cable sizes 1 No
c. Hydraulically operated compression tools with a set of dies for different cable sizes. 1 No

5.03.00 The tools shall be shipped in separate containers, clearly marked with the service for which they are intended.

6.00.00 SPARES

The bidder shall submit a list of recommended spare parts for three (3) years satisfactory and trouble free operation, indicating the itemized price of each item of the spare.

7.00.00 DRAWING, DATA & MANUALS

7.01.00 Drawing data manuals shall be submitted and in quantities and procedures as specified in general conditions of contract and / or else where in this specification on approval & subsequent distribution after the issue of letter of intent.

7.02.00 To be submitted with the bid:

a. Manufacture's catalogues giving cable construction details and characteristics.
b. Cable current rating for different type of installation inclusive of operating factors for ambient temperature, grouping etc.
c. Write-up on manufacture's recommended method of splicing, jointing, termination etc. of the cables.
d. Type test report on H.V power cable.

7.03.00 To be furnished for Approval and distribution:

a. Confirmed cable data.
b. Shop test reports.

SPECIFICATION FOR LT PANEL/ SWITCHGEAR

2.01.00 CONSTRUCTION: -

2.01.01 Switchgear enclosure shall conform to the degree of protection IP4x minimum thickness of sheet metal used shall be 2 mm.

2.01.02 The switchgear shall comprise a continuous line up of single / Multi-tire cubicles. The installations of circuit breakers however shall be limited to the bottom two tires only.

2.01.03 The design shall be of fully compartmentalized execution with metal/ insulating portions. Working height shall be limited between 750 mm to 1800 mm from the floor level.

2.01.04 Each breaker shall be housed in a separate cubicle, complete with an individual front access door; each vertical section shall have a removable back cover. All doors & covers shall be gasketed.

2.01.05 Switchgear cubicle shall be so sized as to permit closing of the front access door when the breaker is pulled out to ISOLATED position.

2.01.06 All switchgear, lamps & indicating instruments shall be flush mounted on the respective cubicle door whereas relays & other auxiliary devices of any may be mounted on a separate cubical.

2.02.00 BUS AND BUS TAPS

2.02.01 The main buses & connections shall be of high conductivity aluminium alloy, as per IS : 5082 sized for specification current rating with maximum temperature limited to 85 degree C (i.e., 35 degree C rise over 50 degree C ambient). Bus bars shall be designed for a maximum current density of 0.8A/ sqmm.

2.02.02 All bus connections shall have adequate contact pressure which should be ensure by means of two bolt connections with plain & spring washers locknuts. Bimetallic connections between dissimilar metals.

2.02.03 Bus connections shall be fully insulated for working voltage with adequate phase / ground clearances.

Insulating sleeves for bus bars & surrounds for joints shall be provided.

Bus insulator shall be flame-retardant, track resistant type with high creep age surface.

2.02.04 All buses & connections shall be supported & braced to with stand the stresses due to maximum short circuit current & also to take care of any thermal expansion.

2.02.05 Bus-bars shall be sleeved in colour coded manner for easy identification & so located that the sequence RYB shall be from left to right, top to bottom of front to rear, when viewed from the front of switchgear assembly.

2.02.06 Bolted disconnected links shall be provided from all incoming & outgoing feeders for isolation of neutral, if necessary.

2.03.00 CIRCUIT BREAKER

2.03.01 Circuit breaker shall be three poles, single throw, air breaker type with stored energy, trip free mechanism & shunt trip. The circuit breaker of the outgoing feeder shall have an in built microprocessor base release, short circuit, over current & earth fault protection release.

2.03.02 Circuit breakers shall be draw out type, having SERVICE, TEST & ISOLATED position with positive indication for each position along with in built relay unit.

2.03.03 Circuit breaker of identical rating shall be physically & electrically interchangeable.

2.03.04 Circuit breaker shall be motor wound spring charged mechanism, motor voltage should be 240 V AC. For motor wound mechanism, spring charging shall take place automatically after each breaker closing operation. One open close-open operation of the circuit breaker shall be possible after failure of power supply to the motor. Power supply for this motor shall be taken from the output of auto changeover.

2.03.05 Mechanical safety interlocking shall be provided to prevent the circuit breaker from being racked in or out of the service position when the breaker is closed.

2.03.06 Automatic safety shutters shall be provided to fully cover the female primary disconnects when the breaker is withdrawn.

2.03.07 Each breaker shall be provided with an emergency manual trip, mechanical ON-OFF indicator, an operation counter & mechanism charge/ discharge indicator.

2.03.08 In additional to the auxiliary contacts required for normal breaker operation & indication, each breaker shall be provided with following for interlocking purpose:-

a) Position/ cell switch with 4 NO. + 4 NC contacts. These shall be available as spare for automation work.
Control Supply :- 230V AC for closing,
Tripping & indication lamps.

b) Auxiliary switch, with 6 NO+ NC contact, mounted on the stationary portion of the switchgear & operated mechanically by a sliding level from the breaker, in SERVICE position. These shall be available as spare for automation work.

2.03.09 Limit / auxiliary switches shall be convertible type, that is, suitable for changing NO contact to NC & Vice-Versa.

2.04.00 MOULDED CASE CIRCUIT BREAKERS

2.04.01 Moulded case circuit breakers (MCCB) or fuse free breakers, incorporated in switchboards wherever required, shall conform to IS 13947 : 1993 in all respects. MCCBs shall be suitable either for single phase 240 Volts or 3 Phase 415 Volts AC 50 HZ supply.

MCCB cover and case shall be made of high strength heat resisting and flame retardant thermosetting insulating material. Operating handle shall be quick make/break, trip - free type. Operating handle shall have suitable ON, OFF and TRIPPED indicators. Three phase MCCBs shall have a common handle for simultaneous operation and tripping of all the three phases. Suitable arc extinguishing device shall be provided for each contact. Tripping unit shall be of microprocessor based electronic type provided on each pole and connected by a common tripe bar such that tripping of any one pole causes three poles to open simultaneously. Electronic tripping device shall have IDMT characteristics for sustained over loads and short circuits.
Contact trips shall be made of suitable arc resistant sintered alloy. Terminals shall be of liberal design with adequate clearances.
MCCBs shall be provided with following accessories, if specified in drawings/schedule of quantities :

- Shunt trip
- Alarm switch
- Auxiliary switch

MCCBs shall be provided with following interlocking devices for interlocking the door a switch board.

- Handle interlock to prevent unnecessary manipulations of the breaker.
- Door interlock to prevent door being opened when the breaker is in ON position
- Deinterlocking device to open the door even if the breaker is in ON position.

MCCBs shall have rupturing capacity as specified in drawings/schedule of quantities.

2.04.02 MCCB shall be triple pole air break.

2.04.03 The MCCB shall have a quick - make, quick - break mechanism operated by a suitable external rotary handle, complete with position indicator this handle shall have provision for pad locking in ON & OFF position.

2.04.04 MCCB should have microprocessor base electronic release with over current, earth fault & short circuit protection equivalent to L&T `D' since with RC-10 release.

2.05.00 CONTROL & INDICATION :-

The circuit breaker shall be wired up wired up for both local & remote operation. A local- remote selector switch shall be provided for this purpose. Each breaking cubicle shall be equipped with following :-

2.05.01. One (1) Test- neutral - service selector switch stay put type with test/ service position pistol grip handle & key interlock for breaker marked 'E'.

2.05.02. Two (2) heavy duty, oil tight push buttons for TRIP & CLOSE.

2.05.03. Three (7) LED indicating lights on front of compartment :-

GREEN : breaker open & spring charged
RED : Breaker close
AMBER : Trip / circuit healthy condition
WHITE : Control supply failure
Phase indication : One Red, One Blue & One Yellow position.

2..01 Lamps shall be low watt, LED type lamp & lens shall be replaceable from the front.

2.05.05 The general scheme of connections for control, interlock & protection shall got approved before fabrication of panel.

2.06.00 FUSES :-

Fuses shall be HRC, preferably link type with a minimum interrupting capacity equal to the short circuit current.

2.06.01 Fuses shall be furnished complete with fuse base & fittings of such as to permit easy & safe replacement of fuse element. Visible indicated indication shall be provided on blowing of the fuse.

2.07.00 CURRENT TRANSFORMER :-

2.07.01 Current transformer shall be cast- resin type. All secondary connections shall be brought out to terminal blocks where or delta connection will be made.

2.07.02 Ratings : (unless otherwise not specified in BOQ)

- for incomers and buscoupler
  2000-1000/5+5 : 3 sets
- For out goings :
  1200-600/5+5 : 2 sets
  800-400/5+5: 3 sets
  600-300/5+5 : 2 sets
  400-200/ 5+5 : 3 sets
  200-100/5+5 : 5 sets
  150-100/5+5 : 2 sets
  100-50/5+5:3sets

Accuracy class of the current transformers shall be :-

a.) Class 5P10 for other relaying (protection).
b.) Class 1.0, ISF < 5 for metering.

2.08.00 RELAYS :-

2.08.01 Relays shall be of drawout design with built in testing facilities. Small auxiliary relays may be in non drawout execution.

2.08.02 Relay shall be rated for operation on 5 Amp secondary current & 110 / 220 V secondary voltage ; number & rating of relay contacts shall suit the job requirements.

2.08.03 The contractor shall furnish, install & co-ordinate all relays to suit the requirements of protection & interlock & as broadly indicated in the annexure & drawings.

2.09.00 METERS (DIGITAL DISPLAY):-

2.09.01 Indicating instruments shall be switch board type & accuracy class of 2% .

2.09.02 All Digital Watt-hour meter shall be provided , Alternatively, they may have test block to facilitate testing of meter without disturbing C.T. or V.T. secondary connections.

2.09.03 Each breaker shall be with volt meter, amp meter with selector switches & KWH meters. Only out going feeders will be relaxed from voltmeters.

2.10.00 SECONDARY WIRING :-

2.10.01 The switchgear shall be fully wired at the factory to ensure proper functioning of control, protection, & interlocking schemes.

2.10.02 Fuses & links shall be provided to permit individual circuit isolation from bus wires without disturbing other circuits. All spare contacts of relays, switches & other devices shall be wired upto terminal blocks.

2.10.03 Wiring shall be done with FRLS PVC flexible, 650V grade, PVC insulated switchboard wires with solid copper conductors of 2.5 sq.mm for voltage circuits alongwith numbered ferrules.

2.10.04 Each wire shall be identified, at both ends, with permanent markers bearing wire numbers as per contractors wiring diagrams.

2.10.05 Wire terminations shall be made with crimping type connectors with insulating sleeves. Wire shall not be spliced between terminals.

2.11.00 TERMINAL BLOCKS

2.11.01 Terminal blocks shall be 660V grade box clamp type with marking strips, similar to ELMEX 10 sqmm of equal. Terminals for C.T. secondary leads shall have provision for shorting.

2.11.02 Not more than two wires shall be connected to any terminals equal in number to 20% active terminals shall be furnished.

2.11.03 Terminal blocks shall be located to allow easy access. Wiring shall be so arranged that individual wires of an external cable can be connected to consecutive terminals.

2.12.00 CABLE TERMINATION :-

2.12.01 Switchgear shall be designed for cable entry from the bottom. Sufficient space shall be provided for each of termination & connection.

2.12.02 All provision & accessories shall be furnished for termination & connection of cables, including removable gland plates, cable supports, crimp type tinned copper/ aluminium lugs, brass compression gland with tapered washer (power cable only) & terminal block.

2.12.03 Gland plate shall be minimum 4 mm thick.

2.13.00 BUS DUCT CONNECTION :-

2.13.01 Bus duct connections, where specified shall be furnished along with transportation of panel. Bus duct connections shall be generally from the top.

2.13.02 All connecting bus work shall have the same continuous rating as associated switchgear bus & shall be fully braced for the listed short circuit current.

2.13.03 All provision such as matching flange & other accessories shall be furnished for connection to bus duct if any, being supplied by this purpose will be furnished by contractor.

GROUND BUS :-

2.14.01 A ground bus, rated to carry maximum fault current, shall external full length of the switchgear.

2.14.02 The ground bus shall be provided with two bolt drilling with GI bolts & nuts at each to receive 50 x 6mm GI flat.

2.14.03 Each stationary unit shall be connected directly to the ground bus. The frame of each circuit breaker & drawout VT unit shall be grounded through heavy multiple contacts at all times except when the primary disconnecting devices are separated by a safe distance.

2.14.04 Whenever the schematic diagrams indicate a definite ground at the switchgear, a single wire for each circuit thus grounded shall be run independently to the ground bus & connected thereto.

2.14.05 C.T. & V.T. secondary neutrals shall be earthed through removable links so removed without disturbing others.

2.15.00 NAMEPLATES :-

2.15.01 Nameplates of approved design shall be furnished at each cubicle & at each instrument & device mounted on or inside the cubicle.

2.15.02 The material shall be lamicoid or approved equal, 3mm thick with white letter on block background.

2.15.03 The name plate shall be held self-tapping screws. Nameplate size shall be minimum 20 x 75 mm for instrument device & 40 x 150mm for panels.

2.15.04 Caution notice suitable metal plate shall be affixed at the back of each vertical panel.

2.16.00 SPACE HEATERS PLUG SOCKETS :-

2.16.01 Each vertical section shall be provided with thermostat controlled space heater & 5A, 3 pin plug socket.

2.16.02 Cubical heater, plug-socket circuit shall have individual switch fuse units.

2.17.00 A.C. / D.C. POWER SUPPLY :-

2.17.01 The following power supplied will be made available to the switchgear :
240A.C.Supply:TwoFeeders
The DC supply required for control purposes is to be obtained in each module through a rectifier arrangement, which will convert the 250V AC supply to 110V DC. The equipment necessary for this rectification including protective relaying as per the approved drawing are also to be included.

2.17.02 Isolating switch fuse units shall be provided at each switchgear for the incoming supplies, 2-pole, single throw for A.C. & 2-pole, double throw for D.C. Bus-wires of adequate capacity shall be provided to distribute the incoming supplies to different cubicles. Isolating switch-fuse units shall be provided at each cubicle for AC/DC supplies.

2.17.03 AC load shall be so distributed as to present a balance loading on three-phase supply system.

2.18.00 PAINTING :-

2.18.01 All surface shall be sand blasted, pickled & grounded as required to produce a smooth, clean surface free of scale, grease & rust.

2.18.02 After cleaning, the surface shall be given a phosphate coating followed by 2 coats of high quality prime & stove after each coat.

2.18.03 The switchgear shall be finished in light gray (IS shade # 631) with two coats of synthetic enamel paint.

2.18.04 Sufficient quantity of touch- up paint shall be furnished for application at site.

3.00.00 SPECIAL TOOLS & TACKLES :-

3.00.01 A set of special tools & tackle (manual charging handle & operating handle trolley for lifting outside breaker for maintenance) which are necessary or convenient for erection, commissioning, maintenance & overhauling of the equipment shall be supplied.

3.00.02 The tools shall be shipped in separate containers (Tool Box) clearly marked with the name of the equipment for which they are intended.

4.00.0 SPARES :-

4.00.01 The bidder shall submit list of recommended spare parts for three (3) years satisfactory & trouble free operation indicating the itemized price of each item of the spares.

5.00.00 DRAWINGS, DATA & MANUALS :-

5.01.00 To be furnished for approval after award of work.

a.) General arrangement drawing showing constructional features, space required in front for withdrawals, power & control cable entry points etc.
b.) Details of materials with specifications.
c.) Typical foundation plan & loading.
d.) Typical breaker control schematic.
e.) Matching flanges & terminals for the bus termination.
f.) Type test reports on circuit breaker.
g.) Technical leaflet on
  i. Circuit breaker
  ii. Instrument transformers
  iii. Relays, meters, switches etc.
h.) Single line diagram
i.) Control schematics
j.) Wiring diagram

5.02.00 Instruction manuals of switchgear & individual equipment :-
The manual shall clearly indicate the installation method, checkup & tests to carried out before commissioning of the equipment.

5.03.00 The bidder may note that the drawings, data & manuals listed here in are minimum requirements only the bidder shall ensure that the other necessary write-ups, curves & information required to fully describe the equipment are submitted with his bid.

CIRCUIT BREAKER

Make -As per approved make.
Type - Microprocessor release air Circuit breaker Rate
Rated frequency - 50 Hz
Rated current - **1600/(Icu=Icf=1sec 50 kA)**
800A(Icu=Icf=1sec 50 kA)
No. of pole - 3 Aux. indication & thermal masonry.

Interlocking arrangement electrically & mechanically with bus coupler & incomer.

PROTECTION (FOR LT SUPPLY 415V PANEL)

The minimum protection to provide for different type of circuit are listed below :-

INCOMING FEEDER :-

(i) 2 over current +E/F relay microprocessor based alongwith the element of instantaneous o/c & E/F protection.

BUS COUPLER :-

(i) 3 O/C relay microprocessor based
All inverse time O/C relay shall be 3 sec. Version.
All definite time O/C relay shall have adjustable time range of 0-6 Sec.
Apart from protection relays each breaker shall be provided with auxi. Contact multiplier relay, anti pumping relay, trip supervision relay, lockout relay test terminal block. These relay shall be hand reset.

Specifications Automatic Fire Detection & Alarm System

1. **SCOPE**

This specification covers the supply, installation, testing and commissioning of the Fire Detection Systems and generally comprise

- Provision of Smoke and Heat Detectors.
- Provision of Manual Call Points.
- Provision of Response Indicator Units.
- Provision of Audio Alarm units.
- Local and Main Control Unit for the System.
- Public Address System.
- Wiring between Detectors and Control Units to make the complete System

2. STANDARDS AND CODES

- Specification for Smoke Detectors BS 5445 : 1984
- Specification for Heat Sensitive Detectors

  for use in automatic fire alarm Systems IS 2175 : 1977
- Code of Practice for installation of automatic Fire Alarm System using Heat sensitive type Fire Detectors IS 2189: 1976
- Code of Practice for Electrical Wiring installations (System voltage not exceeding 660 volts) IS 732 : 1963
- Automatic Fire Alarm Systems in buildings BS 3116 Part I
- Control and indicating equipment BS 3116 Part IV
- British Code of practice for installation and servicing of Fire Alarm Systems CP 1019 : 1972
- Underwriters Laboratory Specification for Smoke Detectors UL 268

All equipment and the installation shall be as per the relevant Indian Standards Specifications. Where these Standards do not exist, the relevant British Standards or any other internationally accepted Standard shall apply.

3. IONISATION TYPE SMOKE DETECTORS

3.1 GENERAL

The Ionisation type Smoke Detectors shall be capable of sensing fire in the smoldering or the incipient stage. Smoke Detectors shall be sensitive to products of combustion of all materials like wood, paper, rubber, natural and synthetic fibres, plastic and common liquid hydrocarbons in accordance with the sensitivity requirements of BS 5445 Part 7 : 1984.

3.2 CONSTRUCTIONAL FEATURES DETECTOR HEAD

The Smoke Detector enclosure shall be of white plastic moulded with high impact self extinguishing polycarbonate and shall be fitted to the base by a twist and lock action. Correct alignment of the electrical contacts in the base with the terminal pins of the Detector shall be ensured. The twist and lock action shall ensure a good electrical contact with the wiping action. Apertures in the Detector housing shall allow the free ingress of smoke through a stainless steel gauze and into the smoke sensing ionisation chamber.

IONISATION CHAMBERS

The Detector head shall incorporate two ionization chambers and twin radioactive sources namely Americium 241 having a radio activity of less than 1.0 micro curies. The radioactive source shall be

mounted on a stainless steel electrode and shall be electrically insulated from the gauze and the chamber cage. The second radioactive source shall be mounted on the underside of the stainless steel electrode. Air within the chambers shall be ionized by the radioactive sources with the second being the sealed reference chamber in electrical series with the first - smoke sensing chamber. The gauze and the chamber cage shall provide electrical screening to the smoke sensing chamber.

DETECTOR BASES

The Detector bases shall be suitable for mounting directly on a 75 mm recessed round box or as required at the site. The bases shall have terminals which shall be suitable for receiving 1.5 sq mm PVC copper conductor or 2.5 sq mm PVC aluminium conductor cables. Access to the terminals shall be available from the front of the base after removing the Detector. A plastic cover shall be provided with each base to be fixed to the rear to eliminate the ingress of dust, water and insect into the Detector

LED INDICATION LAMP

A LED lamp shall be incorporated which shall normally flicker at the rate of six flashes per minute indicating alertness and shall turn steady when a fire is sensed enabling immediate identification of the Detector.

ELECTRONICS

The Printed Circuit Board electro tinned copper tracks shall be protected from corrosion by a green epoxy solder resist coating. The tracks and solder joints shall be protected against fungus growth by an insulating varnish coating.

The sensitive electronic components shall be protected by a high resistivity silicone encapsu- lation compound. All electronic components shall be electrostatically screened.

The electronic design and circuit shall provide the following safety devices:

- protection against high voltage spikes on the supply line.
- protection against polarity reversal.
- protection of the ionization chamber monitoring circuits from high voltage static Discharges.
- protection against high frequency transients.
- detection of alarm at the control unit even in the event of LED failure.
- protection against transient spikes on long lead lines to the remote indicators

DETECTOR WIRING

The Smoke Detector shall be suitable for 2 wire monitored supply.

OPERATIONAL PARAMETERS

The Detectors shall be suitable for operation at a maximum ambient temperature of 60 deg C. and a minimum of 0 deg C with a maximum relative humidity of 90%.

The Detector sensitivity shall remain constant and not vary with change in the ambient temperature, humidity, pressure or voltage by more than +/- 10%.

The performance of the Detectors shall not be effected by continuous air flows upto 10 meters per second.

The Detectors shall be suitably protected against the accumulation of dust and insects.

The Smoke Detectors shall comply to the requirements of BS 5445 Part 7 : 1984 and EN 54 Part 7 : 1984 for Vibration, Impact and Shock parameters.

The Smoke Detectors shall be designed and constructed to meet the requirements of IP 43.

DETECTOR TESTING IN SITU

It shall be possible to functionally test the Detector as well as assess its actual sensitivity without having to remove the same.

DETECTOR CERTIFICATION

The Smoke Detector shall be UL Listed and tested and approved by independent Authorities for certified compliance and acceptance to the relevant Standards. The Detectors shall be approved by the Local Fire Authorities and relevant documentation shall be supplied with the tender.

4. HEAT SENSITIVE RATE OF RISE CUM FIXED TEMPERATURE TYPE DETECTORS

4.1 GENERAL

The Heat Sensitive Detectors shall be of the rate of rise cum fixed temperature detection type and shall comply to the requirements of IS 2175 : 1977 and NFPA Standard 721. The detectors shall

respond to a rate of rise in temperature of 8 deg C per minute and a fixed temperature of 57 deg C.

4.2 CONSTRUCTIONAL FEATURES

The Heat Detectors shall be of the plug-in type and shall be attached to the mounting plate by a twist and lock motion. The Detector body shall be of moulded plastic, white in colour. The electrical contacts and other moving parts of the Detector shall be enclosed in such a manner that will afford protection against moisture, dust, insects and other foreign matter. All make and break contacts shall be of silver or any other metal or alloy of equivalent characteristics.
The body and other parts shall be made of material inherently resistant to corrosion.
Any adjustments made at the factory shall be sealed and all adjustment screws shall be provided with a reliable means of locking to avoid disturbance of the adjustments in transit. In addition, the means of adjustment shall be rendered inaccessible to prevent tampering when the Detector is being installed or during its operation.

4.3 MOUNTING PLATES

All Detectors shall be installed on mounting plates moulded from white self extinguishing thermoplastic. The Detector shall be attached to the mounting plate with a twist and lock motion. The mounting plate shall be suitable for installation on a 75 mm round recessed box.

4.4 DETECTOR OPERATION

The Detector head shall house a thermostat or a fusible alloy as a fixed temperature element. When activated the external heat collector shall drop to provide a visual confirmation that the fixed temperature element has operated. A pneumatic element shall sense the rate of rise in temperature by expansion of air within a sealed chamber faster than it can escape through the calibrated vent. The resultant increase in
pressure shall depress a diaphragm causing the electrical contacts to close a circuit and trigger an alarm. The rate of rise element shall be of the self restoring type.

4.5 DETECTORS APPROVALS

The Detectors shall meet the performance requirements as per Clause 5 of IS 2175 : 1977 and/or other International Standards. The Detectors shall be UL Listed and FM approved and shall meet the approval requirements of the Local Fire Authorities. Test certificates from independent authorities and the approvals for the Detectors shall be furnished with the tender.

5.0 HEAT SENSITIVE FIXED TEMPERATURE TYPE DETECTORS

5.1 GENERAL

The Heat Sensitive Detectors shall be of the fixed temperature detection type and shall comply to the requirements of IS 2175 : 1977 and NFPA Standard 721. The detectors shall respond to a fixed temperature of 57 deg C. or 94 deg C as specified.

5.2 CONSTRUCTIONAL FEATURES

The Heat Detectors shall be of the plug-in type and shall be attached to the mounting plate by a twist and lock motion. The Detector body shall be of moulded plastic, white in colour. The electrical contacts and other moving parts of the Detector shall be enclosed in such a manner that will afford protection against moisture, dust, insects and other foreign matter. All make and break contacts shall be of silver or any other metal or alloy of equivalent characteristics.
The body and other parts shall be made of material inherently resistant to corrosion.
Any adjustments made at the factory shall be sealed and all adjustment screws shall be provided with a reliable means of locking to avoid disturbance of the adjustments in transit. In addition, the means of adjustment shall be rendered inaccessible to prevent tampering when the Detector is being installed or during its operation.

5.3 MOUNTING PLATES

All Detectors shall be installed on mounting plates moulded from white self extinguishing thermoplastic. The Detector shall be attached to the mounting plate with a twist and lock motion. The mounting plate shall be suitable for installation on a 75 mm round recessed box.

5.4 DETECTOR OPERATION

The Detector head shall house a thermostat or a fusible alloy as a fixed temperature element. When activated the external heat collector shall drop to provide a visual confirmation that the fixed

temperature element has operated.

5.5 DETECTORS CERTIFICATION

The Detectors shall meet the performance requirements as per Clause 5 of IS 2175 : 1977 and/or other International Standards. The Detectors shall be UL Listed and FM approved and shall meet the approval requirements of the Local Fire Authorities. Test certificates from independent authorities and the approvals for the Detectors shall be furnished with the tender.

6. MANUAL CALL POINTS

Manual Call Points shall consist of a push button switch housed in a dust tight sheet steel enclosure of 1.5 mm thick sheet to manually initiate audio visual alarms. The front shall be sealed with a breakable glass cover fixed in such a way that the actuating push button is kept depressed as long as the glass is intact and released automatically when the glass is broken. The front face of the Manual Call Box shall have an area not less than 5000 sq mm and the element shall have an exposed area of not less than 1600 sq mm in the shape of a square or a rectangle.
A small steel hammer shall be attached to the assembly with a steel chain to facilitate breaking of the glass front. The Manual Call Box shall be suitable for surface or recessed mounting as required. The words "IN CASE OF FIRE BREAK GLASS" 5 mm high shall be painted in red on the front face.

7. RESPONSE INDICATOR

The Response Indicator shall consist of a red LED mounted in a sheet steel enclosure of1.5 mm thick sheet suitable for surface or recessed mounting on walls or partitions as required. These shall be connected to the Detectors in the enclosed area to indicate the status of the Detector. In normal circumstances the lamp shall flicker but in the event of the Detector inside the enclosed area sensing a fire, the lamp shall glow steadily.

8. ILLUMINATED SIGNS

The Illuminated Signs shall have the letters "FIRE EXIT" or "NO FIRE EXIT" painted in red on a white perspex sheet as the front face of a sheet steel enclosure constructed with 1.5 mm thick sheet. The perspex sheet shall be back lit with an integral battery back up facility so as to operate independent of the mains supply in the event of a mains failure. The preferred dimensions of the Illuminated Signs shall be 450 mm length and 225 mm height with 100 mm high lettering. They shall be suitable for surface or recessed mounting as required.

9. ALARM SIRENS

Electronic audio alarm sirens shall be suitable for operation on the DC supply of the System and will be actuated from the Main Control Panel in the event of a fire. These shall have a two tone modulated alarm signal for continuous service with an output of 100 dB at a distance of 3 metres.

10. IN CONTROL PANEL

10.1 GENERAL

The Main Control Panel (MCP) shall be centrally located and shall form the nerve centre of the total System. The MCP shall continuously monitor the status of each Fire Zone.

10.2 CONSTRUCTIONAL FEATURES

The MCP shall be metal enclosed, sheet steel cubicle pattern, dead front, floor/wall mounting type as required and suitable for indoor mounting.
The MCP shall be dust and vermin proof. Synthetic rubber gaskets shall be provided on all covers and doors to render the joints dust and vermin proof. All doors shall be lockable.
The MCP shall be fabricated from 2.0 mm CRCA thick sheet steel and shall be folded and braced to provide a rigid support. Joints shall be seam welded.

10.3 MAIN CONTROL PANEL CONFIGURATION

The MCP shall monitor the status of each Fire Zone and shall be configured to include:

a) **Microprocessor** based electronic panel complete with a facia to provide the following indications and controls:

- "FIRE" indication one per zone.

- "FAULT" indication one per zone.
- "FIRE TEST" push button one per zone.
- "ZONE ISOLATE" switch one per zone.
- "DETECTOR FAILURE - OPEN CIRCUIT - SHORT CIRCUIT" indication.
- "DETECTOR REMOVED" indication.
- "BREAK IN WIRING" indication with initiation of alarm

b) Mother Board to control and monitor the entire System with audio/visual alarms and with a facia to provide the following controls and indications:

- "MAINS ON" switch with indicating lamp.
- "SYSTEM ON" switch with indicating lamp.
- "MAINS FAILURE" indication.
- "BATTERY LOW" indication.
- "LAMP TEST" push button.
- "STANDBY ON" indication.
- "SYSTEM RESET" push button
- "ALARM CANCEL" push button.
- "TRICKLE BOOST" toggle switch.
- "AUDIO ALARM" selector switches for general and/or zone wise broadcast..
- "AUTO/MANUAL" selector switch for the Illuminated Signs

c) Power Supply for the System integral with the MCP. The power supply rating shall be adequate for the Detectors, Illuminated Signs and all other devices as required in the System.

The power supply unit integral with the Control Panel shall consist of a 230/24 volt step down transformer. The 24 volt secondary of the transformer shall be rectified through a silicon diode bridge rectifier unit and the D C output filtered to minimise ripples. The unregulated 24 volt DC supply shall be regulated for the electronic circuits and the power to the entire System.

d) Screw type terminal blocks and cable glands for termination of all control wiring.

e) Required potential free spare contacts/ or as called for in Bill Of Quantities.

f) End of Line resistors as required by the System design shall be provided as a part of the Control Panel.

g) Audio visual alarm unit with a provision to sound an alarm throughout the building from the Main Control Panel either as a general broadcast or selectively as may be required.

10.4 ELECTRONICS

The Printed Circuit Board electro tinned copper tracks shall be protected from corrosion by a green epoxy solder resist coating. The tracks and solder joints shall be protected against fungus growth by

an insulating varnish coating.
The sensitive electronic components shall be protected by a high resistivity silicone encapsu- lation compound. All electronic components shall be electrostatically screened.
The electronic design and circuit shall provide protection against high voltage spikes on the supply line
All Printed Circuit Boards shall be mounted in the MCP such that they can be pulled out from the front without the need for disconnecting any wires and shall therefore be mounted on rails and plugged directly into connectors.

10.5 DISPLAY

The Main Control Panel shall be complete with a display showing the layout of each floor of the Building/s and each Fire Zone marked clearly thereon for ready identification with the Zone indications and controls. The Display Panel shall be integral with the MCP and shall be etched in colour on a white perspex sheet as approved by the Engineer in Charge.

10.6 INTERNAL WIRING

All internal wiring shall be with 1.5 sq mm PVC insulated copper conductor wires colour coded and labelled with ferrules for easy identification. The wiring shall be properly bunched and harnessed. The wiring shall be done in a manner such that it is readily accessible from the front for maintenance.

10.7 SHEET STEEL TREATMENT AND PAINTING

Sheet steel materials used in the construction of the Panels should have undergone a rigorous rust proofing process comprising of alkaline degreasing, descaling in dilute sulphuric acid and a recognized phosphating process. The steel work shall then receive two coats of filler oxide primer before final painting.
All sheet steel shall after metal treatment be spray or powder painted with two coats of shade 692 to IS 5 on the outside and white on the inside. Each coat of paint shall be properly stoved and the paint thickness shall not be less than 50 microns.

10.8 NAME PLATES AND LABELS

Suitable engraved white on black name plates and identification labels shall be provided for identification of the Fire Zones as approved by the Engineer in Charge.

11. REMOTE CONTROL PANELS

Remote Control Panels shall generally comply to the Specifications of the Main Control Panels as detailed in para 9 above. These shall be located remotely and will indicate the status of each Zone and the MCP but without any controls. The indications to be provided on the Remote Control Panel shall be :

- "FIRE" indication one per zone
- "FAULT" indication one per zone
- "DETECTOR FAILURE - OPEN CIRCUIT - SHORT CIRCUIT" indication one per Zone
- "DETECTOR REMOVED" indication one per Zone.
- "BREAK IN WIRING" indication one per zone.
- "MAINS ON" indicating lamp
- "SYSTEM ON" indicating lamp
- "MAINS FAILURE" indication
- "BATTERY LOW" indication
- "STANDBY ON" indication

12. BATTERY AND BATTERY CHARGER

Adequately rated 24 volt lead acid rechargeable DC battery with 12 hour autonomy shall be provided for the System. The capacity shall be such as to feed the full load of the Fire Detection System including the Illuminated Signs in the event of a mains failure. It shall be connected to the MCP via a mains failure relay.

The battery shall be complete with a Battery trickle charger set and shall be maintained in a charged condition with the constant trickle charge. It shall be possible to boost the charging of the battery by the manual operation of the trickle/boost toggle switch when 'Battery Low' indication is observed on the Main Control Panel.

The Battery capacity shall fully meet the requirements of Clause 5.2 of IS 2189.

13. WIRING

The wiring for the Fire Detection System shall in general comply with the requirements of IS 2189 : 1976 and IS 732 : 1963. The Detectors in each loop shall be wired upto the Main Control Panel with a 2 core 1.5 sq. mm. copper conductor or 2 core 2.5 sq mm aluminium conductor FRLS PVC insulated 660/1100 volt grade wires in concealed or surface conduit as required. Crimped terminations shall be used throughout the System.

14. TEST CERTIFICATES

Type test certificates from a recognized independent agency shall be furnished for all the equipment. The equipment shall comply to the requirements of the Indian, International Standards, Fire Insurance Authorities and all National and Local Regulations in force.

15. SENSITIVITY ADJUSTMENTS

The sensitivity of all Detectors shall be set/adjusted by the Supplier to suit the site conditions.

16. INSTALLATION, COMMISSIONING AND ACCEPTANCE TESTS

The following installation, commissioning and acceptance tests shall be conducted by the Contractor and shall be apart from the Standard/Routine tests prescribed and normally conduc- ted by the Supplier. These tests shall be carried out as a part of the installation irrespective of whether or not these are covered by the Standard/Routine tests.

INSTALLATION TESTS

- After installation of the Detector Bases and prior to installation of the Detectors, the wiring shall be tested for continuity and insulation resistance. A high voltage insulation meter 500 to 1000 volts shall be used to measure the insulation

resistance between each conductor and between each conductor and earth. The value of insulation resistance shall not be less than 1 Mega ohm.

- The insulation resistance of the wiring to the Response Indicators shall also be checked as above prior to the installation of the Indicators.

COMMISIONING AND ACCEPTANCE TESTS

- Each zone shall be tested by a test fire or by a heat source on all or any one or more of the Detector selected by the Engineer in Charge. The time required for detection shall be noted and shall be within prescribed limits.

- Each alarm circuit shall be energised separately and the sound level reading taken to check for conformity with the minimum standards.

- Open circuit and removal of a Detector from a detection circuit shall be tested.

- Short circuit operation for each detection circuit will be tested.

- Tests to prove satisfactory operation of the system shall be conducted simulating the conditions of

  * Mains Failure

  * Battery disconnection

* Open circuit and short circuit conditions of each alarm circuit

The results of all the tests conducted shall be so recorded and approved by the Engineer in Charge prior to acceptance of the System.

17. AUTHORITIES AND APPROVALS

The work shall conform to the requirements and provisions of the relevant Government Acts, Regulations and Bye Laws of the Local Authorities. The Contractor shall give all notices as required under the said Acts, Regulations and Bye Laws.
The Contractor shall submit applications, drawings etc. as required and obtain approval, licenses and sanctions thereof from Delhi Fire Services and any other Statutory Authorities. The Contractor shall obtain the final completion certificate from the concerned authorities to enable the Engineer in Charge to commission the installation.
The Contractor shall be responsible for the payment of all fees etc. to be paid to the relevant Authorities and the Engineer in Charge shall refund the same to the Contractor on submission of receipts in original.
The work shall not be deemed to be complete until the above approvals, licenses, sanctions etc. have been obtained by the Contractor.

SPECIFICATIONS FOR LIFTS

1. Scope of Work

Work under this contract shall be executed as given in the specifications and at site whether specially shown or not. The Contractor shall carry out and complete the work under this contract in every respect in conformity with the contracts documents and with the directions of and to the specification of the Owners.
The specification is intended to cover the Deign, **Supplying, Installation, Testing & Commissioning of 13 passenger Lifts (2 Nos.) & 1 No goods lift 2000KG (**suitable for PH/disabled person) is not the intent to specify completely constructional features of the equipment and details of the work to be carried out but nevertheless the intent of the specification is to ensure that the equipment and the work shall conform in all respects to the relevant Bureau of Indian Standards Specifications, codes of practice, Acts and other Statutory Regulations as may be applicable and to high standards of engineering design and workmanship. The equipment and work shall perform in continuous operation in a manner acceptable to the Owners who will interpret the meaning of the specifications and the drawings and shall have the right to reject or accept any equipment or work which in their assessment is not complete to meet the requirement of this specification and/or applicable codes and standards.
The materials, design and workmanship shall satisfy the relevant Indian Standard, the job Specifications contained herein and codes referred to where the job specifications stipulated requirements in addition to those contained in the Standard Codes and Specifications, these additional requirements shall also be satisfied.
The Contractor must get acquainted with the proposed site for the works and study specifications and conditions carefully before tendering. The work shall be executed as per programme approved by the Owners. If part of site is not available for any reason or there is some unavoidable delay in supply or materials stipulated by the Owners, the programme of construction shall be modified accordingly and the Contractor shall have no claim for any extras or compensation on this account.
The scope of work under this specification shall include the design, manufacture, works testing, supply, storage, erection, site testing, commissioning, putting into operation, final testing and trials of the passenger elevators as per technical parameters attached with this document.
The scope work shall also include all civil works associated with erection of the equipment and making good and painting the civil works as required.

The Contractor shall include for the supply of entire materials in accordance with this specification and the whole of the work and fixing necessary for the complete installation as set down in his specification and with the accompanying schedules. All apparatus, appliances, materials or labour which may be necessary for satisfactory installation and operation of the system in accordance with the intent or purpose of the specifications shall be considered to be in scope of work of the contract and shall be furnished without extra charges, as if fully described and called for in the specifications and/or shown in plans.

2. Specification

The following BIS and Codes of Practice with upto date amendments will apply to the equipment and the work covered by the scope of this contract.
IS-1860-1980:
IS-3534-1976:
IS-4666-1986:
IS-6383-1971:
IS-732-1963 :
In addition the relevant clauses of the Indian Electricity Rules 1956 as amended upto date and the Indian Electricity Act 1910 shall apply. The Contractor must also take into account local and State regulations as in vogue in UP for the design and installation of Lifts.
Wherever appropriate Indian Standards are not available, relevant British and/or IEC Standards shall be applicable. BIS certified equipment shall be used as a part of the Contract.

Site Conditions

All equipment shall be suitable for satisfactory and continuous operation under the following site conditions:
Maximum 45°C 90% RH
Minimum 2°C 90% RH

Authorities

The work shall conform to all provisions of the relevant Government Legislation, Regulations and by-laws of the Central/Local Authorities and of any Companies to whose system the installation is proposed to be connected. The Contractor shall give all notices required under the said Acts, Regulations and/or by-laws. The Contractor shall be liable for any omissions and commissions in this regard.

3. Specifications and Schedules

The Specifications and Schedule of Quantities shall be considered as part of this contract and any work or materials shown in Schedule and not called for in the Specifications or vice versa, shall be executed as if specially called for in both. The drawings indicate the extent and general arrangement of the equipment, landings, hoistways etc. and area essentially diagrammatic.

The work shall be installed as indicated on the drawings. However any minor changes found essential to co-ordinate the installation of this work with other trades shall be made without any additional cost to the Owner. The data given herein is as exact as could be secured, but its complete accuracy is not guaranteed. Exact locations, distances and levels will be governed by the site conditions.

4. Departure from Specifications

Should the Contractor wish to depart from the provisions in these specifications such departure shall be listed in a separate Schedule with full particulars and reasons for the same. Unless this is done the tender shall be deemed to comply in every respect with these specifications. The Contractor should submit complete and detailed technical specification clearly describing the equipment to be supplied and its capability alongwith the bid.
All similar parts and/or equipment shall be interchangeable with one another.

5. Works to be done by the contractor.

In addition to the manufacturer, supply, installation, testing and commissioning of the lift including all auxiliary equipment, following works shall be deemed to be included within the scope of the work to be done by the contractor.

- All minor building work necessary for installation of equipment such as making of opening in wall/ floors, either of RCC or brick masonry etc., and restoring them to original condition and finish. The scope of minor building work includes all grouting of foundation concrete pads to be formed or made as base for supporting R.S. joists etc., grouting d anchoring of all boards clamps, supports, foundation bolts, installation in position of R.S. joists in the machine room, lift well or in the pit, such work shall exclude cutting of marble work and construction of partition wall wherever involved.

- Supply of necessary R.S. joists or angle iron support brackets etc., for installation of the lift, either in the machine room or at other places as may be necessary including their installation in position.
- All electrical works except bringing in main connection and earth connection to the machine room terminated on suitable switch fuse unit/ board. All electrical works including inter-connection from this switch / board and loop earthing from the earth bar to be provided in the machine room shall be done by the successful contractor.
- Responsibility to ensure safety or lift materials against pilferage and damage till the installation is handed over to the consignee.
- All scaffolding as may be necessary in the lift well during erection work and subsequently removed.
- Temporary barricades with caution boards at each landing to prevent accident during execution of work.
- Supply and installation of landing facia plates made of steel, car apron plates, sill support angles with necessary clamps, foundation bolts support etc., as are necessary in connection with the installation of the lift.
- Steel ladder to be provided for access to lift pit wherever required under regulations.

6. Coordination with other agencies

The successful contractor shall coordinate lift installation work with other contractor / agencies engaged in construction of building if any and exchange freely all technical information so as to make the execution of works contract smooth.

7. **Completeness of tender**

All fittings, equipments, units, assemblies and accessories, hardware, foundation bolts, terminal lugs for electrical connections, cable glands, junction box and items which are useful and necessary for efficient assembly in operation and installation shall be complete in all details whether such details have been mentioned in the specification or not.

Scaffolding

Scaffolding, minor builders work including providing dash fasteners for fixing rails, brackets etc. shall be the responsibility of Contractor.

Contractor shall include in his scope of work all steel requirements for machine beams, bearing plates, buffer supports, channels as required. All steel items not including but required for the installation work shall be part of the tender document.

8. Completion Certificate

On completion of the installation a certificate shall be furnished by the Contractor countersigned by the licence Supervisor under whose direct supervision the installation was carried out. This certificate shall be in the prescribed from as required by the local supply authority. The Contractor shall be responsible for getting the installation inspected and approved by the local authorities concerned.

9. Statutory Approvals

The Contractor shall submit the required applications, drawings, etc to the Corporation, lift Inspector, Electrical Inspectors, Factory Inspectors and/or any other statutory authorities and obtain the approval, licenses and/or sanctions. The final completion certificate shall be obtained by the Contractor from all statutory authorities to enable the Owners to commission the equipment or its utilization. The Contractor shall be responsible for all fees etc to be paid to the various authorities in this respect. The work shall not be deemed to have been completed until the above approval certificates, etc have been obtained by the Contractor.

10. Spares

Contractors shall submit list of recommended spares for 5 years operation listing items with individual prices.

11. Documentation

The Contractor shall provide six sets of operation & maintenance manuals with instructions for routine and periodic maintenance.

12. **Levelling**

The Elevators shall be leveled by the suppliers and the required leveling accuracy maintained with 20mm thick flooring in the car to be provided by the Owners. The weight of flooring that can be accommodated in the car with guaranteed leveling as required shall be intimated in the tender.

TECHINICAL SPECIFICATION FOR ELEVATORS

1. Electric Supply

The available system of electric supply is 415 volts between phases and 230 volts between neutral & phase and neutral – 3 phase 4 wire AC 50 Hz system suitable for operation at ±10% of rated supply voltage. In addition for illumination and control power required for elevators and equipment shall be indicated in the tender. Power shall be provided at one point n each Machine Room at a point to be indicated by the Contractor. All subsequent electrical systems shall be the responsibility of the Contractor.

2. Technical Particulars

The technical particulars of the Elevators are detailed in the enclosed schedule. The schedule indicates the capacity, travel, speed, number of openings, machine room and hoist way sizes etc. Should any further information required by the Contractor the same can be obtained from the offices of the Consultants.

3. **Driving Mechanism**

Elevator Machine

The Elevator machine shall be suitable for 415 volts 3 phase 50 Hz AC supply with a voltage variation of +/- 10% and shall be placed directly above the hoist way upon the machine room floor slab and steel beam furnished in place by the Contractor.

The machine shall have a high efficiency and low power consumption and shall be designed to withstand the peak currents in lift duties. Anti vibration rubber pads of adequate thickness shall be used below the machine to reduce the noise and vibrations.

The elevator machine shall be worm gearless reduction type and shall consist of a motor, electromechanical brake worm gear, sheave shaft and sheave all completely mounted on a common bed plate. The worm shall be provided with ball bearings to take the end thrust and roller bearings shall be provided for the sheave shaft to ensure alignment and long bearing life. The hard alloy cast iron or steel sheave shall have rope grooves to ensure proper traction and minimum rope wear. Adequate means of lubrication shall be provided for all bearings and worm gear.

Means for manual operation of the lift car shall be made by providing winding wheel suitably marked to indicate the direction of the movement to enable the lift car to be brought to the nearest landing. There shall be a warning display for switching off electrical supply before the manual operations.

Brake

The electromagnetic brake shall be spring applied and electrically released. It shall come into action after the lift has come to a complete halt to hold the car in position. The brake shall operate automatically with the safety devices and release the brake manually such release requiring the action of manual force to move the lift in short stops.

AC Motor

The AC self lubricating motor shall be suitable for elevator use with high starting torgue and low starting current. Thermostats shall be embedded in the stator winding to indicate the temperature rise in the motor. The AC motor shall have class F insulation and suitable for 210 starts per hour with a maximum temperature rise of 50°C over the ambient.

Controls

The Elevators control shall be AC variable voltage variable frequency (A.C.V.V.V.F). The system shall control the starting, stopping direction of motion, running of the lift motor and application of the brake and/or safety devices in the event of power failure or any other emergency. It shall be so designed as to ensure a smooth and constant acceleration and retardation under all opening conditions.

The contractor shall be wall/floor mounted, vertical totally enclosed cubicle type with hinged doors on the front and the rear to provide easy access to all components in the controller. The cubicle

shall be well ventilated such that the temperature inside never exceeds the safe limits of the components at ambient room conditions in the machine room.

The controller shall operate within the supply voltage variation of plus 10% to minus 20% of the nominal voltage.

a) Over current

b) Under voltage

c) Over voltage

d) Single phasing

e) Phase reversal

The controller shall be designed to cut off the power supply, apply the brake and bring the car to a rest in the event of any of the above failures occurring.

The Contractor must state clearly the forms of protection provide for each equipment.

If any devices of the electro mechanical type are used the same shall be equipped with arc chutes to prolong the life of contacts. Contractors must stipulate the type of devices used and the material of the contacts.

Contractors must support such offers with complete details of experience, number of lifts installed and operational in India, collaboration for equipment design and manufacture etc.

Hoist Ropes

Round standard steel wire ropes as per Indian standards shall be used for Lift suspension. The number and size of the hoist way ropes shall be so selected to ensure proper factor of safety minimum 10 and adequate traction for the elevator. The governor ropes shall also be wire ropes.

The Hoist way landing door shall be provided with an interlock such that:

a) It shall not be possible for the car to be started or kept in motion until all the landing doors and the car door are locked in the closed position.

b) It shall not be possible to open the landing door from the landing unless the Lift car is within the particular landing zone.

c) The car doors & Hoist way landing doors open automatically as the car is stopping at a landing. The closing of the car and landing door must occur before the car is set in motion.

Car Platform

The car platform shall be of framed construction and designed on the basis of rated load.

Car Enclosure

The elevator car enclosure shall be as per parameters enclosed in the schedule of quantities. The ceiling shall have an arrangement for a cabin fan mounted on the roof of the car. Indirect fluorescent lighting shall be provided to evenly illuminate the car. The car enclosure shall be pre-laminated particle board 12 mm thick to wall and ceiling in desired shade and grooves covered with teakwood beading of desired shape with floor 5mm thick steel chequered plate.

Car Design:

Car walls finish stainless steel, front and doors in stainless steel, mirror on rear car panel, Dimpled anti skid vinyl flooring

Car operating Panel:

Stylish brushed SS finish car operating panel, visual call confirmation, dot matrix display,car position indicator

Landing doors:

fully automatic landing doors in powder coated finish

Car Door

The car entrance for the elevators shall be protected by Steel collapsible gate duly painted and providing car and landing doors with horizontal biparting as per IS14665

Hoist way Landing Doors

For the hoist way doors at each landing, two mild steel painted panels centre opening horizontal sliding doors shall be provided to give a clear opening as indicated in the technical parameters. These shall be duly painted to the shade approved by the institute and suit to the site condition.

Car and Hoist way Operations

The car and hoist way doors shall be mechanically connected such that both move simultaneously

for opening and closing. The hoist way landing door shall be provided with and interlock such that.
It shall not be possible for the car to be started or kept in motion until all the landing doors and the card door are locked in the closed position.
It shall not be possible to open the landing door from the landing unless the lift car is within the particular landing zone.
The car doors and hoist way landing doors open automatically as the car is stopping at a landing. The closing of the car and landing door must occur before the car is set in motion.

Door Hangers and Tracks

The car and the landing door shall be provided with two point suspension sheave type hangers complete with tracks sheaves and rollers shall be steel with moulded nylon collar and shall include shielded ball bearings. Tracks shall be of suitable steel section with smooth surface. The landing doors shall be complete with headers, sills, frames etc as reqd.

Cabin Fan

noiseless cabin fan shall be include for all elevators.

Emergency Light

An emergency light unit using sealed maintenance free battery power pack and fluorescent lamp to operate automatically in case of power failure shall be provided in each elevator car.

Alarm Bell

An emergency alarm bell including wiring shall be provided and connected to plainly marked push button in the car operating panel. The alarm shall be provided in the Ground floor lobby if required, The Owner may at his own cost extend the alarm bell to the security/control room.
The alarm unit shall be solid state siren type operated by 2 nos. 9 volts dry batteries to give a waxing and warning siren when the alarm button in the car is pressed momentarily.

Operation Buttons

The following operation buttons shall be provided

In Each Lift Car

Stainless steel return panels of suitable thickness shall be provided on each side of the door with the following flush mounted controls on one side:-

a) Illuminated type push buttons corresponding to the floors served. Floor nos. on push buttons shall be numbered from 1 to onward.

b) Door open button

c) Emergency stop button

d) Emergency call button connected to a bell for an emergency signal

e) Two position key operated switch for 'with attendant' and 'without attendant' operation

f) Ventilation fan ON/OFF switch

g) Built in intercom of the pick and speak type

h) UP/DOWN direction display

At Landing

Illuminated type 'UP' and 'DOWN' push buttons at each intermediate landings and single illuminated type push buttons at terminal floors. The push buttons shall illuminated when the same is pressed to indicate that the call has been registered. The button shall remain illuminated until the call is answered.
One set of calling buttons shall be provided for a bank of two elevators

Indications In Each Car

The following indications shall be provided in the cars:

a) Digital car position indicator provided above door to indicate the landing at which the car is stopped or passing.

b) Illuminate "UP" and "DOWN" arrows on the position indicator above door to indicate direction of travel.

At all landings

Combined hall position indicator and hall lanterns is not part of the offer. This feature is generally a standard part of the equipment for Duplex Lifts i.e. two Lifts in the same control.

Safety Devices

The following safety devices shall be provided:

Self Leveling

The Lift shall be provided with a +/- 5mm self leveling accuracy feature of the two way automatic type. The self leveling device should automatically correct for under run, over run and rope stretch.

Terminal & Final Limits

Terminal limit switches shall be provided to slow down and stop the car automatically at the terminal landings and final limit switches shall be furnished to automatically cut off the power and apply the brake should the car travel beyond the terminal landings.

Terminal Buffers

Suitable spring buffers shall be used from existing Lift.

Interlocking

Adequate interlocking is to be provided so that the car shall not move if the landing doors are even partially open.

Car Safety and Governor

The car safety shall be provided to stop the car whenever excessive descending speed is attained. The safety will be operated by a centrifugal governor located at the top of the hoist way and connected to the governor through a continuous steel rope. Suitable means shall be supplied to cut off power from the motor and apply the break on application of the safety.

Fireman Switch

Each elevator shall have a fireman switch glass front for access by the fireman. The operation of this switch shall cancel all calls to this Lift and will stop at the next nearest landing if traveling upwards. The doors will not open at this landing and the Lift will return to the ground floor. In case the elevator is traveling downwards when the fireman's switch is operated it will go straight to the ground floor by passing all calls enroute. The emergency stop button inside the car shall be rendered inoperative.

4. Gearless machine:

The gearless machine shall consist of a motor, traction sheave and break-drum or brake disc completely aligned on a single shaft. Gearless machine shall be A.C. gearless with VVVF drive.

5. **Hand winding wheel or handle:**

At times of lift stoppage due to any reasons, it shall be possible to move the lift car to the nearest landing manually. The manual operation shall be by means of winding. Wheel or handle mounted on the end of the motor shaft. The up or down direction of the movement of the car should be clearly marked on the motor or at suitable location. A warning plate written in bold signal red colour advising the maintenance staff to switch off the mains supply before releasing the break and operating the wheel is to be prominently displayed.

6. Inter- communication system:

Recommends for provision of either an emergency or a telephone inside the car but as a general experience it is seen that over a period of time these devices become inoperative due to one reasons or the other. Therefore, in order to have at least one device of communication functioning at all the times, as an alternative arrangement, provision of both i.e. telephone with minimum tow connections-one at the operator's room and other at guard room and the emergency signal with re-chargeable batteries as source of supply shall be made in the lift cars.

The device used for emergency signals should incorporate a feature that gives immediate feed-back to the car passengers that the device has worked properly and the signal has been passed on to the intended agency. This shall be achieved by pressing of button from control room which shall give audio signal to the passengers in the car

7. **Emergency Power Supply for lift car:**

This shall include suitable secondary battery with trickle/boost charge arrangement and inverter power pack with necessary contactors for supplying the light fixtures in the lift car. The same battery shall also feed the alarm bell and communication equipment.

8. Car landings:

All the lift car landing shall be well lit to an illumination level of 150 lux and shall be free from obstructions. The control for landing lights and the sigh lights shall be tamper proof. Wherever stand by power supply is available, these lights shall be connected to standby circuits also.

9. Instructions:

Detailed instructions as specified for guidance of passengers shall be prominently displayed inside the car by contractor and outside the car at all landings by the department. The Braile signage will be posted by the department outside lift lobby at all landings for the lift meant for barrier free requirements as per specifications.

10. Levelling:

All lift (s) shall be incorporated with suitable floor leveling devices. In case of lifts with automatic power operated doors and with A.C. VVVF controller a separate level device for automatic leveling with leveling accuracy of ± 5mm shall be incorporated.

11. Counter Weight Guards:

Guards of wire metal/ mesh shall be provided in the lift pit to a suitable height above the pit floor to eliminate the possibility of injuries to the maintenance personnel.

12. **Guide shoes**:

Two numbers of guide shoes at the top and two numbers at the bottom shall be provided on the lift car and counter-weight.

Type of shoes:

For passenger lifts and bed-cum-passenger lifts

i. For speed upto 1.5 mps sliding guide shoes shall be used. Sliding guide shoes For car shall be always flexible and for counterweight solid guide shoes can be Used upto 1.0 mps.

ii. For speeds more than 1.5 mps roller guide shoes shall be used for car and Counter weight.

13. Rope fastenings:

The ends of lift ropes shall be properly secured to the car and counter weight hitch plates as the case may be with adjustable rope shackles having individual tapers babbit sockets, or any other suitable arrangement. Each lift rope shackle shall be fitted with a suitable shackle spring, seat washer, shackle nut & shackle nut split pin.

14. Guards for lift ropes:

Where lift ropes run round a sheave or sheaves on the car and/ or counterweight of gearless machine suitable guards shall be provided to prevent injury to maintenance personnel.

15. Number & size of ropes:

The contractor must indicate the number and size of lift ropes and governor ropes proposed to be used, their origin, type, ultimate strength and factor of safety. The contractor should furnish certificate of ropes from the rope from the rope manufacturers issued by competent authority.

16. Safety Equipments:

Every lift installation shall necessarily be provided with the following safetyfeatures:
The safety gear shall be provided in accordance with IS (part-4-Sec.4):2001, each type of car safety shall be actuated by a speed governor.

17. **Governor**:

The car safety shall be operated by speed governor located overhead and driven by governor rope suitable connected to the car and mounted on its own pulleys. The rope shall be maintained in tension by means of weighted or spring loaded tension sheaves located in the pit. Governor shall be provided for lifts with a travel of more than 5.5 meters. The governor rope shall be not less than 6mm in dia and shall be made of steel or phosforbronze. These shall be in accordance with IS 14665 (part 4/sec-4):2001. Governor for car safety gears shall be adjusted to actuate the safety gear at the following speeds: -

i. For rated speeds upto 1m/s maximum governor tripping speed shall be either 140 percent of rated speed or 0.88 m/s, whichever is higher. For rated speed above 1m/s maximum governor tripping speed shall be 115 per cent of the rated speed plus 0.25 m/s.

ii. Minimum governor tripping speed shall be 115 per cent of the rated speed.

The governor shall be of "V" groove wheel design and only wheel is stopped to actuate the car safety upon a pre-determined over speed downward without damaging the rope.
The governor, rope and sheave shall be so located so as to minimize danger of accidental injury to the equipment.
The governor sheave and tension sheave shall be according to clause 2.4 and the
The requirements for field tests on car safety and governor and for drop tests to
Buffers –
Buffers shall be oil resistant rubber pad type for speeds upto 0.25 mps and spring/ oil type for speeds upto 1.5 mps and only oil type for speeds higher than 1.5 mps.
Buffers shall be suitable for installation in the space available. Buffers anchorage at pit floors shall be installed avoiding puncturing of water proofing. Oil buffers of the car and counter weight shall be of the spring return type of gravity type.
When the lift car rests on fully compressed buffers there shall be at least 60 cms clearance between the lowest point in its car frame and any obstruction in the pit exclusive of buffers and their supports. Similarly when the lift car cross head is 60cm from the nearest obstruction above it, no projection on the car shall strike any part of overhead structure.
The contractor must indicate the name of buffer manufacturers, buffer stroke & certified maximum loads.

18. Door Locks:

Electro-mechanical door lock shall be provided for all the landing doors and they shall be such that the doors cannot open unless the car is at rest at the particular landing. It shall not be possible to move the car unless all the landing doors and the car door are closed and locked. This requirement however does not apply when the lift car is provided with automatic leveling devices and in such cases, it shall be permitted to move the car with both the doors open in the leveling zone for the purpose of leveling.

Automatic- cum-attendant operation:

i. Single automatic Push Button with/ without attendant – The operating devices for this operation shall incorporate in the car control panel, car buttons corresponding to the various landings served and single landing button at each landing, all electrically connected to controller governing floor selection, direction of travel, acceleration, retardation etc.
This system shall be so arranged that when the car is not in use, on pressing a landing call button the car shall start automatically provided all the doors are closed. During the movement of the car and also when car tops at floor landing, other landing call buttons are in-operative for a predetermined time. The pressing of a car button shall automatically start the car and sent it to the desired landing. In all the cases, the starting of the car is contingent on the establishment of landing door and car inter-lock circuits. To indicate the availability, or 'in use' light shall be place in the landing call button panel. When light shall be 'OFF' the passenger shall be able to call the car. In case of manual operated door if the lift is standing at any landing with doors open (when not in use), the pressing of the landing call button shall ring a bell, fitted at the top of car to attract the attention of the people soliciting their help for closing the lift door if any one of the them happens to be near the lift incase of power operated doors, the landing and car doors shall be arranged to open automatically when the car is parked at landing after all the calls are served and the lift is parked at any landing. The doors can remain open or alternatively if desired, the car shall be arranged to close after a pre-determined time unless closing is prevented or interpreted by the car doors re-opening device or the door open button.
The lift shall be suitable for dual operation with or without attendant by the provision of key operated transfer switch indicating 'attendant' and 'automatic' positions. During 'attendant' operations the landing call shall be disconnected from the control system and shall be connected to an announciator in the lift car. The attendant shall then operate the car to answer the registered calls. This operation is recommended for single speed control lift for low rising building having a single lift installation.

19. Simplex Selective-Collective operation with/ without attendant:

Automatic operation by means of one button in the car for each landing level served and by up and down buttons at the landings, wherein all stops registered by the momentary actuation of the car made defined under non-selective Automatic Operation but where in the stops registered by the momentary actuation of the landing buttons are made in the order in which the landing are reached in each direction of travel (irrespective of the sequence in which the buttons have been actuated). With this type of operation, all 'up' landing calls are answered when the car is traveling in the up direction and all 'down' landing calls are answered when the car is traveling in the down direction, except in the case of the uppermost or lowermost calls which are answered as soon as they are reached in-respective if the direction of travel of the car.

20. **Duplex Collective Selective Operation with/ without attendant**:

The control system for this operation shall be similar to the one described under simplex selective-collective operation except that in this system there shall be tow lift car adjacent wells. It shall be arranged to co-ordinate both cars for efficient service and prevent them from answering the same calls by the provision of only one set of landing call button fixtures. It shall automatically assign each call to the car that will be in the best position to answer promptly. The system shall be so arranged that when the cars are idle, normally one car will be parked at the lower main landing with its doors closed or open and the other car shall be free car parked with the doors closed or open to the landing where it answered its last call, and shall be the one to attend to the nearest call.

Each car shall always respond to calls registered by its own car call buttons. When either car is parked out of service for any reasons the other car shall function as single car (simplex) selective collective. Besides the control system shall also arranged for independent service from inside the car.

A by-pass button (non-stop button) shall also be provided inside the car to enable the attendant to by-pass any landing if the car is full or if otherwise so required.

The two lifts shall be arranged with or without attendant operation and shall function as described using single car selective-collective operation. When the transfer switch is in the attendant position the operation of the cars shall be identical with that described for automatic operations except that:

i. Closing of doors and starting of cars shall be initiated by the car buttons only.

ii. Buzzers and directional lights in the car are operative, and

iii. Landing by-pass shall be effective.

The pressing of an up or down landing call shall illuminate appropriate direction
has been at the floor for longest time.

21. Automatic selection of traffic programme:

The group supervisory control continuously examines traffic conditions in the building and automatically puts into operation the programme which can best cope with the demand at any particular time. This is fully automatic and requires no supervision or attendant. To suit the traffic demand in the building, suitable traffic programmes can be selected for inclusion in this control.

22. Controlling Equipment:

The movement of the car shall be electrically controlled by means of a controller

23. Control circuits:

The control circuit shall be designed to the type of lift specified for safety operation. It shall not be possible to start the car unless all the car and landing doors are fully closed and landing doors locked. The circuit shall have an independent fuse protection for fault and over loads and be arranged so that earth fault or an open circuit shall not create unsafe condition. The circuit shall be so arranged that for the stoppage of the car at specified landing or for actuation of a contactor by emergency switches or operation of safety gears the system shall not depend upon the completion or maintenance of an electrical circuit to cut off power supply and apply the brakes. This requirement is not applicable to dynamic braking and speed control devices.

24. Terminal Boards:

All wiring for external control circuits shall be brought to a terminal board with means of identification of each wire. Metallic/plastic identification tags shall invariably be provided. All connections of wires to terminal boards shall be adequately clamped or screwed.

25. Auxiliary Switches:

i. Emergency stop switches:
On top of the lift car an emergency stop switch shall be provided for use by maintenance personnel. Stop switch shall be provided in the machine room. Operation of these switches/ buttons shall cancel all the registered calls and landing calls for that particular lift.
ii. Maintenance switch on top of the car
For purpose of inspection and maintenance, maintenance switch shall be provided on top of the car. The control circuitory shall be so arranged that in the event of the operation of this switch:

a. The car speed shall be less than the rated speed not exceeding 0.85 meters/sec.

b. The car movement shall be possible only on the application of the continuous pressure on a button. It shall be so mounted to prevent any inadvertent operation.

iii. Fireman Switch:
Fireman switch with glass to break for access shall be provided at ground or main floor for all the lifts. The operation of this switch shall isolate/ or cancel all calls to all the lifts and the lifts will stop at he next nearest landing if traveling upward. The doors will not open at this landing and the lifts will start traveling to ground floor. If these were already traveling down, they will go straight to ground floor direct without stopping enroute.
iv. Inspection facility:
An inspector's change over switch and set of test buttons shall be provided in the controller. Operation of the inspector's change over switch shall make both the car and landing buttons inoperative and permit the lift to be worked in either direction from machine room for test purposes by pressing corresponding test buttons in the controller. It shall not however interfere with the emergency stop switches inside the car or on the top of the car.
v. Safety line indicators:
If specified visual tell tale lights may be provided to monitor the conditions of faults in the safety line of the lift for easier fault finding. These indicators will remain lit when safety circuits are normal. One indicator shall be provided for each safety on the controller. If any indicators fail to light up as the lift proceeds in its sequence of operation, there shall be visual indication of the safety line open circuit and also its location for easier fault finding.

26. Control Wiring:

i. Wiring in machine room:
Power wiring between the controller and main board controller to various landings shall be done in heavy gauge conduit or metal duct & shall conform to I.E. Rules 1956 and CPWD Specifications for electrical works. Following general principles shall be followed in siring:

a. i) Control cables carrying DC and power cable carrying AC shall not be run in the same conduit or metal duct and they shall be laid as per I.E. rules.

ii) Metal duct with removable inspection cover shall be preferred.
iii) in case of control cables also the harness shall be separate as far as feasible for separate functions and laid separately in suitably dimensioned metal duct or in a separate conduit such as the signal8ing, locking, lamp indication and safeties. Control cables for different voltages in the lift installation works should be laid as per IE. Rules.

b. At least 5 percent with a minimum of 5 unconnected spare wires shall be available out of all the lines to be provided in the wiring harness from the midway junction box to the machine room.

c. There shall be a master isolating switch Fuse associated with the controller heavy duty load break, quick make quick break type TP&N preferably interlocked with controller cabinet door. Isolator handle shall have provision for external locking in off position.

All relays shall be suitable for lift service and shall incorporate adequate
Contact wipe for reliable operation. Relays shall operate satisfactorily between 80 percent to 110 percent of their voltage.
Main motor contactors shall be suitable for A.C. duty. Tenderer shall be required to furnish full details of make, type, applicable standard, voltage and current rating, duty class, type and routine tests done etc., on contactors and relays. Copies of type test certificates and other test certificates shall also be furnished by the successful tenderer.
All cables shall be with copper conductors and flame retardant or PVC insulated of appropriate size. The cables feeding motor and in heavy current flow paths shall be so selected that the size matches the protecting fuses and will not result in more than 2 percent voltage drop from the main board to

the terminals of motor. Control cables shall not be less than 0.5 sq. mm. or equivalent if stranded; where installation of heavy gauge conduits present difficulties, short lengths of flexible conduits will be permitted but effective electrical continuity and earth bonding shall be ensured. Ferrules shall be slipped at the ends of all cables as per standard control wiring practice. All terminal blocks shall be suitably marked.

27. Trailing Cables:

A single trailing cable for lighting control and signal circuit is permitted, if all the conductors of this trailing cable are insulated for maximum voltage running through any one conductor of this cable. The lengths of the cables shall be adequate to prevent any strain due to movement of the car. All cables shall be properly tagged by metallic/plastic tags for identification.

Trailing cables shall run from a junction box on the top of the car to a junction box located in the shaft near mid point of travel and from these junction boxes conductors shall be run to the various locations

Trailing cables exceeding 30 meters in length shall run so that the strain on individual cable conductors will be reduced to a minimum and the cables are free from contact with the car counterweight, shaft walls or other equipment.

Trailing cables exceeding 30 meters in length shall have steel supporting fillers and shall be suspended directly by them without rubbing over other supports.

Cables less that 30 meters in length shall have no – metallic fillers and shall be suspended by looping cables around supports of porcelain spools type or equivalent.

28. Earthing:

Metal frames and all metal work of the lift controller frame etc., shall be earthed with double earth leads taken to the earth bar. Looping shall be permitted if such routing is feasible. All other individual metallic frame work of components etc., shall be loop earthed.

29. Lift Rope Compensation:

The lift rope compensation for lift travel shall be provided for lift travels beyond 40m in all cases.

30. Automatic Rescue Devices (ARD):

The automatic rescue devices (ARD) meant for the purpose of bringing the lift car to the nearest landing doors are being used selectively and is generally restricted to commercial buildings having heavy traffic. However, frequent power failures being the common phenomenon, the provision of ARD shall be made in all the lifts in public buildings. The ARD shall have the following specifications:

i. ARD should move the elevator to the nearest landing in case of power failure during normal operation of elevator.

ii. ARD should monitor the normal power supply in the main controller and shall activate rescue operation within 10 seconds of normal power supply failure. It should bring the elevator to the nearest floor at a slower speed than the normal run. While proceeding to the nearest floor the elevator will detect the zone and stop. After the operation is completed by the ARD the elevator is automatically switched over to normal operation as soon as normal power supply resumes.

iii. In case the normal supply resumes during ARD in operation the elevator will continue to run in ARD mode until it reaches the nearest landing and the doors are fully opened. If normal power supply resumes when the elevator is at the landing. It will automatically be switched to normal power operation.

iv. All the lift safeties shall remain active during the ARD mode of operation.

v. The battery capacity should be adequate so as to operate the ARD at least seven times a day provided the duration between usages are at least 30 minutes.

Appendix-I

LIST OF APPROVED MAKES for lifts : Johnson/Kone/Omega/Otis

SPECIFICATION FOR ELECTRICAL ERECTION

1.00.00 GENERAL

1.01.00 The tenderer shall furnish & install all materials & equipment which are obviously a part of the completed installation but have not been specifically mentioned in this specification without any additional charge to the Authority.

1.02.00 All ladders, platforms, scaffolding, temporary supports, any other facility required for erection at site shall also be provided.

1.03.00 The tenderer shall at all times work in close coordination with Engineer-in-charge supervisory personnel & afford them every facility to become familiar with the erection & maintenance of the equipment.

1.04.00 The tenderer shall arrange his schedule of work & method of operation to minimize inconvenience to other contractors at the project site. In case of any difference between contractors. The decision of the Owner shall be final & binding on all parties concerned.

1.05.00 In case of any hold up due to fault of other contractors or for any other reason, the tenderer shall bring it to the notice of the engineering-in-charge in writing without any delay. Otherwise any delay in completion of his work will be accounted for.

1.06.00 In case of any contradiction/ confusion with any other section/ sub-section of this specification, the same shall be referred to the Engineer-in-charge in this respect shall be final & binding.

2.00.00 REGULATIONS

The complete installation shall meet the requirements of the latest edition of the relevant Indian Standard & I.E. Rules.

3.00.00 DRAWINGS

The tenderer shall inform himself fully with the relevant Electrical layout single line diagram & schematic drawings enclosed with the package specification.

The tenderer shall furnish all erection drawings, catalogue data sheets, etc as required to cover specific information for all items.

4.00.00 TRANSPORATION

The contractor shall be responsible for the transportation to the site of all equipment, materials & supplies to be provided by him according to terms of the contract. The contractor shall be responsible for arranging transportation as advised by Owner depending on requirement & to meet the completion schedule. In the event of the schedule requiring change in the mode of transportation the same shall be arranged by the contractor without any extra cost.

5.00.00 UNLOADING

The contractor shall arrange to unload equipment received at site & also arrange to transport the material from the unloading point to site.

The contractor shall make all necessary arrangement for tools & tackles, men & machinery for unloading of equipment at site & its transportation to site or storage. It is clearly understood that demurrage, whereas & other expenses incurred by the contractor due to delayed clearance of the material or for any other reason, shall be to the contractor's account.

6.00.00 STORAGE AT SITE

The contractor shall provide coverage of the equipment & material, security arrangement & all other facilities required for proper & safe storage till completion of the work.

7.00.00 PROTECTION OF WORK

7.01.00 The contractor shall effectively protect his work at his own expense, equipment & material under his custody from theft, damage or tampering.

7.02.00 Finished work where required shall be suitably covered to keep it clean & free from defacement or injury.

7.03.000 For protection of his work contractor shall provide fencing & lighting arrangement connect up space heaters & provide heating arrangement as necessary or directed by Engineer-in-charge.

7.04.00 Contractor shall be responsible for any loss or damage to equipment & material until his work is fully & finally accepted.

8.00.00 OPENING OF CASE, CHECKING AND CLEANING OF PART

8.01.00 All packing cases or package shall be opened in presence of Owner's reprehensive.

8.02.00 All equipment, accessories & materials i.e. Switchgear, transformer, bus duct, power &control cables etc after receipt at site shall be jointly inspected & checked with packing list & identified with erection drawings.

8.03.00 All claims against loss or damage in transmit shall be lodged by the contractor under intimation to Owner. The contractor shall be responsible for processing and settlement of claim including furnishing any information that may be required in this connection.

8.04.00 The contractor shall ensure that insurance formalities are observed & any loss of claim due to the fault of the contractor shall be to the contractor's account.

8.05.00 All parts shall be thoroughly cleaned all rust removed & surface polished as required.

8.06.00 Cleaned & polished parts shall be coated with anti-corrosive paints where necessary & stored with care, ready for erection.

9.00.00 TESTING EQUIPMENT

The major testing equipment that are required to be arranged by the contractor are listed below:

a.) Insulation Tests:

i) Power operated Meggar - 1 kV & 2.5 kV grade

ii) Hand operated Meggar - 500 Volt/ 1100 Volt grade

b.) Hand driven earth Resistance Meggar, range 0-1/3/30 Ohms.

c.) High potential testing set- roller mounted type

d.) Tong testers of suitable ranges

e.) Contact resistance measuring set for micro-ohms

f.) Torque wrench of various sizes.

g.) Multimeters, test lamp, field telephone with buzzer set, different gauges etc.

10.00.00 PAINTING

After completion of the erection, all equipment & materials supplied under this specification shall be given necessary protective painting. The colour of the final coat shall be approved by the Owner.

11.00.00 ERECTION

11.01.00 Method & materials

11.01.01 All work shall be installed in a first class, neat & workman like manner by mechanics skilled in the trade involve. All details on the installation shall be mechanically & electrically correct.

11.01.02 All materials shall be brand new & of best available quality without having imperfections & blemishes. Where two or more units of the same manufacture.

11.01.03 All conduits & equipment shall be installed in such a manner as to preserve access to any other equipment installed.

12.00.00 DETAILED REQUIREMENT OF INSTALLATION:

12.01.01 All alignment, leveling, grouting, base channel fixing & anchoring adjustments shall be carried out in accordance with manufacturer's instructions and install necessary floor steel for supporting the panels.

12.01.02 All connections, in switchgear shall be completed, checked and adjusted to ensure safety & satisfactory operation of the equipment.

12.01.03 In some cases minor modifications may have to be carried out at site in the wiring & mounting of the equipment to meet the requirement of desired control scheme & the contractor shall have to do the same at no extra cost.

12.02.00 Transformer

12.02.01 The contractor shall place the transformer on its foundation, assemble parts, fabricate & erect & supporting structure for detachable type cable chamber.

12.02.02 H.V. test of transformer oil shall be carried out taking a sample from individual transformer. If the result is not in satisfaction of the purchaser, oil conditioning of that particular transformer shall have to be carried out.

12.03.00 L.T. Bus duct shall be erected duly supported on the soffit on the building by structural member supplied along with the bus duct. The bus duct will pass through separate wall between transformer & switchgear & will reset on two flanges one each at the switchgear & The transformer end. The grounding of the bus duct shall be carried as per the relevant stranded. The flanges supplied alongwith the bus duct shall be erected & terminals end equipment namely transformer & switchgear will be connected to the bus duct. The bus duct shall be erected in straight, vertical or horizontal formation as per the site requirement. The test like mili volt drop on the contacts, insulation resistance value & proper tightness shall be ensured by the contractor.

12.03.01 For draining out of oil a oil soak pit for transformer is to be erected of the suitable capacity.

12.04.00 Miscellaneous items :

12.04.01 The tenderer shall install miscellaneous minor items to complete the installation of equipment.

12.04.02 These equipment will be generally floor or wall mounted. The exact location will be as decided by the Owner at site or as shown in Final drawings.

12.04.03 All support & bracket needed for installation shall be fabricated & painted by the tenderer.

12.04.04 All welding, cutting, chipping & grouting as & when necessary shall be carried out by the contractor.

12.05.00 Handling of cable drum and cable

12.05.01 Rolling of drum shall be avoided as far practicable. For short distance, the drums may be rolled they are rolled slowly and in proper direction as marked on the drum. In absence of any identification, the drums may be rolled in the same direction as it was rolled during taking up the cable.

12.05.02 For unreeling the cable, the drum shall be mounted on jacks or on cable wheel. The spindle shall be strong enough to carry the weight without bending. The drum shall be rolled on the spindle slowly, so that cable should come out over the drum & not below the drum.

12.05.03 While laying cable, cable shall be used at an interval of 2 meters. The cable shall be pushed over the roller by a gang of people positioned in between rollers. The cable shall not be pulled from the end without laying intermediate pushing arrangement. Bending radius shall not be less than what is specified by manufacturer.

12.06.00 Cable laying :

Cables shall generally be installed in cable trays except for some short runs in buried formation or in conduit / pipe for protection or crossing. Multi core power cables laid on trays & riser shall be neatly dressed & clamped with fabricated 25 x 3 mm G.S. flat or cable tray at an interval of maximum 1 meter for vertical / inclined run & 1.50 meter for horizontal run. Control cables may be laid in single layer with touching formation. Power & control cables shall be claimed in separate group. Power & control cables shall not be laid in a common tray excepting in very special case where a gap of 150 mm shall be maintained between power & control cables.

12.06.01 H.T. & L.T. power cables shall be laid in cable tray in single layer & with spacing equal to the diameter of cable.

12.06.02 Control cables can be laid upto a maximum of three layers in each tray.

12.06.03 Both power & control cables shall be clamped to the tray rungs by means of clamp made up of 25 x 3 mm fabricated G.S. flat at an interval of 1500 mm for horizontal run & 1000 mm for vertical / inclined cable run.

12.06.04 The cable trays shall be run with a vertical spacing of 300 mm cable trenches. A minimum of 300 mm clearance shall be provided between the top of tray & beams, cold piping, 500 mm clearance for hot piping/ object to facilitate installation of cables in tray.

12.06.05 Adequate pull boxes shall be provided in conduit run to facilitate. Cable pulling in long runs & also to ensure that there will be no more than 270 degree bend between the pull points.

12.06.06 Cable tray shall be installed to accommodate cable manufacturer's recommended maximum pulling tension & minimum bending radius.

12.06.07 All openings in the floor & wall for cable access shall be sealed after installation of the cable system with non-inflammable materials.

12.06.08 All floor / wall openings for cable entry to the electrical equipment & accessories shall be sealed with non-inflammable material, after completion of cable installation. Thickness of such materials shall be equal to the thickness of floor / wall.

12.07.00 Cables-power & control :

12.07.01 The tenderer shall install & connect all power & control cable required for complete installation within his scope of work. Type & size of power & control cable shall be as specified & as supplied under a separate sub section for power & control cable.

12.07.02 In general all power & control cable shall be run in cable trays in cable trenches. Isolated runs of control cables shall be run in rigid conduit.

12.07.03 Jointing of power cable should be avoided as far as possible. However, if any splicing of control cable is required to carry out interlock it will be done in junction boxes not in the conduit or in the trays. Such junction boxes shall be in the scope of tenderer.

12.07.04 The contractor shall not install cables with different voltage grade in the same cable tray.

12.07.05 During cable installation care shall be taken so that the actual bending radius of each cable is not less than the one recommended by the cable manufacturer.

12.07.06 For cables buried directly underground there shall be a stone free sand cushion both above & below the cable run being held by brick wall supports on two (2) sides. The excavated portion above the top sand cushion shall be covered by concrete precast slab supported on the side walls & finally filled up with standard back fill.

12.07.07 Cables shall be pulled into the trenches in strict accordance with the cable manufacture's instruction.

12.07.08 Tenderer shall furnish & install suitable solderless crimping type cable lugs at the termination of all wires & cables if not already furnished with the equipment.

12.07.09 All exposed conduits & armoured cables shall be tagged with the numbers that appear in the conduit & cable schedules as prepared by the tenderer. All conduits & armoured cables shall be tagged at their entrance and/ or exist from any piece of apparatus, junction box or pull box. Aluminium tags shall be used with the number engraved/ punched on the tag. Tag shall be suitable secured to the

conduit or armoured cable.

The cable tags shall also be provided at all bends and at interval of 30 M on straight run of cable in order to facilitate the identification.

12.07.00 Laying termination & connection of all control cables for interlock, protection, indication & annunciation.

The tenderer shall prepare cable schedule & interconnection diagram & submit the same for approval of the Authority. Cable laying shall be started with the approval cable schedule & interconnection diagrams. Separate cables for each type of following services/ functions as applicable shall be used & laid along the run for each feeder.

a.) Power - designate as 'P'

b.) Control protection interlock, metering, indication & annunciation designate as 'C'.

13.00.00 FIELD TESTING :

13.01.00 Field Testing shall be required for all the equipment & accessories furnished, installed or connected by the tenderer to ensure proper installation, setting, connection & in accordance with the plans, specifications & manufacturer's recommendations.

Testing shall be conducted in presence of Owner's engineers with prior notice at least 2 weeks before commencement of any test.

13.02.00 Field testing work shall be done as per the latest edition of the relevant standards. All tests recommended by the equipment manufacturer shall be conducted. The tenderer shall submit the list of all field tests to be conducted for all equipment & accessories for review / approval by the Owner.

13.03.00 Testing shall include any additional tests suggested by the Owner that he deems necessary because of field conditions to determine that equipment, materials & system meet requirements of the specification.

13.04.00 The tenderer shall depute qualified personal to conduit all testing & shall provide all labour & testing equipment required for & incidental to testing.

13.05.00 The tenderer shall be responsible for any damage to equipment & material due to improper test procedure or test apparatus & shall replace or restore to original condition of any damaged equipment or material.

13.06.00 The tenderer shall maintain in quadruplicate a written record of all tests showing date, personal making the tests, equipment or material tested, test performed & result. Two copies of test records shall be given to the Authority.

14.00.00 COMMISSIONING :

After the satisfactory test are performed the equipment & material shall be put on trial operation by the tenderer. After successful trial operation, the equipment shall be put on performance tests. Initially at no load condition & finally with different loading conditions.

SPECIFICATION & CODE OF PRACTISE FOR THE ELECTRICAL WORK

The following specifications will apply under all circumstances to the equipment to be installed against this contract and it is to be ensured that the contractor shall obtain for himself at his own expense and on his own responsibility all the information which may be necessary for purpose of making the tender and for entering into a contract keeping in view the specification and inspection of site etc.

The tendered rates shall include for the cost of material erection, connection, commissioning, labour, supervision, tools, transport, contingencies, breakage, wastage, sundries, scaffolding, maintenance of installations for defect liability period i.e. they should be for an item complete in all respects.

The general specifications of electrical works for internal-2023 and general specifications for Sub-station works-2013 of CPWD shall be followed.

1. SITE CONDITIONS: the equipment to be erected and commissioned should be suitable for the site conditions, it is estimated that the maximum temperature as site will be 50ºC.

2. L.S.SPECIFICATIONS:

The following Indians standards including latest amendments, specifications will apply to the equipment and the contract unless specified otherwise.

a)	Transformer	IS 2026-1977 & 1981
b)	Low tension air-circuit breakers and MCCB	IS 2516-1965
c)	Switch fuse unit on cubicle switch boards etc.	IS 4047-1967
d)	Switch fuse unit on industrial boards etc	IS 4064-1967
e)	Switch gear bus bars	IS 375-1963

f)	HRC fuse links	IS 2208-1962
g)	Distribution fuse boards	IS 2675-1966
h)	Degree of protection provided by enclosure For low voltage switchgear	IS 2147-1962
i)	PVC cables.	IS 1954-1962
j)	11,000 volt paper insulated lead sheathed cables	IS 692-1965
k)	Tubular fluorescent lamps for general lighting Service.	IS 2418-1965
l)	Tungsten filament lamps for general service.	IS 418-1963
m)	Ceiling fans	IS 374-1966
n)	Flood light	IS 1947-1961
o)	Well glass flame proof electric light fitting	IS 2206-1962 Part-I
p)	XLPE cables	IS 7098-Part-II
q)	Industrial light fittings with metal reflectors.	IS 1971-1961
r)	Water tight electric light fittings	IS 3533-1966
s)	Fittings for rigid steel conduits	IS 2667-1964
t)	Rigid steel conduits for electrical wiring	IS 1958-1964
u)	Accessories for rigid steel conduit for electrical Wiring.	IS 3873-1966
v)	Switch socket outlets.	IS 4615-1963
w)	Three pin pug and socket outlets	IS 1233-1967
x)	Switches for domestic and similar purpose	IS 3858-1966
y)	AC electricity meters	IS 722-1977/1980+86

CODE FOR PRACTICE

Earthing	IS 3043-1966
Electrical wiring installations	IS 732-1963
Lighting protection	IS 2309-1

Acceptable Makes for Internal Electrical Installation Works

S.No.	Items	Makes
1	MS Conduit (ISI marked)	BEC/AKG/NIC/Steel craft/ M-Key, SK (E.R.W)
2	PVC Conduit and accessories	Polycab/AKG/Asian
3	PVC/XLPE insulated aluminium/Copper conductor armoured/Unarmoured MV Cable upto 1100 V	Havells/Finolex/KEI/Grandlay/ Gloster
4	FRLS PVC insulated copper conductor stranded flexible wire i/c control cables	Havells/Finolex/KEI/Grandlay/RR Kabel/ Gloster
5	Cable Raceway floor/wall mounted and accessories	Schenider/Legrand/Cooper
6	Modular Switch & Socket	Legrand (Myrus)/M.K. (Element)/Schneider (Zencelo India)/Havells/ ABB
7	Metal clad Industrial Socket	Legrand/Siemens/Schneider/C&S/ABB
8	Cat-6 Cable	Beldon/Siemon/Legrand/Penduit (Pannet)
9	Cable Glands	Dowells/Commet/Gripwell/Raychem
10	Crimp Patch Cord	Beldon/Siemon/Legrand/Penuit (Pannet)
11	Protection Device (MCB/RCCB/DB/ELCB)	Siemens (Betagard),/Hager/Schneider (Acti9)/ Legrand (DX 3)/ C&S / ABB
12	MCCBs	Siemens (3VA)/L&T (MNX)/Schneider(NSX)/ Legrand (DPX 3)/ C&S / ABB
13	Power contactor	Siemens (Sicop),/L&T (MNX) / Schneider (Tesys) / Legrand (CTX 3) / ABB (Ax) / C&S
14	Surge Protection Devices	Siemens/L&T/Schneider (Acti 9) / Legrand
15	Panel Accessories	Siemens /L&T/Schneider / Legrand/Tecnic / ABB/ C&S
16	Selector Switch	Salzer/Seimens /BCH/ Kacee
17	Auxiliary Relays	Siemens/L&T/Schneider/Legrand/ABB
18	LED/Metal Halide/Fluorescent Internal Lighting Fixture	Philips/ Vipro/Havells/Crompton/Decon
19	External Lighting Fixture	Philips/ Wipro/Havells/Crompton
20	Emergency Lighting/ Exit Sign boards	Philips/Havells/Lighting Technologies/Trilux/Prolite
21	Ceiling Fan (ISI marked & BEE rated 5 star)	Havells/Almonard/Orient/Usha/Bajaj
22	Paint	Nerolac/Asian/Berger
23	Advance Lighting Protection System (Early Streamer Emission Type)	LPI (Australia)-by allied power/SGI (Duval Messien/satellite (France)- by SGI/Bradlay (USA)- by JMV/Erico (USA)-by security shoppe/ABB
24	GI Pipe	Tata/Jindal/SAIL
25	IEC 61439 Part-I & II compliance Design verified assembly type Electrical Panels	Schneider (Blokset)/Legrand (XL 3) / Siemens (Sepan)/ L&T (Ti) /ABB (ArTu)/C&S The components used in the panel shall be of the same make which were used for getting the test certificate of IEC 61439, the same shall be provided for which no separate permission is required from the engineer in charge.
26	Non Design verified assembly type Electrical Paels	Tricolite, Delhi /Siemens / Schneider/ Milestone/ Neptune
27	Air Circuit Breaker	Siemens (3 WL-ETU 45B)/ Schneider (Master Pact NW-7.0A)/L&T (U power omega- MTX 3.5)/Legrand(DMX 3 MP4 LSIG)/ C&S/ABB
28	Surge Voltage Protection	Siemens /Schneider/L&T/Legrand/ABB
29	Earth fault module	Siemens/Schneider/L&T/Legrand
30	Protection relays	Siemens/Areva/L&T/Legrand
31	C.Ts and PTs	Kappa/AE/Matrix
32	Digital Meters	Siemens (PAC)/ Schneider/ (conzerv) / Secure Enersol / L&T
33	Change Over Switch	L&T/Havells /Socomec/ABB/C&S
34	Indicating lamps	ESBEE/Schneider/Siemens/Vaishno

35	Power capacitors	Epcos/ Neptune / Legrand /ABB
36	Automatic Power factor correction relay/controller	Epcos/Siemens (PAC) /Schneider (Conzerv)/L&T/Neptune
37	Sealed Maintenance Free Batteries	Exide/Panasonic/Hitachi/Shinkobe
38	Battery charger	Caldyne/Chhabi Electricals/Statcon/Max Power
39	Cable Trays (Factory Fabricated/Overhead & Floor Raceways	Legrand/MEM/OBO
40	HDPE underground cable duct	Rex Polyextrusion/Tirpura/Plasomatics/Duraline
41	Insulation Mats	DL Miller & Co. Ltd.?Premier Polyfilm Ltd./RMG Polyvinyl India Ltd/Jyoti
42	Smoke/Heat detectors	Apollo/ System Sensor/ Agni
43	Manual Call point	PRD/System-Tek/ Simplex/ System Sensor/Agni
44	Response indicators	PRD/System-Tek/ Simplex/ System Sensor/Agni
45	Fire Exit Signs	System-Tek/ Simplex/ Agni
46	Fire Control Panel	System-Tek/ Morley /Agni
47	Speaker / Hooter	System-Tek/ Philips /Agni
48	Occupancy Sensors/ Movement Sensor	Legrand/ Philips/ Wipro
49	Flush type switch /socket	Anchor/ Kinjal/ SSK/ Havells Reo
50	Fuse switches unit / switch fuse unit /HRC fuse	L&T / Siemens/ Havells/ C&S
51	Exhaust fan	Almonard/ Alstom/ Crompton
52	XLPE insulated HT cables	/Gloster KEI/Havells
53	Cable lug	Ascon (Heavy gauge) Jainson Dowells
54	Lamp Holder (Brass)	Kay/SSK/Kinjal
55	Telephone wires/Telephone Cable / jelly filled telephone cables	Finolex /Delton/Havell's /R.R. Kabel
56	Telephone tag blocks	Krone/ Pouyet
57	Telephone outlet	MK Electric /Legrand (Mosaic)/Crabtree (Piccadilly)
59	GI raceways	Milestone Engineering /Legrand/MDS/Neptune Systems Pvt. Ltd./MK
60	PVC raceways	Legrand/ MK
61	Electronic ballast	Philips /Wipro/Bajaj/Decon/Crompton/Havells
62	DLP plastic trunking	Legrand/MK
63	Geysers	Recold /Venus /Usha Lexus /Sphere hot
64	Tower Light	Ligman/Simes/Bega
65	HT/LT transformers	ABB/Schneider /CGL (Crompton Greaves Ltd.)
66	HT SF-6 circuit breakers/VCB	Siemens /ABB/CGL
67	Programmable Logic Controller(PLC)	Siemens/Allen-Bradley/Schneider
68	Earthing (Chemical Earthing) Plate Earthing	JMV/As per CPWD Norms
69	Octagonal Pole	Bajaj/Crompton/Phillips
70	11 kV HT panel I/c relay	CGL/Schneider/ABB
71	Control Relay Panel	CGL/Schneider/ABB
72	Lightning Arrestor	ABB/Alltec/JMV
73	Temp. Gauge	Guru
74	Gate Valve	Leader/Sant
75	Electrical Backup	Spare hot/ Racold
76	PVC Tank	Syntex/ Polycon
77	Thermostat	ISI Marked
78	Flat Collector Plate	Solocrome/ Tata BP/ Racold
79	S.S Sheet	Jindal / National
80	HT/LT cable joints (Straight through/outdoor/indoor)	3M/ Denson/ GSeal
81	Alternator	STAMFORD
82	DG Set	Sterling Generator/ Kirlosker /Caterpillar/Cummins Power / Greaves Cotton

83	Lifts	Johnson/Otis/Omega/Kone

Any other item not covered in the above list shall be ISI marked and as approved by Engineer In Charge.

PART-D

The bill of quantity for Electrical work is uploaded separately containing page no. from 1 to 16 is part of contract agreement.

PART- E

Percentage of Schedule for major & minor components is uploaded separately containing 1(One) page.

Testing Charges

केन्द्रीय लोक निर्माण विभाग

कार्यालय ज्ञापन

No. DG/MAN/410

ISSUED BY AUTHORITY OF DIRECTOR GENERAL, CPWD

NIRMAN BHAWAN, NEW DELHI DATED: 22.10.2021

Subject: Addition of new Para 4.10.2 in CPWD Works Manual 2019 regarding testing charges to be borne by contractor.

It has been noticed that following provisions are sometimes being made in the NITs / Agreements by the NIT approving authorities:

"The cost of test shall be borne by contractor/ department in the manner as below:

i. By the contractor, if the result shows that material does not conform to the relevant codes/ specification.
ii. By the department, if the results show that the material conforms to relevant codes/ specification."

It has been decided by the competent authority that testing charges shall be borne by the contractor in all cases. Accordingly following new para is added in CPWD Works Manual -2019.

Existing Provision	Modified Provision
4.10 Preparation of NIT	**4.10 Preparation of NIT**
4.10.2 No Provision	**4.10.2 Testing charges to be borne by contractor** **Following provision shall be incorporated by the NIT approving authority in the NIT:** **All expenditure to be incurred for testing of samples e.g. packaging, sealing, transportation, loading, unloading etc. including testing charges shall be borne by the contractor. The NIT shall have list of approved laboratories for testing as approved by ADG / SDG.**

This issues with the approval of competent authority.

(वी.पी. साहू) 22/10/2021

अधीक्षण अभियंता(सी.एंड एम.)

Issued from file No. CSQ/CM/16(1)/2021 e-file 9116587

प्रतिलिपि: सभी केलोनिवि तथा लोनिवि दिल्ली के अधिकारियों को आवश्यक सूचना एवं कार्यवाही हेतु (केलोनिवि वेबसाईट के माध्यम से).