

भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान पुणे

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH

(An Autonomous Institution, Ministry of Human Resource Development, Govt. of India)

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NOTICE INVITING e-TENDER (e-Procurement mode)

Indian Institute of Science Education and Research, Pune re-invites online bids (e-tender) percentage rates bids for the following work from reputed contractors found eligible as per minimum eligibility criteria defined in clause 2 & 3 of NIT, for the work mentioned below.

Brief Details of Tender:

Sr. No.	Description of work in Brief	Estimated cost put to bid (Rs.)	Earnest Money (Rs.)	Period of Completion	Pre bid meeting Date & time	Last date & time of submission of bid and uploading the scan copies	Time & date of opening of technical bids
1	2	3	4	5	6	7	8
1.	Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune NIT NO : 25/IISER/PUNE/2017-18	890 lakh	17.80 lakh	10 months	16 6 2017 at 11.00 hrs	27 6 2017 at 15 00 hrs	28 6 2017 at 11 00 hrs

The Tender Document can be downloaded from Central Public Procurement (CPP) Portal <https://eprocure.gov.in/eprocure/app> or Institute website www.iiserpune.ac.in and bid is to be submitted **online only** through the E-procurement portal up to the last date and time of submission

Critical Dates of Tender

Sr.No	Particulars	Date	Time
1	Date of Online Publication/Download of Tender	8 6 2017	15 00 hrs
2	Bid Submission Start Date	21 6 2017	15 00 hrs
3	Pre-Bid Meeting	16 6 2017	11 00 hrs
4	Bid Submission Close Date	27 6 2017	15 00 hrs
6	Opening of Technical Bids	28 6 2017	11 00 hrs

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

Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 0120-4200462, 0120-4001002, 91-8826246593.

Information & Instructions for Online Bid Submission:

This tender document has been published on the Central Public Procurement Portal ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)) & Institute website www.iiserpune.ac.in . The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

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

- 1.1 The intending bidder must read the terms and condition of NIT carefully. Bidder should submit his bid only if he considers himself eligible and he is in possession of all the required documents.
- 1.2 Bid documents should be submitted online complete in all respect along with requisite amount of Bid security/EMD and tender fee (cost of bid documents) . Complete set of tender documents comprising Volume I, II, III. & IV has been made available at e-tender portal ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app))
- 1.3 The bidder would be required to register at e-tender portal ([URL:http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app) For submission of the bids, the bidder is required to have digital Signature Certificate (DSC) from one of the authorized Certifying Authorities.
- 1.4 Information and instruction for bidders posted on website shall form part of the bid document.
- 1.5 The bid document consisting of Vol-I – Technical bid, Vol-II- Special conditions of the contract, Vol-III- Technical Specifications & Vol-IV -Financial bid (BOQ) and the set of terms and conditions of the contract to be complied with and other necessary documents can be seen and downloaded from website ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)) free of cost.
- 1.6 But the bid can only be submitted after uploading the mandatory scanned documents such as Online EMD & tender fee transaction receipt, Bank Guarantee of any Scheduled bank towards part of EMD (if applicable) in favour of Director, IISER Pune, as specified in the press notice.
- 1.7 Those contractors not registered on the website mentioned above, are required to get registered beforehand. If needed they can be imparted training on online tendering process as per details available on the website. The intending bidder must have valid class-III digital signature to submit the bid.
- 1.8 On opening date, the contractor can login and see the bid opening process. After opening of bids he will receive the competitor bid sheets.
- 1.9 Contractor can upload documents in the form of JPG format and PDF format.
2. Certificate of Financial Turn Over: At the time of submission of bid contractor may upload Affidavit/ Certificate from CA mentioning Financial Turnover of last 3 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. There is no need to upload entire voluminous balance sheet.
- 2.1 In item rate tender, contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in blue colour and after entering the rate, it remains sky blue only. In addition to this, while selecting any of the cells a warning appears that if any cell is left blank the same shall be treated as "0". Therefore, if any cell is left blank and no rate is quoted by the bidder, rate of such item shall be treated as "0" (Zero).

However, if a tenderer quotes nil rates against each item in item rate tender or does not

quote any percentage above/below on the total amount of the tender or any section /sub head in percentage rate tender, the tender shall be treated as invalid and will not be considered as lowest tenderer.

In case of percentage rate tender, contractor has to quote % above or below the total estimated cost put to tender and in case bidder quote item wise rate in the BOQ then tender shall be rejected.

- 2.2 The tender document can be downloaded from <http://eprocure.gov.in/eprocure/app> and be submitted only through the same website.

3. REGISTRATION of Bidder on e-Procurement Portal

- 3.1 Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal ([URL:http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app)) by clicking on the link “Click here to Enroll”. Enrolment on the CPP Portal is free of charge.
- 3.2 As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- 3.3 Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- 3.4 Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.), with their profile.
- 3.5 Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse.
- 3.6 Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken.
- 3.7 The CPP Portal also has user manual with detailed guidelines on enrollment and participation in the online bidding process. Any queries related to process of online bids or queries related to CPP Portal may be directed to the 24x7 CPP Portal Helpdesk.
- 3.8 The Institute will not be responsible for any type of technical issue regarding uploading of tender on website. [URL:http://eprocure.gov.in/eprocure/app](http://eprocure.gov.in/eprocure/app)) and any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is **0120-4200462, 0120-4001002, 91-8826246593**.

4. SEARCHING FOR TENDER DOCUMENTS

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

4. PREPARATION OF BIDS

- 4.1 Bidder should take into account any corrigendum published on the tender document before submitting their bids.

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

5. SUBMISSION OF BIDS

- 5.1 Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- 5.2 The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 5.3 A standard BoQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
- 5.4 The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
- 5.5 The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 5.6 Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
- 5.7 Kindly add scanned PDF or JPG format files of all relevant documents in a single PDF file of compliance sheet.

6. ASSISTANCE TO BIDDERS

- 6.1 Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
- 6.2 Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is **0120-4200462, 0120-4001002, 91-8826246593**.



INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH(IISER) PUNE

VOLUME I

TECHNICAL BID

NAME OF WORK: Construction of outreach chemistry lab including internal electrical HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

Bids to be submitted online on : ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app))

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NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

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INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH(IISER) PUNE**SECTION I -NOTICE REINVITING e-TENDERING**

Indian Institute of Science Education and Research, Pune invites online bids (e-tender) percentage rates bids for the following work from reputed contractors found eligible as per minimum eligibility criteria defined in clause 2 & 3 of NIT, for the work mentioned below.

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

Estimated cost put to tender	: Rs 890 Lakh
Period of completion	: 10 months (including monsoon period.)
Cost of tender documents	: Rs. 1000/-
Bid security/ EMD	: Rs. 17.80 Lakh
Dates & time of pre bid meeting	: 16 6 2017 at 11 00 hrs The Director, IISER, Pune Main Building, IISER Pune campus, Dr. Homi Bhabha Road, Pashan, Pune-411 008
Last Dates & time to fill/upload the tender through e-tendering.	: 27/6/2017 up to 15 00 hrs
Time & date of online opening of Technical Bid	: 28/6/2017 at 11 00 hrs at the office of The Director, IISER, Pune Main Building, IISER Pune campus, Dr. Homi Bhabha Road, Pashan, Pune-411 008
Time & date of online opening of Financial bids	: Shall be intimated to technically qualified

2. The applicant should be a well-established and reputed civil engineering / building contractor of long standing experience and capability fulfilling following requirement will be eligible to apply. Work executed for private body will be considered only if contractor/ firm produces tax deduction at source certificate.

Joint Ventures shall not be acceptable.

- a) Should have experience of having successfully completed works during the last seven years ending 31/5/ 2017 (i) Three similar works each costing not less than Rs. **350 lakh** or completed two similar works each costing not less than **Rs 530 lakh** or completed one similar work costing not less than **Rs 710 Lakh**

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

Similar work means: Construction of RCC framed building structures, residential or non-residential buildings including Pre Engineered Buildings. Documentary evidence is required to be produced.

This should be certified by an officer not below the rank of Executive Engineer in Govt. Departments and Superintending Engineer/ Chief Project manager or Equivalent in other organizations.

- b) Should have had average financial turnover of at least **Rs 350 lakhs** on construction works during the immediate last three consecutive financial years ending 31st March, 2017. No enhancement in the value of turnover for the past years shall be made for bringing them to current turnover level.
- c) Should not have incurred any loss during the immediate last two consecutive financial years ending 31st March, 2017.
- d) Should have solvency of **Rs. 300 lakh** certified by a Scheduled Bank and obtained not earlier than three months before the date of submission of Bid.

3. CONTRACT ELIGIBILITY CRITERIA

Further, the contract eligibility includes the following:

- 3.1 Experience on similar type of completed works executed during the **last seven years**; and details like monetary value, clients, proof of satisfactory completion.

Similar work means: Construction of RCC framed building structures, residential or non-residential buildings including Pre Engineered Buildings. Documentary evidence is required to be produced.

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

- 3.2 Enlistment/Registration, if any, with specified departments (CPWD, State PWDs, MES, Railways)/ Organizations, class / type of registration or previous pre- qualification(s) for similar projects.
- 3.3 Documentary evidence of adequate financial standing, Certified by Bankers, Audited Profit & Loss A/c and Balance Sheet, Annual turnover in **last five years**, access to

- adequate working capital.
- 3.4 Information regarding projects in hand, current orders, regarding litigation, exclusion/expulsion or black listing, if any.
- 3.5 Details of establishment.
- 3.6 Bidder shall have service tax registration/VAT registration/ Sales Tax registration/ EPF registration.
- 3.7 Bidders not meeting the minimum eligibility criteria shall be summarily rejected.
- 3.8 Copy of the certificates of work experience and other required documents as specified in the bid documents shall be scanned and uploaded to the e-tendering website within period of bid submission. However, certified copy of all the scanned and uploaded documents as specified in the NIT shall be submitted by the lowest bidder only within a week physically in the office of the tender opening authority.
- 4 The time allowed for carrying out the work will be **10 months** including monsoon from the date of start as defined in **schedule 'C'** or from the first date of handing over of the site, whichever is later, in accordance with the phasing, if any, indicated in the tender
- 5 The bid document is Two stage two Envelope e-tendering system can be seen from the Central Public Procurement Portal ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)) & Institute website www.iiserpune.ac.in The contents of Envelope I & Envelope II are specified in the NIT.
- 6 **Submission of Bid Documents**
Information and instruction for bidder for e-tendering forming part of bid document and posted on website [URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)
Last date and time of submission of bid, original EMD and deposition of original EMD and list of documents as detailed below at IISER Pune and uploading the scan copies of the below mentioned documents:
- List of Document to be scanned and uploaded within the period of bid submission and hard copy to be submitted to IISER Pune:**
- I. Net banking receipt towards EMD & tender fee
 - II. Enlistment Order of the Contractor if any
 - III. All Eligibility documents as per Annexure-I
 - IV. Certificate of Registration for Sales tax/VAT/PAN/TAN/ESIC/PF and acknowledgement of up to date filed return.
 - V. Tender documents & financial bid
- 7 Tender documents should be submitted online complete in all respect along with requisite amount of Bid security/EMD and tender fee. After submission of bid the contractor can re-submit revised bid any number of times but before last time and date of submission of bid as notified.
While submitting revised bid, contractor can revise the rate of any one or more item(s) any number of times (bidder need not reenter rate of all the items) but before last time

- and date of submission of bid as notified.
- 8 Director, Indian Institute of Science Education & Research, Pune shall be the "Accepting Authority" hereinafter referred to as such for the purpose of this Contract.
- 9 Bids must be accompanied by bid-security/EMD (Earnest Money Deposit) amount. specified for the work in clause 10 payable at Pune and drawn in favour of The Director; IISER Pune Bid Security shall have to be valid for 45 days beyond the validity of the bid.
- 10 **Bid Security/EMD and tender fee:**
- 10.1 Bid security/EMD amounting to **Rs. 17.80 lakh and Tender fee of Rs. 1000/-** shall be deposited online in IISER Pune Bank Account before the date and time fixed for opening of bid failing which the bid will be declared non responsive.
- a) Bidder to deposit full Bid security and tender fee before the time and date of submission of the Bid in IISER Pune Bank account as detailed below:
Name-IISER Pune
Bank-State Bank of India
Branch-NCL Campus Branch, Pune 411008
Current A/c No. 30042605732
IFSC-SBIN0003552
Scan copy of the receipt of online transaction is required to be uploaded on Website on or before the date and time of bid submission.
- 10.2 Bid Security/EMD of unsuccessful Bidders will be returned to them within 45 days from the date of acceptance of bid of the successful Bidder.
- 10.3 The Bid Security may be forfeited, if
- a) The Bidder withdraws / modifies his Bid or any item thereof after opening of bid.
- b) The successful Bidder fails within the specified time limit to commence the work.
- 11 Bid shall be opened on the day fixed for opening of bids at 11.00 hours, in the presence of the Bidders who wish to attend. If the office happens to be closed on the date of receipt of the bids as specified, the bids will be received and opened on the next working day at the same time and venue.
- 12 Bidders attention is also drawn to instruction of filling and submission of tender Attached herewith. You may forward your queries on tender documents and /or depute your technical representative for discussion on tender /drawings to clarify doubts, if any, at least two days before the date of submission mentioned in the website.
- 12.1 The Bidder may submit their questions/ queries/ clarifications if any, in writing or by email/ fax to reach the IISER Pune on or before **16 6 2017 before 11 00 hrs**. Bidders can send queries on their letter head referring tender number by Speed post on above said address so as to reach IISER Pune or on fax No 020-20251566 or on e-mail address

ysrajput@iiserpune.ac.in up to **16 6 2017 before 11 00 hrs.**

13 Pre-bid meeting

- 13.1 The Bidder or his officially authorized representative is invited to attend a pre-bid meeting, which will take place as per date & time specified in the NIT. Bidder/ bidder representative who wish to attend Pre-bid meeting should carry a valid identity proof certifying his designation with said firm.
- 13.2 The purpose of the meeting is to clarify issues and to answer questions on matters that may be raised at that stage.
- 13.3 The Bidder is requested to submit their questions/ queries/ clarifications in writing or by email/ fax to reach the IISER Pune before the meeting. Bidders can send Pre-bid queries on their letter head referring tender number by Speed post on above said address so as to reach IISER Pune or on Fax: +91-020-20251566 or on e-mail address ysrajput@iiserpune.ac.in before up to 11 00 Hours.
- 13.4 Minutes of the meeting (MOM), including the text of the questions raised (without identifying the source of enquiry) and the responses given will be uploaded as corrigendum on website ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)) and www.iiserpune.ac.in
- 13.5 If any amendment in the tender document uploaded on the website is necessitated due to any query raised by any bidder including the text of the questions raised (without identifying the source of enquiry) and the responses given will be uploaded as corrigendum on websites ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app)) and www.iiserpune.ac.in Bidders are requested to take note of the corrigendum and quote their rates accordingly.
- 13.6 In case revised BOQ is uploaded on website by IISER, tenderer /bidder has to quote in revised BOQ only. The uploading quotation in pre-revised BOQ shall be considered as a wilful negligence by the bidder and his quotation shall be considered as non-responsive.

14 Cost of Bidding

- 14.1 The Bidder shall bear all costs associated with the preparation and submission of his Bid, and the IISER, Pune will in no case be responsible and liable for these costs.

15 Site visit & availability of site

- 15.1 The Bidder should inform the IISER in advance about the proposed site visit.
- 15.2 The Bidder, at his own responsibility and risk is encouraged to visit, inspect and survey the Site and its surroundings and satisfy himself before submitting his bid as to the form and nature of the Site, the means of access to the Site, the accommodation he may require, etc.
- 15.3 In general, Bidders shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. A Bidder

shall be deemed to have full knowledge of the Site, whether he inspects it or not and no extra claims due to any misunderstanding or otherwise shall be allowed.

- 15.4 The costs of visiting the Site shall be at the Bidders' own expense. Any report shared at the site, by the IISER is subject to verification by the contractor. Any deviations of information in the report and the actual site will not be the responsibility of the IISER.
- 15.5 The site for the work is available.
- 15.6 The architectural and structural drawings shall be made available in phased manner as per requirement of the same as per approved program of completion submitted by the contractor after award of the work.

16 Content of Bidding Documents

- 16.1 Submission of a bid by a Bidder implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be executed and local conditions and other factors having a bearing on the execution of the works.
- 16.2 The Bidder shall submit the Bid, which satisfies each and every condition laid down in the bid documents, failing which, the bid is liable to be rejected.
- 16.3 Notice Inviting e-Tender shall form part of the Contract document.

- 16.3.1 The documents listed below comprises one set of bid document that are uploaded on website as

Envelope-I:

Technical Bid document- Volume I

- a) Notice Inviting e-Tender (Including eligibility criteria)
- b) Tender Form and General Rules and Directions for the Guidance of the Contractor
- c) General Conditions of Contract
- d) Special Conditions of Contract
- e) Safety Code for Contract Work
- f) Format of BGs
- g) Schedule C

Volume II- Special Conditions

Volume-III : Technical specifications & Architectural Drawings

Envelope- II

Volume –II:

Financial bid - Schedule of quantity (BOQ).

17 Amendment of Bid Documents

- 17.1 Before the deadline for submission of bids, the IISER Pune may modify the bidding documents by issuing corrigendum.
- 17.2 Any corrigendum so issued shall be part of the bid documents as well as Contract document and shall be on uploaded website [URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app) and www.iiserpune.ac.in Bidders should take note of the uploaded corrigendum and submit the tenders accordingly.

18 Bid Validity

- 18.1 The bid submitted shall become invalid if:
- (i) The bidders is found ineligible.
 - (ii) The bidder does not deposit EMD & Tender fee as per clause 10 of the NIT.
 - (iii) The bidders does not upload all the required documents (including service tax registration/ VAT registration/ Sales Tax registration) as stipulated in the bid document including the copy of EMD.
 - (iv) If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted physically by the lowest tenderer in the office of tender opening authority.
- 18.2 The bids submitted shall remain valid for acceptance for a period of 45 days from the date of opening of the technical bids. If any bidder withdraws his tender before the said period or issue of letter of acceptance, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the IISER, Pune, then the IISER, Pune shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money as aforesaid. Further the bidder shall not be allowed to participate in the re-tendering process of the work.

19 Bid Opening

- 19.1 Online bid documents submitted by intending bidders shall be opened only of those bidders, whose have uploaded scanned copy of EMD & Tender fee transaction receipt BG as a part of EMD form i/c tender documents scanned and uploaded are found in order.

PART I

- 19.2 On the due date and appointed time as specified in the NIT, IISER, Pune will first open Envelope –I , Technical bid of bids of the bidders satisfying conditions of 19.1, in the presence of the Bidders or their representatives who choose to attend. In the event of the specified date for Bid opening being declared a holiday by the IISER, Pune, and the Bids will be opened at the appointed time and location on the next working day.
- 19.2 If all Bidders have submitted unconditional Bids together with requisite Bid security then all Bidders will be so informed then and there. If any Bid does not contain Bid security in the manner prescribed in the Bid documents, then that Bid shall not be opened and bids shall stand rejected.

20 Technical Evaluation of the bids

- 20.1** The bidder qualifying initial criteria as set out in Para 2 & 3 and the details furnished by bidders in the Proforma enclosed as Annexure-1 of Section II will be evaluated by the IISER Pune technical evaluation committee appointed by the competent authority.

Performa's listed are elaborated below,

- I) Initial bidding capacity Proforma "A"
- II) Financial Information Proforma "B"
- a) Solvency certificates from a scheduled bank - Form I
- b) Details of all works of similar nature completed during the last 7 years ending last day of the 31/5/2017 Proforma "C"
- c) Project under execution or Awarded Proforma "C1"
- d) Performance report of works referred to in Proforma 'C' & 'C1' – Form II
- e) Personnel & establishment Performa D & D1
- f) ISO certification on works if any Form III
- g) Confidential report to be obtained by the IISER from the client on the work executed by the contractor during last five year certification if required.
- m) The bidders qualifying the initial eligibility criteria as set out in clause no 2 & 3 above will be evaluated based on the information submitted by bidders as per clause no 20.1 after due verification and selection will be made by IISER, PUNE on the basis of the strength of individual applicants. Main consideration will be the ability of the Principal Contractor to fulfill technical, financial, contractual and legal obligations. Special emphasis will be laid on competence to do good quality works within specified time schedule and in close co-ordination with other agencies over and above the rate structure of the items.
- n) IISER Pune reserves the right to waive off minor deviations in the eligibility, if the technical evaluation committee consider that they do not materially affect the capability of the bidder to perform the contract. IISER Pune decision in this regard shall be final and binding & conclusive.

20.2 TECHNICAL EVALUATION CRITERIA:

The bidders qualifying the initial eligibility criteria, as set out in Para 2 & 3) above, will be evaluated for following criteria by scoring method on the basis of details furnished by them and inspection by the technical committee.

- | | | |
|-----|---|------------------|
| (a) | Financial strength (Form "A" & B) | Maximum 20 Marks |
| (b) | Experience in similar nature of work during last seven years (Form "C") | Maximum 20 Marks |
| (c) | Performance on work (Form "E") -Time over run | Maximum 20 Marks |

(d) Performance on work (Form "E") – Quality

Maximum 40 Marks

.....

Gross Marks Total**100 Marks**

.....

	Attributes	Evaluation	
(a)	Financial strength (20 Marks) (i) Average annual turnover 16 marks (ii) Solvency certificate 4 marks	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more In between (i) & (ii)- on pro-rata basis	
(b)	Experience in similar (20 marks) Class of work	(i) 60% marks for minimum eligibility criteria (ii) 100% marks for twice the minimum eligibility criteria or more In between (i) & (ii)- on pro-rata basis	
(c)	Performance on works (20 marks) (time over run)		
	Parameter calculation for points	Score	Maximum Marks
	If TOR =	1.00 1.25 2.00 >3.50	20
	(i) without levy of compensation	20 15 10 0	
	(ii) with levy of compensation	20 5 0 0	
	(iii) Levy of compensation not decided	20 12 10 0	
TOR = AT/ST, where AT = Actual Time; ST = Stipulated Time. Note: Marks for value in between the stages indicated above is to be determined by straight line variation basis.			
(d)	Performance of Works (Quality)	Maximum (40 marks)	

Score:	
(i) Outstanding	40
(ii) Very Good	30
(iii) Good	20
(iv) Poor	0

To become eligible for short listing the bidder must secure at least Fifty percent marks in each attribute and Sixty percent marks in aggregate. The IISER Pune, however, reserves the right to restrict the list of short listed agencies out of technically qualified agencies to any number deemed suitable by it.

Note: The average value of works for time overrun & quality shall be taken on the basis of performance report of the eligible similar works.

PART II

21 Opening of Financial /Price bid

- 21.1 After technical evaluation of (part I) bids as per clause 2, 3 & 20 above only technically qualified bidders will be informed about the date & venue of opening of priced bid. Priced bid will be opened in the presence of representatives of intending bidders on the said date.

22. Clarification of Bids

- 22.1 To assist in the examination and comparison of Bids, the IISER, Pune may, at its discretion, ask any Bidder for clarification of his Bid, including breakdown of unit rates. The request for clarification and the response shall be in writing or by email / fax, but no change in the price or substance of the Bid shall be sought, offered, or permitted except as required to confirm the correction of arithmetic errors discovered by the IISER, Pune in the evaluation of the bids
- 22.2 No, Bidder shall contact the IISER, Pune on any matter relating to his bid from the time of the bid opening to the time the contract is awarded.
- 22.3 Any effort by the Bidder to influence the IISER's bid evaluation, bid comparison or contract award decisions, may result in the rejection of his bid.
23. Indian Institute of Science Education and Research Pune, does not bind itself to accept the lowest or any other bid, and reserves the right to reject any or all of the tenders received without assigning any reasons. Bids in which any of the prescribed conditions are not fulfilled or any conditions including that of the conditional rebate put forth by the bidder shall be summarily rejected.

- 24 If the Bid of the successful Bidder is seriously unbalanced in relation to the Engineer-in-charge or his representative's estimate of the cost of work to be executed under the contract, the IISER, Pune may require the Bidder to produce detailed rate analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those rates with the implementation/construction methods and schedule proposed.
- 25 **Award Criteria**
- 25.1. The IISER, Pune shall award the contract to the Bidder whose evaluated offer / bid has been determined to be the technically suitable and financially lowest and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to execute the contract satisfactorily. The Board of Governors of IISER reserves the right to accept or reject any application and to annul the pre-qualification process and reject all applications at any time, without thereby incurring any liability to the affected applicants or specifying the grounds for the Employer's action
- 26 The contractor whose tender is accepted will be required to furnish Performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in Schedule C. This guarantee shall be in accordance with the prescribed form. In case the contractor fails to deposit the said performance guarantee within the period as indicated in Schedule 'C'. including the extended period if any, the Earnest Money deposited by the contractor shall be forfeited automatically without any notice to the contractor and without prejudice to any other right or remedy. The Earnest Money deposited along with tender shall be returned after receiving the aforesaid performance guarantee.
- 27 **Disclosures**
- Any change in the constitution of the contractor's firm, where it is a partnership firm, as declared in the prequalification documents submitted by the bidders at the time of submission of pre-qualification documents, should be disclosed to the IISER, Pune, at any time between the submission of bids and the signing of the contract.

Superintending Engineer

For & on behalf of the Director, IISER, Pune.

SECTION I**II) ADDITIONAL INFORMATION AND INSTRUCTION TO APPLICANTS****1.0. GENERAL****1.1 STATEMENT OF OBJECTIVES AND BRIEF PARTICULARS OF THE WORK**

The IISER Pune, proposes to construct a Campus building on its land measuring about 3,96,704 Sqm (98.0 Acres) located in a prime location of the Pune city, Maharashtra State.

The proposed work consists of RCC framed construction G+2 structure including electrical, firefighting, BMS and HVAC works as per architectural drawings.

IISER Pune is operational campus and work need to be taken up in a well planned manner as per the milestones specified in the Schedule C and site shall be made available for work in proportion to the resources deployed by the agency and after completion of one segment work on other segment can be taken up.

- ❖ All drawings (Architectural / Structural / Services) for the work are shall be made available by IISER Pune.
- ❖ Work shall be executed according to Conditions of Contract, Specifications, BOQ item and Drawings . Bidder should quote his rates taking into account all the site constrains.

1.2 Letter of transmittal and other forms for pre-qualification are attached (Annexure I)

1.3. All information called for in the enclosed forms should be furnished against the respective columns in the forms. If information is furnished in a separate document, reference to the same should be given against respective columns. Such separate documents shall be chronologically placed at the end of the prescribed application. If information is 'nil' it should also be mentioned as 'nil' or 'no such case'. If, any particulars/query is not applicable in case of the applicant, it should be stated as 'not applicable'. However, the applicants are cautioned that not giving complete information called for in the application forms required, not giving it in clear terms or making change in the prescribed forms or deliberately suppressing the information may result in the applicant being summarily disqualified. Applications made by Fax and those received late will not be entertained.

1.4. References, information and certificates from the respective clients certifying suitability, technical know-how or capability of the applicant should be signed by an officer not below the rank of Superintending Engineer/Chief Project Manager or equivalent.

1.5 The Tenderer is advised to attach any additional information which he thinks is necessary in regard to his capabilities to establish that the applicant is capable in all respects to successfully complete the envisaged work. He is however, advised not to attach superfluous information. No further information will be entertained after pre-qualification document is submitted, unless it is called for by Employer.

1.6 LETTER OF TRANSMITTAL

The applicant should submit the letter of transmittal attached with tender document duly signed by the agency.

- 1.8 INTEGRITY AGREEMENT duly signed by the agency along with letter is required to be submitted by the agency.

LETTER OF TRANSMITTAL

From

To

**THE DIRECTOR,
INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH (IISER)**
IISER Pune campus, Main Building,
Dr. HOMI BHABHA ROAD, PUNE – 411 008

Sub: SUBMISSION OF TENDER DOCUMENTS FOR THE WORK OF

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

Sir,

Having examined the details given in press notification and the tender document for the above work, I/we hereby submit the tender documents and other relevant information. I/we agree with all the terms and conditions given in the bid document.

1. I/We hereby certify that all the statements made and information supplied in the enclosed forms and accompanying statements are true and correct.
2. I/We have furnished all information and details necessary for eligibility criteria and have no further pertinent information to supply.
3. I/We submit the requisite certified solvency certificate and authorize the Director, IISER, Pune – 411 008 to approach the Bank issuing the solvency certificate to confirm the correctness thereof. I/We also authorize Superintending Engineer, Pune 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 know-how & capability for having successfully completed the following works

Name of Work:

Certificate from

- 1.
- 2.
- 3.

- 1.
- 2.
- 3.

Enclosures:

Seal of applicant
Date of submission

Signature(s) of applicant(s)

To,

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

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

Dear Sir,

It is here by declared that IISER is committed to follow the principle of transparency, equity and competitiveness in public procurement.

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

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

Yours faithfully

Sd/-

Registrar

Forwarding letter for Integrity Agreement

To,

**The Registrar,
Indian Institute of Science Education and Research
Pune.**

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

Dear Sir,

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

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

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

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

Yours faithfully

(Duly authorized signatory of the Bidder)

To be signed by the bidder and the signatory competent / authorised to sign the relevant contract on behalf of IISER

INTEGRITY AGREEMENT

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

BETWEEN

IISER represented through its Registrar, (Hereinafter referred as the '**Principal/Owner**', which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

AND

.....
(Name and Address of the Individual/firm/Company)

through (Hereinafter referred to as the (Details of duly authorized signatory)

"Bidder/Contractor" and which expression shall unless repugnant to the meaning or context hereof include its successors and permitted assigns)

Preamble

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

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

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

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

Article 1: Commitment of the Principal/Owner

- 1) The Principal/Owner commits itself to take all measures necessary to prevent corruption and to observe the following principles:

- (a) No employee of the Principal/Owner, personally or through any of his/her family members, will in connection with the Tender, or the execution of the Contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - (b) The Principal/Owner will, during the Tender process, treat all Bidder(s) with equity and reason. The Principal/Owner will, in particular, before and during the Tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the Tender process or the Contract execution.
 - (c) The Principal/Owner shall endeavor to exclude from the Tender process any person, whose conduct in the past has been of biased nature.
- 2) If the Principal/Owner obtains information on the conduct of any of its employees which is a criminal offence under the Indian Penal code (IPC)/Prevention of Corruption Act, 1988 (PC Act) or is in violation of the principles herein mentioned or if there be a substantive suspicion in this regard, the Principal/Owner will inform the Chief Vigilance Officer and in addition can also initiate disciplinary actions as per its internal laid down policies and procedures.

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

- 1) It is required that each Bidder/Contractor (including their respective officers, employees and agents) adhere to the highest ethical standards, and report to the Government / Department all suspected acts of **fraud or corruption or Coercion or Collusion** of which it has knowledge or becomes aware, during the tendering process and throughout the negotiation or award of a contract.
- 2) The Bidder(s)/Contractor(s) commits himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the Tender process and during the Contract execution:
- a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal/Owner's employees involved in the Tender process or execution of the Contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the Tender process or during the execution of the Contract.
 - b) The Bidder(s)/Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to cartelize in the bidding process.
 - c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act. Further the Bidder(s)/Contractor(s) will not use improperly, (for the purpose of competition or personal gain), or pass on to others, any information

or documents provided by the Principal/Owner as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

- d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the names and addresses of agents/representatives in India, if any. Similarly, Bidder(s)/Contractor(s) of Indian Nationality shall disclose names and addresses of foreign agents/representatives, if any. Either the Indian agent on behalf of the foreign principal or the foreign principal directly could bid in a tender but not both. Further, in cases where an agent participates in a tender on behalf of one manufacturer, he shall not be allowed to quote on behalf of another manufacturer along with the first manufacturer in a subsequent/parallel tender for the same item.
 - e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the Contract.
- 3) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
 - 4) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm indulge in fraudulent practice **means a willful misrepresentation or omission of facts or submission of fake/forged documents in order to induce public official to act in reliance thereof, with the purpose of obtaining unjust advantage by or causing damage to justified interest of others and/or to influence the procurement process to the detriment of the Government interests.**
 - 5) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm use Coercive Practices (means the act of obtaining something, compelling an action or influencing a decision through intimidation, threat or the use of force directly or indirectly, where potential or actual injury may befall upon a person, his/ her reputation or property to influence their participation in the tendering process).

Article 3: Consequences of Breach

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

- 1) If the Bidder(s)/Contractor(s), either before award or during execution of Contract has committed a transgression through a violation of Article 2 above or in any other form, such as to put his reliability or credibility in question, the Principal/Owner after giving 14 days notice to the contractor shall have powers to disqualify the Bidder(s)/Contractor(s) from the Tender process or terminate/determine the Contract, if already executed or exclude the Bidder/Contractor from future contract award processes. The imposition and duration of the exclusion will be determined by the severity of transgression and

determined by the Principal/Owner. **Such exclusion may be forever or for a limited period as decided by the Principal/Owner.**

- 2) **Forfeiture of EMD/Performance Guarantee/Security Deposit:** If the Principal/Owner has disqualified the Bidder(s) from the Tender process prior to the award of the Contract or terminated/determined the Contract or has accrued the right to terminate/determine the Contract according to Article 3(1), the Principal/Owner apart from exercising any legal rights that may have accrued to the Principal/Owner, may in its considered opinion forfeit the entire amount of Earnest Money Deposit, Performance Guarantee and Security Deposit of the Bidder/Contractor.
- 3) **Criminal Liability:** If the Principal/Owner obtains knowledge of conduct of a Bidder or Contractor, or of an employee or a representative or an associate of a Bidder or Contractor which constitutes corruption within the meaning of IPC Act, or if the Principal/Owner has substantive suspicion in this regard, the Principal/Owner will inform the same to law enforcing agencies for further investigation.
- 4) **Article 4: Previous Transgression**
 - 1) The Bidder declares that no previous transgressions occurred in the last 5 years with any other Company in any country confirming to the anticorruption approach or with Central Government or State Government or any other Central/State Public Sector Enterprises in India that could justify his exclusion from the Tender process.
 - 2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the Tender process or action can be taken for banning of business dealings/ holiday listing of the Bidder/Contractor as deemed fit by the Principal/ Owner.
 - 3) If the Bidder/Contractor can prove that he has resorted / recouped the damage caused by him and has installed a suitable corruption prevention system, the Principal/Owner may, at its own discretion, revoke the exclusion prematurely.

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

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

Article 6- Duration of the Pact

This Pact begins when both the parties have legally signed it. It expires for the Contractor/Vendor 12 months after the completion of work under the contract or till the continuation of defect liability period, whichever is more and for all other bidders, till the Contract has been awarded.

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

Article 7- Other Provisions

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

Article 8- LEGAL AND PRIOR RIGHTS

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

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

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

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

WITNESSES:

1.
(signature, name and address)

2.
(signature, name and address)

Place:

Dated :

ANNEXURE 1

PROFORMA 'A'

INFORMATION REGARDING INITIAL BIDDING CAPACITY

The information to be filled in by the Bidder in the following pages will be used for purposes of Pre-qualification as provided above.

1. For Individual Bidders

1.1 Constitution or legal status of Bidder (Attach Copy)

Place of registration:

Principal place of business:

(Power of attorney of signatory of Bid)

1.2 Value of work Completed during the last five years (in Rs. Lacs)

<i>Particular</i>	<i>Year</i>	<i>Value</i>
Total value of Work Executed in the last five years**	2012-13	
	2013-14	
	2014-15	
	2015-16	
	2016-17	

** Immediately preceding the financial year in which bids are received. Attach certificate from Chartered accountant.

1.3 (works for which bids have been submitted and works which are yet to be completed) as on the date of this bid calculated as per **clause 3.8**(A) Existing commitments and on-going works: (format for **clause 3.7**)

<i>Description of work</i>	<i>Place & state</i>	<i>Contract No. & Date</i>	<i>Name & Address of Client</i>	<i>Value of Contract (Rs. Lacs)</i>	<i>Stipulated period of completion</i>	<i>Value of work remaining to be completed</i>	<i>Anticipated date of completion (Rs.)</i>	<i>Remarks Information regarding the litigation if any</i>

(B) Works for which bids already submitted (format for **clause 3.7**)

<i>Description of work</i>	<i>Place & State</i>	<i>Name and Address of Client</i>	<i>Value of contract Rs in Lakhs</i>	<i>Stipulated period of completion</i>	<i>Date when decision is expected</i>	<i>Remarks if any</i>

PROFORMA 'B'**FINANCIAL INFORMATION**

- I. 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.)

Years

Year	2012-13	2013-14	2014-15	2015-16	2016-17
Gross annual turn over					
Profit/ Loss					

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

- III. Solvency Certificate from Bankers of the bidder in the prescribed Form "I".

Signature of Chartered Accountant with Seal Signature of Bidder(s)

Form I

FORM OF BANKERS' CERTIFICATE FROM A SCHEDULED BANK

This is to certify that to the best of our knowledge and information that;

(Name of the individual or the firm)

(Name of the proprietor in case of a sole proprietorship concern or names of partners in case of partnership concern as per bank's record, be indicated)

(Address of the customer as per bank record)

is a / are customer(s) of our bank, is/are respectable and can be treated as good for any engagement up to a limit of Rs. _____
(Rupees _____ only)

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

Signature of the Manager

Seal of Bank

Note : This certificate should be issued on the letter head and addressed to the DIRECTOR , Main Building, Dr. HOMI BHABHA ROAD, IISER, PUNE – 411 008 in a Sealed Cover

PROFORMA 'C'**DETAILS OF ALL WORKS OF SIMILAR CLASS COMPLETED DURING THE LAST 7 (Seven)
YEARS ENDING LAST DAY OF THE MONTH**

<i>S. No.</i>	<i>Name of work/ project and location</i>	<i>Owner or Sponsori-ng organizat-ion</i>	<i>Cost of work in crores of Rupees</i>	<i>Date of commen- cement As per contract</i>	<i>Stipulat-ed date of comple- tion</i>	<i>Actual date of compl- etion</i>	<i>Litigation/ar- bitration cases pending/in progress with details</i>	<i>Name and address/te- leph-one number of officer to whom referen-ce may be made</i>	<i>Remar-ks</i>
1	2	3	4	5	6	7	8	9	10

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

SIGNATURE OF BIDDER(S)

PROFORMA "C1"

PROJECTS UNDER EXECUTION OR AWARDED

<i>S No</i>	<i>Name of work/ project and location</i>	<i>Owner or Sponsoring organizati on</i>	<i>Cost of work in crores of Rupe-es</i>	<i>Date of commen- cement As per contract</i>	<i>Stipulat-ed date of completion</i>	<i>Actual date of compl- etion</i>	<i>Litigation/a rbitation cases pending /in progress with details</i>	<i>Name and address / telephone number of officer to whom reference may be made</i>	<i>Rema- rks</i>
1	2	3	4	5	6	7	8	9	10

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

SIGNATURE OF BIDDER(S)

Form 'II'

PERFORMANCE REPORT OF WORKS REFERRED TO IN PROFORMA 'C' & 'C1'

1. Name of the work/
Project & Location.
2. Agreement No.
3. Estimated Cost
4. Tendered Cost
5. Date of Start
6. Date of completion
 - (a) Stipulated date of completion.
 - (b) Actual date of completion.
7. Amount of compensation levied for delayed
Completion if any.
8. Amount of reduced rate items, if any
9. Performance report
 - i) Quality of Work : Outstanding/Very Good / Good / Fair / Poor
 - ii) Financial soundness : Outstanding/Very Good / Good / Fair / Poor
 - iii) Technical Proficiency : Outstanding/Very Good / Good / Fair / Poor
 - iv) Resourcefulness : Outstanding/Very Good / Good / Fair / Poor
 - v) General Behaviour : Outstanding/Very Good / Good / Fair / Poor

DATED:**Executive Engineer or Equivalent**

PROFORMA 'D'**STRUCTURE AND ORGANISATION**

1. Name and address of the applicant
2. Telephone No./Telex No./Fax No.
3. Legal Status (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 photo-copy)
 - a) Registration Number.
 - b) Organization / Place of registration
5. Names and Titles of Directors and officers with designation to be concerned with this work.
6. Designation of individuals authorized to act for the organization.
7. Was the bidder ever required to suspend construction for a period of more than six months continuously after you commenced the construction? If so, give the name of the project and reasons of suspension of that.
8. Has the bidder, or any constituent partner in case of partnership firm, ever abandoned the awarded work before its completion? If so, give the name of the project and give reasons for abandonment.
9. Has the bidder or any constituent partner in case of partnership firm, ever been debarred / black listed for tendering in any organization at any time? If so, give details:
10. Has the bidder or any constituent partner in case of partnership firm, ever been convicted by a court of law? If so, give detail.
11. In which field of Civil Engineering Construction, the bidder has specialization and interest ?
- 12 Any other information considered necessary but not included above.

SIGNATURE OF BIDDER(S)

PROFORMA 'D1 '

DETAILS OF TECHNICAL & ADMINISTRATIVE PERSONNEL TO BE EMPLOYED FOR THE WORK

S.N o.	Designation	Stre ngt h	Allotted for this project	Name	Qualification	Professional Experience and details of work carried out	How these would be involved in this work	Remarks
1	2	3	4	5	6	7	8	9

Signature of Bidders

Form 'III'**PROFORMA ON ISO CERTIFICATION, IF ANY**

1. Year of Certification

2. Name and Address of Certifying Agency

3. Name of Management Representative

4. Validity of Certificate

Note : Attested copy of certificate (attested by Government Officer or Notary Public) to be enclosed.

SIGNATURE OF BIDDER

WITH SEAL

CHECK LIST: Details of Enclosures/documents required to be uploaded on website <https://eprocure.gov.in/eprocure/app> through the E-procurement portal up to the last date and time of submission of tender.

Sl.No	Description of item	Uploaded on website	Not uploaded
1.	Pre-Qualification Documents as per Annexure 1 Pro forma A to E & Form I to III (page 24 to 32)		
2.	Power of attorney as required		
3.	Certificate of Registration as required		
4.	Memorandum of Articles of association as required		
5.	C A certificate for Audited Balance Sheet and Profit & Loss statement for the past five financial years		
7.	Supporting certificates for technical and financial capability from relevant authorities.		
8	Organization Chart with responsibilities, Curriculum Vitae of personnel proposed for this project.		
9	INTEGRITY AGREEMENT duly signed by the agency along with letter of Transmittal		
10	Any other important information.		
11	Affidavit for eligible similar works vide NIT clause 2(a) page 3		
12	Scan copies of EMD , TENDER FEE, BG as PART EMD		
13	Letter of transmittal NIT page 16		
14	Uploading of the tender document Vol-I, Vol-II, Vol-III & IV		
15	Any other relevant document required to be uploaded on website as per tender conditions.		

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH – IISER PUNE.

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

SECTION – II

PERCENTAGE RATE TENDER & CONTRACT FOR WORKS

SECTION- II

Tender Form

Percentage Rate Tender & Contract for Works

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

- (a). Tender(s) to be submitted online by (time) **15.00 hours on 20 6 2017**
(URL:<https://eprocure.gov.in/eprocure/app>)
- (b). Tender(s) to be opened in presence of tenderers who may be present at **11 00 hours on 21 6 2017** in the office of the Superintending Engineer , Indian Institute of Science Education and Research ,Pune

TENDER

I/We have read and examined the notice Inviting Tender, Schedule, Specifications applicable, Drawings & Designs, General Rules and Directions, Conditions of Contract, clauses of contract, special conditions, Schedule of Rate & other document 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 Director Of Indian Institute of Science Education and Research Pune (IISER-Pune) within the time specified in Schedule **10 months** viz, schedule of quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to the Conditions of contract and with such materials as are provided for and in respects in accordance with such conditions so far as applicable.

We agree to keep the tender valid for (45) forty five days from the due date of its opening and not to make any modifications in its terms and conditions.

A sum of Rs (figure)------(in words) -----

has been deposited in Deposit at call Receipt of a Schedule bank/demand draft of a scheduled bank/bank guarantee issued by a Schedule Bank as earnest money. If I/we, fail to furnish the prescribed performance guarantee within prescribed period, I/we agree that the said Director Of Indian Institute of Science Education and Research Pune (IISER-Pune) or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely, if I/we fail to commence work as specified, I/we agree that Director Of Indian Institute of Science Education and Research Pune(IISER-PUNE) or his

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.

The said Performance Guarantee shall be a guarantee to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form. Further, I/We agree that in case of forfeiture of Earnest Money or Performance Guarantee as aforesaid, I/We shall be debarred for participation in the re-tendering process of the work.

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

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

Dated

Signature of Contractor

Seal

Postal Address

Witness :

Address:

Occupation:

ACCEPTANCE

The above tender (as modified by you as provided in the letters mentioned hereunder) is accepted by me for and on the Director IISER, Pune for sum of

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

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

(a)

(b)

(c)

For & on behalf of the Director, IISER Pune

Signature.....

Dated.....

Designation.....

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH – IISER PUNE.

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

SECTION – III**GENERAL CONDITIONS OF CONTRACT**

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH PUNE**(i) General Rules & Directions**

1. All work proposed for execution by contract will be notified in a form of invitation to tender prominently displayed in public places and signed by the officer inviting tender or by publication in Newspapers as the case may be.

This form will state the work to be carried out, as well as the date for submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited with the application, and the amount of the security deposit and performance guarantee to be deposited by successful tenderer and the percentage, if any, to be deducted from bills. Copies of specification, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the officer inviting tender shall also be open for inspection by the contractor at the office of officer inviting tender during office hours.

2. In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act 1952.
3. Receipts for payment made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.
4. Applicable for Item Rate Tender only
Any person who submits a tender shall fill up the usual printed form, stating at what rate he is willing to undertake each item of the work. Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort, including conditional rebates will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes. (Applicable for Item Rate Tender only)

The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paise and considering more than fifty paise as rupee one.

In case the lowest tendered amount (worked out on the basis of quoted rate of Individual items) of two or more contractors is same, the such lowest contractors may be asked to submit sealed revised offer quoting rate of each item of the schedule of quantity for all sub sections/sub heads as the case may be, but the revised quoted rate of each item of schedule of quantity for all sub sections/sub heads should not be higher than their respective origin original rate quoted already at the time of submission of tender. The lowest tender shall be decided on the basis of revised offer.

If the revised retendered amount (worked out on the basis of quote rate of individual items) of two or more contractors received in revised offer is again found to be equal, then the lowest tenderer, among such contractors, shall be decided by draw of lots in the presence of Registrar IISER Pune, Engineer in charge lowest contractors those have quoted equal amount of their tenders.

In case of any such lowest contractor in his revised offer quotes rate of any item more than their respective original rate quoted already at the time of submission of tender, then such revised offer shall be treated invalid. Such case of revised offer of the lowest contractor or case of refusal to submit revised offer by the lowest contractor shall be treated as withdrawal of his tender before acceptance and 50% of his earnest money shall be forfeited.

In case all the lowest contractors those have same tendered amount (as a result of their quoted rate of individual items), refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each lowest contractors.

Contractor, whose earnest money is forfeited because of non-submission of revised offer, or quoting higher revised rate(s) of any item(s) than their respective original rate quoted already at the time of submission of his bid shall not be allowed to participate in the re-tendering process of the work.

4 A. Applicable for Percentage Rate Tender only

In case of Percentage Rate Tenders, contractor shall fill up the usual printed form, stating at what percentage below/above (in figures as well as in words) the total estimated cost given in Schedule of Quantities at Schedule-A, he will be willing to execute the work. The tender submitted shall be treated as invalid if :

- 1 The contractor does not quote percentage above/below on the total amount of tender or any section/sub head of the tender.
- 2 The percentage above/below is not quoted in figures & words both on the total amount of tender or any section/sub head of the tender.
- 3 The percentage quoted above/below is different in figures & words on the total amount of tender or any section/sub head of the tender.

Tenders, which propose any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions of any sort including conditional rebates, will be summarily rejected. No single tender shall include more than one work, but contractors who wish to tender for two or more works shall submit separate tender for each. Tender shall have the name and number of the works to which they refer, written on the envelopes.

4B. In case the lowest tendered amount (estimated cost + amount worked on the basis of percentage above/below) of two or more contractors is same, such lowest contractors will be asked to submit sealed revised offer in the form of letter mentioning percentage above/below on estimated cost of tender including all sub sections/sub heads as the case may be, but the revised percentage quoted above/below on tendered cost or on each sub section/sub head should not be higher than the percentage quoted

at the time of submission of tender. The lowest tender shall be decided on the basis of revised offers.

In case any of such contractor refuses to submit revised offer, then it shall be treated as withdrawal of his tender before acceptance and 50% of earnest money shall be forfeited.

If the revised tendered amount of two more contractors received in revised offer is again found to be equal, the lowest tender, among such contractors, shall be decided by draw of lots in the presence of Registrar, IISER, Pune, Superintending Engineer, Dy. Registrar (F&A) & the lowest contractors those have quoted equal amount of their tenders.

In case all the lowest contractors those have quoted same tendered amount, refuse to submit revised offers, then tenders are to be recalled after forfeiting 50% of EMD of each contractor.

Contractor(s), whose earnest money is forfeited because of non-submission of revised offer, shall not be allowed to participate in the re-tendering process of the work.

5. The officer inviting tender or his duly authorized representative will open tenders in the presence of any intending contractors who may be present at the time, and will enter the amounts of the several tenders in a comparative statement in a suitable form. In the event of a tender being accepted, a receipt for the earnest money shall thereupon be given to the contractor who shall thereupon for the purpose of identification sign copies of the specifications and other documents mentioned in Rule-I. The earnest money of all unsuccessful bidders shall thereupon be returned to the contractor remitting the same, without any interest.
6. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest or any other tender.
7. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as any acknowledgement of payment to the officer inviting tender and the contractors shall be responsible for ensuring that he procures a receipt signed by the officer inviting tender or a duly authorized cashier/accounts officer.
8. The memorandum of work tendered for and the schedule of materials to be supplied by the department and their issue-rates, shall be filled and completed in the office of the officer inviting tender before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and incomplete, he shall request the officer to have this done before he completes and delivers his tender.
9. The tenderers shall sign a declaration under the officials Secret Act 1923, for maintaining secrecy of the tender documents drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.

10. In the case of Item Rate Tenders, only rates quoted shall be considered. Any tender containing percentage below / above the rates quoted is liable to be rejected. Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However, if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall unless otherwise proved be taken as correct. If the amount of an item is not worked out by the contractor or it does not correspond with the rates written either in figures or in words, then the rates quoted by the contractor in words shall be taken as correct. Where the rates quoted by the contractor in figures and in words tally, but the amount is not worked out correctly, the rates quoted by the contractor will unless otherwise proved be taken as correct and not the amount. In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this/these item(s) in other items and rate for such item(s) will be considered as zero and work will be required to be executed accordingly.
- 10A In case of Percentage Rate Tenders only percentage quoted shall be considered. Any tender for Item containing item rates is liable to be rejected. Percentage quoted by the contractor in Rate percentage rate tender shall be accurately filled in figures and words, so that there is no Tender only discrepancy.
11. In the case of any tender where unit rate of any item/items appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.
12. All rates shall be quoted on the tender form. The amount for each item should be worked out and requisite totals given. Special care should be taken to write the rates in figures as well as in words and the amount in figures only, in such a way that interpolation is not possible. The total amount should be written both in figures and in words. In case of figures, the word 'Rs' should be written before the figure of rupees and word 'P' after the decimal figures, e.g. Rs. 2.15 P and in case of words, the word 'Rupees' should precede and the word 'Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word 'only' it should invariably be up to two decimal places. While quoting the rate in schedule of quantities, the word 'only' should be written closely following the amount and it should not be written in the next line.
- 12A In Percentage Rate Tender, the tenderer shall quote percentage below /above (in figure as well as in words) at which he will be willing to execute the work. He shall also work out the total amount of his offer and same should be written in the figures as well as in Words in such a way that no interpolation is possible. In case of figures, the word 'Rs' should be written before the figure of rupees and word 'P' after the decimal figures e.g. 'Rs 2.15P' and in case of words, the word 'Rupees' should precede and the word 'Paise' should be written at the end.

13. (i) The Contractor, whose tender is accepted, will be required to furnish performance guarantee of 5% (Five Percent) of the tendered amount within the period specified in scheduled C. This guarantee shall be in the form of Deposit at call receipt of any scheduled bank/ banker's cheque of any scheduled bank/Demand draft of any scheduled bank /Pay order of any scheduled bank or Government Securities or Fixed Deposit Receipt or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the prescribed form.
- (ii) The Contractor, whose tender is accepted, will also be required to furnish by way of Security Deposit for the fulfillment of his contract, an amount equal to 2.50 % of the tendered value of the work. The Security Deposit will be collected by deductions from the running bills of the contractor at the rates mentioned above and the earnest money deposited at the time of tenders, will be treated as a part of the Security Deposit. The security amount will also be accepted in the shape of Government Securities. Fixed Deposit Receipt and Guarantee Bonds of a Scheduled Bank or State Bank of India will also be accepted for this purpose provided confirmatory advice is enclosed.
14. On acceptance of the tender, the name of the accredited representative(s) of the contractor who would be responsible for taking instructions from the Engineer-in-Charge shall be communicated in writing to the Engineer-in-Charge.
15. Sales-tax/Vat, (except service tax) purchase tax, turnover tax or any other tax on material in respect of this contract shall be payable by the contractor and IISER Pune will not entertain any claim whatsoever in respect of the same. However, in respect of service tax, same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to him by the Engineer-in-Charge after satisfying that it has been actually and genuinely paid by the contractor.
16. The contractor shall give a list of IISER employees, if any, related to him.
17. The tender for the work shall not be witnessed by a contractor or Contractors who himself/ themselves has/ have tendered or who may and has/ have tendered for the same work. Failure to observe this condition would render, tenders of the contractors tendering, as well as witnessing the tender, liable to summary rejection.
18. The tender for composite works includes, in addition to building work, all other works such as sanitary and water supply installations ,drainage installation, External Façade, Electrical works, Heating ventilation and air conditioning system, Integrated Building Management system, Lifts, roads and path etc. The tenderer apart from being a registered contractor (B&R) of appropriate class, must associate himself with agencies of appropriate class which are eligible to tender for sanitary and water supply drainage, electrical Heating ventilation and Air conditioning system, Integrated Building Management system, Solar Water Heating system works in the composite tender.
19. The contractor shall submit list of works which are in hand (progress) in the following form:

Name of work	Name of client & particulars of works being executed	Value of work In Rs.	Position of works in progress	Remarks

19. The contractor shall comply with the provisions of the Apprentices Act 1961, and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Engineer in charge may at his discretion without prejudice to any other right or remedy available in law cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.
20. Bidder shall have valid Provident Fund Code Number, VAT registration No and bidders shall also ensure compliance of the EPF & MP Act, 1952 by the sub-contractors, if any engaged by the contractor for the said work.

(ii) CONDITIONS OF CONTRACT

Definitions:

- 1 The **contract** means the documents forming the tender and acceptance thereof and the formal agreement executed between the competent authority on behalf of the Director, Indian Institute Of Science Education and Research Pune and the Contractor, together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-Charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.
- 2 In the contract, the following expressions shall, unless the context otherwise requires, have the meanings, hereby respectively assigned to them :-
 - i). The expression **works** or **work** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent, and whether original, altered, substituted or additional.
 - ii). The **Site** shall mean the land/ or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.
 - iii). The **Contractor** shall mean the individual, firm or company, whether incorporated or not, undertaking the works shall include the legal personal representative of such individual or the persons composing such firm or company, or the successors of such firm or company and the permitted assignees of such individual, firm or company.
 - iv). The **Director**, Indian Institute of Science Education and Research Pune means his successors also.
 - v). The **Engineer-in-Charge** means Engineer/Officer either from IISER, Pune or consultant notified by The Director (IISER, Pune) who shall supervise and be in-charge of work and who shall act on behalf of the Director, IISER for execution of contract.
 - vi) **IISER** means Indian Institute of Science Education and Research Pune, or his authorized representative.

- vii) **Accepting Authority** shall mean the authority mentioned in Schedule 'C'.
- viii) **Excepted Risk** are risks due to riots (other than those on account of contractor's employees), war (whether declared or not) invasion, act of foreign enemies, hostilities, civil war, rebellion revolution, insurrection, military or usurped power, any acts of Government, damages from aircraft, acts of God, such as earthquake, lightening and unprecedented floods, and other causes over which the contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by IISER Pune of the part of the works in respect of which a certificate of completion has been issued or a cause solely due to IISER-Pune's faulty design of works.
- ix). **Market Rate** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus the percentage mentioned in Schedule 'C' to cover, all overheads and profits.
- x). **Schedule(s)** referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers or the standard Schedule of Rates of the CPWD Delhi schedule of rates mentioned in Schedule 'C' hereunder, with the amendments thereto issued up to the date of receipt of the tender.
- xi). **Department** means Indian Institute of Science Education and Research Pune. (IISER Pune)
- xii). **Specifications** means the specifications contained in tender documents, CPWD specifications 2009 Vol I & II with up to date correction slips, CPWD specifications for internal Electrical works – 2013, external electrical services-2007, DG set & Wet riser, sprinkler specification-2006, Substation works Part IV 2013, Indian standard specification, technical specifications as applicable.
- xiii). **Tendered Value** means the value of the entire work as stipulated in the letter of award.
- xiv). **Consultant** means Consultant appointed by the Indian Institute of Science Education and Research Pune.
- xv) **Date of commencement of work: The date** of commencement of work shall be the date of start as specified in schedule "C" or the first date of handing over the site, whichever is later, in accordance with the phasing if any, as indicated in the tender documents.

- 3 Where the context so requires, words imparting the singular only also include the plural and vice versa. Any reference to masculine gender shall whenever required include feminine gender and vice versa.
- 4 Headings and Marginal notes to these General Conditions of Contract shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.
- 5 The contractor shall be furnished, free of cost one certified copy of the contract documents except standard specifications. Schedule of Rates and such other printed and published documents, together with all drawings as may be forming part of the tender papers. None of these documents shall be used for any purpose other than that of this contract
- 6 The work to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plants, equipment and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of quantities shall, unless otherwise stated, be held to include wastage on materials, carriage and cartage, carrying and return of empties, hoisting, setting, fitting and fixing in position and all other labours necessary in and for the full and entire execution and completion of the work as aforesaid in accordance with good practice and recognized principles.
7. The contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.
8. The several documents forming the contract are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale and special conditions in preference to General conditions.
- 8.1. In the case of discrepancy between the schedules of quantities, the specifications and or the drawings, the following order of preference shall be observed.
 - (i) Description of schedule of Quantities
 - (ii) Technical specification and Special Condition, if any.
 - (iii) C.P.W.D. Specification

- (iv) Drawings
 - (v) Indian Standard Specifications of B.I.S.
- 8.2 If there are varying or conflicting provision made in any one document forming part of the contract, the Accepting Authority shall be deciding authority with regard to the intention of the documents and his decision shall be final and binding on the contractor.
- 8.3 Any error in the description, quantity or rate in Schedule of Quantities or any omission there from shall not vitiate the contract or release the contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the contract.
9. The successful tenderer/contractor, on acceptance of his tender by the Accepting Authority, shall within one month from the stipulated date of start of the work, sign the contract consisting of:-
- (i) The notice inviting tender, all the documents including drawings if any, forms the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.
 - (ii) Standard Form Consisting of followings
 - (a) NIT, Work order
 - (b) Percentage rate tender form & Contract for worker.
 - (c) General Rules and Directions
 - (d) Condition of contracts
 - (e) Clauses of contracts
 - (f) Safety code
 - (g) Model rules for the protection of health, sanitary arrangements for workers employed by IISER or its Contractors.
 - (h) Contractors labour regulations
 - (i) Proforma of agreement
 - (j) Proforma of Schedule A to C
 - (k) Special Condition of contracts
 - (l) Technical specifications
 - (m) Tender drawings
 - (n) Priced Schedule of quantities.
 - (o) All correspondence between the parties till award of contract
 - (iii) Till such time contract agreement is signed between the parties, all the documents mentioned Sr. 9 (i), 9 (ii)- (a to o) above shall be binding on the contractor.
 - (iv) No payment for the work done will be made unless contract is signed by the contractor.

(iii) CLAUSES OF CONTRACT**CLAUSE – I****Performance Guarantee**

- (i) The contractor shall submit an irrevocable Performance Guarantee of 5% (Five percent) of the tendered amount in addition to other deposits mentioned elsewhere in the contract for his proper performance of the contract agreement, (not withstanding and/or without prejudice to any other provisions in the contract) within period specified in Schedule 'C' from the date of issue of letter of acceptance. This period can be further extended by the Engineer-in-Charge up to a maximum period as specified in schedule 'C' on written request of the contractor stating the reason for delays in procuring the Performance Guarantee, to the satisfaction of the Engineer-in-Charge. This guarantee shall be in the form of Deposit at call receipt of any Schedule Bank/Banker's Cheque of any Schedule Bank/Demand Draft of any Scheduled Bank/Pay Order of any Scheduled Bank or Government Securities or Fixed Deposit Receipts or Guarantee Bonds of any Scheduled Bank or the State Bank of India in accordance with the form annexed hereto. In case a fixed deposit receipt of any Bank is furnished by the contractor to the IISER Pune as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the IISER Pune to make good the deficit.
- (ii) The Performance Guarantee shall be initially valid up to the stipulated date of completion plus 60 days beyond that. In case the time for completion of work gets extended, the contractor shall get the validity of Performance Guarantee extended to cover such extended time for completion of work. After recording of the completion certificate for the work by the competent authority, the Performance Guarantee shall be returned to the contractor, without any interest. However, in case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance Guarantee shall be retained as Security Deposit. The same shall be returned year wise proportionately.
- (iii) The Engineer-in-Charge shall not make a claim under the Performance Guarantee except for amounts to which the Director IISER Pune is entitled under the contract (not withstanding and / or without prejudice to any other provisions in the contract agreement) in the event of:-
- (a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-Charge may claim the full amount of the Performance Guarantee.
- (b) Failure by the contractor to pay Director IISER Pune any amount due, either as agreed by the contractor or determined under any of the Clauses/Conditions

of the agreement, within 30 days of the serving of notice to this effect by Engineer-in-Charge.

- (iv) In the event of the contract being determined or rescinded under provision of any of the Clause / Condition of the agreement, the Performance Guarantee shall stand forfeited in full and shall be absolutely at the disposal of the Director IISER Pune.

CLAUSE – I A

Recovery of Security Deposit :-

The person/persons whose tender(s) may be accepted (hereinafter called the contractor) shall permit Government at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 2.5% of the gross amount of each running and final bill till the sum deducted will amount to security deposit of 2.5% of the tendered value of the work. Such deductions will be made and held by Government by way of Security Deposit unless he/they has/have deposited the amount of Security at the rate mentioned above in cash or in the form of Government Securities or fixed deposit receipts. In case a fixed deposit receipt of any Bank is furnished by the contractor to the Government as part of the security deposit and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to the Government to make good the deficit

All compensations or the other sums of money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due to or may become due to the contractor by IISER Pune on any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the State Bank of India or by Scheduled Banks or Government Securities (if deposited for more than 12 months) endorsed in favour of the Director IISER Pune, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof.

The security deposit as deducted above can be released against bank guarantee issued by a Scheduled Bank, on its accumulations to a minimum of Rs.5 lakh subject to the condition that amount of such bank guarantee, except last one, shall not be less than Rs.5 lakh. Provided further that the validity of bank guarantee shall be in conformity with provisions contained in clause 17 which shall be extended from time to time depending upon extension of contract granted under provisions of clause 2 and clause 5.

In case of contracts involving maintenance of building and services/any other work after construction of same building and services/other work, then 50% of Performance

Guarantee shall be retained as Security Deposit. The same shall be returned year wise proportionately.

Note – 1: Government papers tendered as security will be taken at 5% (five percent) below its market price or at its face value, whichever is less. The market price of Government paper would be ascertained by the Director IISER Pune at the time of collection of interest and the amount of interest to the extent of deficiency in value of the Government paper will be withheld if necessary.

Note – 2: Government Securities will include all forms of Securities mentioned in Rule No. 274 of the G.F Rules except fidelity bond. This will be subject to the observance of the condition mentioned under the rule against each form of security.

Note – 3: Note 1 & 2 above shall be applicable for both clause 1 and 1A.

CLAUSE -2 - Compensation for Delay :-

If the contractor fails to maintain the required progress in terms of clause 5 or to complete the work and clear the site on or before the contract or extended date of completion, he shall, without prejudice to any other right or remedy available under the law to the IISER Pune on account of such breach, pay as agreed compensation the amount calculated at the rates stipulated below as the authority specified in schedule 'C' (whose decision in writing shall be final and binding) may decide on the amount of tendered value of the work for every completed day/month (as applicable) that the progress remains below that specified in Clause 5 or that the work remains incomplete.

This will also apply to items or group of items for which a separate period of completion has been specified.

(i)	Compensation for Delay of work	@1.5% per month of delay computed on per day basis.
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Provided always that the total amount of compensation for delay to be paid under this Condition shall not exceed 10% of the Tendered Value of work or of the Tendered Value of the item or group of items of work for which a separate period of completion is originally given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the IISER Pune. In case, the contractor does not achieve a particular milestone mentioned in schedule C, or the re-scheduled milestone(s) in terms of Clause 5.4, the amount shown against that

milestone shall be withheld, to be adjusted against the compensation levied at the final grant of Extension of Time. With-holding of this amount on failure to achieve a milestone, shall be automatic without any notice to the contractor. However, if the contractor catches up with the progress of work on the subsequent milestone(s), the withheld amount shall be released. In case the contractor fails to make up for the delay in subsequent milestone(s), amount mentioned against each milestone missed subsequently also shall be withheld. However, no interest, whatsoever, shall be payable on such withheld amount.

CLAUSE– 2A - Incentive for Early Completion:-

In case, the contractor completes the work ahead of updated stipulated date of completion considering the effect of extra work (to be calculated on pro-rata basis as cost of extra work X stipulated period/tendered cost), a bonus @ 1% (one per cent) of the tendered value per month computed on per day basis, shall be payable to the contractor, subject to a maximum limit of 5% (five per cent) of the tendered value. The amount of bonus, if payable, shall be paid along with final bill after completion of work. Provided always that provision of the Clause 2A shall be applicable only when so provided in 'Schedule C'.

CLAUSE– 3 - When Contract can be Determined:-

Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other rights or remedy against the contractor in respect of any delay, inferior workmanship, any claims for damages and/ or any other provisions of this contract or otherwise, and whether the date of completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

- i). If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkman like manner shall omit to comply with the requirement of such notice for a period of seven days thereafter.
- ii). If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continues to do so after a notice in writing of seven days from the Engineer-in-Charge.
- iii). If the Contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.
- iv). If the contractor persistently neglects to carry out his obligations under the contract and / or commits default in complying with any of the terms and conditions of the

contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

- v). If the contractor shall offer or give or agree to give to any person in IISER Pune service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for IISER Pune.
- vi). If the contractor shall enter into a contract with IISER Pune in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have been previously disclosed in writing to the Engineer-in-Charge.
- vii) If the contractor had secured the contract with IISER Pune as a result of wrong tendering or other non-bonafide methods of competitive tendering or commits breach of Integrity Agreement.
- viii) If the contractor being an individual or if a firm, any partner thereof shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceeding for liquidation or composition (other than a voluntary liquidation for the purpose of amalgamation or reconstruction) under any Insolvency Act for the time being in force or make any conveyance or assignment of his effects or compositions or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any Insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors.
- ix) If the contractor being a company shall pass a resolution or the court shall make an order that the company shall be wound up or if a receiver or a manager on behalf of a creditor shall be appointed or if circumstances shall arise which entitle the court or the creditor to appoint a receiver or a manager or which entitle to make the court to make winding up order.
- x) If the contractor shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days.
- xi) If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer-in-Charge.

When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in-Charge on behalf of the Director IISER Pune shall have powers:

- a). To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract shall be liable to be forfeited and shall be absolutely at the disposal of the IISER Pune.
- b). After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be un-executed out of his hands and to give it to another contractor to complete the work at the risk and cost of the original contractor. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work.

In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provision aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

CLAUSE-3A

In case, the work cannot be started due to reasons not within the control of the contractor within 1/8th of the stipulated time for completion of work or one month whichever is higher, either party may close the contract. In case contractor wants to close the contract, he shall give notice to the department stating the failure on the part of department. In such eventuality, the Performance Guarantee of the contractor shall be refunded within following time limits :

- (i) If the Tendered value of work is up to Rs. 45 lac : 15 days.
- (ii) If the Tendered value of work is more than Rs 45 Lac and up to Rs. 2.5 Crore : 21 days.
- (iii) If the Tendered value of work exceeds Rs. 2.5 Crore : 30 days.

If PG is not released within prescribed time limit, then a simple interest @ 0.25% per month shall be payable on PG amount to the contractor from the date of expiry of prescribed time limit.

A compensation for such eventuality, on account of damages etc. shall be payable @ 0.25% of tendered amount subject to maximum limit of Rs. 10 lacs.

CLAUSE- 4

Contractor liable to pay compensation even if action not taken under clause 3:-

In any case in which any of the powers conferred upon the Engineer-in-Charge by Clause-3 thereof, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the contractor, clerk of the works, foreman or other authorized agent to remove such tools, plant, materials or stores from the premises (within a time to be specified in such notice) in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expense of any such sale shall be final and conclusive against the contractor.

CLAUSE- 5

Time and Extension for Delay :-

The time allowed for execution of the Works as specified in the Schedule 'C' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in Schedule 'C' or from the date of handing over of the site whichever is later. If the contractor commits default in commencing the execution of the work as aforesaid, IISER Pune shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the Earnest Money & Performance Guarantee absolutely.

- 5.1 As soon as possible after the contract is concluded, the contractor shall submit a Time and Progress Chart for each mile stone and get it approved by the IISER Pune. The chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of 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 (except for special jobs for which a separate programme has been agreed upon) complete the work as per mile stones given in Schedule 'C'.

a) Project Management shall be done by using project management software for works costing up to Rs. 5 Crore.

b) The project management shall be done using M.S. Project software for works costing more than Rs. 5 Crore and up to Rs. 20 Crore.

c) For works costing more than Rs. 20 Crore, project management shall be done using Primavera Software.

PROGRAMME CHART

- to (i) The Contractor shall prepare an integrated programme chart in MS Project/Primavera software for the execution of work, showing clearly all activities from the start of work completion, with details of manpower, equipment and machinery required for the fulfillment of the programme within the stipulated period or earlier and submit the same for approval to the Engineer-in-Charge within ten days of award of the contract. A recovery of Rs. 2500/- (for works costing up to Rs. 20 Crores) / Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission of the above programme.

(ii) The programme chart should include the following: a) Descriptive note explaining sequence of the various activities. b) Network (PERT / CPM / BAR CHART). c) Programme for procurement of materials by the contractor. Programme of procurement of machinery / equipment having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor. In addition to above to achieve the progress of Work as per programme, the contractor must bring at site adequate shuttering material required for cement concrete and R.C.C. works etc. for three floors within one month from the date of start of work till the completion of RCC work as per requirement of work. The contractor shall submit shuttering schedule adequate to complete structure work within laid down physical milestone.

(iii) If at any time, it appears to the Engineer-in-Charge that the actual progress of work does not conform to the approved programme referred above or after rescheduling of milestones, the contractor shall produce a revised programme within 7 (seven) days, showing the modifications to the approved programme to ensure timely completion of the work. The modified schedule of programme shall be approved by the Engineer in Charge. A recovery of Rs. 2500/- (for works costing up to Rs. 20 Crores) / Rs. 5000/- (for

works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission of the modified programme.

(iv) 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.

(v) The contractor shall submit the progress report using MS Project/Primavira software with base line programme referred above for the work done during previous month to the Engineer-in-charge on or before 5th day of each month failing which a recovery Rs. 2500/- (for works costing up to Rs. 20 Crores) / Rs. 5000/- (for works costing more than Rs. 20 Crores) shall be made on per day basis in case of delay in submission of the Monthly progress report.

5.2 If the work(s) be delayed by :-

- i). force majeure, or
- ii). abnormally bad weather, or
- iii). serious loss or damage by fire, or abnormal floods
- iv). civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or.
- v). delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or
- vi). non-availability of stores, which are the responsibility of IISER Pune to supply, or
- vii). non-availability or break down of tools and Plant to be supplied or supplied by IISER Pune, or
- viii). Any other cause which, in the absolute discretion of Engineer-in-Charge is beyond the Contractor's control.

then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

5.3 Request for rescheduling of Mile stones and extension of time, to be eligible for consideration, shall be made by the Contractor in writing within fourteen days of the happening of the event causing delay on the prescribed form. The contractor may also, if practicable, indicate in such a request the period for which extension is desired.

5.4 In any such case the authority as indicated in Schedule 'C' may give a fair and reasonable extension of time and reschedule the mile stones for completion of work. Such extension or rescheduling of the milestones shall be communicated to the Contractor by the authority as indicated in Schedule 'C' in writing, within 3 months or 4 weeks of the date of receipt of such request respectively. Non application by the contractor for extension

of time/ rescheduling of the milestones shall not be a bar for giving a fair and reasonable extension/ rescheduling of the milestones by the authority as indicated in Schedule 'C' and this shall be binding on the contractor.

CLAUSE- 6

Measurements of Work Done :-

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement, the value in accordance with the contract of work done.

All measurement of all items having financial value shall be entered in Measurement Book and/ or level field book so that a complete record is obtained of all works performed under the contract.

All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties.

If for any reason the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the IISER Pune shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available, then a mutually agreed method shall be followed.

The contractor shall give, not less than seven days notice to the Engineer-in-Charge or his authorized representative in charge of the work, before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct

dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the IISER Pune to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that recording of measurements of any item of work in the measurement book and/ or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE- 6A

Computerized Measurement Book :-

Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement the value of work done in accordance with the contract.

All measurements of all items having financial value shall be entered by the contractor and compiled in the shape of the Computerized Measurement Book having pages of A-4 size as per format of the IISER Pune so that a complete record is obtained of all the items of works performed under the contract.

All such measurements and levels recorded by the contractor or his authorized representative from time to time, during the progress of the work, shall be got checked by the contractor from the Engineer-in-Charge or his authorized representative as per interval or program fixed in consultation with Engineer-in-Charge or his representative. After the necessary corrections made by the Engineer-in-Charge, the measurement sheets shall be returned to the contractor for incorporating the corrections and for resubmission to the Engineer-in-Charge for the dated signatures by the Engineer-in-Charge and the contractor or their representatives in token of their acceptance.

Whenever bill is due for payment, the contractor would initially submit draft computerized measurement sheets and these measurements would be got checked / test checked from the Engineer-in-Charge and / or his authorized representative. The contractor will, thereafter, incorporate such changes as may be done during these checks / test checks in his draft computerized measurements, and submit to the IISER Pune a computerized measurement book,

duly bound, and with its pages machine numbered. The Engineer-in-Charge and / or his authorized representative would thereafter checks this MB, and record the necessary certificates for their checks / test checks.

The final, fair, computerized measurement book given by the contractor, duly bound, with its pages machine numbered, should be 100% correct, and no cutting or over-writing in the measurements would thereafter be allowed. If at all any error is noticed, the contractor shall have to submit a fresh computerized MB with its pages duly machine numbered and bound, after getting the earlier MB cancelled by the IISER Pune. Thereafter, the MB shall be taken in the IISER Pune Office records, and allotted a number as per the Register of Computerized MB's. This should be done before the corresponding bill is submitted to the IISER Pune Office for payment. The contractor shall submit two spare copies of such computerized MB's for the purpose of reference and record by the various officers of the IISER Pune.

The contractor shall also submit to the IISER Pune separately his computerized Abstract of Cost and the bill based on these measurements, duly bound, and its pages machine numbered along with two spare copies of the "bill. Thereafter, this bill will be processed by the IISER Pune Office and allotted a number as per the computerized record in the same way as done for the measurement book meant for measurements.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for checking of measurements / levels by the Engineer-in-Charge or his representative.

Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available then a mutually agreed method shall be followed.

The contractor shall give, not less than seven days' notice to the Engineer-in-Charge or his authorized representative in charge of the work, before covering up or otherwise placing beyond the reach of checking and/or test checking the measurement of any work in order that the same may be checked and/or test checked and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of checking and/or test checking measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of checking and/or test checking measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the IISER Pune to check the measurements recorded by contractor and all provisions stipulated herein above shall be applicable to such checking of measurements or levels.

It is also a term of this contract that checking and/or test checking the measurements of any item of work in the measurement book and/ or its payment in the interim, on account of final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

CLAUSE– 7 - Payment on Intermediate Certificate to be Regarded as Advances: -

No payment shall be made for work, estimated to cost Rs. fifty thousand or less till after the whole of the work shall have been completed and certificate of completion given. For works estimated to cost over Rs. fifty thousand, the interim or running account bills shall be submitted by the contractor for the work executed on the basis of such recorded measurements on the format of the IISER Pune in triplicate on or before the date of every month fixed for the same by the Engineer-in-Charge. The contractor shall not be entitled to be paid any such interim payment if the gross work done together with net payment / adjustment of advances for material collected, if any, since the last such payment is less than the amount specified in Schedule 'C', in which case the interim bill shall be prepared on the appointed date of the month after the requisite progress is achieved. Engineer-in-Charge shall arrange to have the bill verified by taking or causing to be taken, where necessary, the requisite measurements of the work. In the event of the failure of the contractor to submit the bills, Engineer-in-Charge shall prepare or cause to be prepared such bills in which event no claims whatsoever due to delays on payment including that of interest shall be payable to the contractor. Payment on account of amount admissible shall be made by the Engineer-in-Charge certifying the sum to which the contractor is considered entitled by way of interim payment at such rates as decided by the Engineer-in-Charge. The amount admissible shall be paid by 10th working day after the day of presentation of the bill by the Contractor to the Engineer-in-Charge or his Assistant Engineer together with the account of the material issued by the IISER Pune, or dismantled materials, if any. In the case of works outside the headquarters of the Engineer-in-Charge, the period of ten working days will be extended to fifteen working days. In case of delay in payment of intermediate bills after 45 days of submission of bill by the contractor provided the bill submitted by the contractor found to be in order, a simple interest @ 7.5% per annum shall be paid to the contractor from the date of expiry of prescribed time limit which will be compounded on yearly basis.

All such interim payments shall be regarded as payment by way of advances against final payment only and shall not preclude the requiring of bad, unsound and imperfect or unskilled work to be rejected, removed, taken away and reconstructed or re-erected. Any certificate given by the Engineer-in-Charge relating to the work done or materials delivered forming part of such payment, may be modified or corrected by any subsequent such certificate (s) or by the final certificate and shall not by itself be conclusive evidence that any work or materials to which it relates is/ are in accordance with the contract and specifications. Any such interim payment, or any part thereof shall not in any respect conclude, determine or affect in any way powers of the Engineer-in-Charge under the contract or any of such payments be treated as final settlement and adjustment of accounts or in any way vary or affect the contract.

Pending consideration of extension of date of completion, interim payments shall continue to be made as herein provided, without prejudice to the right of the IISER Pune to take action under the terms of this contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.

The Engineer-in-Charge in his sole discretion on the basis of a certificate from his Assistant Engineer/Representative to the effect that the work has been completed up to the level in question make interim advance payments without detailed measurements for work done (other than foundations, items to be covered under finishing items) up to lintel level (including sunshade etc.) and slab level, each floor working out at 75% of the assessed value. The advance payments so allowed shall be adjusted in the subsequent interim bill by taking detailed measurements thereof.

In case of composite contract if main contractor fails to make the payment to the contractor associated by him within 15 days of receipt of each running account payment, then on the written complaint of contractor associated for such work, Engineer in charge of work shall serve the show cause to the main contractor and if reply of main contractor either not received or found unsatisfactory, Engineer in charge may make the payment directly to the contractor associated for such work as per term & condition of the agreement drawn between main contractor & associate contractor fixed by main contractor. Such payment made to associated contractor shall be recovered by Engineer-in-charge of work from the next R/A bill due to main contractor as the case may be.

CLAUSE– 8 - Completion Certificate and Completion Plans :-

Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of the receipt of such notice, the Engineer-in-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/ their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning of dirt on or before the date fixed for the completion of work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding surplus materials and rubbish etc. and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

CLAUSE- 8A**Contractor to Keep Site Clean :-**

When the annual repairs and maintenance of works are carried out, the splashes and droppings from white washing, colour washing, painting etc., on walls, floor, windows etc shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done without waiting for the actual completion of all the other items of work in the contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either departmentally or through any other agency. Before taking such action, the Engineer-in-Charge shall give ten days notice in writing to the contractor.

CLAUSE- 8B - Completion Plans (as built drawing) to be Submitted by the Contractor :-

The contractor shall submit completion plan as required vide General Specifications for Electrical works (Part-I Internal) 2005 and (Part-II External)1994 as applicable within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work subject to a ceiling of Rs.15,000 (Rs. Fifteen Thousand Only) as may be fixed by the Engineer-in-Charge concerned and in this respect the decision of the Engineer-in-Charge shall be final and binding on the contractor.

The contractor shall submit completion plan for water, sewerage and drainage line plan within thirty days of the completion of the work.

In case, the contractor fails to submit the completion plan as aforesaid, , the department will get it done through other agency at his cost and actual expenses incurred plus Rs. 15,000/for the same shall be recovered from the contractor.

CLAUSE- 9**Payment of Final Bill :-**

The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within the period specified herein under, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge or his authorized Asstt. Engineer/Representative, complete with account of materials issued by the IISER Pune and dismantled materials.

- (i) If the Tendered value of work is up to Rs. 45 lac : 2 months
- (ii) If the Tendered value of work is more than 45 Lac and up to Rs. 2.5 Crore : 3 months
- (iii) If the Tendered value of work exceeds Rs. 2.5 Crore : 6 months

In case of delay in payment of final bills after prescribed time limit, a simple interest @ 7.5% per annum shall be paid to the contractor from the date of expiry of prescribed time limit which will be compounded on yearly basis, provided the final bill submitted by the contractor found to be in order.

CLAUSE- 9A - Payment of Contractor's Bills to Banks :-

Payments due to the contractor may, if so desired by him, be made to his bank, registered financial, co-operative or thrift societies or recognized financial institutions instead of direct to him provided that the contractor furnishes to the Engineer-in-Charge (1) an authorization in the form of a legally valid document such as a power of attorney conferring authority on the bank, registered financial, co-operative or thrift societies or recognized financial institutions to receive payments and (2) his own acceptance of the correctness of the amount made out as being due to him by IISER Pune or his signatures on the bill or other claim preferred against IISER Pune before settlement by the Engineer-in-Charge of the account or claim by payment to the bank, registered financial, co-operative or thrift societies or recognized financial institutions. While the receipt is given by such banks; registered financial, co-operative or thrift societies or recognized financial institutions shall constitute a full and sufficient discharge for the payment, the contractor shall wherever possible present his bills duly receipted and discharged through his bank, registered financial, co-operative or thrift societies or recognized financial institutions.

Nothing herein contained shall operate to create in favour of the bank; registered financial, co-operative or thrift societies or recognized financial institutions any rights or equities vis-à-vis the Director IISER Pune.

CLAUSE- 10 - Materials to be Provided by the Contractor :-

The contractor shall, at his own expense, provide all materials, required for the works other than those which are stipulated to be supplied by the IISER Pune.

The contractor shall, at his own expense and without delay; supply to the Engineer-in-Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-Charge furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in-Charge shall within thirty days of supply of samples or within such further period as he may require intimate to the contractor in writing whether samples are approved by him or not. If samples are not approved, the contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval, fresh samples complying with the specifications laid down

in the contract. When materials are required to be tested in accordance with specification, approval of the Engineer-in-Charge shall be issued after the test results are received.

The contractor shall at his risk and cost submit the samples of materials to be tested or analyzed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.

The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer-in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The Engineer-in-Charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles, or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in-Charge shall also have full powers to require other proper materials to be substitute thereof and in case of default, the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the contractor.

The contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped with the all necessary testing equipment as specified in schedule "C".

CLAUSE- 10 A - Secured Advance on Non-Perishable Materials: -

The contractor, on signing an indenture in the form to be specified by the Engineer-in-Charge, shall be entitled to be paid during the progress of the execution of the work up to 90% of the assessed value of any materials which are in the opinion of the Engineer-in-Charge non-perishable, non-fragile and non-combustible and are in accordance with the contract and which have been brought on the site in connection therewith and are adequately stored and/ or protected against damage by weather or other causes but which have not at the time of advance been incorporated in the works. When materials on account of which an advance has been made under this sub-clause are incorporated in the work, the amount of such advance shall be recovered/ deducted from the next payment made under any of the clause or clauses of this contract.

Such secured advance shall also be payable on other items of perishable nature, fragile and combustible with the approval of the Engineer-in-Charge provided the contractor provides a comprehensive insurance cover for the full cost of such materials. The decision of the Engineer-in-Charge shall be final and binding on the contractor in this matter. No secured advance, shall however, be paid on high-risk materials such as ordinary glass, sand, petrol, diesel etc.

CLAUSE-10B - Mobilization Advances :-

- (i) Mobilization Advance not exceeding 10% of the tendered value may be given, if requested by the contractor in writing within one month of the order to commence the work. Such advance shall be paid in two or more installments to be determined by the Engineer-in-Charge at his sole discretion. The first installment of such advance shall be released by the Engineer-in-Charge to the contractor on a request made by the contractor to the Engineer-in-Charge in this behalf. The second and subsequent installments shall be released by the Engineer-in-Charge only after the contractor furnishes a proof of the satisfactory utilization of the earlier installment to the entire satisfaction of the Engineer-in-Charge.

Before any installment of advance is released, the contractor shall execute a Bank Guarantee Bond from Scheduled Bank for the amount equal to 110% of the amount of advance and valid for the contract period. This (Bank Guarantee from Scheduled Bank for the amount equal to 110% of the balance amount of advance) shall be kept renewed from time to time to cover the balance amount and likely period of complete recovery.

Provided always that provision of Clause 10 B shall be applicable only when so provided in 'Schedule C'.

Plant Machinery & Shuttering Material Advance:-

- (ii) An advance for plant, machinery & shuttering material required for the work and brought to site by the Contractor may be given if requested by the contractor in writing within one month of bringing such plant and machinery to site. Such advance shall be given on such plant and machinery, which in the opinion of the Engineer-in-Charge will add to the expeditious execution of work and improve the quality of work. In the case of new plant and equipment to be purchased for the work, the advance shall be restricted to 90% of the price of such new plant and equipment paid by the contractor for which the contractor shall produce evidence, satisfactory to the Engineer-in-Charge. In the case of second hand and used plants and equipment, the amount of such advance shall be limited to 50% of the depreciated value of plant and equipment as may be decided by the Engineer-in-Charge. The contractor shall, if so required by the Engineer-in-Charge, submit the statement of value of such old plant and equipment duly approved by a Registered Valuer recognized by the Central Board of Direct Taxes under the Income-Tax Act, 1961. No such advance shall be paid on any plant and equipment of perishable nature and on any plant and equipment of a value less than Rs. 50,000/-

Seventy five per cent of such amounts of advance shall be paid after the plant and equipment is brought to site and balance twenty five per cent on successfully commissioning the same. However, total amount of advance for plant machinery and shuttering material shall be limited to 5% of the tendered value for the work.

Leasing of equipment shall be considered at par with purchase of equipment and shall be covered by tripartite agreement with the following:-

1. Leasing company which gives certificate of agreeing to lease equipment to the contractor.
2. Engineer-in-Charge, and
3. The contractor

This advance shall further be subject to the condition that such plant and equipment (a) are considered by the Engineer-in-Charge to be necessary for the works; (b) and are in working order and are maintained in working order; (c) hypothecated to the IISER Pune as specified by the Engineer-in-Charge before the payment of advance is released. The contractor shall not be permitted to remove from the site such hypothecated plant and equipment without the prior written permission of the Engineer-in-Charge. The contractor shall be responsible for maintaining such plant and equipment in good working order during the entire period of hypothecation failing which such advance shall be entirely recovered in lump sum. For this purpose, steel scaffolding and form work shall be treated as plant and equipment.

The contractor shall insure the plant and machinery for which mobilization advance is sought and given, for a sum sufficient to provide for their replacement at site. Any amounts not recovered from the insurer will be borne by the contractor.

Interest and Recovery:-

(iii) The mobilization advance and plant and machinery advance in (i) & (ii) above bear simple interest at the rate of 10 per cent per annum and shall be calculated from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums advanced shall be made by the deduction from the contractors bills commencing after first ten per cent of the gross value of the work is executed and paid, on pro-rata percentage basis to the gross value of the work billed beyond 10% in such a way that the entire advance is recovered by the time eighty per cent of the gross value of the contract is executed and paid, together with interest due on the entire outstanding amount up to the date of recovery of the installment.

(iv) If the circumstances are considered reasonable by the Engineer-in-charge, the period Mentioned in (ii) and (iii) for request by the contractor in writing for grant of mobilization advance and plant and equipment advance may be extended in the discretion of Engineer-in-charge.

CLAUSE10-C - Payment on Account of Increase in Prices / Wages due to Statutory Order(s) :-

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) and/or wages of labour increases as a direct result of the coming into force of any fresh law, or statutory rule or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty) beyond the prices/wages prevailing at the time of the last stipulated date of receipt of tenders including extensions, if any, for the work during contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, then the amount of the contract shall accordingly be varied and provided further that any such increase shall be limited to the price/wages prevailing at the time of stipulated date of completion or as prevailing for the period under consideration, whichever is less.

If after submission of the tender, the price of any material incorporated in the works (excluding the materials covered under Clause 10CA and not being a material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 thereof) and/or wages of labour as prevailing at the time of last stipulated date of receipt of tender including extensions, if any, is decreased as a direct result of the coming into force of any fresh law or statutory rules or order (but not due to any changes of rate in sales tax/VAT, Central/State Excise/Custom Duty), Government shall in respect of materials incorporated in the works (excluding the materials covered under Clause 10CA and not being material supplied from the Engineer-in-Charge's stores in accordance with Clause 10 hereof) and/or labour engaged on the execution of the work after the date of coming into force of such law statutory rule or order be entitled to deduct from the dues of the contractor, such amount as shall be equivalent to the difference between the prices of the materials and/or wages as prevailed at the time of the last stipulated date for receipt of tenders including extensions if any for the work and the prices of materials and/or wages of labour on the coming into force of such law, statutory rule or order. This will be applicable for the contract period including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2.

Engineer-in-Charge may call books of account and other relevant documents from the contractor to satisfy himself about reasonability of increase in prices of materials and wages.

The contractor shall, within a reasonable time of his becoming aware of any alteration in the price of any such materials and/or wages of labour, give notice thereof to the Engineer-in-Charge stating that the same is given pursuant to this condition together with all information relating thereto which he may be in position to supply.

For this purpose, the labour component of the work executed during period under consideration shall be the percentage as specified in Schedule C, of the value of work done during that period and the increase/decrease in labour shall be considered on the minimum daily wages in rupees of any unskilled adult male mazdoor, fixed under any law, statutory rule or order.

CLAUSE– 10-CA**Payment due to Variation in Prices of Materials after receipt of tender :-**

If after submission of the tender, the price of materials specified in Schedule C increases/decreases beyond the base price(s) as indicated in Schedule C for the work, then the

amount of the contract shall accordingly be varied and provided further that any such variations shall be effected for stipulated period of Contract including the justified period extended under the provisions of Clause 5 of the Contract without any action under Clause 2.

However for work done/during the justified period extended as above, it will be limited to indices prevailing at the time of updated stipulated date of completion considering the effect of extra work (to be calculated on pro-rata basis as cost of extra work x stipulated period/tendered cost).

The increase/decrease in prices of cement, steel reinforcement and structural steel shall be determined by the Price indices issued by the Director General, CPWD. For other items provided in the Schedule 'C', this shall be determined by the All India Wholesale Price Indices of materials as published by Economic Advisor to Government of India, Ministry of Commerce and Industry. Base price for cement, steel reinforcement and structural steel shall be as issued under the authority of Director General CPWD applicable for Delhi including Noida, Gurgaon, Faridabad & Ghaziabad and for other places as issued under the authority of Zonal Chief Engineer, CPWD and base price of other materials issued by concerned Zonal chief Engineer and as indicated in Schedule 'C'. In case, price index of a particular material is not issued by Ministry of Commerce and Industry, then the price index of nearest similar material as indicated in Schedule 'C' shall be followed.

The amount of the contract shall accordingly be varied for all such materials and will be worked out as per the formula given below for individual material:

Adjustment for component of individual material

CI - Clo

$$V = P \times Q \times \frac{\text{CI} - \text{Clo}}{\text{Clo}}$$

where

V = Variation in material cost i.e. increase or decrease in the amount of rupees to be paid

P = Base Price of material as issued under authority of DG, CPWD or concerned Zonal Chief Engineer and as indicated in Schedule "F".

For Projects and Original Works

Q = Quantity of material brought at site for bonafide use in the works since previous bill excluding any such quantity consumed in the deviated quantity of items beyond deviation limit and extra /substituted item, paid/to be paid at rates derived on the basis of market rate under clause 12.2.

For Maintenance Works

Q = Quantity of material brought at site for bonafide use in the works since previous bill including any such quantity consumed in the deviated quantity of items beyond deviation limit paid at agreement rate and extra /substituted item being scheduled items, but excluding non schedule extra /substituted item paid/to be paid at market rate under clause 12.2.

Note:

(i) The date wise record of ready mix concrete shall be kept in a register and the cement consumption for the same shall be calculated accordingly.

(ii) If built-up steel items are brought at site from workshop, then the variation shall be paid for the structural steel up to the period when the built up item/finished product is brought at site.

Clo = Price index for cement, steel reinforcement bars and structural steel as issued by the

DG, CPWD and corresponding to the time of base price of respective material indicated in Schedule 'C'. For other items, if any, provided in Schedule 'C', All India Wholesale Price Index for the material as published by the Economic Advisor to Government of India, Ministry of Industry and Commerce and corresponding to the time of base price of respective material indicated in Schedule 'C'.

CI = Price index for cement, steel reinforcement bars and structural steel as issued under the authority of DG, CPWD for period under consideration. For other items, if any, provided in Schedule 'C', All India Wholesale Price Index for the material for period under consideration as published by Economic Advisor to Government of India, Ministry of Industry and Commerce.

Note: (i) In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the index prevailing at the time of stipulated date of completion or the prevailing index of the period under consideration, whichever is less, shall be considered.

Provided always that provisions of the preceding Clause 10 C shall not be applicable in respect of Materials covered in this Clause

(ii) If during progress of work or at the time of completion of work, it is noticed that any material brought at site is in excess of requirement, then amount of escalation if paid earlier on such excess quantity of material shall be recovered on the basis of cost indices as applied at the time of payment of escalation or as prevailing at the time of effecting recovery, whichever is higher.

(iii) Cement mentioned wherever in this clause includes Cement component used in RMC brought at site from outside approved RMC plants, if any

CLAUSE– 10 CC

Payment due to Increase / Decrease in Prices / Wages after Receipt of Tender for Works

If the prices of materials (not being materials supplied or services rendered at fixed prices by the department in accordance with clause 10 & 34 thereof) and/or wages of labour required for execution of the work increase, the contractor shall be compensated for such increase as per provisions detailed below and the amount of the contract shall accordingly be varied, subject to the condition that that such compensation for escalation in prices and wages shall be available only for the work done during the stipulated period of the contract including the justified period extended under the provisions of clause 5 of the contract without any action under clause 2.

However, for the work done during the justified period extended as above, the compensation as detailed below will be limited to prices/wages prevailing at the time of updated stipulated date of completion considering the effect of extra work (to be calculated on pro-rata basis as cost of extra work x stipulated period/tendered cost). No such compensation shall be payable for a work for which the stipulated period of completion is equal to or less than the time as specified in Schedule C. Such compensation for escalation in the prices of materials and labour, when due, shall be worked out based on the following provisions:

- (i) **The base date for working out such escalation shall be the last stipulated date of receipt of tenders including extensions, if any.**

The cost of work on which escalation will be payable shall be reckoned as below :-

(a)	Gross value of work done up to this quarter	:	(A)
(b)	Gross value of work done up to the last quarter	:	(B)
(c)	Gross value of work done since previous quarter(A-B)	:	(C)
(d)	Full assessed value of Secured Advance (excluding materials Covered under Clause 10 CA) fresh paid in this quarter :		(D)
(e)	Full assessed value of Secured Advance (excluding materials Covered under Clause 10 CA) recovered in this quarter :		(E)
(f)	Full assessed value of Secured Advance for which escalation is payable In this quarter (D-E)	:	(F)
(g)	Advance payment made during this quarter	:	(G)
(h)	Advance payment recovered during this quarter	:	(H)
(i)	Advance payment for which escalation is payable in this quarter (G-H)		(I)
(j)	Extra items/deviated quantities of items paid as per Clause 12 based of Prevailing market rates during this quarter	:	(J)

$$\text{Then, } M = C + F + I - J$$

$$W = 0.85 M$$

(iii) Components for materials (except cement, reinforcement bars, structural steel or other materials covered under clause 10 CA) labour, P.O.L., etc. shall be pre-determined for every work and incorporated in the conditions of contract attached to the tender papers included in Schedule 'C'. The decision of the Engineer-in-Charge in working out such percentage shall be binding on the contractors.

(iv) The compensation for escalation for other materials (excluding cement, reinforcement bars, structural steel or other materials covered under clause 10 CA) and P.O.L. shall be worked as per the formula given below:

(a) Adjustment for civil component (except cement, structural steel, reinforcement bars and other materials covered under clause 10CA) / electrical component of construction '

$$V_m = W \times \frac{X_m}{100} + \frac{MI - M_{lo}}{M_{lo}}$$

V_m = Variation in material cost i.e. increase or decrease in the amount in rupees to be paid or recovered.

W = Cost of work done worked out as indicated in sub-para (ii) of Clause 10CC.

X_m = Component of 'materials' (except cement, structural steel, reinforcement bars and other materials covered under clause 10CA) expressed as percent of the total value of work.

MI = All India Wholesale Price Index for civil component/electrical component* of construction material as worked out on the basis of All India Wholesale Price Index for Individual Commodities/ Group Items for the period under consideration as published by Economic Advisor to Govt. of India, Ministry of Industry & Commerce and applying weightages to the Individual Commodities/Group Items. (In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the index prevailing at the time of stipulated date of completion or the prevailing index of the period under consideration, whichever is less, shall be considered.)

M_{lo} = All India Wholesale Price Index for civil component/electrical component* of construction material as worked out on the basis of All India Wholesale Price Index for Individual Commodities/Group Items valid on the last stipulated date of receipt of tender including extension, if any, as published by the Economic Advisor to Govt. of India, Ministry of Industry & Commerce and applying weightages to the Individual Commodities/Group items.

*Note: relevant component only will be applicable.

(b) Adjustment for component of 'POL'

$$V_f = W \times \frac{Z}{100} + \frac{FI - F_{lo}}{F_{lo}}$$

V_f = Variation in cost of Fuel, Oil & Lubricant i.e. increase or decrease in the amount in rupees to be paid or recovered.

W = Cost of Work done worked out as indicated in sub-para (ii) of Clause 10CC.

Z = Component of Fuel, Oil & Lubricant expressed as percent of the total value of work.

FI = All India Wholesale Price Index for Fuel, Oil & Lubricant for the period under consideration as published by Economic Advisor to Govt. of India, Ministry of Industry & Commerce, New Delhi. (In respect of the justified period extended under the provisions of clause 5 of the contract without any action under clause 2, the index prevailing at the time of stipulated date of completion or the prevailing index of the period under consideration, whichever is less, shall be considered.)

F_{lo} = All India Wholesale Price Index for Fuel, Oil & Lubricant valid on the last stipulated date of

receipt of tender including extension, if any.

(v) The following principles shall be followed while working out the indices mentioned in para (iv) above.

(a) The compensation for escalation shall be worked out at quarterly intervals and shall be with respect to the cost of work done as per bills paid during the three calendar months of the said quarter. The dates of preparation of bills as finally entered in the Measurement Book by the Assistant Engineer/ date of submission of bill finally by the contractor to the department in case of computerised measurement books shall be the guiding factor to decide the bills relevant to the quarterly interval. The first such payment shall be made at the end of three months after the month (excluding the month in which tender was accepted) and thereafter at three months' interval. At the time of completion of the work, the last period for payment might become less than 3 months, depending on the actual date of completion.

(b) The index (MI/FI etc.) relevant to any quarter/period for which such compensation is paid shall be the arithmetical average of the indices relevant to the three calendar months. If the period up to date of completion after the quarter covered by the last such installment of payment, is less than three months, the index MI and FI shall be the average of the indices for the months falling within that period.

(vi) The compensation for escalation for labour shall be worked out as per the formula given below:

$$VL = W \times \frac{Y}{100} \times \frac{LI - Llo}{Llo}$$

VL= Variation in labour cost i.e. amount of increase or decrease in rupees to be paid or recovered.

W= Value of work done, worked out as indicated in sub-para (ii) above.

Y= Component of labour expressed as a percentage of the total value of the work.

LI= Minimum wage in rupees of an unskilled adult male mazdoor, fixed under any law, statutory rule or order as applicable on the last date of the quarter previous to the one under consideration. (In respect of the justified period extended under the provisions of Clause 5 of the contract without any action under Clause 2, the minimum wage prevailing on the last date of quarter previous to the quarter pertaining to stipulated date of completion of the minimum wage prevailing on the last date of the quarter previous to the one under consideration, whichever is less, shall be considered.)

Llo= Minimum daily wage in rupees of an unskilled adult male mazdoor, fixed under any law, statutory rule or order as on the last stipulated date of receipt of tender including extension, if any.

(vii) The following principles will be followed while working out the compensation as per Sub-para (vi) above.

- (a) The minimum wage of an unskilled male mazdoor mentioned in sub-para (vi) above shall be the higher of the wage notified by Government of India, Ministry of Labor and that notified by the local administration both relevant to the place of work and the period of reckoning.
- (b) The escalation for labour also shall be paid at the same quarterly intervals when escalation due to increase in cost of materials and/or P.O.L. is paid under this clause. If such revision of minimum wages takes place during any such quarterly intervals, the escalation compensation shall be payable at revised rates only for work done in subsequent quarters.
- (c) Irrespective of variations in minimum wages of any category of labour, for the purpose of this clause, the variation in the rate for an unskilled adult male mazdoor alone shall form the basis for working out the escalation compensation payable on the labour component.

(viii) In the event the price of materials and/or wages of labour required for execution of the work decrease/s, there shall be a downward adjustment of the cost of work so that such price of materials and/or wages of labour shall be deductible from the cost of work under this contract and in this regard the formula herein before stated under this Clause 10CC shall mutatis mutandis apply, provided that :

(a) no such adjustment for the decrease in the price of materials and/or wages of labour aforementioned would be made in case of contract in which the stipulated period of completion of the work is equal to or less than the time as specified in Schedule 'C'.

(b) the Engineer-in-Charge shall otherwise be entitled to lay down the procedure by which the provision of this sub-clause shall be implemented from time to time and the decision of the Engineer-in-Charge in this behalf shall be final & binding on the contractor.

(ix) Provided always that:-

(a) Where provisions of clause 10CC are applicable, provisions of clause 10C will not be applicable but provisions of clause 10CA will be applicable.

(b) Where provisions of clause 10CC are not applicable, provisions of clause 10C and 10CA will become applicable.

CLAUSE- 10D

Dismantled material IISER-Pune Property :-

The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work, etc as IISER PUNE's property and such materials shall be disposed off to the best advantage of IISER Pune according to the instructions in writing issued by the Engineer-in-Charge.

CLAUSE- 11

Work to be Executed in Accordance with Specifications, Drawings, Orders etc.:-

The contractor shall execute the whole and every part of the work in the most substantial and workmanlike manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge and the contractor shall be furnished free of charge one copy of the contract documents together with specifications, designs, drawings and instructions as are not included in the standard specifications of Central Public Works Department specified in Schedule 'C' or in any Bureau of Indian Standard or any other, published Standard or Code or, Schedule of Rates or any other printed publication referred to elsewhere in the contract.

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction.

CLAUSE- 12 :

Deviations/Variations Extent and Pricing :-

The Engineer-in-Charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out of the works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations omissions, additions or

substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

The completion cost of any agreement for Maintenance works including works of up gradation, aesthetic, special repair, addition/ alteration shall not exceed 1.25 times of Tendered amount.

12.1 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, be extended, if requested by the contractor, as follows :

- (i) In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value plus
- (ii) 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

Deviation, Extra Item and pricing

12.2

A. For Project and original works:

In the case of extra item(s) (items that are completely new, and are in addition to the Pricing items contained in the contract), the contractor may within fifteen days of receipt of order or occurrence of the item(s) claim rates, supported by proper analysis, for the work and the engineer-in-charge shall within prescribed time limit of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

B. For Maintenance works including works of up gradation, aesthetic, special repair, addition/ alteration:

In the case of Extra Item(s) being the schedule items (Delhi Schedule of Rates items), these shall be paid as per the schedule rate plus cost index (at the time of tender) plus/minus percentage above/ below quoted contract amount.

Payment of Extra items in case of non-schedule items (Non-DSR items) shall be made as per the prevailing market rate.

12.3

Deviation, Substituted items, pricing

A. For Project and original works:

Substituted In the case of substituted items (items that are taken up with partial substitution or in lieu of Items, items of work in the contract), the rate for the agreement item (to be substituted) and Pricing substituted item shall also be determined in the manner as mentioned in the following para

a) If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

(b) If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted), the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

B. For Maintenance works including works of up gradation, aesthetic, special repair, addition/alteration:

- In the case of Substitute Item(s) being the schedule items (Delhi Schedule of Rates items), these shall be paid as per the schedule rate plus cost index (at the time of tender) plus/minus percentage above/ below quoted contract amount. Payment of Substitute in case of non-schedule items (Non-DSR items) shall be made as per the prevailing market rate.

Deviation, Deviated quantities, pricing:

A. For Project and original works:

In the case of contract items, substituted items, contract cum substituted items, which Quantities, exceed the limits laid down in schedule C, the contractor may within fifteen days of receipt of Pricing order or occurrence of the excess, claim revision of the rates, supported by proper analysis for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities, the Engineer-in-Charge shall within prescribed time limit of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

B. For Maintenance works including works of up gradation, aesthetic, special repair, addition/alteration:

In the case of contract items, which exceed the limits laid down in schedule C, the contractor shall be paid rates specified in the schedule of quantities.

The prescribed time limits for finalising rates for Extra Item(s), Substitute Item(s) and Deviated Quantities of contract items are as under:

- (i) If the Tendered value of work is up to Rs. 45 lac : 30 days.
- (ii) If the Tendered value of work is more than Rs. 45 Lac and up to Rs. 2.5 Crore : 45 days
- (iii) If the Tendered value of work exceeds Rs. 2.5 Crore : 60 days.

12.3 A. For Project and original works:

The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the limits laid down in Schedule C, and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

B. For Maintenance works including works of up gradation, aesthetic, special repair, addition/alteration:

In case of decrease in the rates prevailing in the market of items for the work in excess of the limits laid down in Schedule C, the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within fifteen days of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of fifteen days having regard to the market rates.

- 12.4 The contractor shall send to the Engineer-in-Charge once every three months, an up to date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge which he has executed during the preceding quarter failing which the contractor shall be deemed to have waived his right. However, the Director IISER Pune may authorize consideration of such claims on merits.

12.5 For the purpose of operation of Schedule C, the following works shall be treated as works relating to foundation :

- (i) For buildings, compound walls, plinth level or 1.2 metres (4 feet) above ground level, whichever is lower excluding items of flooring and D.P.C. but including base concrete, below the floors.
- (ii) For abutments, piers, retaining walls of culverts and bridges, walls of water reservoirs, the bed of floor level.
- (iii) For retaining walls where floor level is not determinate, 1.2 metres above the average ground level or bed level.
- (i) For the reservoirs/tank (other than overhead reservoir/tanks): All works up to 1.2 metres above the ground level.
- (v) For Basement: All works up to 1.2m above ground level or up to floor 1 level whichever is lower.

(vi) For Roads, all items of excavation & filling treatment of sub – base.

- 12.6 Any operation incidental to or necessarily has to be in contemplation of tenderer while Filing, tender or necessary for proper execution of the item included in the Schedule of Quantities or in the Schedule of Rates mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer or the rate given in the said Schedule of Rates, as the case may be. Nothing extra shall be admissible for such operations.

CLAUSE- 13

Foreclosure of Contract due to Abandonment or Reduction in Scope of Work :-

If at any time after acceptance of the tender, Engineer in charge shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment or compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

The contractor shall be paid at contract rates. full amount for works executed at site and in addition, a reasonable amount as certified by the Engineer-in-Charge for the items hereunder mentioned which could not be utilised on the work to the full extent in view of the foreclosure:-

- i). Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site office; storage accommodation and water storage tanks.
- ii). IISER Pune shall have the option to take over contractor's materials or any part thereof either brought to site or of which the contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however IISER Pune shall be bound to take over the materials or such portions thereof as the contractor does not desire to retain. For materials taken over or to be taken over by IISER Pune, cost of such materials as detailed by Engineer-in-Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the contractor.
- iii). If any materials supplied by IISER Pune are rendered surplus, the same except normal wastage shall be returned by the contractor to IISER Pune at rates not exceeding those at which these were originally issued, less allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the contractor. In addition, cost of transporting such materials from site to IISER Pune stores, if so required by IISER Pune, shall be paid.

- iv). Reasonable compensation for transfer of Tools & Plants from site to contractor's permanent stores or to his other works, whichever is less. If Tools & Plants are not transported to either of the said places, no cost of transportation shall be payable.
- (v). Reasonable compensation for repatriation of contractor's site staff and imported labour to the extent necessary.

The contractor shall, if required by the Engineer-in-Charge, furnish to him books of account, wage books, time sheets and other relevant documents and evidence as may be necessary to enable him to certify the reasonable amount payable under this conditions.

The reasonable amount of items on (i), (iv) and (v) above shall not be in excess of 2% of the cost of the work remaining incomplete on the date of closure, i.e. total stipulated cost of the work as per accepted tender less the cost of work actually executed under the contract and less the cost of contractor's materials at site taken over by the IISER Pune as per item (ii) above. Provided always that against any payments due to the contractor on this account or otherwise, the Engineer-in-Charge shall be entitled to recover or be credited with any outstanding balance due from the contractor for advance paid in respect of any tool, plants and materials and any other sums which at the date of termination were recoverable by the IISER Pune from the contractor under the terms of the contract.

A compensation for such eventuality, on account of damages etc. shall be payable @ 0.5% of cost of work remaining incomplete on date of closure i.e. total stipulated cost of the work less the cost of work actually executed under the contract shall be payable.

CLAUSE- 14

Carrying out part work at risk & cost of contractor

If contractor:

- (i) At any time makes default during currency of work or does not execute any part of the work with due diligence and continues to do so even after a notice in writing of 7 days in this respect from the Engineer-in-Charge; or
- (ii) Commits default in complying with any of the terms and conditions of the contract and does not remedy it or takes effective steps to remedy it within 7 days even after a notice in writing is given in that behalf by the Engineer-in-Charge; or

Fails to complete the work(s) or items of work with individual dates of completion, on or before the date(s) so determined, and does not complete them within the period specified in the notice given in writing in that behalf by the Engineer-in-Charge.

The Engineer-in-Charge without invoking action under clause 3 may, without prejudice to any other right or remedy against the contractor which have either accrued or accrue thereafter to IISER Pune, by a notice in writing to take the part work / part incomplete work of any item(s) out

of his hands and shall have powers to:

(a) Take possession of the site and any materials, constructional plant, implements, stores, etc., thereon; and/or

(b) Carry out the part work / part incomplete work of any item(s) by any means at the risk and cost of the contractor.

The Engineer-in-Charge shall determine the amount, if any, is recoverable from the contractor for completion of the part work/ part incomplete work of any item(s) taken out of his hands and execute at the risk and cost of the contractor, the liability of contractor on account of loss or damage suffered by IISER Pune because of action under this clause shall not exceed 10% of the tendered value of the work.

In determining the amount, credit shall be given to the contractor with the value of work done in all respect in the same manner and at the same rate as if it had been carried out by the original contractor under the terms of his contract, the value of contractor's materials taken over and incorporated in the work and use of plant and machinery belonging to the contractor. The certificate of the Engineer-in-Charge as to the value of work done shall be final and conclusive against the contractor provided always that action under this clause shall only be taken after giving notice in writing to the contractor. Provided also that if the expenses incurred by the department are less than the amount payable to the contractor at his agreement rates, the difference shall not be payable to the contractor.

Any excess expenditure incurred or to be incurred by IISER Pune in completing the part work/ part incomplete work of any item(s) or the excess loss of damages suffered or may be suffered by Government as aforesaid after allowing such credit shall without prejudice to any other right or remedy available to IISER Pune in law or per as agreement be recovered from any money due to the contractor on any account, and if such money is insufficient, the contractor shall be called upon in writing and shall be liable to pay the same within 30 days.

If the contractor fails to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to sell any or all of the contractors' unused materials, constructional plant, implements, temporary building at site etc. and adjust the proceeds of sale thereof towards the dues recoverable from the contractor under the contract and if thereafter there remains any balance outstanding, it shall be recovered in accordance with the provisions of the contract.

In the event of above course being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advance on any account or with a view to the execution of the work or the performance of the contract.

CLAUSE- 15

Suspension of work

- i). The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons :-
- a). On account of any default on the part of the contractor or
 - b). for proper execution of the works or part thereof for reasons other than the default of the contractor, or
 - c). for safety of the works or part thereof

The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

- ii). If the suspension is ordered for reasons (b) and (c) in sub-para (i) above :-
- a). The contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part and :
 - b). If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries and/ or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within fifteen days of the expiry of the period of 30 days.
- iii). If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer-in-Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by IISER Pune or where it affects whole of the works, as an abandonment of the works by IISER Pune, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge.

In the event of the contractor treating the suspension as an abandonment of the contract by IISER Pune, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/ or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provide the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.

CLAUSE 15 A

The contractor shall not be entitled to claim any compensation from Government for the loss suffered by him on account of delay by Government in the supply of materials in schedule 'B' where such delay is covered by the difficulties relating to the supply of wagons, force majeure or any reasonable cause beyond the control of the Government.

This clause 15 A will not be applicable for works where no material is stipulated

CLAUSE- 16

Action in case Work not Done as per Specifications :-

All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in-Charge, his authorized subordinates In charge of the work and all the superior officers, officer of the Quality Assurance Unit of the IISER Pune or any organization engaged by the IISER Pune for Quality Assurance and Chief Technical Examiner's Office of The Central Vigilance Commission of India, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-Charge or his authorised subordinates In charge of the work or to the in charge of Quality Assurance or his subordinate officers or the officers of the organization engaged by the IISER Pune for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality interior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months (six months in case of the work costing Rs.10 Lac and below except road work) of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-Charge in his demand

aforesaid, then the contractor shall be liable to pay compensation at the same rate as under Clause 2 of the contract (for non-completion of the work in time) for this default.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the authority **specified in Schedule 'C'** may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment and/ or get it and other connected and incidental items rectified, or removed and re-executed at the risk and cost of the contractor. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

CLAUSE- 17

Contractor Liable for Damages, Defects during Maintenance Period:-

If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part is being executed, or if any damage shall happen to the work while in progress, from any cause whatever of if any defect, shrinkage or other faults appear in the work within twelve months (6 months in the case of any work costing Rs. 10,00,000/- and below except road work) after a certificate final or otherwise of its completion shall have been given by the Engineer-in-Charge as aforesaid arising out of defect or improper materials or workmanship the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense or in default the Engineer-in-Charge cause the same to be made good by other workman and deduct the expense from any sums that may be due or at any time thereafter may become due to the contractor, or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of twelve months (six months in the case of work costing Rs. Ten lacs and below except road work) after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later. Provided that in the case of road work if in the opinion of the Engineer-in-Charge, half of the security deposit is sufficient, to meet all liabilities of the contractor under this contract, half of the security deposit will be refundable after six months and the remaining half after twelve months of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later.

In case of Maintenance and operation works of Electrical & Mechanical services, the security deposit deducted from contractors shall be refunded within one month from the date of final payment or within one month from the date of completion of the maintenance contract whichever is earlier.

CLAUSE- 18

Contractor to Supply Tools & Plants etc. :-

The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), machinery, tools & plants as specified in Schedule 'C' In addition to this, appliances, implements,

other plants, ladders, cordage, tackle, scaffolding and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specification or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting the measurement for examination at any time and from time to time of the work or materials. Failing his so doing the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under this contract or otherwise and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

CLAUSE- 18 A

Recovery of Compensation paid to Workmen :-

In every case in which by virtue of the provisions sub-section (1) of section 12, of the Workmen's Compensation Act, 1923, IISER Pune is obliged to pay compensation to a workman employed by the contractor, in execution of the works, IISER Pune will recover from the contractor, for the amount of the compensation so paid ; and, without prejudice to the rights of the IISER Pune under sub-section (2) of Section 12, of the said Act, IISER Pune shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by IISER Pune to the contractor whether under this contract or otherwise. IISER Pune shall not be bound to contest any claim made against it under Sub-Section (1) Section 12, of the said Act, except on the written request of the contractor and upon his giving to IISER Pune full security for all costs for which IISER Pune might become liable in consequence of contesting such claim.

CLAUSE- 18 B

Ensuring Payment and Amenities to Workers if Contractor fails :-

In every case in which by virtue of the provisions of the Contract Labor (Regulation and Abolition) Act, 1970, and of the Contract Labor (Regulation and Abolition) Central Rules, 1971, IISER Pune is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the rules under Clause 19H or under the C.P.W.D. Contractor's Labor Regulations, or under the Rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by IISER Contractors, IISER Pune will recover from the contractor, the amount of wages so paid or the amount of expenditure so incurred, and without prejudice to the rights of the IISER Pune under sub-Section (2) of Section 20, and sub-Section (4) of Section 21, of the Contract Labor (Regulation and Abolition) Act, 1970, IISER Pune shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by IISER Pune to the contractor whether under this contract or otherwise IISER Pune shall not be bound to contest any claim made against it under sub-Section (1) of Section 20, sub-Section (4) of Section 21, of the said Act, except on the written request of the contractor and upon his giving to the IISER Pune full security for all costs for which IISER Pune might become liable in contesting such claim.

CLAUSE- 19**Labor Laws to be Complied by the Contractor :-**

The contractor shall obtain a valid license under the Contract Labor (Regulation & Abolition) Act, 1970, and the Contract Labor (Regulation and Abolition) Central Rules 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provisions of the Child Labor (Prohibition & Regulation) Act, 1986.

The contractor shall also comply with the provisions of the building & other Construction Workers (Regulation and Conditions of Services) Act, 1996 and the building and other Construction Workers Welfare Cess Act, 1996.

Any failure to fulfill these requirements shall attract the penal provisions of this contract arising out of the resultant non-execution of the work.

CLAUSE- 19A

No labour below the age of fourteen years shall be employed on the work.

CLAUSE-19B**Payment of Wages :-**

- i). The contractor shall pay to labour employed by him either directly or through sub-contractors, wages not less than fair wages as defined in the C.P.W.D. Contractor's Labor Regulations or as per the provisions of the Contract Labor (Regulation and Abolition) Act, 1970 and the contract Labor (Regulation and Abolition) Central Rules, 1971, wherever applicable.
- ii). The contractor shall, notwithstanding the provisions of any contract to the contrary, cause to be paid fair wage to labour indirectly engaged on the work, including any labour engaged by his sub-contractors in connection with the said work, as if the labour had been immediately employed by him.
- iii). In respect of all labour directly or indirectly employed in the works for performance of the contractor's part of this contract, the contractor shall comply with or cause to be complied with the Central Public Works Department contractor's Labor Regulations made by Government from time to time in regard to payment of wages, wage period, deductions from wages recovery of wages not paid and deductions unauthorisedly made, maintenance of wage books or wage slips, publication of scale of wages and other terms of employment, inspection and submission of periodical returns and all other

matters of the like nature or as per the provisions of the Contract Labor (Regulation and Abolition) Act 1970, and the Contract Labor (Regulation and Abolition) Central Rules, 1971 wherever applicable.

- iv). a). The Engineer-in-Charge concerned shall have the right to deduct from the moneys due to the contractor any sum required or estimated to be required for making good the loss suffered by a worker or workers by reason of non-fulfillment of the conditions of the contract for the benefit of the workers, non-payment of wages or of deductions made from his or their wages which are not justified by their terms of the contract or non-observance of the Regulations.
- b). Under the provision of Minimum Wages (Central) Rules, 1950, the contractor is bound to allow to the labours directly or indirectly employed in the works one day rest for 6 days continuous work and pay wages at the same rate as for duty. In the event of default, the Engineer-in-Charge shall have the right to deduct the sum or sums not paid on account of wages for weekly holidays to any labours and pay the same to the persons entitled thereto from any money due to the contractor by the Engineer-in-Charge concerned.

In the case of Union Territory of Delhi, however, as the all inclusive minimum daily wages fixed under Notification of the Delhi Administration No.F.12 (162) MWO / DAB / 43884-91, dated 31-12-1979 as amended from time to time are inclusive of wages for the weekly day of rest, the question of extra payment for weekly holiday would not arise.

- v). The contractor shall comply with the provisions of the Payment of Wages Act, 1936, Minimum Wages Act, 1948, Employees Liability Act, 1938, Workmen's Compensation Act, 1923, Industrial Disputes Act, 1947, Maternity Benefits Act, 1961, and the Contractor's Labor (Regulation and Abolition) Act 1970, or the modifications thereof or any other laws relating thereto and the rules made there under from time to time.
- vi). The contractor shall indemnify and keep indemnified Government against payments to be made under and for the observance of the laws aforesaid and the C.P.W.D. Contractor's Labor Regulations without prejudice to his right to claim indemnity from his sub-contractors.
- vii). The laws aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract.
- viii). Whatever is the minimum wage for the time being, or if the wage payable is higher than such wage, such wage shall be paid by the contractor to the workmen directly without the intervention of Jamadar and that Jamadar shall not be entitled to deduct or recover any amount from the minimum wage payable to the workmen as and by way of commissions or otherwise.

- ix) The contractor shall ensure that no amount by way of commission or otherwise is deducted or recovered by the Jamadar from the wage of workmen.

CLAUSE 19C

In respect of all labour directly or indirectly employed in the work for the performance of the Contractor's part of this contract, the contractor shall at his own expense arrange for the safety provisions as per C.P.W.D. Safety Code framed from time to time and shall at his own expense provide for all facilities in connection therewith. In case the contractor fails to make arrangement and provide necessary facilities as aforesaid, he shall be liable to pay a penalty of Rs.200/- for each default and in addition, the Engineer-in-Charge shall be at liberty to make arrangement and provide facilities as aforesaid and recover the costs incurred in that behalf from the contractor.

CLAUSE 19D

The contractor shall submit by the 4th and 19th of every month, to the Engineer-in-Charge, a true statement showing in respect of the second half of the preceding month and the first half of the current month respectively.

- (1) the number of labourers employed by him on the work,
- (2) their working hours,
- (3) the wages paid to them.
- (4) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them, and
- (5) the number of female workers who have been allowed maternity benefit according to Clause 19F and the amount paid to them.

Failing which the contractor shall be liable to pay to IISER Pune, a sum not exceeding Rs.200/- for each default or materially incorrect statement. The decision of the Engineer-in-Charge shall be final in deducting from any bill due to the contractor the amount levied as fine and be binding on the contractor.

CLAUSE 19 E

In respect of all labour directly or indirectly employed in the works for the performances of the contractor's part of this contract, the contractor shall comply with or cause to be complied with all the rules framed by Government from time to time for the protection of health and sanitary arrangements for worker employed by Central Public Works Department and its contractors.

CLAUSE 19F

Leave and pay during leave shall be regulated as follows:

1. Leave:

- (i) In the case of delivery- maternity leave not exceeding 8 weeks, 4 weeks up to and including the day of delivery and 4 weeks following that day.
- (ii) In the case of miscarriage - up to 3 weeks from the date of miscarriage.

2. Pay:

- (i) In the case of delivery - leave pay during maternity leave will be at the rate of the women's average daily earnings, calculated on total wages earned on the days when full time work was done during a period of three months immediately preceding the date on which she gives notice that she expects to be confined or at the rate of Rupee one only a day whichever is greater.
- (ii) In the case of miscarriage- leave pay at the rate of average daily earnings calculated on the total wages earned on the days when full time wages was done during a period of three months immediately preceding the date of such miscarriage.

3. Conditions for the grant of Maternity Leave:

No maternity leave benefit shall be admissible to a woman unless she has been employed for a total period of not less than six months immediately preceding the date on which she proceeds on leave.

4. The contractor shall maintain a register of Maternity (Benefit) in the Prescribed Form as shown in appendix – I and II, and the same shall be kept at the place of work.

CLAUSE 19 G

In the event of the contractor(s) committing a default or breach of any of the provisions of the Central Public Works Department, Contractor's Labor Regulations and Model Rules for the protection of health and sanitary arrangements for the workers as amended from time to time or furnishing any information or submitting or filling any statement under the provisions of the above Regulations and Rules which is materially incorrect, he/ they shall, without prejudice to any other liability, pay to the IISER Pune a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting, filling such materially incorrect statements and in the event of the contractor(s) defaulting continuously in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of 5 percent of the estimated cost of the work put to tender. The decision of the Engineer-in-Charge shall be final and binding on the parties.

Should it appear to the Engineer-in-Charge that the contractor(s) is/are not properly observing and complying with the provisions of the C.P.W.D. Contractor's Labor Regulations and Model Rules and the provisions of the Contract Labor (Regulation and Abolition) Act 1970, and the Contract Labor (R&A) Central Rules 1971, for the protection of health and sanitary arrangements for work-people employed by the contractor(s) (hereinafter referred as "the said Rules") the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said Rules be complied with and the amenities prescribed therein be provided to the work-people within a reasonable time to be specified in the notice. If the contractor(s) shall fail within the period specified in the notice to comply with and/ observe the said Rules and to provide the

amenities to the work-people as aforesaid, the Engineer-in-Charge shall have the power to provide the amenities herein before mentioned at the cost of the contractor(s). The contractor(s) shall erect, make and maintain at his/ their own expense and to approved standards all necessary huts and sanitary arrangements required for his/ their work-people on the site in connection with the execution of the works, and if the same shall not have been erected or constructed, according to approved standards, the Engineer-in-Charge shall have power to give notice in writing to the contractor(s) requiring that the said huts and sanitary arrangements be remodeled and/ or reconstructed according to approved standards, and if the contractor(s) shall fail to remodel or reconstruct such huts and sanitary arrangements according to approved standards within the period specified in the notice, the Engineer-in-Charge shall have the power to remodel or reconstruct such huts and sanitary arrangements according to approved standards at the cost of the contractor(s).

CLAUSE 19H

The contractor(s) shall at his/ their own cost provide his/ their labour with a sufficient number of huts (hereinafter referred to as the camp) of the following specifications on a suitable plot of land to be approved by the Engineer-in-Charge.

- I) a) The minimum height of each hut at the eaves level shall be 2.10m (7ft.) and the floor area to be provided will be at the rate of 2.7 sq. m. (30 sq. ft.) for each member of the worker's family staying with the labourer.
- b) The contractor(s) shall in addition construct suitable cooking places having a minimum area of 1.80m x 1.50m (6' x 5') adjacent to the hut for each family.
- c) The contractor(s) shall also construct temporary latrines and urinals for the use of the labourers each on the scale of not less than four per each one hundred of the total strength, separate latrines and urinals being provided for women.
- d) The contractor(s) shall construct sufficient number of bathing and washing places, one unit for every 25 persons residing in the camp. These bathing and washing places shall be suitably screened.
- II) a) All the huts shall have walls of sun-dried or burnt-bricks laid in mud mortar or other suitable local materials as may be approved by the Engineer-in-Charge. In case of sun-dried bricks, the walls should be plastered with mud gobri on both sides. The floor may be kutcha but plastered with mud gobri and shall be at least 15cm (6") above the surrounding ground. The roofs shall be laid with thatch or any other materials as may be approved by the Engineer-in-Charge and the contractor shall ensure that throughout the period of their occupation, the roofs remain water-tight.
- b) The contractor(s) shall provide each hut with proper ventilation.
- c) All doors, windows, and ventilators shall be provided with suitable leaves for security purposes.
- d) There shall be kept an open space of at least 7.2m (8 yards) between the rows of huts which may be reduced to 6m (20 ft.) according to the availability of site with the approval of the Engineer-in-Charge. Back to back construction will be allowed.

- III) **Water Supply** – The contractor(s) shall provide adequate supply of water for the use of labourers. The provisions shall not be less than two gallons of pure and wholesome water per head per day for drinking purpose and three gallons of clean water per head per day for bathing and washing purpose. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which may be of metal or masonry, shall be provided. The contractor(s) shall also at his/their own cost make arrangements for laying pipe lines for water supply to his/their labour camp from the existing mains wherever available, and shall pay all fees and charges therefore.
- IV) The site selected for the camp shall be high ground, removed from jungle.
- V) **Disposal of Excreta** – The contractor(s) shall make necessary arrangements for the disposal of excreta from the latrines by trenching or incineration which shall be according to the requirements laid down by the Local Health Authorities. If trenching or incineration is not allowed, the contractor(s) shall make arrangements for the removal of the excreta through the Municipal Committee/authority and inform it about the number of labourers employed so that arrangements may be made by such Committee/authority for the removal of the excreta. All charges on this account shall be borne by the contractor and paid direct by him to the Municipality/authority. The contractor shall provide one sweeper for every eight seats in case of dry system.
- Vi) **Drainage** – The contractor(s) shall provide efficient arrangements for draining away Sullage water so as to keep the camp neat and tidy.
- VII) The contractor(s) shall make necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers.
- VIII) **Sanitation** – The contractor(s) shall make arrangements for conservancy and sanitation in the labour camps according to the rules of the Local Public Health and Medical Authorities.

CLAUSE 19 I

The Engineer-in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractor's employ upon the work who may be incompetent or misconduct himself and the contractor shall forthwith comply with such requirements.

CLAUSE 19 J

It shall be the responsibility of the contractor to see that the building under construction is not occupied by anybody unauthorizedly during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally then the Engineer-in-Charge shall have the option to refuse to accept the said building / buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and for such delay, a levy up to 5% of tendered value of work may be imposed by the Engineer-in-Charge whose decision shall be final both with regard to the justification and quantum and be binding on the contractor.

However, the Engineer-in-Charge, through a notice, may require the contractor to remove the illegal occupation any time on or before construction and delivery.

CLAUSE 19 K**Employment of Skilled / Semi Skilled Workers –**

The contractor shall, at all stages of work, deploy skilled/semi skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute / Industrial Training Institute/National Institute of construction Management and Research (NICMAR) / National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/certified by State/Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/semi skilled workers required in such trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certified from recognized Institute to Engineer-in-Charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs.100 per such tradesmen per day. Decision of Engineer-in-Charge as to whether particular tradesmen possess requisite skill and amount of compensation in case of default shall be final and binding.

Provided always, that the provisions of this Clause shall not be applicable for works with estimated cost put to tender being less than Rs. 5 crores.

CLAUSE 19L**Registration with EPFO and ESIC**

The ESI and EPF contributions on the part of employer in respect of this contract shall be paid by the contractor. These contributions on the part of the employer paid by the contractor shall be reimbursed by the Engineer-in-charge to the contractor on actual basis.

CLAUSE 20:**Minimum Wages Act to be complied with:**

The Contractor shall comply with all the provisions of the Minimum Wages Act, 1948, and Contract Labor (Regulation & Abolition) Act, 1970, amended from time to time and rules framed there under and other labour laws affecting contract labour that may be brought into force from time to time.

CLAUSE 21 :**Work not to be sublet. Action in case of insolvency -**

The Contract shall not be assigned or sublet without the written approval of the Engineer-in-Charge. And if the contractor shall assign or sublet his contract, or attempt to do so, or become insolvent or commence any insolvency proceedings or make any composition with his creditors or attempt to do so, or if any bribe, gratuity, gift, loan, perquisite, reward or advantage pecuniary or otherwise, shall either directly or indirectly, be given, promised or offered by the contractor, or any of his servants or agent to any public officer or persons in the employ of IISER Pune in any way relating to his office or employment, or if any such officer or person shall become in any way directly or indirectly interested in the contract, the Engineer-in-Charge on behalf of the Director IISER Pune shall have power to adopt the courses specified in Clause 3 hereof in the interest of

IISER Pune and in the event of such course being adopted, the consequences specified in the said Clause 3 shall ensue.

CLAUSE 22 :

All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of IISER Pune without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

CLAUSE 23 :

Changes in Firm's Constitution to be Intimated -

Where the Contractor is a partnership firm, the previous approval in writing of the Engineer-in-Charge shall be obtained before any change is made in the constitution of the firm. Where the contractor is an individual or a Hindu undivided family business concern, such approval as aforesaid shall likewise be obtained before the Contractor enters into any partnership agreement where under the partnership firm would have the right to carry out the works hereby undertaken by the contractor. If previous approval as aforesaid is not obtained, the contract shall be deemed to have been assigned in contravention of Clause 21 hereof and the same action may be taken, and the same consequences shall ensue as provided in the said Clause 21.

CLAUSE 24 :

All works to be executed under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced, and from time to time carried on.

CLAUSE 25 :

Settlement of Disputes & Arbitration -

Except where otherwise provided in the contract, all questions and disputes relating to the meaning of the specifications, design, drawings and instructions here-in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be dealt with as mentioned hereinafter :-

i) If the contractor considers any work demanded of him to be outside the requirements of the contract, or disputes any drawings, record or decision given in writing by the Engineer-in-Charge on any matter in connection with or arising out of the contract or carrying out of the work, to be unacceptable, he shall promptly within 15 days request the Director, IISER, Pune in writing for written instruction or decision. Thereupon, the Director, IISER, Pune shall give his written instructions or decision within a period of one month from the receipt of the contractor's letter.

If the Director, IISER, Pune fails to give his instructions or decision in writing within the aforesaid period or if the contractor is dissatisfied with the instruction or decision of the Director, IISER, Pune, the contractor may, within 15 days of the receipt of Director, IISER, Pune decision, appeal to the Chairman Building & works Committee (BWC), IISER Pune who shall afford an opportunity

to the contractor to be heard, if the latter so desires, and to offer evidence in support of his appeal. The Chairman BWC, IISER Pune shall give his decision within 30 days of receipt of contractor's appeal. If the contractor is dissatisfied with the decision Chairman BWC, IISER Pune, the contractor shall within a period of 30 days from receipt of the Chairman BWC, IISER Pune decision, appeal before the Dispute Redressal Committee (DRC) along with a list of disputes with amounts claimed in respect of each such dispute and giving reference to the rejection of his disputes by the Chairman BWC, IISER Pune. The Dispute Redressal Committee (DRC) shall give his decision within a period of 90 days from the receipt of Contractor's appeal. The constitution of Dispute Redressal Committee (DRC) shall be as indicated in Schedule 'C'. If the Dispute Redressal Committee (DRC) fails to give his decision within the aforesaid period or any party is dissatisfied with the decision of Dispute Redressal Committee (DRC), then either party may within a period of 30 days from the receipt of the decision of Dispute Redressal Committee (DRC), give notice to the Chairman, Building and Works Committee, IISER, Pune for appointment of arbitrator on prescribed proforma as per Appendix XV, failing which the said decision shall be final binding and conclusive and not referable to adjudication by the arbitrator.

It is a term of contract that each party invoking arbitration must exhaust the aforesaid mechanism of settlement of claims/disputes prior to invoking arbitration.

ii) Except where the decision has become final, binding and conclusive in terms of Sub Para (i) above, disputes or difference shall be referred for adjudication through arbitration by a sole arbitrator appointed by the Chairman, Building and Works Committee, IISER Pune, If the arbitrator so appointed is unable or unwilling to act or resigns his appointment or vacates his office due to any reason whatsoever, another sole arbitrator shall be appointed in the manner aforesaid. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor.

It is a term of this contract that the party invoking arbitration shall give a list of disputes with amounts claimed in respect of each such dispute along with the notice for appointment of arbitrator and giving reference to the rejection by the Chairman, Building and Works Committee, IISER Pune of the appeal.

It is also a term of this contract that no person, other than a person appointed by such The Chairman, Building and Works Committee, IISER Pune or, as aforesaid, should act as arbitrator and if for any reason that is not possible, the matter shall not be referred to arbitration at all.

It is also a term of this contract that if the contractor does not make any demand for appointment of arbitrator in respect of any claims in writing as aforesaid within 120 days of receiving the intimation from the Engineer-in-Charge that the final bill is ready for payment, the claim of the contractor shall be deemed to have been waived and absolutely barred and the IISER Pune shall be discharged and released of all liabilities under the contract in respect of these claims.

The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 (26 of 1996) or any statutory modifications or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause.

It is also a term of this contract that the arbitrator shall adjudicate on only such disputes as are referred to him by the appointing authority and give separate award against each dispute and claim referred to him and in all cases where the total amount of the claims by any party exceeds Rs.1,00,000/- the arbitrator shall give reasons for the award.

It is also a term of the contract that if any fees are payable to the arbitrator, these shall be paid equally by both the parties.

It is also a term of the contract that the arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the parties calling them to submit their statement of claims and counter statement of claims. The venue of the arbitration shall be such place as may be fixed by the arbitrator in his sole discretion. The fees, if any, of the arbitrator shall, if required to be paid before the award is made and published, be paid half and half by each of the parties. The cost of the reference and of the award (including the fees, if any, of the arbitrator) shall be in the discretion of the arbitrator who may direct to any by whom and in what manner, such costs or any part thereof shall be paid and fix or settle the amount of costs to be so paid.

CLAUSE 26**Contractor to Indemnify IISER Pune against Patent Rights -**

The Contractor shall fully indemnify and keep indemnified the Director IISER Pune against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against IISER Pune in respect of any such matters as aforesaid, the contractor shall be immediately notified thereof and the contractor shall be at liberty, at his own expense, to settle any dispute or to conduct any litigation that may arise there from, provided that the contractor shall not be liable to indemnify the Director IISER Pune if the infringement of the patent or design or any alleged patent or design right is the direct result of an order passed by the Engineer-in-Charge in this behalf.

CLAUSE 27 :**Lump sum Provisions in Tender -**

When the estimate on which a tender is made includes lump sum in respect of parts of the work, the contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-Charge payable of measurement, the Engineer-in-Charge may at his discretion pay the lump sum amount entered in the estimate, and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the contractor with regard to any sum or sums payable to him under the provisions of the clause.

CLAUSE 28 :**Action Where no Specifications are Specified -**

In case of any class of work for which there is no such specifications as referred to in Clause 11, such work shall be carried out in accordance with the Bureau of Indian Standard Specifications. In case there are no such specifications in Bureau of Indian Standards, the work shall be carried out as per Manufacturer's Specifications, In case there are no such specifications as required above, the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

CLAUSE 29 : With-Holding and Lien in Respect of Sums Due from Contractor:

- (i) Whenever any claim or claims for payment of a sum of money arises out of or under the contract or against the contractor, the Engineer-in-Charge or the IISER Pune shall be entitled to withhold and also have a lien to retain such sum or sums in whole or in part from the security, if any deposited by the contractor and for the purpose aforesaid, the Engineer-in-Charge or the IISER Pune shall be entitled to withhold the security deposit, if any, furnished as the case may be and also have a lien over the same pending finalisation or adjudication of any such claim. In the event of the security being insufficient to cover the claimed amount or amounts or if no security has been taken from the contractor, the Engineer-in-Charge or the IISER Pune shall be entitled to withhold and have a lien to retain to the extent of such claimed amount or amounts referred to above, from any sum or sums found payable or which may at any time thereafter become payable to the contractor under the same contract or any other contract with the Engineer-in-Charge of the IISER Pune or any contracting person through the Engineer-in-Charge pending finalisation of adjudication of any such claim.

It is an agreed term of the contract that the sum of money or moneys so withheld or retained under the lien referred to above by the Engineer-in-Charge or IISER Pune will be kept withheld or retained as such by the Engineer-in-Charge or IISER Pune till the claim arising out of or under the contract is determined by the arbitrator (if the contract is governed by the arbitration clause) by the competent court, as the case may be and that the contractor will have no claim for interest or damages whatsoever on any account in respect of such withholding or retention under the lien referred to above and duly notified as such to the contractor. For the purpose of this clause, where the contractor is a partnership firm or a limited company, the Engineer-in-Charge or the IISER Pune shall be entitled to withhold and also have a lien to retain towards such claimed amount or amounts in whole or in part from any sum found payable to any partner/ limited company as the case may be, whether in his individual capacity or otherwise.

- (ii) IISER Pune shall have the right to cause an audit and technical examination of the works and the final bills of the contractor including all supporting vouchers, abstract etc. to be made after payment of the final bill and if as a result of such audit and technical examination any sum is found to have been overpaid in respect of any work done by the contractor under the contract or any work claimed to have been done by him under the contract and found not to have been executed, the contractor shall be liable to refund the amount of over-payment and it shall be lawful for IISER Pune to recover the same from him in the manner prescribed in sub-Clause (i) of this Clause or in any other manner legally permissible; and if it is found that the contractor was paid less than what was due to him under the contract in respect of any work executed by him under it, the amount of such under payment shall be duly paid by IISER Pune to the contractor, without any interest thereon whatsoever.

Provided that the IISER Pune shall not be entitled to recover any sum overpaid, nor the contractor shall be entitled to payment of any sum paid short where such payment has been agreed upon between the Engineer-in-Charge or the Director IISER Pune on the one hand and the contractor on the other under any term of the contract permitting payment for work after assessment by the Engineer-in-Charge or the Director IISER Pune.

CLAUSE 29A :

Lien in Respect of Claims in other Contracts

Any sum of money due and payable to the contractor (including security deposit returnable to him) under the contract may be withheld or retained by way of lien by the Engineer-in-Charge or the IISER Pune or any other contracting person or persons through Engineer-in-Charge against any claim of the Engineer-in-Charge or IISER Pune or such other person or persons in respect of payment of a sum of money arising out of or under any other contract made by the contractor with the Engineer-in-Charge or the IISER Pune or with such other person or persons.

It is an agreed term of the contract that the sum of money so withheld or retained under this Clause by the Engineer-in-Charge or the IISER Pune will be kept withheld or retained as such by the Engineer-in-Charge or IISER Pune or till his claim arising out of the same contract or any other contract is either mutually settled or determined by the Arbitration Clause or by the competent court, as the case may be and that the contractor shall have no claim for interest or damages whatsoever on this account or on any other ground in respect of any sum of money withheld or retained under this Clause and duly notified as such to the contractor.

CLAUSE 30 :

Unfiltered Water Supply

The Contractor(s) shall make his/ their own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions.

- i) That the water used by the contractor(s) shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.
- ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of contractor(s) if the arrangements made by the contractor(s) for procurement of water are in the opinion of the Engineer-in-Charge, unsatisfactory.

CLAUSE 31

Departmental Water Supply, if Available

Water if available may be supplied to the contractor by the department subject to the following conditions:-

- (i) The water charges @ 1% shall be recovered on gross amount of the work done.
- (ii) The contractor(s) shall make his/their own arrangement of water connection and laying of pipelines from existing main of source of supply.
- (iii) The Department do not guarantee to maintain uninterrupted supply of water and it will be incumbent on the contractor(s) to make alternative arrangements for water at his/ their own cost in the event of any temporary break down in the IISER Pune water main so that the progress of his/their work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such break down.

CLAUSE 32:

Alternate Water Arrangements

- i) Where there is no piped water supply arrangement and the water is taken by the contractor from the wells or hand pump constructed by the IISER Pune, no charge shall be recovered from

the contractor on that account. The contractor shall, however, draw water at such hours of the day that it does not interfere with the normal use for which the hand pumps and wells are intended. He will also be responsible for all damage and abnormal repairs arising out of his use, the cost of which shall be recoverable from him. The Engineer-in-Charge shall be the final authority to determine the cost recoverable from the contractor on this account and his decision shall be binding on the contractor.

ii) The contractor shall be allowed to construct temporary wells in IISER Pune land for taking water for construction purposes only after he has got permission of the Engineer-in-Charge in writing. No charges shall be recovered from the contractor on this account, but the contractor shall be required to provide necessary safety arrangements to avoid any accidents or damage to adjacent buildings, roads and service lines. He shall be responsible for any accidents or damage caused due to construction and subsequent maintenance of the wells and shall restore the ground to its original condition after the wells are dismantled on completion of the work.

CLAUSE 33 :

Return of Surplus Materials

Notwithstanding anything contained to the contrary in this contract, where any materials for the execution of the contract are procured with the assistance of IISER Pune either by issue from IISER Pune stocks or purchase made under orders or permits or licenses issued by IISER Pune, the contractor shall hold the said materials economically and solely for the purpose of the contract and not dispose of them without the written permission of the IISER Pune and return, if required by the Engineer-in-Charge, all surplus or unserviceable materials that may be left with him after the completion of the contract or at its termination for any reason whatsoever on being paid or credited such price as the Engineer-in-Charge shall determine having due regard to the condition of the materials. The price allowed to the contractor however shall not exceed the amount charged to him excluding the element of storage charges. The decision of the Engineer-in-Charge shall be final and conclusive. In the event of breach of the aforesaid condition, the contractor shall in addition to throwing himself open to action for contravention of the terms of the license or permit and/or for criminal breach of trust, be liable to IISER Pune for all moneys, advantages or profits resulting or which in the usual course would have resulted to him by reason of such breach.

CLAUSE 34 :

Employment of Technical Staff and Employees

Contractors Superintendence, Supervision, Technical Staff & Employees

(i) The contractor shall provide all necessary superintendence during execution of the work and all along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

The contractor shall immediately after receiving letter of acceptance of the tender and before commencement of the work, intimate in writing to the Engineer-in-Charge, the name(s), qualifications, experience, age, address(s) and other particulars along with certificates, of the principal technical representative to be in charge of the work and other technical representative(s) who will be supervising the work. Minimum requirement of such technical representative(s) and their qualifications and experience shall not be lower than specified in Special Condition of contract. The Engineer-in-Charge shall within 3 days of receipt of such communication intimate in writing his approval or otherwise of such a representative(s) to the contractor. Any such approval may at any time be withdrawn and in case of such withdrawal, the

contractor shall appoint another such representative(s) according to the provisions of this clause. Decision of the tender accepting authority shall be final and binding on the contractor in this respect. Such a principal technical representative and other technical representative(s) shall be appointed by the contractor soon after receipt of the approval from Engineer-in-Charge and shall be available at site before start of work.

All the provisions applicable to the principal technical representative under the Clause will also be applicable to other technical representative(s). The principal technical representative and other technical representative(s) shall be present at the site of work for supervision at all times when any construction activity is in progress and also present himself/themselves, as required, to the Engineer-in-Charge and/or his designated representative to take instructions. Instructions given to the principal technical representative or other technical representative(s) shall be deemed to have the same force as if these have been given to the contractor. The principal technical representative and other technical representative(s) shall be actually available at site fully during all stages of execution of work, during recording/checking/test checking of measurements of works and whenever so required by the Engineer-in-Charge and shall also note down instructions conveyed by the Engineer-in-Charge or his designated representative(s) in the site order book and shall affix his/their signature in token of noting down the instructions and in token of acceptance of measurements, checked measurements/test checked measurements. The representative(s) shall not look after any other work. Substitutes, duly approved by Engineer-in-Charge of the work in similar manner as aforesaid shall be provided in event of absence of any of the representative(s) by more than two days.

If the Engineer-in-Charge, whose decision in this respect is final and binding on the contractor, is convinced that no such technical representative(s) is/are effectively appointed or is/are effectively attending or fulfilling the provision of this Clause, a recovery (non-refundable) shall be effected from the contractor as specified in Schedule 'C' and the decision of the Engineer-in-Charge as recorded in the site order book shall be final and binding on the contractor. Further if the contractor fails to appoint suitable technical Principal technical representatives and/or other technical representative(s) and if such appointed persons are not effectively present or are absent by more than two days without duly approved substitute or do not discharge their responsibilities satisfactorily, the Engineer-in-Charge shall have full powers to suspend the execution of the work until such date as suitable other technical representative(s) is/are appointed and the contractor shall be held responsible for the delay so caused to the work. The contractor shall submit a certificate of employment of the technical representative(s) (in the form of copy of Form-16 or CPF deduction issued to the Engineers employed by him) along with every on account bill/ final bill and shall produce evidence if at any time so required by the Engineer-in-Charge.

ii) The contractor shall provide and employ on the site only such technical assistants as are skilled and experienced in their respective fields and such foremen and supervisory staff as are competent to give proper supervision to the work.

The contractor shall provide and employ skilled, semiskilled and unskilled labour as is necessary for proper and timely execution of the work.

The Engineer-in-Charge shall be at liberty to object to and require the contractor to remove from the works any person who in his opinion misconduct himself, or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Engineer-in-Charge to be undesirable. Such person shall not be employed again at works site without the

written permission of the Engineer-in-Charge and the persons so removed shall be replaced as soon as possible by competent substitutes.

CLAUSE 35 : Levy/Taxes Payable by Contractor

- i) Sales Tax/VAT (except service tax), building and other construction worker welfare cess or any other cess/ tax in respect of this contract shall be payable by the contractor and Government shall not entertain any claim whatsoever in this respect. However, in respect of service tax on Contract, same shall be paid by the contractor to the concerned department on demand and it will be reimbursed to him by the Engineer-in Charge after satisfying that it has been actually and genuinely paid by the contractor.
- ii) The contractor shall deposit royalty and obtain necessary permit for supply of the red bajri, stone, kankar, etc. from local authorities.
- iii) If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the IISER Pune and does not any time become payable by the contractor to the State Government. Local authorities in respect of any material used by the contractor in the works then in such a case, it shall be lawful to the IISER Pune and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the contractor.

CLAUSE 36:

Conditions for Reimbursement of Levy/ Taxes if levied after receipt of Tenders

- i) All tendered rates shall be inclusive of all taxes and levies (except service tax) payable under respective statutes. However, pursuant to the Constitution (46th Amendment Act, 1982), if any further tax or levy is imposed by Statute, after the last stipulated date for the receipt of tender including extensions if any and the contractor thereupon necessarily and properly pays such taxes/ levies, the contractor shall be reimbursed the amount so paid, provided such payments, if any, is not, in the opinion of the Director IISER Pune (whose decision shall be final and binding on the contractor) attributable to delay in execution of work within the control of the contractor.
- ii) The contractor shall keep necessary books of accounts and other documents for the purpose of this condition as may be necessary and shall allow inspection of the same by a duly authorized representative of the IISER Pune and/or the Engineer-in-Charge and further shall furnish such other information/ document as the Engineer-in-Charge may require from time to time.
- iii) The contractor shall, within a period of 30 days of the imposition of any such further tax or levy, pursuant to the Constitution (Forty Sixth Amendment) Act 1982, give a written notice thereof to the Engineer-in-Charge that the same is given pursuant to this condition, together with all necessary information relating thereto.

CLAUSE 37 :

Termination of Contract on Death of Contractor

Without prejudice to any of the rights or remedies under this contract, if the contractor dies, the Engineer-in-charge on behalf of the Director IISER Pune shall have the option of terminating the contract without compensation to the contractor.

CLAUSE 38 :

If Relative Working in IISER PUNE then the Contractor not Allowed to Tender

The contractor shall not be permitted to tender for works in the IISER Pune responsible for award and execution of contracts in which his near relative is posted as Accountant or as an Officer in any capacity between the grades of the Engineer-in-Charge 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 IISER or in the Ministry of HRD. Any breach of this condition by the contractor would render him liable to be removed from the approved list of contractors of this IISER Pune. **If however the contractor is registered in any other department, he shall be debarred from tendering in IISER PUNE of this condition.**

NOTE: By the term "near relatives" is meant wife, husband, parents and grandparents, children and grand children, brothers and sisters, uncles, aunts and cousins and their corresponding in-laws.

CLAUSE 39:

No Gazetted Engineer to Work as Contractor within One Year of Retirement.

No Engineer of gazetted rank or other gazetted officer employed in engineering or administrative duties in an engineering department of the Government of India shall work as a contractor or employee of a contractor for a period of; one years after his retirement from government service without the previous permission of Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found at any time to be such a person who had not obtained the permission of Government of India as aforesaid, before submission of the tender or engagement in the contractor's service, as the case may be.

CLAUSE 40:

Compensation During Warlike Situations

The work (whether fully constructed or not) and all materials, machines, tools and plants, scaffolding, temporary buildings and other things connected therewith shall be at the risk of the contractor until the work has been delivered to the Engineer-in-Charge and a certificate from him to that effect obtained. In the event of the work or any materials properly brought to the site for incorporation in the work being damaged or destroyed in consequence of hostilities or warlike operation, the contractor shall when ordered (in writing) by the Engineer-in-Charge to remove any debris from the site, collect and properly stack or remove in store all serviceable materials salvaged from the damaged work and shall be paid at the contract rates in accordance with the provision of this agreement for the work of clearing the site of debris, stacking or removal of serviceable material and for reconstruction of all works ordered by the Engineer-in-Charge, such payments being in addition to compensation up to the value of the work originally executed before being damaged or destroyed and not paid for. In case of works damaged or destroyed but not already measured and paid for, the compensation shall be assessed by Engineer-in-Charge up to Rs.5000/- and by the Director IISER Pune concerned for a higher amount. The contractor shall be paid for the damages/ destruction suffered and for the restoring the material at the rate based on analysis of rates tendered for in accordance with the provision of the

contract. The certificate of the Engineer-in-Charge regarding the quality and quantity of materials and the purpose for which they were collected shall be final and binding on all parties to this contract.

Provided always that no compensation shall be payable for any loss in consequence of hostilities or warlike operations(a) unless the contractor had taken all such precautions against air raid as are deemed necessary by the A.R.P. Officers or the Engineer-in-Charge. (b) for any material etc. not on the site of the work or for any tools, plant, machinery scaffolding, temporary building and other things not intended for the work.

In the event of the contractor having to carry out reconstruction as aforesaid, he shall be allowed such extension of time for its completion as is considered reasonable by the Engineer-in-Charge.

CLAUSE 41:

Apprentices Act Provisions to be Complied with

The contractor shall comply with the provisions of the Apprentices Act, 1961 and the rules and orders issued there under from time to time. If he fails to do so, his failure will be a breach of the contract and the Engineer-in-Charge may in his discretion, cancel the contract. The contractor shall also be liable for any pecuniary liability arising on account of any violation by him of the provisions of the said Act.

CLAUSE 42:

Release of Security Deposit after Labor Clearance.

Security Deposit of the work shall not be refunded till the contractor produces a clearance certificate from the Labor Officer. As soon as the work is virtually complete the contractor shall apply for the clearance certificate to the Labor Officer under intimation to the Engineer-in-Charge. The Engineer-in-Charge, on receipt of the said communication, shall write to the Labor Officer to intimate if any complaint is pending against the contractor in respect of the work. If no complaint is pending, or record till after 3 months after completion of the work and/ or no communication is received from the Labor Officer to this effect till six months after the date of completion, it will be deemed to have received the clearance certificate and the Security Deposit will be released if otherwise due.

(iv) SAFETY CODE

1. Suitable scaffolds should be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well as suitable footholds and hand-hold shall be provided on the ladder and the ladder shall be given an inclination not steeper than $\frac{1}{4}$ to 1 ($\frac{1}{4}$ horizontal and 1 vertical)
2. Scaffolding of staging more than 3.6m (12 ft) above the ground or floor, swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly attached or bolted, braced and otherwise secured at least 90 cm (3ft) high above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends there of with only such opening as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working platform, gangways and stairways should be so constructed that they should not sag unduly or unequally, and if the height of the platform or the gangway or the stairway is more than 3.6 (12ft) above ground level or floor level, they should be closely boarded, should have adequate width and should be suitably fastened as described in (2) above.
4. Every opening in the floor of a building or in a working platform shall be provided with suitable means to prevent the fall of person or materials by providing suitable fencing or railing whose minimum height shall be 90cm (3ft).
5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9m (30ft) in length while the width between side rails in rung ladder shall in no case be less than 29 cm. ($11\frac{1}{2}$ "") for ladder up to and including 3m (10ft) in length. For longer ladders this width should be increased at least $\frac{1}{4}$ " for each additional 30cm (1foot) of length. Uniform step spacing of not more than 30cm shall be kept. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites or work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The contractor shall provide all necessary fencing and lights to protect the public from accident and shall be bound to bear the expenses of defense of every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and cost which may be awarded in any such suit, action or proceedings to any such person or which may, with the consent of the contractor, be paid to compensate any claim by any such person.
6. Excavation and Trenching - All trenches 1.2m (4ft) or more in depth, shall at all times be supplied with the least one ladder for each 30m (100ft) in length or fraction thereof. Ladder shall extend from bottom of the trench to at least 90 cm (3ft) above the surface of the ground. The side of the trenches which are 1.5m (5ft) or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing. The excavated materials shall not be placed within 1.5m (5ft) of the edges of the trench or half of the depth of the trench whichever is more. Cutting

shall be done from top to bottom. Under no circumstances undermining or undercutting shall be done.

7. Demolition – Before any demolition work is commenced and also during the progress of the work,
 - i) All roads and open areas adjacent to the work site shall either be closed or suitably protected.
 - ii) No electric cable or apparatus which is liable to be a source of danger or a cable or apparatus used by the operator shall remain electrically charged.
 - iii) All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.
 - iv) Wire mesh netting to be provided for dismantling areas.
8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge should be kept available for the use of the person employed on the site and maintained in a condition suitable for immediate use, and the contractor should take adequate steps to ensure proper use of equipment by those concerned. The following safety equipment shall invariably be provided :
 - i) Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective footwear and protective goggles.
 - ii) Those engaged in white washing and mixing or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles.
 - iii) Those engaged in welding works shall be provided with welder's protective eye-shields and helmets.
 - iv). Stone breaker shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
 - v). When workers are employed in sewers and manholes, which are in active use, the contractor shall ensure that the manholes are opened and ventilated at least for an hour before the workers are allowed to get into the manholes, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to the public. In addition, the contractor shall ensure that the following safety measure is adhered to:
 - a). Entry for workers into the line shall not be allowed except under supervision of the Engineer-in-Charge or any other Higher officer.

- b). At least 5 to 6 manholes upstream and downstream should be kept open for at least 2 to 3 hours before any man is allowed to enter into the manhole for working inside.
- c). Before entry presence of Toxic gases should be tested by inserting wet lead acetate paper which changes colour in the presence of such gases and gives indication of their presence.
- d). Presence of Oxygen should be verified by lowering a detector lamp into the manhole. In case, no Oxygen is found inside the sewer line, workers should be sent only with Oxygen kit.
- e). Safety belt with rope should be provided to the workers. While working inside the manholes such rope should be handled by two men standing outside to enable him to be pulled out during emergency.
- f). The area should be barricaded or cordoned off by suitable means to avoid mishaps of any kind. Proper warning signs should be displayed for the safety of the public whenever cleaning works are undertaken during night or day.
- g). No smoking or open flames shall be allowed near the blocked manhole being cleaned.
- h). The malba obtained on account of cleaning of blocked manholes and sewer lines should be immediately removed to avoid accidents on account of slippery nature of the malba.
- i). Workers should not be allowed to work inside the manhole continuously. He should be given rest intermittently. The Engineer-in-Charge may decide the time up to which a worker may be allowed to work continuously inside the manhole.
- j). Gas masks with Oxygen Cylinder should be kept at site for use in emergency.
- k). Air-blowers should be used for flow of fresh air through the manholes. Whenever called for portable air blowers are recommended for ventilating the manholes. The Motors for these shall be vapour proof and of totally enclosed type. Non sparking gas engines also could be used but they should be placed at least 2 metres away from the opening and on the leeward side protected from wind so that they will not be a source of friction on any inflammable gas that might be present.
- l). The workers engaged for cleaning the manholes/ sewers should be properly trained before allowing to work in the manhole.
- m). The workers shall be provided with Gumboots or non sparking shoes bump helmets and gloves non sparking tools safety lights and gas masks and portable air blowers (when necessary). They must be supplied with

barrier cream for anointing the limbs before working inside the sewer lines.

- n). Workmen descending a manhole shall try each ladder stop or rung carefully before putting his full weight on it to guard against insecure fastening due to corrosion of the rung fixed to manhole well.
 - o). If a man received a physical injury, he should be brought out of the sewer immediately and adequate medical aid should be provided to him.
 - p). The extent to which these precautions are to be taken depend on individual situation but the decision of the Engineer-in-Charge regarding the steps to be taken in this regard in an individual case will be final.
- vi). The Contractor shall not employ men and women below the age of 18 years on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following precaution should be taken:-
- a). No paint containing lead or lead products shall be used except in the form of paste or readymade paint.
 - b). Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint is dry rubbed and scraped.
 - c). Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash during and on the cessation of work.
9. An additional Clause (viii) (i) of Safety Code (iv) the Contractor shall not employ women and man below the age of 18 on the work of painting with product containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, the following principles must be observed for such use :
- i). While lead, sulphate of lead or product containing these pigment, shall not be used in painting operation except in the form of pastes or paint ready for use.
 - ii). Measures shall be taken, wherever required in order to prevent danger arising from the application of a paint in the form of spray.
 - iii). Measures shall be taken, wherever practicable, to prevent danger arising out of from dust caused by dry rubbing down and scraping.
 - iv). Adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
 - v). Overall shall be worn by working painters during the whole of working period.

- vi). Suitable arrangement shall be made to prevent clothing put off during working hours being spoiled by painting materials.
 - vii). Cases of lead poisoning and suspected lead poisoning shall be notified and shall be subsequently verified by medical man appointed by competent authority of Institute.
 - viii). Institute may require, when necessary medical examination of workers.
 - ix). Instruction with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.
10. When the work is done near any place where there is risk of drowning, all necessary equipment should be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision, should be made for prompt first aid treatment of all injuries likely to be obtained during the course of the work.
11. Use of hoisting machines and tackle including their attachment, anchorage and supports shall conform to the following standards or conditions :-
- i).
 - a). These shall be of good mechanical construction, sound materials and adequate strength and free from patent defects and shall be kept repaired and in good working order.
 - b). Every rope used in hoisting or lowering materials or as a means of suspension shall be of durable quality and adequate strength, and free from patent defects.
 - ii). Every crane driver or hoisting appliance operator, shall be properly qualified and no person under the age of 21 years should be in charge of any hoisting machine including any scaffolding winch or give signals to operator.
 - iii). In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or as means of suspension the safe working load shall be ascertained by adequate means. Every hoisting machine and all gear referred to above shall be plainly marked with the safe working load. In case of a hoisting machine having a variable safe working load each safe working load and the condition under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing.
 - iv). In case of IISER Pune machines, the safe working load shall be notified by the Electrical Engineer-in-charge. As regards contractor's machines the contractors shall notify the safe working load of the machine to the Engineer-in-Charge whenever he brings any machinery to site of work and get it verified by the Electrical Engineer-in-Charge concerned.

12. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safeguards. Hoisting appliances should be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions should be taken to reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced. When workers are employed on electrical installations, which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots and may be necessary should be provided. The worker should not wear any rings, watches and carry keys or other materials which are good conductors of electricity.
13. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.
14. These safety provisions should be brought to the notice of all concerned by display on a notice board at a prominent place of work spot. The person responsible for compliance of the safety code shall be named therein by the contractor.
15. To ensure effective enforcement of the rules and regulations relating to safety precautions the arrangements made by the contractor shall be open to inspection by the Labor Officer or Engineer-in-Charge or their representatives.
16. Notwithstanding the above clauses from (1) to (15) there is nothing in these to exempt the contractor from the operations of any other Act or Rules in force in the Republic of India.

(v) **MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGMENTS FOR WORKERS EMPLOYED BY CONTRACTORS FOR THIS WORK.**

1. APPLICATION

The rules shall apply to all buildings and construction works in which twenty or more workers are ordinarily employed or are proposed to be employed in any day during the period which the contract work is in progress.

2. DEFINITION

Work place means a place where twenty or more workers are ordinarily employed in connection with construction work on any day during the period during which the contract work is in progress.

3. FIRST-AID FACILITIES

(i) At every work place there shall be provided and maintained, so as to be easily accessible during working hours, First –aid boxes at the rate of not less than one box for 150 contract labour or part thereof ordinarily employed.

(ii) The First-aid box shall be distinctly marked with a red cross on white background and shall contain the following equipment:-

(a) For work places in which the number of contract labour employed does not exceed 50.

Each first-aid box shall contain the following equipment:

1. 6 small sterilized dressings.
2. 3 medium size sterilized dressings
3. 3 large size sterilized dressings
4. 3 large burn dressings
5. 1(30ml) bottle containing a two percent alcoholic solution of iodine
6. 1(30ml) bottle containing salvolatile having dose and mode of administration indicated on the label.
7. 1 Snakebite lancet.
8. 1(30ml) bottle of potassium permanganate crystals.
9. 1 Pair scissors.
10. 1 copy of first aid leaflet issued by the Director General, Factory Advice Service and Labor Institutes, Government of India.
11. 1 Bottle containing 100 Tablets (Each of 5 gms) of aspirin.
12. Ointment for burns.
13. A Bottle of suitable surgical antiseptic solution.

- a. For work places in which the number of contract labour exceed 50.

Each first-aid box shall contain the following equipment:

1. 12 small sterilized dressings
2. 6 medium size sterilized dressings
3. 6 large size sterilised dressings
4. 6 large size sterilized burn dressings
5. 6(15 gms) packets sterilized cotton wool.
6. 1(60 ml.) bottle containing a two percent alcoholic solution iodine
7. 1 (60ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
8. 1 roll of adhesive plaster
9. snake bite lancet
10. 1 (30gms.) bottle of potassium permanganate crystals.
11. 1 pair scissors.
12. 1 copy of the first-aid leaflet issued by the Director General Factory Advice Service and Labor Institutes/ Government of India.
13. A bottle containing 100 tablets (each of 5 gms.) of aspirin
14. Ointment for burns
15. A bottle of suitable surgical antiseptic solution.

- (iii) Adequate arrangements shall be made for immediate recoupment of the Equipment when necessary.
- (iv) Nothing except the prescribed contents shall be kept in the First-aid box.
- (v) The First-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.
- (vi) A person in charge of the First-aid box shall be a person trained in First-aid treatment, in the work places where the number of contract labour employed is 150 or more.
- (vii) In work places where the number of contract labour employee is 500 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained compounder. The compounder shall be on duty and shall be available at all hours when the workers are at work.
- (viii) Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

4. DRINKING WATER

In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of cold water fit for drinking.

Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.

Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door, which shall be dust and waterproof.

A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. WASHING FACILITIES

- (i) In every work place adequate and suitable facilities for the washing shall be provided and maintained for the use of contract labour employed therein .
- (ii) Separate and adequate cleaning facilities shall be provided for the use of male and female workers.
- (iii) Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

6 LATRINES AND URINALS

- (i) Latrine shall be provided in every work place on the following scale namely:
 - (a) Where female are employed, there shall be at least one latrine for every 25 females.
 - (b) Where male are employed, there shall be at least one latrine for every 25 males.

Provided that, where the number of males or females exceed 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be up to first 100, one for every 50 thereafter.

- (ii) Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have proper door and fastening.
- (iii) Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials shall be cement washed inside and outside at least once a year, latrines shall not be of a standard lower than borehole system.

- (iv) (a) Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men only" or "For Women only" as case may be.

(b) The notice shall also bear the figure of a man or of a woman, as the case may be.
- (v) There shall be at least one urinal for male workers up to 50 & one for female workers up to 50 employed at time, provided that where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females up to the first 500 & one for every one 100 or part thereafter.
- (vi) (a) The latrines & urinals shall be adequately lighted & shall be maintained in a clean & sanitary condition at all times.

(b) Latrines & urinals other than those connected with flush sewage system shall comply with the requirements of the Public Health Authorities.
- (vii) Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines & urinals.
- (viii) Disposal of excreta: -unless otherwise arranged for by the local sanitary authority, arrangements for proper disposal of excreta by incineration at the workplace shall be made by means of a suitable incinerator. Alternately excreta may be disposed of by putting a layer of night soil at the bottom of a pucca tank prepared for the purpose & covering it with a 15 cm. Layer of waste or refuse & then covering it with layer earth for a fortnight (when it will turn to manure)
- (ix.) The Contractor shall at his own expense, carry out all the instructions issued to him by the Engineer-in- Charge to effect proper disposal of night soil and other conservancy work in respect of contractor's workmen or the employees on the site. The contractor shall be levied by Municipal or Cantonment Authority for execution of such on his behalf.

7 PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost, four suitable sheds, two for meals and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 meters (10 ft.) from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq.m. (6 sq.ft.) per head.

Provided that the Engineer-in-Charge may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

8 CRECHES

- (i) At every work place, at which 20 or more women worker are ordinarily employed, there shall be provided two rooms of reasonable dimensions for the use of their children under at the age of six years. One room shall be used as a play room for the children and the other as their bedroom. The rooms shall be constructed with specifications as per clause 19H (ii) a, b & c.
- (ii) The rooms shall be provided with suitable and sufficient openings in for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.
- (iii) The contractor shall supply adequate number of toys and games in the playroom and sufficient number of cots and bedding in the bedroom.
- (iv) The contractor shall provide one Ayaa to look after the children in the crèche when, the number of women workers does not exceed 50 and two when the number of women workers exceed 50.
- (v) The use of the rooms earmarked as crèches shall be restricted to children, their attendants and mothers of the children.

9 CANTEEN

- (i) In every work place where the work regarding the employment of contract labour is likely to continue for six months and where in contract labour numbering one hundred or more are ordinarily employed an adequate canteen shall be provided by the contractor for the use of such contract labour.
- (ii) The canteen shall be maintained by the contractor in an efficient manner.
- (iii) The canteen shall consist of at least a dining hall, kitchen, store room, pantry and washing places separately for workers and utensils.
- (iv) The canteen shall be sufficiently lighted at all times when any person has access to it.

The floor shall be made of smooth and impervious materials and inside walls shall be lime-washed or colure washed at least once in each year.

Provided that the inside walls of the kitchen shall be lime-washed every four months.
- (vi) The premises of the canteen shall be maintained in a clean and sanitary condition.
- (vii) Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.
- (viii) Suitable arrangements shall be made for the collection and disposal of garbage.
- (ix) The dining hall shall accommodate at a time 30% of the contract labour working

at a time.

- (x) The floor area of dining hall excluding the area occupied by the service counter any furniture except tables and chairs shall not be less than one square meter (10sft) per diner to be accommodated as per prescribed as prescribed in sub-Rule 9.
- (xi). (a) A portion of dining hall and service counter shall be partitioned off and reserved for women worker in proportion to their number.

(b) Washing place for women shall be separate and screened to secured privacy
- (xii) Sufficient tables stools, chair or benches shall be available for the number of diners to be accommodated as prescribed in sub-Rule9.
- (xiii) (a) 1. They shall be provided and maintained sufficient utensils crockery, furniture and any other equipment necessary for the efficient running of the canteen

2. The furniture utensils and other equipment shall be maintained in a clean &hygienic condition.

(b) 1. Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.

2. A service counter, if provided, shall have top of smooth and impervious material.

3. Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipment.
- (xiv) The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.
- (xv) The charges for food stuffs, beverages and any other items served in the canteen shall be based on 'No profit, No loss' and shall be conspicuously displayed in the canteen.
- (xvi) In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken in to consideration as expenditure namely.
 - (a) The rent of land and building.
 - (b) The depreciation and maintenance charges for the building and equipment provided for the canteen.
 - (c) The cost of purchase, repairs and replacement of equipment including furniture, crockery, cutlery and utensils.
 - (d) The water charges and other charges incurred for lighting and ventilation.
 - (e) The interest and amounts spent on the provision and maintenance equipment provided for the canteen.

- (xvii) The accounts pertaining to the canteen shall be audited once every 12 months by registered accountants and auditors

10. ANTI MALARIAL PRECAUTIONS:-

The contractor shall at his own expense, conform to all anti- material instructions given to him by Engineer –in-Charge including the filling up of any borrow pits which may have been dug by him.

- 11** The above rules shall be incorporated in the contracts and in notices inviting tenders and shall form an integral part of the contracts .

12 AMENDMENTS.

Government may, from time to time, add to or amend these rules and issue directions- it may consider necessary for purpose of removing any difficulty which may arise in the administration thereof

(vi) Contractor's Labor Regulations**1. DEFINITIONS**

- i. Workman means any person employed by IISER Pune or its contractor directly or indirectly through a subcontractor with or without the knowledge of the IISER Pune to do any skilled, semiskilled or unskilled manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment are expressed or implied but does not include any person:-
 - a) Who is employed mainly in a managerial or administrative capacity : or
 - b) Who, being employed in a supervisory capacity draws wages exceeding five hundred rupees per mensem or exercises either by the nature of the duties attached to the office or by reason of powers vested in him, function mainly of managerial nature: or
 - c) Who is an out worker, that is to say, person to whom any articles or materials are given out by or on behalf of the principal employers to be made up cleaned, washed, altered, ornamental finished, repaired adopted or otherwise processed for sale for the purpose of the trade or business of principal employers and the process is to be carried out either in the home of the out worker or in some other premises, not being premises under the control and management of principal employer.

No person below age of 14 years shall be employed to act as a workman.

- ii) **Fair Wages** means wages whether for time or piece work fixed and notified under the provisions of the Minimum Wages Act from time to time.
 - iii) **Contractors** shall include every person who undertakes to produce a given result other than a mere supply of goods or articles of manufacture through contract labour or who supplies contract labour for any work and includes a subcontractor.
 - iv) **Wages** shall have the same meaning as defined in the Payment of Wages Act.
2. i) Normally working hours of an adult employee should not exceed 9 hours a day. The working day shall be so arranged that inclusive of interval for rest, if any, it shall not spread over more than 12 hours on any day.
- ii) When an adult worker is made to work for more than 9 hours on any day or for more than 48 hours in any week, he shall be paid over time for the extra hours put in by him at double the ordinary rate of wages.
 - iii) a) Every worker shall be given a weekly holiday normally on a Sunday, in accordance with the provisions of the Minimum Wages (Central) Rules 1960 as amended from time to time irrespective of whether such worker is governed by the Minimum Wages Act or not.
 - b) Where the minimum wages prescribed by the Government under the Minimum Wages Act are not inclusive of the wages for the weekly day of rest, the worker

shall be entitled to rest day wages at the rate applicable to the next preceding day, provided he has worked under the same contractor for a continuous period of not less than 6 days.

- c) Where a contractor is permitted by the Engineer-in-Charge to allow a worker to work on a normal weekly holiday, he shall grant a substituted holiday to him for the whole day on one of the five days immediately before or after the normal weekly holiday and pay wages to such worker for the work performed on the normal weekly holiday at overtime rate.

3. DISPLAY OF NOTICE REGARDING WAGES ETC.

Contractor shall before he commences his work on contract, display and correctly maintain and continue to display and correctly maintain in a clear and legible condition in conspicuous places on the work, notices in English and in local Indian languages spoken by the majority of the workers giving the minimum rates of wages fixed under minimum wages acts, the actual wages being paid, the hours of work for which such wages are earned, wages periods, dates of payments of wages and other relevant information as per appendix 'III'.

4. PAYMENT OF WAGES.

- i. The contractor shall fix wage periods in respect of which wages shall be payable
- ii. No wage period shall exceed one month.
- iii. The wages of every person employed as contract labour in an establishment or by contractor where less than one thousand such person are employed shall be paid before expiry of seventh day & in other cases before expiry of tenth day after the last day of period in respect of which the wages are payable
- iv. Where the employment of any worker is terminated by or on behalf of the contractor the wages earned by him shall be paid before the expiry of the second working day from the date on which his employment is terminated.
- v. All payment of wages shall be made on a working day at the work premises and during the working time and on a date notified in advance and in case the work is completed before the Expiry of the wage period, final payment shall be made within 48 hours of the last working day.
- vi. Wages due to every worker shall be paid to him direct or to other person authorized by him in this behalf.
- vii. All wages shall be paid in current coin or currency or in both.
- viii. Wages shall be paid without any deductions of any kind except those specified by the Central Government by general or special order in this behalf or permissible under the Payment of Wages Act 1956.
- ix. A notice showing the wages period and the place and time of disbursement of

wages shall be displayed at the place of work and a copy sent by the contractor to the Engineer-in-Charge under acknowledgment.

- x. It shall be the duty of the contractor to ensure the disbursement of wages in the presence of the Engineer-in-charge or any other authorized representative of the Engineer-in-Charge who will be required to be present at the place and time of disbursement of wages by the contractor to workmen.
- xi. The contractor shall obtain from the Engineer-in-charge or any other authorized representative of the Engineer-in-Charge as the case may be, a certificate under his signature as the end of the entries in the "Register of wages" or the "Wage cum-Muster Roll " as the case may be in the following form :-

"Certified that the amount shown in column No----- has been paid to the workman concerned in my presence on ----- at -----"

5. FINES AND DEDUCTIONS WHICH MAY BE MADE FROM WAGES

- (i) The wages of a worker shall be paid to him without any deduction of any kind except the following
 - (a) Fines
 - (b) Deduction for absence from duty i.e. from the place or the places where by the terms of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent.
 - (c) Deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money or any other deduction which he is required to account, where such damage or loss is directly attributable to his neglected or default.
 - (d) Deduction for recovery of advance or for adjustment of overpayment of wages, advances granted shall be entered in a register.
 - (e) Any other deduction which the central government may from time to time allow.
- (ii) No fine should be imposed on any worker save in respect of such acts and omissions on his part have been approved of by the Chief Labor Commissioner.

Note:- An approved list of Acts & Omissions for which fine can be imposed is enclosed at Appendix-X
- (iii) No fine shall be imposed on a worker and no deduction for damage and loss shall be made from his wages until the worker has been given opportunity of showing cause against such fines or deductions.
- (iv) The total amount of fine which may be imposed in any one wage period on a worker shall not exceed an amount equal to three pause in a rupee of the total wages, payable to him in respect of that wage period.
- (v) No fine imposed on any worker shall be recovered from him by installment, or after the expiry of sixty days from the date on which it was imposed.

- (vi) Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

6. LABOUR RECORDS

- (i) The contractor shall maintain a **Register of persons employed** on work on contract in Form XIII of the CL (R&A) Central Rules 1971 (Appendix IV)
- (ii) The contractor shall maintain a **Muster** Roll register in respect of all workmen employed by him on the work under Contract in Form XVI of the CL (R&A) Rules 1971 (Appendix V).
- (iii) The contractor shall maintain a **Wage Register** in respect of all workmen employed by him on the work under contract in Form XVII of the CL (R&A) Rules 1971 (Appendix VI).
- (iv) **Register of accident** - The contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:
- a) Full particulars of the labourers who met with accident
 - b) Rate of Wages
 - c) Sex
 - d) Age
 - e) Nature of accident and cause of accident.
 - f) Time and date of accident
 - g) Date and time when admitted in Hospital,
 - h) Date of discharge from the Hospital
 - i) Period of treatment and result of treatment.
 - j) Percentage of loss of earning capacity and disability as assessed by Medical officer
 - k) Claim required to be paid under Workmen's Compensation Acts.
 - l) Date of payment of compensation.
 - m) Amount paid with details of the person to whom the same was paid.
 - n) Authority by whom the compensation was assessed.
 - o) Remarks

The contractor shall maintain a **Resister of Fines** in the in the form XII of CL(R&A)Rules 1971(Appendix-XI)

The Contractor shall display in good condition and in conspicuous place of work the approved list of acts and omission for which fine can be imposed (Appendix-X).

The contractor shall maintain a **Resister of deduction for damage or loss** in Form XX of the CL(R&A) Rules 1971(Appendix-XII)

The contractor shall maintain a Register **of Advances** in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIII).

The contractor shall maintain a Register of Overtime in Form XXIII of the CL (R&A) Rules 1971 (Appendix-XIV).

7. ATTENDANCE CARD-CUM-WAGE SLIP

- i) The contractor shall issue an **Attendance card-cum-wage slip** to each workman employed by him in the specimen format (Appendix-VII)

- ii) The card shall be valid for each wage period.
- iii) The contractor shall mark the attendance of each workman on the card twice each day, once at the commencement of the day and again after the rest interval, before he actually starts work.
- iv) The card shall remain in possession of the worker during the wage period under reference.
- v) The contractor shall complete the wage slip portion on the reverse of the card at least a day prior to the disbursement of wages in respect of the wage period under reference.
- vi) The contractor shall obtain the signature or thumb impression of the worker on the wage slip at the time of disbursement of wages and retain the card with himself.

8. EMPLOYMENT CARD

The contractor shall issue an **Employment Card** in Form XIV of the CL (R&A) Central Rules 1971 to each worker within three days of the employment of the (Appendix-VIII).

9. SERVICE CERTIFICATE

On termination of employment for any reason whatsoever the contractor shall issue to the workman whose services have been terminated, a **Service certificate** in Form XV of the CL (R&A) Central Rules 1971 (Appendix-IX)

10. PRESERVATION OF LABOUR RECORDS

All records required to be maintained under Regulation Nos. 6&7 shall be preserved in original for a period of three years from the date of last entries made in them and shall be made available for inspection by the Engineer-in- Charge or Labor Officer or any other officers authorized by the Ministry of Urban Development in this behalf.

11. POWER OF THE LABOUR OFFICER TO MAKE INVESTIGATION OR INQUIRY

The Labor officer or any person authorized by Central Government on their behalf shall have power to make to make enquiry with a view to ascertaining & enforcing due & proper observance of Fair wage Clauses and the Provisions of these Regulations. He shall investigate in to any complaint regarding the default made by the contractor or subcontractor in regard to such provision.

12. REPORT OF LABOUR OFFICER.

The Labor Officer or other persons authorized as aforesaid shall submit a report of result of his investigation or enquiry to the Director IISER Pune concerned indicating the extent, if any, to which the default has been committed with a note that necessary deductions from the contractor's bill be made and the wages and other dues be paid to the labourers concerned. In case appeal is made by the contractor under Clause 13 of these regulation, actual payment to labourers will be made by Director IISER Pune after the Engineer-in-Charge has given his decision on such appeal.

- i) The Director IISER shall arrange payments to the labour concerned within 45 days

from the receipt of the report from the Labor Officer or the Engineer-in-Charge as the case may be.

13. APPEAL AGAINST THE DECISION OF LABOUR OFFICER

Any person aggrieved by the decision and recommendations of the Labor Officer or other person so authorized may appeal against such decision to the Engineer-in-Charge concerned within 30 days from the date of decision, forwarding simultaneously a copy of his appeal to the Director IISER concerned but subject to such appeal, the decision of the officer shall be final and binding upon the contractor.

14. PROHIBITION REGARDING REPRESENTATION THROUGH LAWYER

- i) A. workman shall be entitled to be represented in any investigation or enquiry under these regulations by:
 - a) An officer of a registered trade union of which he is a member.
 - b) An officer of a federation of trade unions to which the trade union referred to in Clause (a) is affiliated.
 - c) Where the employer is not a member of any registered trade union, by an officer of a registered trade union, connected with the industry in which the worker is employed or by any other workman employed in the industry in which the worker is employed.
- ii) An employer shall be entitled to be represented in any investigation or enquiry under these regulations by
 - b) An officer of an association of employers of which he is a member.
 - c) An officer of a federation of associations of employers to which association referred to in Clause (a) is affiliated.
 - d) Where the employers is not a member of any association of employers, by an officer of association of employer connected with industry in which employer engaged or by any other employer, engaged in the industry in which the employer is engaged.
- iii) No party shall be entitled to be represented by legal practitioner in any investigation or enquiry under these regulations.

15. INSPECTION OF BOOKS AND SLIP:-

Contractor shall allow inspection of all the prescribed labour records to any of his workers or to his agent at a convenient time and place after due notice is received or to the Labor Officer or any other person, authorized by the Central Government on his behalf.

16. SUBMISSION OF RETURNS

The contractor shall submit periodical returns as may be specified from time to time.

17. AMENDMENTS

The Central Government may from time to time add to or amend the regulation and on any question as to the application /interpretation or effect of those regulations the decision of the Engineer-in-Charge concerned shall be final.

Appendix 'I'

(vii) Form of Performance Security (Guarantee)**Bank Guarantee Bond**

1. In consideration of the Director IISER Pune (hereinafter called "IISER-Pune") having offered to accept the terms and conditions of the proposed agreement between-----
-----and----- (hereinafter called "the said Contractor(s)") for the work -----
----- (hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs.----- (Rupees -----
-----only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement.

We ----- (hereinafter referred to as "the Bank") hereby (indicate the name of the Bank) Undertake to pay to the IISER Pune an amount not exceeding Rs-----.(Rupees -----only) on demand by IISER Pune

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 demand from the IISER Pune stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs----- (Rupees -----only)
3. We, the said bank further undertake to pay the IISER Pune 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 there under and the Contractor(s) shall have no claim against us for making such payment.

4. We, ----- further agree that the guarantee herein contained shall (indicate the name of the Bank) remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the IISER Pune 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 IISER Pune 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 IISER Pune that the IISER Pune (indicate the name of the Bank) shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the IISER Pune against the said contractor(s) and to forbear or enforce any of the terms and

conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the IISER Pune or any indulgence by the IISER Pune 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 (indicate the name of the Bank) with the previous consent of the IISER Pune in writing.
8. This guarantee shall be valid up to-----unless extended on demand by the IISER Pune. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs----- (Rupees-----only) and unless a claim in writing is lodged with us within 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)

(viii) Proforma of Agreement

ARTICLE OF AGREEMENT is made at Pune on the day of..... 2012 between Indian Institutes Of Science Education and Research Pune, (IISER Pune) (Herein after referred to as the employer which expression shall includes its successors and assigns where the context so admits) of the one part and -----

(Hereinafter referred to as the "contractor(s) which expression shall include his/their respective heirs, executors, administrators and assigns where the context so admits) of the other part.

WHEREAS the employer is desirous of getting the work.....done and caused drawings, schedule of quantities, terms and conditions and specification describing the work to be executed and completed maintained.(hereinafter called "the works")and has accepted a tender of the CONTRACTOR for the execution, completion and guarantee of such works.

AND WHERE AS the contractor has deposited a Sum Of Rs.-----

----- With employer as security

for the due performance of this agreement as provided in the said Conditions.

NOW IT IS HEREBY agreed and declared by and between the parties as follows.

- (a) In consideration of the payments to be made to him as herein after provided the contractor shall upon and subject to the condition herein contained and the said conditions executed and complete the work shown upon the said drawings and such further detailed drawings which may be furnished to him and described in the said specifications and the said priced schedule of quantities within ----- from the date of order to commence the work.
- (b) The employer shall pay to the contractor such sum that shall become payable hereunder at the times and in the manner specified in the said conditions.
- (c) Time is essence of this agreement and the contractor agrees to pay compensation for delay as per Clause 2 of general Condition of Contract.
- (e) The documents mentioned below under (g) shall form the basis of this agreement and the decision Engineer or the Engineers in Charge, in reference to all matters of dispute as to material and workmanship shall be final and binding on both the parties.
- (f) The employer through the Engineer-in-Charge reserves to himself the right of altering the drawings and the adding to or omitting any items of works or of having portions of the same carried out departmentally or otherwise and such alterations or variations shall not violate agreement.
- (g) This agreement comprises the work said above and the entire subsidiary work connected there with, even though work may not be shown on the drawings or described in the said specifications or the priced schedule of quantities.

This agreement contains the following documents in addition to pages of articles of agreement.

- (a) NIT/WORK ORDER
- (b) Percentage rate tender form & contract for works.
- (c) General Rules and Directions
- (d) Condition of contracts
- (e) Clauses of contracts
- (f) Safety code
- (g) Models rules for the protection of health, sanitary arrangements for workers employed by IISER Pune or its Contractors.
- (h) Contractors labour regulations
- (i) Proforma of agreement
- (j) Proforma of Schedule A to C
- (k) Special Condition of contracts
- (l) Technical specifications
- (m) Tenders drawings
- (n) Price Schedule/ Schedule of Quantities
- (o) All corresponds between the parties until award of contract.
- (p) Prequalification document

In witness whereof the parties hereto have their respective hands the day and the year herein above written.

Signed by for and on behalf of the employer.

Superintending Engineer.

Witness (1)-----

Witness (2)-----

Signed by the said contractor

Address-----

Witness (1)-----

Countersigned

Witness (2)-----

(IX) PROFORMA BANK GUARANTEE IN LIEU OF BID SECURITY

**(On Non Judicial Stamp paper to be stamped in accordance
with stamp act, the stamp paper to be in name of
Executing Bank)**

Ref.....

Date.....

Bank Guarantee No.....

To INDIAN INSTITUTE OF SCIENCE EDUCATION & RESEARCH,PUNE

Dear Sir,

In accordance with your Notice Inviting Tender for _____ under your tender
No _____ dated _____ M/s _____ (hereinafter called the
Tenderer) with following directors on their Board of Directors /Partners of the firm.

1_____	2_____
3_____	4_____
5_____	6_____
7_____	8_____
9_____	10_____

Wish to participate in the said tender for the following:

1_____

2_____

3_____

Whereas it is a condition in the tender documents that the tenderer has to deposit Bid Security with respect to the tender, with Indian Institute of Science Education & Research, Pune amounting to Rs..... or alternatively the tenderer is required to submit "Bank Guarantee" from a nationalised bank irrevocable and operative till 28 days after the validity of the offer. (i.e. 120 days from the date of opening of tender), for the like amount which amount is likely to be forfeited on the happening of contingencies mentioned in the tender documents. And whereas the tenderer desires to secure exemption from deposit of Bid Security and has offered to furnish a Bank Guarantee for a sum of Rs..... to the IISER, Pune for the purpose of securing exemption from the deposit of Bid Security.

1. NOW THEREFORE, we the Bank, a body corporate constituted under the Banking Companies (Acquisition and Transfer of undertakings) Act 1969 and having a branch office at..... (hereinafter referred to as the Bank") do hereby undertake and agree to pay on demand in writing by the IISER, Pune the amount of Rs..... (Rupees.....) to the **Indian Institute of Science Education & Research, Pune** without any demur, reservation or recourse.
2. We, the aforesaid Bank, further agree that the IISER, Pune shall be the sole judge of and as to whether the tenderer has committed any breach or breaches of any of the terms and conditions of the tender and the extent of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the IISER, Pune on account thereof the extent of the bid security required to be deposited by the Tenderer in respect of the said Tender document and the decision of the IISER, Pune that the Tenderer has committed such breach or breaches and as to the amount or amounts of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the IISER, Pune shall be final and binding on us.
3. We, the said Bank further agree that the Guarantee herein contained shall remain in full force and effect until it is released by the IISER, Pune and change in the constitution, liquidation or dissolution of the Tenderer shall not discharge our liability guaranteed herein.
4. It is further declared that it shall not be necessary for the IISER, Pune to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the IISER, Pune may have obtained or shall obtain from the Contractor at the time when proceedings are taken against the Bank for whatever amount may be outstanding or unrealized under the Guarantee.
5. The right of the IISER, Pune to recover the said amount of Rs..... (Rupees) from us in manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said M/s..... (Tenderer) and/or that any dispute or disputes are pending before any authority, officer, tribunal or arbitrator(s) etc.

6. Notwithstanding anything stated above, our liability under this guarantee shall be restricted to Rs.....(Rupees.....) and our guarantee shall remain in force up to..... and unless a demand or claim under the guarantee is made on us in writing within three months after the aforesaid date i.e. on or before the all your rights under the guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there under.

Date.....

place.....

(Signature)_____

(Printed Name)_____

(Designation)_____

(Bank's Common seal)_____

(Authorisation No.)_____

In the presence of:

Witness

1)_____

2)_____

Accepted

(Signature of the Officer)

For and on behalf of the

INDIAN INSTITUTE OF SCIENCE EDUCATION
AND RESEARCH , PUNE

APPENDIX (xv) -CLAUSE 25

APPENDIX XV Notice for appointment of Arbitrator [Refer Clause 25]

To
The Chairman
Building and Works Committee
IISER Pune.

Dear Sir,

In terms of clause 25 of the agreement, particulars of which are given below, I/we hereby give notice to you to appoint an arbitrator for settlement of disputes mentioned below:

1. Name of applicant
2. Whether applicant is Individual/Prop. Firm/Partnership Firm/Ltd. Co.
3. Full address of the applicant
4. Name of the work and contract number in which arbitration sought
5. Name of the Division which entered into contract
6. Contract amount in the work
7. Date of contract
8. Date of contract Date of initiation of work
9. Stipulated date of completion of work
10. Actual date of completion of work (if completed)
11. Total number of claims made
12. Total amount claimed
13. Date of intimation of final bill (if work is completed)
14. Date of payment of final bill (if work is completed)
15. Amount of final bill (if work is completed)
16. Date of request made to SE for decision
17. Date of receipt of SE's decision
18. Date of appeal to you
19. Date of receipt of your decision.

Specimen signatures of the applicant

(only the person/authority who signed the contract should sign)

I/We certify that the information given above is true to the best of my/our knowledge. I/We enclose following documents.

1. Statement of claims with amount of claims.
- 2.

Yours faithfully

Copy in duplicate to:
Engineer in Charge.

(vi) PROFORMA OF SCHEDULES

(Operative Schedules to be supplied to each intending tenderer)

SCHEDULE 'A'

Schedule of quantities

Enclosed as section VII

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			

Tools and plants to be hired to the contractor

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

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

Reference to General Conditions of contract.-

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

	Estimated cost put to tender	:	Rs 890 Lakh
(i)	Earnest money	:	Rs. 17.80 Lakhs (to be returned after receiving performance guarantee)
(ii)	Performance Guarantee	:	5% of tendered value.
(iii)	Security Deposit	:	2.5 % of tendered value.

SCHEDULE 'C'**GENERAL RULES & DIRECTIONS :**

Officer inviting tender	Superintending Engineer IISER, Pune.
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Maximum percentage for quantity of items of work to be executed beyond which rates are to be determined in accordance with Clauses 12.2 & 12.3:	See below
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Definitions:

2(v)	Engineer-in-Charge	Superintending Engineer IISER, Pune.
2(viii)	Accepting Authority	The Director, IISER, Pune
2(ix)	Percentage on cost of materials and labour to cover all overheads and profits	15%
2(x)	Standard Schedule of rates	CPWD Delhi Schedule of Rates 2016
2(viii)	Department	Indian institute of Science Education & Research, IISER, Pune
2(ix)	Standard contract Form	Percentage rate tender form & Contract of works

Clause 1

- (i) Time allowed for submission of Performance Guarantee from the date of issue of letter of acceptance 15days
- (ii) Maximum allowable extension with late fee @ 0.1% per day of Performance Guarantee amount beyond the period provided in (i) above 15 days

Clause 2

Authority for fixing compensation The Director Indian institute of Science
under clause 2. Education & Research, IISER Pune

Clause 2 A

Whether Clause 2A shall be applicable Yes Applicable

Clause 5

Number of days from the date of issue of letter of award works for reckoning date of start 15 days

Mile stone(s) as per table given below:-

SI No.	Description of Milestone (Physical)	Time allowed in days/months (From date of start)	Amount to be with-held in case of non-achievement of Milestone
1	All works up to Foundation and plinth	60 days	1 %
2	First floor slab	90 days	1 %
3	Second floor slab & GF Brick works	120 days	1%
4	Complete Brick work, waterproofing works complete	180 days	1%
4	Electrical, HVAC, other miscellaneous works	240 days	0.5%
5	Finishing, testing and handing over	300 days	0.5%

Authority to decide:

- (i) Extension of time The Director Indian institute of Science
Education & Research, IISER Pune
- (ii) Rescheduling of mile stones Engineer in charge
- (iii) Shifting of date of start in case of delay in handing over of site: Superintending Engineer

Clause 6, 6 A

Clause applicable – (6 or 6A) 6A

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. 100 lakh

Clause 10

List of testing equipment to be provided by the contractor at site lab. Shall be tested in the approved Labs

Clause 10 B

Whether Clause 10 B shall be applicable Not applicable

Clause 10 C

Component of labour expressed as percent of value of work = Not Applicable

Clause 10 CA**Applicable**

Material covered	Nearest Materials (other than cement, reinforcement bars and Structural steel) for which all India Wholesale price Index to be followed	Base price and its corresponding period of all the materials covered Under clause 10CA*
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- 1) Cement (1) OPC- 5200/-MT i/c 12.50% VAT
(Rate for Pune approved by CE WZ-II , CPWD, Nagpur for the m/o Aug, 2016)
- 2) Steel bars & rods primary producers Rs. 34650/- MT i/c 5 % VAT.
(Rate for Pune approved by CE WZ-II , CPWD, Nagpur for the m/o July, 2016)

CLAUSE 10 CC**NOT APPLICABLE**

Clause 10 CC to be applicable in contracts with stipulated period
of completion exceeding the period shown in next column 12 months
Schedule of component of other Materials, Labour, POL etc. for price escalation.

Component of civil (except materials covered under
Clause 10CA /Electrical Construction materials

expressed as percent of total value of work Xm -- 00 %

Component of Labour
expressed as percent of total value of work. Y 00 %

Component of P.O.L-
expressed as percent of total value of work. Z..... 00 %

Note : Xm.....% should be equal to (100) -(materials covered under clause 10CA i.e. Cement, Steel and other material specified in clause 10CA + Component of Labour + Component of P.O.L).

Clause 11

- Specifications to be followed for execution work
- 1) Technical specification given in Tender documents.
 - 2) CPWD standard specification 2009 Volume I & II with up to date correction slips for civil works.
 - 2a) CPWD standard specification for internal Electrical works – 2013, external electrical services- 2007, DG set & Wet riser, sprinkler, specification-2006, Substation works Part IV- 2013.
 - 3) Indian Standard Specification
 - 4) Manufactures specification
 - 5) Engineer In charge decision.

Clause 12

Type of work	Project and original work
12.2 & 12.3	Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for building Super structure work & other Associated Electro-mechanical works (±) 30 %
12.5	(i) Deviation Limit beyond which clauses 12.2 & 12.3 shall apply for foundation work (Except earth work) (±) 100%
	(ii) Deviation Limit for items in earth work subhead of DSR or related items (±) 100%

Clause 16

Competent Authority for deciding reduced rates The Director Indian institute of Science Education &. Research, IISER Pune

Clause 18

List of mandatory machinery, tools & plants - As per requirement of the work
To be deployed by the contractor at site at his cost:

Clause 16

Competent Authority for deciding reduced rates The Director Indian institute of Science Education &. Research, IISER Pune

Clause 18

List of mandatory machinery, tools & plants - As per site requirements.
To be deployed by the contractor at site at his cost:

Clause 25

Constitution of Dispute Redressal Committee (DRC) Chairman - Prof. L S Shashidhara, IISER, Pune.

Members: (1) Mr Sushant Baliga, Retd. ADG CPWD, New Delhi (2) Mr K S Wagh, Retd. Chief Engineer, IIT Mumbai

Clause 34 (i)

Requirement of Technical Representative(s) and recovery rate to be affected from Contractor bill for non-deployment of technical staff at site of work:

S.No .	Technical Representative(s)	Qualification & Discipline of the Technical representative(s)	Minimum Experience of the Technical representative(s)	Minimum Numbers to be employed at site	Rate at which recovery shall be made from the contractor in the event of not fulfilling provision of clause 34(i)	
					Figure	Words
1	Project Manager	BE (Civil)	10 years	1	45000	Forty five thousand only
1	Site Engineer	BE (Civil)/BE Electrical	5 years	1	35000	Thirty five thousand only



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
(IISER) PUNE**

Volume -II

SPECIAL CONDITIONS OF CONTRACT

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

Bids to be submitted online on : ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app))

<u>CL. NO.</u>	<u>DESCRIPTION</u>
1.	GENERAL
2.	SCOPE OF WORK
3.	LAYOUT
4.	SPECIFICATIONS TO BE FOLLOWED
5.	CLARIFICATIONS
6.	QUANTITIES
7.	CARE IN SUBMISSION OF TENDERS
8.	SITE INSPECTION
9.	SPECIFICATIONS AND DRAWINGS
10.	CONSTRUCTION PROGRAMME
11.	SECURITY RULES
12.	TEMPORARY APPROACH ROADS
13.	REPLACEMENT OF METRIC UNITS BY BRITISH EQUIVALENTS
14.	VARIATION IN DIFFERENT GRADES / SECTIONS OF REINFORCEMENT AND STRUCTURAL STEEL
15.	MAINTENANCE OF CLEAN SITE CONDITION
16.	CONTRACTOR TO PROVIDE LABOUR AND ASSISTANCE
17.	MODE OF MEASUREMENT
18.	VALIDITY OF RATE
19.	LAND FOR SITE ESTABLISHMENT AND LABOUR
20.	WATER SUPPLY
21.	FIRE FIGHTING
22.	SUPPLY OF ELECTRIC POWER
23.	CONTRACTOR'S SITE ORGANIZATION
24.	LIABILITY FOR LOSS, DAMAGE, ACCIDENT ETC.
25.	PLANT & MACHINERY
26.	MOBILIZATION
27.	METHODOLOGY FOR CONSTRUCTION WORKS.
28.	READY MIX CONCRETE
29.	REMOVAL OF TEMP.WORK, PLANT & SURPLUS MATERIALS
30.	TAXES
31.	CONSULTANTS APPOINTED BY IISER

32. RIGHTS OF OTHER AGENCIES

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<u>CL. NO.</u>	<u>DESCRIPTION</u>
33.	SAFETY MEASURES
34.	GOVERNMENT LABOUR ACTS / LAWS
35.	PRESENTATION BY SUCCESSFUL BIDDER]
36.	NOMINATED SPECIALIST AGENCIES
37.	QUALITY MANAGEMENT REQUIREMENTS
38.	QUALITY ASSURANCE
39.	QUALITY PLAN
40.	INPROCESS INSPECTION
41.	FINAL INSPECTION
42.	IDENTIFICATION AND TRACEABILITY
43.	PRESERVATION HANDLING AND STORAGE
44.	QUALITY RECORDS
45.	NON-CONFORMANCE
46.	CORRECTIVE ACTION
47.	AUDIT
48.	ADDITIONAL REQUIREMENTS
49.	PRICE ADJUSTMENT CLAUSE
50.	INCENTIVE FOR EARLY COMPLETION
51.	MATERIALS SUPPLIED BY CONTRACTOR
52.	GREEN BUILDING MEASURES
53.	MILESTONE
54.	RECOVERY FOR CEMENT AND STEEL MATERIALS

LIST OF ANNEXURES

ANNEXURE - I	ANALYSIS OF WATER SAMPLES PROPOSED TO BE USED
ANNEXURE -II	SUB SOIL INVESTIGATION REPORT
ANNEXURE-III	LIST OF APPROVED MAKES
ANNEXURE-IV	LIST OF EQUIPMENT TO BE DEPLOYED ON THE WORK
ANNEXURE-V	HAND BOOK ON HEALTH AND SAFETY AT WORK

Total page 87 (Eighty seven pages only)

1. GENERAL

These special conditions supplement the General Conditions of Contract and shall be considered as part of the contract document. Where these special instructions are at variance with the corresponding conditions, stipulations, and specifications elsewhere in the tender document, these special instructions shall prevail.

2. SCOPE OF WORK

In general scope of work is described in Section-V, Technical Specifications and Section-VIII, Schedule of Quantities and Rates.

3. LAYOUT

The contractor shall layout his work from base pillar established by IISER and shall be responsible for all measurement and survey work in connection therewith. The contractor shall at his own expenses furnish all stakes, templates, platforms, equipment, arrange labour that may be required in setting or laying out any part of the work. The contractor shall be held responsible for proper execution of the work to such lines and grades as may be established or indicated in the drawings and specifications.

4. SPECIFICATIONS TO BE FOLLOWED

The work shall be carried out strictly in accordance with the Contract Specification & CPWD specifications. In the absence of any specification for any work or material, relevant Indian Standard Specifications will be applicable and where no Indian Standard Specification exists, relevant International Standard Specifications will apply.

Further, in absence of any mention of specification in these specifications provided for the contract regarding work, material or workmanship, the decision of adaptability of relevant IS, BSS, American Standard Specifications or International standard etc, will be entirely at the discretion of Engineer in charge-in-charge and the same shall be binding on the Contractor.

5. CLARIFICATIONS

The tenderer shall note that if any clarifications regarding specifications, conditions of contract, schedule of quantities, scope of work etc. are required, the tenderer should get it clarified in pre-bid meeting which is to be held as per the schedule indicated in the Notice Inviting Tender in the office of the Director Indian Institute of Science Education And Research Pune.

No claim on accounts of any ambiguity in any respect will be entertained after the submission of the tender

6 QUANTITIES

The schedule of quantities indicated in Section-VIII is only indicative and may vary. Payment will be made for actual quantities executed. Contractor's quoted rate shall remain firm for all such variation limits as specified under clause 12 of Section-III General Conditions of Contract of the tender defined in Schedule C .

7 CARE IN SUBMISSION OF TENDERS

Before submitting the tender, the tenderer will be deemed to have satisfied himself by actual inspection of the site, locality of the works, the geological and weather conditions of the site, approaches, availability of materials, camping facilities for the labour force etc. and ensure that all conditions liable to be encountered during the execution of the work are taken into account and that, the rates he enters in the tender form are adequate and all inclusive to comply with the provisions of the special and general conditions of the contract for the completion of the works to the satisfaction of the Engineer in charge.

8 SITE INSPECTION

The tenderer shall ensure that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labour, water, electric power, roads and uncertainties of weather, or similar physical conditions of the site, the conformation and conditions of the ground character, the quality and quantities of surface and sub-surface materials to be encountered, including the sub-soil water level, the character of equipment/facilities needed, preliminary to and during the progress of the work, and all other matters upon which information is reasonable obtainable and which can in any way affect the work or his cost thereof under contract. Any failure of the contractor to acquaint himself with all the available information concerning these conditions will not relieve him of the responsibility of estimating properly, the difficulty or cost of successfully performing the work.

The tenderers should visit the site at own cost and familiarize themselves thoroughly with the site conditions, before submitting their tenders. Non-familiarity with site conditions shall not be considered as a reason for extra claims or for not carrying out the work in strict conformity with the drawings and specifications.

Sub-soil investigation report carried out by IISER is enclosed as Annexure II only for reference to the tenderer

9 SPECIFICATIONS AND DRAWINGS

9.1 The work shall conform to the contract specifications.

9.2 The work shall also conform to the enclosed drawings in Section-VI, and to such other drawings relating thereto as may be furnished from time to time by the Engineer in charge in explanation of details or modifications, including such modifications as the Engineer in charge may consider necessary to meet the conditions encountered during the execution of the work.

- 9.3 It shall be understood that drawings furnished to the contractor shall be interpreted by the use of given dimension and nomenclature only and that the drawing shall not be scaled.
- 9.4 Construction drawings will be issued one month prior to concreting of a particular pour for planning purpose and as the work progress. In case of delay in supply of drawings, the Contractor will be eligible for suitable extension of time only, if in the opinion of the Engineer in charge (whose decision shall be final) such a delay has affected the progress of work. The grant of extension of time shall, however, be governed by the provisions of the General Conditions of Contract. However contractor shall make all out effort to make up for the delays if any during the execution of work, by increasing the resource deployment of men and materials so as get the work completed as per mile stones given in the Schedule C.
- 9.5 Prior to the execution of the work, the contractor shall check all drawings and shall immediately report all errors, discrepancies and/or omissions discovered therein to the Engineer in charge. All such errors, discrepancies and/or omissions will be adjusted/clarified by the Engineer in charge. Any adjustment made by the contractor without prior approval of the Engineer in charge shall be at his own risk and the settlement of any complications arising from such adjustment shall be made by the contractor at his own expense.
- 9.6 In case of difference between drawings and specifications, decision of Engineer in charge shall be final & binding.

10 CONSTRUCTION PROGRAMME

- 10.1 The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor and shall be deemed to be the essence of the contract on the part of the Contractor and shall be reckoned from the 15th days from the date of issue of work order to the Contractor. All work shall be completed in accordance with approved construction schedule, which forms a part of the contract. Monsoon or inclement weather will not be considered for extension of time.

On award of the work, the contractor shall submit a construction time schedule, keeping the phasing of the work for approval of the Engineer in charge-in Charge. The contractor shall strictly adhere to such an approved Programme.

- 10.2 The Contractor is required to record the hindrance if any, while carrying out the construction work as well as executing the work in respect of design, engineering, procurement and supply related issues, in the hindrance register maintained by the Engineer-in-charge. The Contractor shall record hindrances in the Hindrance Register(s) and get it approved/ endorsed by the Engineer-in-Charge, as the case may be.
- 10.3 Hindrances recorded in the register shall form the basis for granting extension of time. The format of the hindrance register is **below mentioned**.

FORMAT FOR 'HINDRANCE REGISTER'

Sl. No	Nature of hindrance	Date of occurrence	Date of removal	Period of hindrance	Overlap-ping period if any	Net extension	Dated sign of Contract-or with name	Dated sign of Engr. with name	Remarks

11 SECURITY RULES

The contractor shall follow at site all security rules as may be framed by the IISER from time to time regarding removal/movement of materials and equipment from site, issue of identity cards, control of entry of personnel and all similar matters.

The contractor and his personnel shall abide by all security measures imposed by the Engineer in charge or his duly authorized representative from time to time any other statutory orders. Nothing extra will be payable on account of stoppage/hindrance of the work.

The contractor, his employees and agents shall not disclose any information or drawings furnished to him by the IISER Any drawings, reports and other information prepared by the contractor/by the Corporation or jointly by both for the execution of the contract shall not be disclosed without the prior written approval of the Engineer in charge. No photographs of the works or plant within the site premises will be taken without the prior written approval of the Engineer in charge.

12. TEMPORARY APPROACH ROADS

The contractor shall construct and maintain at his own cost, the temporary access roads and approaches to the work site, offices, workshop etc. wherever necessary and in his camp area.

The contractor may use the roads formed by the Corporation in the vicinity of the works for transport of equipment and materials.

If additional haulage roads are required by the Contractor, he shall construct them at his own cost. Location of such roads shall be subject to the prior approval of the Engineer in charge. All roads at the work site including any road formed by the contractor will be made use of by the project, other contractors and agencies at site and the contractor is not entitled for any payment as compensation on this account.

Contractor shall clean the spill over concrete and the other materials over the roads used by him regularly.

13. REPLACEMENT OF METRIC UNITS BY BRITISH EQUIVALENTS

Wherever dimensions for materials, fittings fixtures to be used in work are given in metric units, materials with nearest British dimensions may be used with specific prior approval of the Engineer in charge. No extra claim or variation in the rates will be entertained on account of this change.

14. VARIATION IN DIFFERENT GRADES /SECTIONS OF REINFORCEMENT AND STRUCTURAL STEEL

Use of different Grades /Sections of structural, grades/diameter of reinforcement steel will be solely guided by the availability and not necessarily as shown in drawing/specifications. Payment will be made for supply, bending and placing in position/fabrication, on the basis of weight in Tonnes/Kgs as per rates included in the schedule of Quantities and Rates, irrespective of type of steel used. No additional payment on account of variation in diameters, change in type and grades of steel shall be made by the IISER to the Contractor. If the contractor proposes to use higher section or diameter of steel due to non-availability of the required section in his stores/market, Engineer in charge may permit the same based on the technical acceptability. In case the required section/diameter is not available in the Contractor's store but available in market and the Contractor wishes to use the available higher sections/diameters in their stores, the payment shall be restricted to the weight involved as per the drawing. In case the required section/diameter is not available either in the Contractor's store nor in the market, the payment will be made based on the higher section/diameter permitted for use. The payment of the steel shall be made as per the theoretical weight as per Indian standard. No claim due to difference in the weights due to rolling margin shall be entertained.

No reinforcement bar will be cut or hot bent without specific approval of Engineer in charge-in-charge

15. MAINTENANCE OF CLEAN SITE CONDITION

During the construction stage the Contractor shall keep the entire site in neat and tidy conditions by proper housekeeping & stacking of construction materials at the construction site and will remove all debris and waste materials from the site regularly. He will also remove the water in the buildings and maintain the site in hygienic condition. Accumulation and piling of construction materials /debris will not be permitted except only at the locations approved for this purpose from time-to-time.

Cost of maintaining the clean site condition is deemed to have been included in the rates quoted by the contractor.

16. CONTRACTOR TO PROVIDE LABOUR AND ASSISTANCE

The contractor shall provide necessary labour and assistance to the Engineer in charge for checking layout, alignments, levels and other survey works connected with execution of work and also for taking measurement for finished works at no extra cost to the Corporation.

17. MODE OF MEASUREMENT

Mode of measurement when not specified in the tender shall be in accordance with relevant Indian Standard Specifications and where not spelt out in IS; Engineer in charge's decision shall be final and binding on the contractor.

18. VALIDITY OF RATE:

The tenderer shall note that the tender rates quoted by him shall be valid for the period of contract and extended completion time under clauses of the contract from the date of opening of the tender.

The rate for all items of work shall unless clearly specified otherwise, include cost of all labour, materials, tools & plant appliances, transport, equipment, taxes, duties, contractor's supervision, overheads, profits and all that are necessary for the satisfactory completion of the job.

The rates quoted by the tenderer in the schedule shall be inclusive of sales tax on all materials, Value added tax, Royalty octroi duty and/or other duties levied by the Central State Government or other public bodies. Unless otherwise stated in the schedule of quantities, rates for all items shall be for the complete work including supplying and fixing of all materials, etc.

The contractor, when called for by IISER shall furnish detailed analysis in support of the rates quoted by him against each item of the tender. IISER reserves the right to utilize the analysis thus supplied in setting any deviations or claims arising on this contract

The rates for the items included in the Section-VIII 'Schedule of Quantities and Rates' are inclusive of all material, labour, plant and equipment, transport and storage of materials and equipment, necessary supervision by Contractor's / manufacturers authorized representatives, overheads, profits and all incidental expenditures(s) as may be required for the complete and satisfactory execution of the work covered under this contract.

19 LAND FOR SITE ESTABLISHMENT& LABOUR

- 19.1 No Land will be made available by IISER for Setting up of contractor's labour camp. Contractor should make his own arrangement for labour camp outside the IISER campus.
- 19.2 IISER shall give suitable and limited land within the premises for Contractor's timber and steel yards, aggregate yards, workshop, office, site office, toilets, godowns and for erection of equipments etc, required for the work. Qualified vendor shall submit the layout plan showing all the space requirements to IISER before the commencement of work for their prior approval.
- 19.3 Contractor shall be solely responsible for security and safe storage of all his materials and all his establishments.
- 19.4 The Contractor shall arrange adequate facilities for medical aid and treatment for his staff and workers engaged on the project, both at work site, as well as at the labour camp.

20. WATER SUPPLY

- 20.1 The contractor shall make his own arrangements for construction water supply and water to meet the domestic requirements for his employees/ workers. Contractor may be permitted to drill bore wells for construction, domestic and fire fighting water requirement by IISER in their premises. However permission if any required from local Authorities for use of underground water shall be obtained by contractor at no extra cost to IISER.
- 20.2. The contractor shall at his own cost arrange to draw and distribute the water and shall lay and maintain water supply lines to his construction site. He shall construct suitable storage tanks to meet at least 4 day's requirement at work site. To ensure adequate water supply at all levels on the works for the purpose of construction, he shall install necessary pumps, for delivery of water at all levels with requisite pressure. Water supply scheme proposed by the contractor shall be subjected to the approval of the Engineer in charge. The contractor shall provide necessary number and capacity of electrical/diesel operated high lift pumps to ensure supply of water at the highest point of the structure. To ensure uninterrupted water supply in the event of power failure, contractor is directed to install diesel pumps as a stand by measure. The contractor shall ensure availability of potable quality of water as specified and required for all his construction activities at all times. Chemical analysis of the water likely to be available at site is enclosed in Annexure 1. This information is for general guidance of the tenderer, who will have to verify the quality before quoting to assess the cost for arranging construction water. In general the contractor shall make his own arrangements for water supply for labour camp. The Contractor shall make his own arrangement to receive, treat, test, pump and distribute the water required for the Camp. He shall construct at his own cost storage tank(s) of adequate capacity to meet 4 day's requirement. He shall also lay at his own cost the distribution lines and maintain the same during the currency of the contract.

21. FIRE FIGHTING

- 21.1 The contractor shall make his own arrangements for fire fighting and fire prevention both at the construction site and at his camp. He shall have storage of adequate capacity dedicated to meet the fire fighting and fire prevention requirement, both at the construction site and labour camp at his own cost.
- 21.2 The equipment and piping required for this purpose will be installed and maintained by the contractor during the entire construction period till the works are handed over to the IISER. Notwithstanding this, the contractor shall be entirely responsible for the consequences arising due to fire, if it occurs during the period of construction and no payment will be made, or claim will be entertained on any account by the IISER. Fire fighting lines shall not be used for any other purpose. The quoted rates shall be deemed to have taken into account these measures for Fire Fighting / Fire Prevention.

22 SUPPLY OF ELECTRIC POWER

- 22.1 No electric power supply for construction as well as for labour camp shall be provided by IISER .Contractor may apply to concerned Authorities (MSEDCL) for temporary connection for construction and pay the charges to MSEDCL directly at no extra cost to IISER. Cost of electric Power required for construction is deemed to have been included in contractors rate structure. Contractor is advised to make his own arrangements of diesel generators to meet his requirements of electrical power during interruption in power supply and keep electrically operated equipments to the minimum in view of uncertainty of 24 hours power supply. Non-availability of regular power supply shall not be a reason for extension of time and /or extra payment .IISER will only issue recommendation letters for obtaining temporary electric connection from MSEDCL.
- 22.2 The contractor shall make his own arrangement for the distribution of power to all his works
- 22.3 It shall be the responsibility of the contractor to provide and maintain the complete installation to the safety requirements of site. All cabling and installation shall be subject to the approval of the Engineer in charge / Safety Engineer in charge and shall comply in all respects with the appropriate statutory requirements given as follows:
- a) Indian Electricity Act 1910 (as amended)
 - b) Electricity Supply Act 1948 (as amended)
 - c) Indian Electricity Rules. 1956 (as amended) and shall be subject to approval of the Engineer in charge.
 - d) Latest MSEDCL regulations.
- For this purpose, the contractor shall provide full specifications of the equipment and the layout drawing for approval. Approval of the Engineer in charge does not absolve the contractor from complying with any or all other conditions laid down in this section.
- 22.4 IISER will not be liable for any loss / damage to the contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply. IISER will also not be liable for any loss to the contractor arising from failure, interruption or stoppage of power supply or variation in voltage or frequency
- 22.5 Power supply shall be subjected to all restrictions and regulations which are in existence now and as may be enforced MSEDCL from time to time, for which contractor will not have any claim whatsoever
- 22.6 Power supply shall not be used for any other unauthorized use.
- 22.7 After completion of the work and after obtaining approval of the Engineer in charge, the contractor shall promptly dismantle the distribution and other facilities, which he may have erected for execution of job at his own cost.
- 22.8 After completion of works the contractor shall at his own cost, promptly dismantle the distribution and other facilities he may have erected

23. CONTRACTOR'S SITE ORGANIZATION

- 23.1 In view of the quantum and nature of work involved and time frame, it is essential that the site organization is necessarily headed by a senior Engineer in charge of the Company. The site in-charge will have to be senior enough to liaise the management directly and shall be vested with powers to take prompt decision. In addition to posting of a senior Engineer in charge with sufficient field experience/ background in the asking to head the site organization, it is also incumbent upon the Contractor that the progress of the project is reviewed fortnightly with the project authorities with appropriate senior level representation from the contractor so that necessary prompt corrective actions could be initiated.
- 23.2 It is to be noted that the time is essence of contract and in order to meet the schedules and to meet targets the Contractor has to plan for work at least in two shifts. Necessary supervisory staff and the labour force will have to be deployed in each shift to ensure that the schedules are met with.
- 23.3 The construction manpower shall be planned taking in to consideration the commencement and completion of various activities
- 23.4 The Contractor shall furnish along with the tender a detailed site organization he proposes to deploy on the works. The organisation shall include the number and category of personnel of different grades for supervisory works up to the grade of Foreman/Asst. Foreman
- 23.5 The Contractor will also submit along with the tender his assessed phase wise, induction of skilled, semi-skilled, un-skilled work force of all categories for the satisfactory and timely completion of the contract

Contractor should submit along with the tender information regarding Manpower deployment in the format enclosed at Annexure IV.

24 LIABILITY FOR LOSS, DAMAGE, ACCIDENT ETC

- 24.1 During the execution of the contract, and until completion certificate is issued, the contractor will be fully liable to compensate all concerned, for any loss, damage or destruction of "works", structures, materials, plant & machinery, persons, property etc. Including third party risk arising due to causes attributable to the Contractor as may be decided by the Engineer in charge whose decision in this regard shall be final. No claim shall be made against IISER Pune on this account. The contractor shall immediately on award of work take out at his own cost a "Contractor's all risk insurance policy" for an amount equivalent to work order value plus the cost of free issue materials of the works with an insurer acceptable to IISER Pune contract wherein IISER Pune shall be named as "co-assured". The taking out of such policy shall not in any way limit or diminish the responsibility of the Contractor for any loss or damage. The Contractor shall obtain insurance for their plant and machinery deployed by them, including third party risks at their own cost.

25. PLANT AND MACHINERY

- 25.1 The tenderer should deploy minimum plant & machinery as per tender conditions and submit the details along with the tender, phase wise deployment chart of plant & machinery as per **Annexure V**. He should also indicate all the technical specifications for special and conventional equipment viz. Type, capacity, year of manufacture / purchase of the plant and machinery. In case the contractor fails to deploy the required plant and machinery at site of work i/c required centering & shuttering materials, Engineer in charge at the risk & cost of the contractor may deploy the same and recover the amount towards this from the payment due to the agency. The contractor shall accordingly increase the labour force and other materials to make use of the deployed plant & machinery at site. No claims for plant & machinery lying ideal if deployed by the Engineer in charge shall be entertained by IISER Pune.
- 25.2 Notwithstanding the approval of equipment listed by the tenderer in his deployment chart, to enable timely completion of work, the tenderer should also bring and deploy additional plants and equipment, at no extra cost to IISER Pune, as may be deemed necessary by Engineer in charge.

26. MOBILIZATION

Contractor shall bring all plant machinery and personnel required for the satisfactory completion of the work as mentioned in specification schedule of quantities and drawings. The contractor shall provide for all the transports required for bringing the above initially to site and for final removal of the same from site after completion of works under relevant schedule items. He shall maintain all the plant; equipment and machinery in good working condition throughout the period of his work at his own cost and same shall be available for inspection of the Engineer in charge.

27. METHODOLOGY FOR CONSTRUCTION WORK.

- 27.1 The tenderer shall submit along with the tender a detailed comprehensive write up/scheme for successful and timely completion particularly of following works:
- Foundation
 - Superstructure Construction
 - Internal Electrification
 - Fire protection system
 - Lift

Tenderer shall give, in his scheme, information on the following points:

- 27.2 Contractor should furnish along with tender detail schemes for Excavation and Dewatering, Centering and Shuttering Production transport and placement of Concrete Production of concrete blocks, internal and external finishes, P.H. works, HT & LT electric installations and HVAC works; based on the quantities of work involved, requirement of materials, manpower and equipments required time required for completion

28. **CONCRETE MIX DESIGN AND TESTING** - Conditions for Ready Mix Concrete

28.1 For cement concrete/Reinforced Cement Concrete (RCC) Works –

The following parameters shall be adopted for mix design in severe exposure.

a) For M 10 grade ready mix concrete:-

1.	Grade of concrete	M 10
2	Nominal maximum size of aggregate	20mm angular as per specifications.
3	Degree of quality control	Good
4	Maximum water cement ratio	0.50
5	Minimum Cement Concrete	180 kg/cum of concrete
6	Type of Cement used	OPC 43 grade or higher grade conforming to IS : 8112
7	Sand	Natural /crushed Coarse sand as per Specifications.
8	Fly ash	fly ash 20% or more confirming to Grade I of IS 3812 (Part-I) with uniform blending with cement in accordance with clauses 5.2 and 5.2.1 of IS 456:2000 .

b) For M 30 grade Ready Mix Concrete

1.	Grade of concrete	M 30
2	Nominal maximum size of aggregate	20mm angular as per specifications.
3	Degree of quality control	Good
4	Type of exposure	Severe
5	Maximum water cement ratio	0.50
6	Minimum Cement Concrete	345 kg/cum of concrete
7	Type of Cement used	OPC 43 grade or higher grade conforming to IS : 8112
8	Sand	Natural /crushed Coarse sand as per Specifications.
9	Fly ash	fly ash 20 % or more confirming to Grade I of IS 3812 (Part-I) with uniform blending with cement in accordance with clauses 5.2 and 5.2.1 of IS 456:2000 .

- 28.2 Approved admixtures confirming to IS:9103 shall be permitted to be used. The chloride content in the admixture shall satisfy the requirements of BIS:5075. The total amount of chloride content in the admixtures mixed concrete shall satisfy the requirements of IS:456-2000.
- 28.3. The concrete mix design with and without admixture will be got carried out by the contractor through laboratories/Test Houses, approved by the Engineer-in-charge.
- 28.4 The various ingredients for mix design / laboratory test shall be sent to the Lab/test houses through the Engineer-in-charge and the samples of such ingredient sent shall be preserved at site by the department till completion of work. The samples shall be taken from the approved materials which are proposed to be used in the work.
- 28.5 The contractor shall submit the mix design report from the approved laboratory and get approval of Engineer-in-charge. No concreting shall be done without prior approval of the mix design by the consultant & Engineer-in-charge.
- 28.6. The contractor shall make cubes of trials mixes as per approved mix design at site laboratory for all grades of concrete in presence of Engineer-in-charge using same ingredient as adopted for design mix prior to commencement of concreting and get them tested in presence of Engineer-in-charge for 7 days and 28 days.
- 28.7 The contractor shall submit the mix design report from the approved laboratory and get approval of Engineer-in-charge. No concreting shall be done without prior approval of the mix design by the Engineer-in-charge.
- 28.8 The contractor shall make cubes of trials mixes as per approved mix design at site laboratory for all grades of concrete in presence of Engineer-in-charge using same ingredient as adopted for design mix prior to commencement of concreting and get them tested in presence of Engineer-in-charge for 7 days and 28 days.
- 28.9 For each change of source/quality/characteristic properties of
- 28.10 The ingredients from that approved & used in the concrete mix during the work, a fresh mix design shall be got done by the contractor from the approved laboratory. Revised trial mix test shall be conducted at laboratory established at site and shall be submitted by the contractor as per the direction of Engineer-in-charge.
- 28.11 The cost of packaging, sealing, transportation, loading, unloading, cost of samples and the testing charges for mix design in all cases shall be borne by the contractor.
- 28.12 The rate for the item of Ready mix concrete shall be inclusive of all the ingredients including admixtures if required, labour, placing, curing, compacting, pumping, machinery, T & P etc. (except shuttering which shall be measured and paid for separately) required for design mix concrete of required strength and workability. The rate quoted by the agency shall be net and nothing extra shall be payable on account of change of quantities of concrete ingredients like cement and aggregates and admixtures etc. as per the approved mix design.

- 28.13 The contractor shall engage Ready Mix Concrete (RMC) producing plant to supply RMC for the work. The RMC plant proposed to be engaged by the contractor shall fulfill the following requirements.
- i) It shall be fully computerized.
 - ii) It should have supplied RMC for Govt./Public undertakings/Local bodies project of similar magnitude.
 - iii) It should have facility for providing printed dispatch slips showing ingredients of concrete carried by each mixer.
 - iv) It shall have a lab with all kind of testing equipments for the checking of concrete and related materials.
- 28.14 The contractor shall within 15 days of award of the work, submit list of at least two RMC plant companies of repute along with details of such plants including details of transit mixer, pumps etc. to be deployed indicating name of owner company, its location, capacity, technical establishment, past experience and text of M.O.U. proposed to be entered between purchaser (the contractor) and supplier (R.M.C. plant) to the Engineer-in-charge who shall give approval in writing (subject to drawl of M.O.U.). The contractor shall draw the M.O.U. with approved R.M.C. plant owner and submit to Engineer-in-charge within a week of such approval. The contractor will not be allowed to purchase ready mixed-concrete without completion of above stated formalities for use in this project.
- 28.15 Engineer-in-Charge reserves the right to cancel the approval of plant with or without assigning any reason.
- 28.16 The Engineer-in-Charge reserves the right to exercise control over the :-
- i) Ingredients, water and admixtures purchased, stored and to be used in the concrete including conducting of tests for checking quality of materials, recordings of test results and declaring the materials fit or unfit for use in production of mix.
 - ii) Calibration check of the R.M.C.
 - iii) Weight and quantity check on the ingredients, water and admixtures added in batch mixing.
 - iv) Time of mixing of concrete.
 - v) Testing of fresh concrete, recordings of results and declaring the mix fit or unfit for use. This will include continuous control on the workability, during production and taking corrective action.
 - vi) For exercising such control, the Engineer-in-charge shall periodically depute his authorized representative at the RMC plant. It shall be responsibility of the contractor to ensure that all necessary equipment, manpower and facilities are made available to Engineer-in-Charge / his representative at R.M.C. plant.

Ingredients, admixtures and water declared unfit for use in production of mix shall not be used. A batch mix found unfit for use shall not be loaded into the truck for transportation.

28.17 All required relevant records of R.M.C. shall be made available to the Engineer-in-Charge or his authorized representative. Engineer-in-Charge shall, as required, specify guidelines & additional procedures for quality control & other parameters in respect of materials and production and transportation of concrete mix which shall be binding on the contractor & the R.M.C. plant.

28.18 43 grade OPC (Conforming to IS : 8112) of brand / make / source as approved by Engineer-in-charge shall only be use for production of concrete.

28.19 QUALITY CONTROL OF READY-MIXED CONCRETRE

It shall be the responsibility of the contractor to ensure that the RMC producer provides all necessary testing equipments and takes all necessary measures to ensure quality control of ready-mixed concrete.

In general the required measures shall be:-

(I) CONTROL OF PURCHASED MATERIAL QUALITY

R.M.C. producer shall ensure that all the materials purchased and used in the production of concrete conform to the stipulation of the relevant agreed standards with the materials suppliers and the requirements of the products mix design and quality control procedures. This shall be accomplished by visual checks, sampling and resting, certification from material supplier and information data for material supplier. Necessary equipment for the testing all material shall be provided and maintained in calibrated condition at the plant by the R.M.C. producer.

(II) CONTROL OF MATERIAL STORAGE

Adequate and effective storage arrangement shall be provided by, RMC producer at RMC plant for prevention of contamination, reliable transfer and feed systems, drainage of aggregates, prevention of freezing or excessive solar heating of aggregate etc.

(III) COMPUTER PRINT OUTS OF EACH TRUCK LOAD

Each truckload transit mixer dispatched to site shall carry computer printout of the ingredients of the concrete it is carrying. The printout shall be produced to Engineer-in-Charge or his representative at site before R.M.C. is used in work.

(IV) TRANSFER AND WEIGHING EQUIPMENT

R.M.C. producer shall ensure that a documented calibration is in place. Proper calibration records shall be made available indicating date of next calibration due, corrective action taken etc. R.M.C. producer shall ensure additional calibration checks whenever required by Engineer-in-Charge in writing to contractor. R.M.C. producer

shall also maintain a daily production record including details of customers to whom R.M.C. was supplied including that day's production including water and admixtures.

The accuracy of measuring equipment shall be within +2% quantity of cement, -3% of quantity of aggregate, admixture and water being measured.

(V) MAINTENANCE OF PLANT, TRUCK MIXERS AND PUMPS

Plant, Truck, Mixers and pumps should be well maintained so that it does not hamper any operation of production, transportation and placement.

(VI) PRODUCTION OF CONCRETE:-

The following precautions shall be taken during the production of R.M.C. at the plant.

- i) Weighing (correct reading of batch data and accurate weighing):- For each load, written, printed or graphical records shall be made of the weights of the materials batched, the estimated slump, the total amount of water added to the load, the delivery tickets number for that load and the time of loading the concrete into the truck.
- ii) Visual observation of concrete during production and delivery or during sampling and testing of fresh concrete, assessment of uniformity, cohesion, workability, adjustment to water content :- The workability of the concrete shall be controlled on a continuous basis during production. The batch mix found unfit shall not be loaded into the truck for transportation. Necessary corrective action shall be taken in the production of mix as required for further batches.
- iii) Use of adequate equipment at the plant to measure surface moisture content of aggregates, particularly fine aggregate and the workability of the concrete, cube test etc. shall also be ensured.
- iv) Making corresponding adjustment at the plant automatically or manually to batched quantities to allow for observed, measured or reported changes in materials or concrete quantities.
- v) Sampling of concrete, testing, monitoring of results.
- vi) Diagnosis and correction of faults identified from observations / complaints

The RMC plant produced concrete shall be accepted by Engineer-in-Charge at site after receipt of the same after fulfilling all the requirements of mix mentioned in the tender documents.

- 28.20 Ready mix concrete shall be arranged in quantity as required at site of work. The ready mix concrete shall be supplied as per the pre-agreed schedule approved by Engineer-in-Charge.

- 28.21 If so required by the Engineer-in-Charge, the RMC producer shall provide separate storage space / godowns for storage of materials approved by Engineer-in-Charge for the design mix concrete.
- 28.22 The use of PPC RMC shall not be permitted.
- 28.23 Frequency of sampling and standard of acceptance shall be as per specifications for design mix concrete.
- 28.24 The RMC shall be placed by pump of suitable capacity and the contractor shall arrange sufficient length of pipe at site to place the RMC in the minimum required time. The contractors shall co-ordinate with R.M.C. supplier and pump hirer to have effective concrete placement. Nothing extra shall be paid for placing of concrete through concrete pump.
- 28.25 The representative of R.M.C. supplier shall attend the site meeting as and when decided by the Engineer-in-Charge.
- 28.26 i) The contractor shall access the quantity of R.M.C. requirement at site well in advance and order accordingly to the R.M.C. supplier. In case excess R.M.C. is received at site, the Department shall not be under any obligation to get the extra quantity utilized and no payment for such R.M.C. shall be made.
- ii) The contractor shall have to employ labour in shifts to ensure continuous casting of slabs and other RCC members. No extra payment on this account shall be made.
- 28.27 The department will recommend to the Traffic Police to issue permits for the entry of the vehicles through the area of no entry zone to the working area. However, absence of such permits will not be cause for delay in completion of the work.
- 28.28 The RMC concrete is required to be placed at site within the initial setting period of concrete. In case there is delay in placement of concrete the same shall be rejected and shall not be allowed to be used at site.
- 28.29 In order to monitor the placement of RMC within initial setting time necessary record needs to be maintained at site.
- 28.30 All materials to be used on the work shall conform to relevant specifications. The Engineer in charge reserves the right to reject any material not up to specification and the contractor will have no claim for any damage, loss or compensation on his account
- 28.31 The natural sand if required shall be washed and rewashed as directed by Engineer in charge-In-Charge. The washed water of the natural sand shall be free from chlorides and sulphates, whose presence, if any, shall be checked with silver nitrate and barium chloride respectively. Manufactured sand shall be permitted for usage only on the specific approval from the Engineer in charge
- 28.32 The contractor shall note that use of self compacting concrete (SCC) using fly ash is envisaged for the work. Therefore, the contractor shall be well equipped to produce, transport, place and finish SCC.

28.33 Measurement:

Dimensions shall be measured nearest to a cm except for the thickness of slab which shall be measured correct to 0.5 cm. The areas shall be worked out nearest to 0.01 sqm. The cubical contents shall be worked out to nearest 0.01 cum.

No deduction shall be made for the following :

- a) Ends of dissimilar materials (e.g. joists, beams, post girders, rafters, purlins, trusses, corbels, steps etc.) upto 500 sqcm. in cross section.
- b) Opening up to 0.1 sqm.
(Note : In calculating area of openings up to 0.1 sqm the size of opening shall include the thickness of any separate lintels or sills. No extra labour for forming such openings or voids shall be paid for.
- c) The volume occupied by reinforcement
- d) The volume occupied by water pipes, conduits etc. not exceeding 25 sq. cm each in cross sectional area. Nothing extra shall be paid for leaving and finishing such cavities and holes.

Measurement shall be taken before any rendering is done in concrete members. Measurement will not include rendering. The measurement of RCC work between various units shall be regulated as below :

- a) Slabs shall be taken as running continuously through except when slab is monolithic with the beam. In that case it will be from the face to face of the beam.
- b) Beams shall be measured from face to face of columns and shall include haunches, if any, between columns and beam. The depth of the beam shall be from the bottom of slab to the bottom of beam if beam and slab are not monolithic. In case of monolithic construction where slabs are integrally connected with beam, the depth of the beam shall be from the top of the slab to the bottom of beam.
- c) The columns measurement shall be taken through
- d) Chajjas along with its bearing on wall shall be measured in cum nearest to two places of decimal. When Chajjas is combined with lintel. Slab or beam, the projecting portion shall be measured as chajjas, built in bearing shall be measured as per item of lintel, slab or beam in which chajjas bears.
- e) Where the band and lintel are of the same height and the band serves as lintel, the portion of the band to be measured as lintel shall be for clear length of opening plus twice the over all depth of band.

28.34 Tolerances

Subject to the condition that structural safety is not impaired and architectural concept does not hamper, the tolerances in dimensions of RCC members shall be as specified in the drawings by the designer. Whenever these are not specified, the permissible tolerance shall be decided by the Engineer-in-Charge after consultation with the designer, if necessary.

When tolerances in dimensions are permitted, following procedure for measurements shall apply :

- a) If the actual dimensions of RCC members do not exceed or decrease the design dimensions of the members plus or minus tolerance limit specified above, the design dimensions shall be taken for the purpose of measurements.
- b) If the actual dimensions exceed the design dimensions by more than the tolerance limit, the design dimensions only shall be measured for the purpose of payment.
- c) If the actual dimensions decrease more than the tolerance limit specified, the actual dimensions of the RCC members shall be taken for the purpose of measurement and payment.
- d) For acceptance of RCC members whose dimensions are not exactly as per design dimensions, the decision of Engineer-in-Charge shall be final. For the purpose of payment, however, the clarification as given in para a, b and c above shall apply.

28.35 Payment

- 1.11.1 Where the concrete fulfills the criteria as specified in AS SPECIFIED CPWD SPECIFICATIONS 2009 VOL-I. Acceptance Criteria, full payment shall be payable subject to the conforming to prescribed specifications.
- 1.11.2 Where the concrete does not satisfy the Acceptance Criteria and nondestructive test has been ordered or where the nondestructive test has been otherwise ordered, the result of nondestructive test shall prevail over the Acceptance Criteria as specified in CPWD specifications 209 VOL-1. Where concrete does not satisfy the strength requirements in Nondestructive test, the Engineer-in-Charge may reject the concrete represented by the test. However, the Engineer-in-Charge may accept the said concrete after remedial measures / retrofitting / rehabilitations, as shall be suggested by approved institutes (IIT Madras/ SERC Chennai), are carried out by the contractor at his risk and cost. The cost of consultancy to such institutes shall also be borne by the contractor. The decision of Engineer-in-Charge shall be final and binding.

1.12 Rate:

- 1.12.1 The rate includes the cost of materials, labours and other inputs involved in all the operations described above, finishing top of concrete in line and level, curing, protection from rains etc. except for the cost of reinforcement, centering and shuttering.
- 1.12.2 No extra payment for richer mix which projects into any member from another member during concreting of junctions of beams, slabs and columns etc. will be made except where so indicated in the structural drawings.

29. REMOVAL OF TEMPORARY WORK, PLANT AND SURPLUS MATERIALS

- 29.1 Prior to final acceptance of the completed work but excepting as otherwise expressly directed or permitted in writing, the contractor shall at his own expense, remove from the site and dispose off the temporary structure, including all false work and scaffolding, grid work, all plant and material and debris for which he is responsible, to the satisfaction of the Engineer in charge.

30 TAXES**30.1 ROYALTIES DUTIES**

All quarry fees, royalties, excise duties, sales tax and other duties/levies on materials brought by the contractor to the site, will be paid for by the contractor directly. If refunds of such payments are, however, admissible, under the rules made by local authorities, the contractor may obtain such refund by following prescribed procedure laid down by the concerned authorities. Assistance of Engineer in charge will be limited to the extent of issuing a certificate stating that the materials so brought to site have become the property of the IISER. The contractor shall take into account this fact while quoting his rates in the tender. If the quarry falls in private land or Government land leased to private parties, the contractor shall have to obtain the permission of such private parties and shall pay the royalties and other charges to them. IISER will help the contractor to obtain permission in such cases to the extent possible but will not be responsible for payment due from the contractor in this regard.

Any variation in the rates of taxes/duties mentioned above, from those prevailing at the time of tender opening, except service tax and Value added Tax are to be borne by contractor.

30.2 SERVICE TAX

The tendered rates shall not include Service tax on work. If Service tax comes into existence by statutory order of the Government during the period of contract the same will be reimbursed by IISER against production of documentary evidence of tax paid.

30.3 VALUE ADDED TAX AND LABOUR CESS

The tendered rates shall be inclusive of Value added tax as prevailing at the time of tender opening. Any variation in the rate VAT during the execution of the work from the

rate of VAT prevailing at the tender opening will be considered for reimbursement/ recovery. The reimbursement/ recovery shall be calculated based on the increase/ decrease in the rate of VAT applied on the liability of VAT (as a percentage of the value of work) as mentioned below and the increase/ decrease in the liability will only be reimbursed/ recovered. For the purpose of calculation of reimbursement/ recovery the liability of VAT shall be considered as **2% (two percent)** of the work done value during the period for which reimbursement/ recovery is being calculated. The work done value shall include value of work as per Priced Schedule extra items, substituted items, escalation and net secured advance paid during the period under consideration. Contractor should produce the certificate of registration of VAT from concerned authorities at the time of submission of tender.

Construction workers welfare Labour cess shall be recovered @ 1% of the work done. Accordingly, Bidder shall quote his rates after taking into consideration of the above recoveries.

30.4 DEDUCTION OF INCOME TAX

As per Income-Tax Act, as amended by Ministry of Finance from time to time, Income Tax at the applicable rate, as notified, will be recovered on the gross value of work done from the R.A. Bills. A certificate for the amount so recovered will be issued by IISER Pune to the contractor on demand.

31 CONSULTANTS APPOINTED BY IISER

IISER has engaged M/s. C R Narayana Rao and company Chennai as Architecture and design consultant for the work and appointed agency of Construction management consultants. Representative of Architect will be visiting site and give direction regarding architectural and structural works. Contractor shall follow the direction and instruction given by the Architects representative at site. However if any financial implications are involved due to such instruction contractor shall bring the same to the notice of IISER before executing. PMC will be supervising the construction work. They will be deploying project Manager & site engineers to overall supervision on work, day to day checking of all Construction activities, quality control, testing of materials, billing, reporting process Etc. Project Manager shall be acting on behalf of IISER and will look after the work as per contract specification & agreement. Contractor shall follow all the instructions from Project Manager and site engineers appointed by project management consultants. However if any financial implications are involved any time during the work the contractor shall bring the same to the notice of IISER before execution.

32 RIGHTS OF OTHER AGENCIES

The contractor shall note that several other agencies may also be simultaneously working within and around the structures covered under the present contract.

The contractor shall permit as directed by the Engineer in charge from time to time, such works to be carried out without any hindrance and fully co-ordinate his activities and extend all his co-operation to the other agencies working therein. In case of dispute

in such co-ordination, the Engineer in charge's decision shall be final and binding on the contractor.

33 SAFETY MEASURES

To avoid possible accidents to staff and labour employed during execution of work, it is imperative to observe the safety code provisions specified under -General Conditions of Contract and Section

The contractor shall follow the safety regulations as prescribed in the tender and Indian Standards. He shall provide necessary safety appliances to his employees as instructed by the Engineer in charge-in-charge/Safety Officer deputed by the IISER Pune depending upon the nature of work. Chains/ ropes or other lifting materials used for the suspension must be of adequate strength and suitable quality and shall be of tested quality. Contractor shall employ minimum following staff for the work

Safety Officers:

Qualifications: Degree in Engineering and Diploma in Industrial safety. One number with minimum 2 years experience.

Safety Supervisors:

Qualifications: Diploma in Engineer in charging and Diploma in Industrial Safety or 6 years experience. 2 numbers

These safety personnel shall not be assigned any other responsibility. The cost of such safety measures shall be included by the tenderer in his rates quoted for items in the schedule of quantities and rates.

34 GOVERNMENT LABOUR ACTS / LAWS

The contract shall strictly follow the Government Labour Acts which are in force at present and introduced from time to time, such as Acts enforced by Regional Provident Fund commissioner, Directorate of ESIS and Enforcement Officer of Contract Labour Act and all necessary arrangements for Labour Security Insurance will have to be made by the Contractor at his own cost.

FAIR WAGES

The wage paid to the labourers shall not be less than the fair / minimum wages as fixed under any law, statutory rule or order from time to time. However, increase in the wages due to any statutory act or by rules framed there under by the Government or by local authorities during the currency of the contract or during any valid period of extension of contract shall not be considered reason for any reimbursement or extra

claim. The bidder is deemed to have taken this aspect into consideration in his unit rates for various items of work covered under this contract.

The tenderer is advised to confirm the latest rate of basic wages and special allowance, if any as declared by the State / Central Government on the date of submission of the tender. IISER Pune is registered with Assistant Labour Commissioner (Central), Pune under the Contract Labour (Regulation and Abolition) Act.

Note: The Contractor shall submit the labour report every month

The contractor shall strictly comply with all provisions of labour laws given— General Conditions of Contract and subsequent statutory requirements in this regard.

The contractor should take into account the provisions of the labour laws while quoting his rates.

LICENSE TO EMPLOY LABOUR

Contractor shall arrange labour license for the labourers employed by him directly or through one or more sub-contractors or agents or any other person, before he undertakes execution of the job.

The Contractor shall get a license from the competent authority of the area where the work is undertaken under sub section 12(i) of the contract labour (Regulation & Abolition) Act, 1970, in case twenty or more workmen are employed by him directly or through one or more sub-contractors or agents or any other person, before he undertakes execution of the job.

35 PRESENTATION BY SUCCESSFUL BIDDER

The successful bidder is required to make a detailed presentation at a short notice of 2-3 days, from the date of intimation regarding the methodology he proposes to execute the job with respect to schedule/deployment of plant and machinery, manpower etc.

36 NOMINATED SPECIALIST AGENCIES

This tender being composite tender including Civil, Plumbing & sanitary Electrical, Lift, External finishes Fire protection system & IBMS etc ,Contractor may be permitted to engage specialized associate agencies as per terms and conditions stipulated in Vendor Prequalification by the Engineer in charge on Specific Approval. Along with tender contractor will have to furnish names and profile of such associated agencies giving details of their experience financial capacity etc whom he proposes to engage for specialized jobs. However responsibility of timely completion of work by associate agencies shall rest with main Contractor. No claims on any accounts will be entertained by IISER Pune due to failure to complete the associate agencies. Delay in completion of work by associate agencies shall be considered as attributable to main Contractor

37. QUALITY MANAGEMENT REQUIREMENTS

The contractor is responsible for planning and developing a programme that assures that all his management; design and technical responsibilities for quality executed effectively.

38 QUALITY ASSURANCE

38.1 Assuring reliability and quality of work carried out under this package is the primary responsibility of the contractor. Contractor shall have a documentation quality system addressing the mechanism to achieve the required quality level and the work carried out conforming to the best manufacturing and work practices prevailing at the time of execution of contract.

38.2 Contractor shall have a well-structured organization of Personnel and resources to specify, achieve, verify and document all work. This should also include the approval from IISER Pune wherever required. Quality system can be in line with National / International standards

38.3 The Contractor / Vendor / Sub-vendors shall have an independent Quality Control Inspection and testing organization. They should also make provision for setting up a test facility wherever required.

The Contractor shall furnish along with this bid an organization chart which includes the structure and size of the Manpower of the Quality Department for detailed scrutiny / approval and acceptance of IISER.

38.4 wherever found essential the contractor may have to provide for hiring outside inspection agency.

39 QUALITY PLAN

39.1 The Contractor shall

- a) Plan the inspection and test activities.
- b) Identify in the quality plan the inspections and tests to be performed on the items listed in the contract, in compliance with contractual and / or technical requirements.
- c) Submit the plan for the Engineer in charge's concurrence / approval following the award of the contract and before the work starts. Referenced inspection and test specifications and / or procedures shall be made available to the quality assurance representative during the implementation of the quality plan. This quality plan shall identify at appropriate stage witness points and hold points and also give clearly the acceptance standards for all inspections, tests and examinations performed.
- d) Update the plan during the life of the contract to reflect current conditions of manufacturing, construction, inspecting and testing and resubmit the plan to the Engineer in charge.

The Quality Plan shall be on a format to be approved by the Engineer in charge.

- 39.2 The quality plans for subcontracted items, when concurred with by the contractor, shall be submitted to the Engineer in charge as applicable, for concurrence and insertion of witness and hold points.

39.3 QUALITY ASSURANCE PROCEDURES

The contractor shall have procedures for the following specific requirements should they apply to the contract:

- Document control
- Procurement
- Measuring and testing equipment
- Inspection and test
- In-process inspection
- Final inspection
- Inspection status
- Identification and traceability
- Preservation, handling and storage during construction
- Construction
- Special Processes
- Quality records
- Non-conformances
- NPC-supplied items
- Corrective actions.

Each QA procedure shall define, as applicable, such things as; its purpose and scope; who is responsible for what; how all steps are to be performed; what materials, equipment and documentation are to be used; how it is all controlled.

QA procedure shall be updated when necessary.

39.4 MEASURING AND TESTING EQUIPMENT

All measuring and testing equipment and devices used to verify characteristics that can affect item quality shall be controlled and maintained. At prescribed intervals, or prior to use, they shall be calibrated and adjusted against certified equipment having a known valid relationship to nationally recognized standards. Where no national standards exist, the basis employed for calibration shall be documented.

- 39.5 Calibration requirements are mandatorily applicable only to the following equipment and instruments.

- Laboratory scale
- Compression test machine
- Tensile test machine
- Concrete batching plant

For all other equipment and instruments, the requirements are non-mandatory but they may be used as a guide.

INSPECTIONS AND TEST

- 39.6 The Contractor shall provide for the performance of inspections and tests as specified in the quality plan. These inspections and tests shall be carried out in accordance with written procedures that define the acceptance / rejection criteria. .
- 39.7 Inspections and tests shall be documented in inspection and test reports that identify as a minimum the item inspected or tested, applicable drawings, specifications or procedures, the date of inspection or test, the inspector, tester or data recorder, the type of observation, the results, the acceptability and the action taken in connection with any deficiencies identified.

40 IN-PROCESS INSPECTION

For Concreting Activities:

- a) The Contractor shall establish adequate measures for pre-concreting, in process and post-concreting inspections to be performed as applicable.

41 FINAL INSPECTION

The contractor shall

- 41.1 Identify, inspect and / or test the completed item as required by the quality plan.
- 41.2 Verify that the item has been inspected at all points shown in the quality plan and that the records are adequate and completed.
- 41.3 Provide for measures for controlling status indicators including the authority for application and removal of tags, stamps or other marking.
- 41.4 Identify non-conforming items until their conformity is established.

42 IDENTIFICATION AND TRACEABILITY

- 42.1 The contractor shall establish and maintain an adequate system to:

Identify Each Item (lot, component or part) to the applicable drawing, specification or other technical document, throughout the whole construction process.

43 PRESERVATION HANDLING AND STORAGE

The contractor shall:

- 43.1 Establish, maintain and document a system for the preservation, storage and handling of all items from the time of receipt through the entire construction process and subsequent storage to prevent abuse, misuse, damage deterioration or loss.

44 QUALITY RECORDS

The Contractor shall:

- 44.1 Maintain quality records as evidence that:
- a) The quality assurance programme meets the requirements of these Quality Management Requirement (manual, procedures, quality plan).
 - b) The items or services meet contractual or other applicable technical requirements) specifications, drawings, calculations, manufacturing, inspection and test procedures).
 - c) Personnel and procedures for special processes are qualified.
 - d) Measuring and testing equipment is calibrated.
 - e) The procurements meet the requirements.
 - f) Corrective actions are being taken and are effective as required.
 - g) Audits are performed as required.
- 44.2 Maintain Final performance quality records which include as appropriate:
- a) As built records
 - b) Material test reports or certificates.
 - c) Non-destructive examination records or certificates.
 - d) Inspection and test records
 - e) Non-conformance reports
 - f) Concrete batch plant printout.

Items (c) and (d) apply to those operations performed after receipt materials from the supplier.

45 NON-CONFORMANCE

- 45.1 The Contractor is responsible for the identification and disposition of all non-conforming items, including those of subcontractors. Final acceptance of the contractor's disposition of those items that violate contractual requirements is the prerogative of the Engineer in charge.

46 CORRECTIVE ACTION

The contractor shall:

- 46.1 Investigate the causes of significant or recurring non-conformances and take appropriate action to prevent repetition.

47 AUDIT

- 47.1 There shall be provision for having periodic internal audits conducted on the Quality Assurance System and the activities affecting quality of this package. These audits may be carried out once in six months by independent group of the contractor.

48 ADDITIONAL REQUIREMENTS / INFORMATION

- 48.1 Total responsibility with regard to quality surveillance/quality control, inspection shall be with the Contractors.
- 48.2 IISER will be represented by a Quality Surveyor designated by the Engineer in charge. The Quality Surveyor and his designated staff will be responsible for checking the quality of work to the extent necessary as per relevant procedures and inspection plans to assess compliance with the provisions of the specifications. His surveillance shall not be limited only to examination of the end product but he shall have complete access to the work and the right to intervene where bad practice is detected. He shall also have the right to conduct or require the contractor to perform, any additional inspection or testing he deems necessary. Any unacceptable defects noted by such tests shall be rectified by the contractor without any extra cost to IISER Pune. The surveillance provided by the Engineer in charge or the approval by the Quality Surveyor of finished work shall not relieve the contractor of any of his responsibilities under this specification. The rejection of any work not meeting these specifications is possible at any time. The contractor shall maintain quality control records, which shall have details of all the quality control operations that were performed. The quality surveyor shall have the right to witness any such operation and call for such record.
- 48.3 Right in the tendering stage itself, the contractor shall give an organization chart including number of persons to be deployed on the work, qualification along with their experience, justifying the adequacy to meet the construction schedule.
- 48.4 Minimum number of personnel to be deployed by the contractor, requisite educational qualification and experience shall be subjected to the verification of IISER
- 48.5. IISER's responsibility to quality will be only in the form of QA function.
- 48.6 All efforts shall be made by the contractor to keep the laboratory facility available throughout the contract period. In the event of testing machine being out of order, contractor shall arrange the testing of materials at his cost at any laboratory approved by IISER
- 48.7 List of pre-qualified/approved test houses, organizations will be given by IISER. If contractor proposes any other standard/certified laboratory, such laboratories will be evaluated for their adequacy in fulfilling the requirements. On fulfilling the

requirements, IISER will approve such laboratories for further testing. Cost of evaluation shall be borne by the contractor.

- 48.8 Contractor shall submit the approved construction methodology and required procedures well in advance of commencement of work. At first instance, it shall be treated as a part of mobilization. These documents shall be revised whenever need arises.
- 48.9 To achieve speedy implementation of commissioning in the schedule time, the contractor shall be responsible for completion relevant systems to the fullest extent before taking up pre-commissioning.
- 48.10 Contractor shall have a clear cut documentation policy which shall include generation of reports, completeness at appropriate time, and careful storage of records.
- 48.11 Contractor shall propose procedures for pre-qualification, procurement/ storage/testing and handling of the materials required for the present package at the time of tendering.
- 48.12 The contractor shall have in-built facilities for internal audit of all the reports documents at least once in six months to see that his quality Assurance system is working, the works are proceeding in proper direction and non-conformances are being identified and corrective actions are in vogue. Contractor shall be responsible for audit, feedback, implementation status, traceability of records.

49. NIL

50 NIL

51 MATERIAL SUPPLIED BY THE CONTRACTOR

All materials required for the work shall be supplied by the contractor from approved source. The bidder may please note that major items e.g. cement, reinforcement steel, paints, caulking, etc. shall be procured directly from the manufacturers.

Contractor shall supply free samples of material to be used on his works whenever asked for. Failure of any sample to pass the specified requirements for a particular use will be sufficient cause for rejection. The materials so rejected shall be removed from the site by the contractor immediately, failing which the same shall be removed by the Engineer in charge at the risk and cost of the Contractor. List of Approved Makes for materials is Enclosed as Annexure –III.

52. GREEN BUILDING MEASURES

LIST OF MEASURES TO BE TAKEN BY CONTRACTOR DURING THE ENTIRE PERIOD OF CONSTRUCTION PROCESS TO ACHIEVE THE DESIRED RATING IN LINE WITH GREEN BUILDING (GRIHA) CRITERIONS.

TENDERERS ARE REQUESTED TO STUDY ALL THESE REQUIREMENTS GIVEN BELOW VERY CARE FULLY AND THE SAME TO BE IMPLEMENTED DURING THE ENTIRE TIME OF CONSTRUCTION PERIOD TO THE SATISFACTION OF GREEN CONSULTANTS /IISER.

NECESSARY DOCUMENTATIONS TO BE PREPARED TO SHOW THE PROOF OF EVIDENCES FOR SUCH CRITERIONS FOLLOWED AT SITE. DOCUMENTATIONS MAY BE OFF PHOTOS, VIDEO CLIPPINGS, CERTIFICATES ETC.

THERE WILL BE NO ADDITIONAL COST WILL BE PAID ON ACCOUNT OF THIS AND IT SHOULD BE CONSIDERED IN THE QUOTED RATE OF ALL ITEMS ITSELF.

52.1 Erosion and sedimentation (criterion 3)

An erosion and sedimentation plan needs to be developed to prevent loss of soil during construction by storm water runoff & wind erosion, prevent sedimentation of storm sewer and polluting the air with dust and particulate matter. Top soil has to be removed carefully and stacked for reuse later in the site. Additional measures such as temporary seeding, permanent seeding, mulching, silt fencing, sedimentation traps etc. can be taken to ensure control of erosion due to wind and storm water runoff. The Principal Civil contractor shall undertake these measures during the construction stage. Photographs of various measures implemented at the site need to be taken by the civil contractor. It is the responsibility of the contractor to ensure that at all times during excavation and construction these measures are strictly followed. Sample enclosed.

a). Preservation of existing vegetation : Principal Civil contractor needs to ensure that they do not disturb vegetation & earthwork 40 ft beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways and main utility branch trenches & 25 ft beyond pervious paving areas, storm water retention facilities etc. Barricading needs to be done along this 40 feet line beyond the building perimeter and it needs to be ensured that no earth beyond this barricade is disturbed. This means that no construction activity can be done outside this 40 feet line including material storage, location of sheds, concrete mixing etc. Again, photographs have to be taken at each stage during construction to ensure all earth and vegetation beyond this 40ft line is kept intact and site disturbance is reduced.

b). Storm water management during construction: Principal Civil contractor needs to take measures to ensure that the storm water runoff during construction does not exceed the runoff before construction. To this effect there is need to provide rain water recharge pits right around the periphery of the site & have rain water harvesting wells to capture rain water and then filter all suspended solids and other materials before recharge into the earth. The details shall be provided by the consultants and executed at site by civil contractor.

c). Construction waste management: Principal Civil contractor while construction has to ensure that the hazardous and inert wastages generated during construction, demolition and land clearing is segregated carefully and kept in multicolored bins at a safe and hygienic place within the premises and easily accessible to approach roads. Principal Civil contractor to keep track of total waste generated at site and either use it on-site for other purposes or resell it to some agency outside. A table with the total waste generated in tons or kgs for construction waste including scrap steel, concrete debris, cement and mortar waste, empty paint containers, empty cement bags etc. needs to be maintained along with details on what was done with the waste – whether it was resold to scrap agents, reused within our own site for filling or other purposes. Sample template enclosed. This template

needs to be filled on a weekly/fortnightly basis based on site work and updated until completion of project.

d).Utilisation of recycled materials and Regional Materials: As per Green building requirements it is recommended to use materials with good recycle content such as cement with fly ash, glass etc. and materials manufactured locally/regionally (within 800 kms of project site). The specifications for these materials will be included into tender documents, however it is the responsibility of the contractor to coordinate with respective agencies/manufacturers and get letters confirming the recycled content and distance from manufacturing locations to project site.

e).Construction management plan: While construction various measures have to be taken for storage of materials, housekeeping at site, safety measures for laborers, and isolation of constructed/finished areas from areas under construction, dust control etc. Specifically the following needs to be adhered to and done by contractor at site:

- i) **Source control:** Specify finish materials such as paints, carpet, composite wood, adhesives, and sealants that have low toxicity levels, or none at all. The Management Plan should specify the control measures for materials containing VOCs. Recover, isolate and ventilate containers housing toxic materials. Also, avoid exhaust fumes from idling vehicles and gasoline fueled tools.
- ii) **Pathway Interruption:** During construction, isolate areas of work to prevent contamination of clean or occupied spaces. Depending on the weather conditions, ventilate using 100% outside air to exhaust contaminated air directly to the outside during installation of VOC-emitting materials. Depressurize the work area allowing the air pressure differential between construction and clean areas to contain dust and odors. Provide temporary barriers that contain the construction area.
- iii) **Housekeeping:** Institute cleaning activities designed to control contaminants in building spaces during construction and prior to occupancy. Porous building materials should be protected from exposure to moisture and stored in a clean area prior to installation. Some other strategies are using vacuum cleaners with high efficiency particulate filters, increasing the cleaning frequency and utilizing wetting agents for dust.
- iv) **Scheduling:** Coordinate construction activities to minimize or eliminate disruption of operations in the occupied portions of the building. Construction activities over the duration of the project should be sequenced carefully to minimize the impact on the indoor air quality. It may be necessary to conduct activities with high pollution potential during off-hours, such as on the weekends or in the evenings to allow time for new materials to air out. Plan adequate time to complete work so flush-out and test procedures can be completed prior to occupancy. Upon completion of construction, replace all filtration media immediately prior to occupancy.

f). Top soil preservation

Measures for development and stabilization of the site before construction to be taken up during the dry season.

Removal of topsoil and stacking the same. The top soil (top 20cms) rich in high organic content to be stripped and stacked at suitable location in the site. It shall be reapplied to the site for re-vegetation after construction is complete.

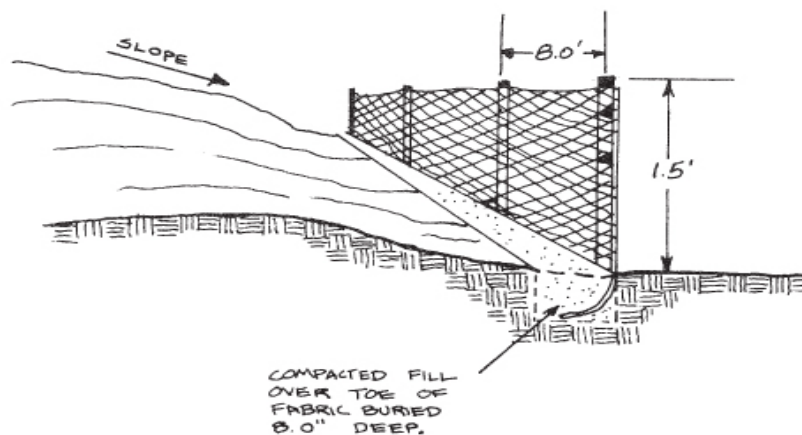
Fabric fences to be constructed around the area of stock piling to reduce wind caused soil erosion and trap sediments. Temporary seeding/mulching techniques to be employed to stabilize stockpiles of topsoil on the site. Mulching of identified areas can be carried out using gravel during construction.

Native species of plants can be planted to stabilize runoff areas which are free of construction activity.

For water erosion, temporary seeding using sedimentation fence ground disturbance of the site is confined to areas where structures, roads and landscape will continue after construction is complete. These areas were physically demarcated with signs, barriers and tapes to ensure only necessary land area is cleared and soil in other areas is undisturbed. Development activities and equipment movement are also restricted to demarcated areas. Further, these areas were mulched with gravel to prevent erosion. The remaining areas were temporarily sodded with local grasses to protect the soil.

g).Construction specifications:

Construct Sediment fence on low side of topsoil stockpile to prevent sediment from being washed into the drainage system. Fence to extend around approximately 70% of the perimeter of the stockpile. Alternatively sediment basins can be constructed by locating posts down slope of fabric to help support fencing.



h).Sediment Basin

A sediment basin will be constructed in the suitable location of the property. All water from disturbed areas will be directed to the basin before leaving the site. The intent is to ensure no soil leaves the site in case of water run-off.

j).Soak Pits and Wells

Soak pits and wells would be constructed along the perimeter of the site.

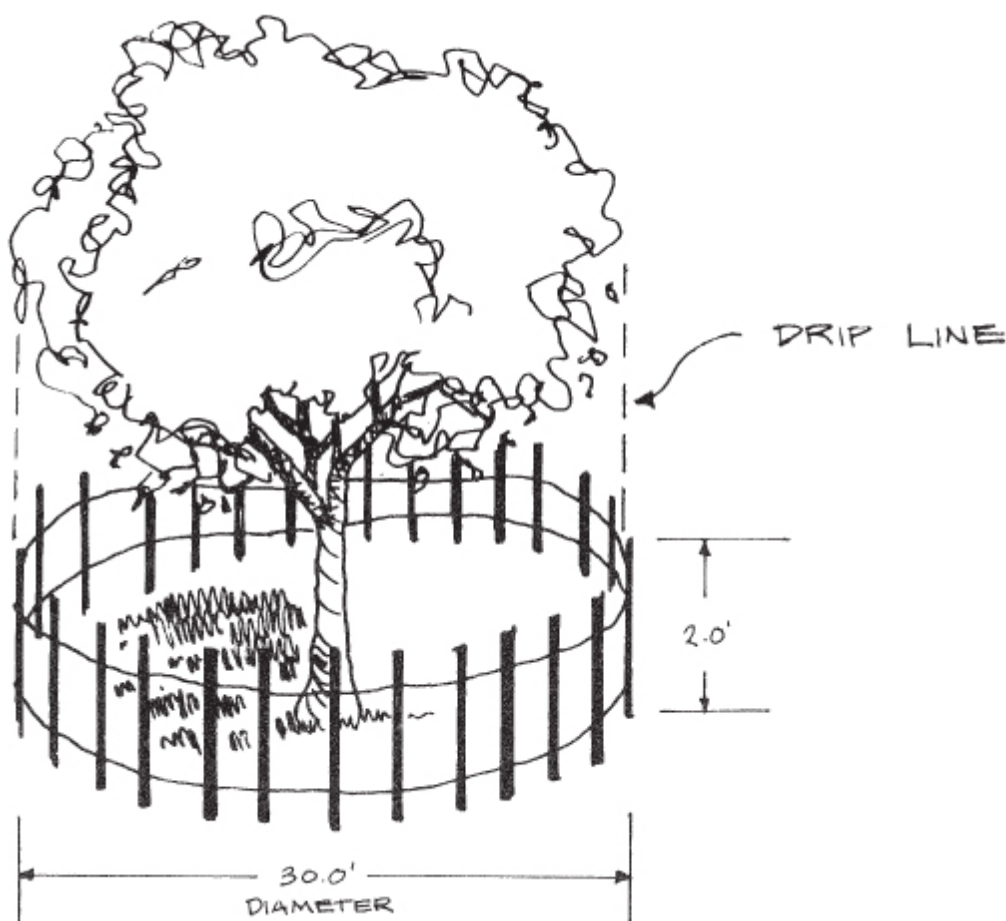
The rainwater runoff from rooftop and hard areas is being collected into closed pipe drain and through a sedimentation chamber discharge into rainwater discharge pit. The suspended matter gets collected in sedimentation chambers, which need to be cleaned periodically as needed.

k).Temporary Diversions

Temporary diversions shall be constructed as required to prevent surface runoff from eroding sediment banks. (NOTE: Sediment-free water may be diverted away from the project sediment basin.) This temporary diversion will outlet to the temporary inlet protection device at the construction entrance as the fill elevation increases.

l).Tree Preservation and Protection

A minimum 2.0 ft high protective fence will be erected around the large tree at the drip line to prevent damage during construction. Sediment fence materials may be used for this purpose.



NOTE:

- SEDIMENT FENCE MATERIAL MAY BE USED TO BUILD FENCE.

- DRIVE STAKES FIRMLY INTO GROUND-AT LEAST 12"

M).SEQUENCE OF IMPLEMENTATION

Development and stabilization measures needed before construction:

These measures have been taken up during the dry season. The following activities were carried out on site during this period of the year when erosion potential is relatively low before commencement of construction activities.

- Marking of areas to be disturbed during construction activity, stockpiling areas and areas for construction activity.
- Clearing removal and stock piling of topsoil.
- Barricading
 - To protect area of stock piled topsoil from wind erosion.
 - To protect areas identified for non-construction activity.

Development and stabilization measures during construction

- Sodding of areas identified for non-construction activity, staging etc.
- Protecting topsoil with mulching/temporary seeding as described.

Development and stabilization measures post-construction

After the landscape and building civil work is completed the following measures will be taken for stabilization in the following sequence: -

- Grading and development around the building including drains, soak pits, and sub surface drainage over basement slab.
- Planting of all trees, shrubs, and ground covers etc. within 15 days of finishing grading works.
- Laying of gravel much in areas as required by design.
- Final connection to the water harvesting pits will be done.
- The filtration systems, filtration structures and sand filters will be installed only after construction has been completed and the site has been permanently stabilized.

4. Operation and maintenance

Proper operation and maintenance of facilities is necessary for their effective use. The following measures will be followed:

- Inspection of soak pits and rain wells after every major storm for the first few months after construction. Annual inspection of the soak pits and rain water harvesting pits before the onset of the monsoon season.
- Periodic removal and replacement of filter media from trench drains and sand filter.
- Quarterly cleanouts and removal of debris from catch basins, drainage inlets and outlets.
- Periodic removal and disposal of accumulated sediments. Sediments in infiltration devices will be removed frequently enough to prevent premature failure of systems developed on site due to clogging.

S.No	Description	Source of Waste Generation at site	Total Wastage Generated at site(in kg / Cum/ Tons)	Total Qty of waste Diverted with in site(in Kg/ Cum/ Tons)	Explanation for Waste diverted with in site	Total Qty of Waste Diverted for use Outside the site (In Kg / Cum)	Explanation for Waste diverted outside the site
1							
2							

53 MILESTONE TO BE MET

Mile stone(s) as per table given below:-

SI No.	Description of Milestone (Physical)	Time allowed in days/months (From date of start)	Amount to be with-held in case of non achievement of Milestone
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As per schedule C

- Completion time for shopping complex and support pavilion shall be 8 Months from the date of start of the work.
- Total time for execution of work i.e. Shopping Centre, Admin Housing, Play fields and Pavilion shall be 24 Months

54 MATERIAL RECOVERY RATES

Theoretical quantity of cement, steel reinforcement, bitumen and other materials and their permissible variation and rate of recovery in case of less consumption.

- (a) Schedule/statement for determining theoretical quantity of cement & bitumen on the basis of Delhi Schedule of Rates 2007 with correction slips 1 to 5 printed by C.P.W.D.

- (ii) Variations permissible on theoretical quantities:
- (a) Cement
For works with estimated cost put to tender not more than Rs. 5 lakh. 3% plus/minus.

For works with estimated cost put to tender more than Rs.5 lakh. 2% plus/minus.
- (b) Bitumen All Works 2.5% plus & only nil on minus side.
- (c) Steel Reinforcement and structural steel sections for each diameter, section and category 2% plus/minus
- (d) All other materials. Nil

RECOVERY RATES FOR QUANTITIES BEYOND PERMISSIBLE VARIATION

S No	Description of Item	Rates in figures and words at which recovery shall be made from the Contractor	
		Excess beyond permissible variation	Less use beyond permissible variation
1	Cement	Nil	Prevailing Market rate + 10 %
2	Steel Reinforcement	Nil	Prevailing Market rate + 10 %

ANNEXURE I

WATER ANALYSIS REPORT

Agency to make his own arrangement for water supply

ANNEXURE II

SUB SOIL INVESTIGATION REPORT

Note to the Tenderer

The given information's regarding the soil investigation and their locations are only indicative to ascertain the General site soil characteristics to quote the corresponding items and planning the work accordingly

Location	Bore hole No.	Depth in soil (m)	Coring in rock(m)
Administration Block	BH -1	0.60	5.40
Auditorium	BH - 2	0.50	5.50
Laboratory Block	BH – 4	4.50	1.50
	BH – 5	1.50	4.50
	BH – 6	1.00	5.00
Multi Level Car Parking	BH - 7	0.60	5.40
Faculty Housing & Post Doc Hostel	BH - 8	2.50	8.20
	BH - 9	1.50	8.70
	BH - 10	2.00	9.00
	BH - 11	1.10	9.90
	BH -12	1.60	7.40
	BH -13	3.00	5.00
Hostel Block -2 & 3	BH -15	5.50	3.50
Hostel Block IV	BH -16	2.10	6.90
Hostel Block -1	BH -17	2.50	6.00
Computer Center	BH -18	1.00	6.00
Lecture Theater Block	BH - 19	0.50	5.50

SUB SOIL PROFILE:

Sub-soil conditions described below are based on drilling and sampling in seventeen boreholes. A generalized sub-soil profile for the area investigated is described below.

ADMINISTRATION BLOCK (BH- 1)

<u>Layer - I</u>	<p><u>BLACK SILTY CLAY</u></p> <p>This layer was encountered from ground surface existing at the time of investigation up to 0.60m depth.</p>
<u>Layer - II</u>	<p><u>HIGHLY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer I up to 5.0m depth. Recovery (Rec.) was 19% to 48% and Rock Quality Designation (RQD) was 10% to 15%. Based on RQD quality of rock can be considered as very poor.</p>
<u>Layer - III</u>	<p><u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer II up to 6.0m that is the maximum depth reached. Recovery (Rec.) was 92% and Rock Quality Designation (RQD) was 67%. Based on RQD quality of rock can be considered as fair. Saturated unconfined compressive strength is zero. Based on strength rock can be classified as very poor.</p>

AUDITORIUM (BH2)

<u>Layer - I</u>	<p><u>YELLOWISH SILTY CLAY</u></p> <p>This layer was encountered from ground surface existing at the time of investigation up to 0.5m depth.</p>
<u>Layer - II</u>	<p><u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer I up to depth 4.50m. Recovery (Rec.) varies from 21% to 35% and Rock Quality Designation (RQD) varies from 16% to 23%. Based on RQD quality of rock can be considered as poor.</p>
<u>Layer - III</u>	<p><u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer II up to depth 6.0m that is the maximum depth reach. Recovery (Rec.) is 56% and Rock Quality Designation (RQD) is 34%. Based on RQD quality of rock can be considered as poor to excellent. Saturated unconfined compressive strength is 78.0Kg/cm². Based on strength rock can be classified as weak.</p>

LABORATORY BLOCK (BH4, BH5, BH6)

<u>Layer - I</u>	<u>YELLOWISH SILTY CLAY</u> This layer was encountered from ground surface existing at the time of investigation up to 4.50m depth in BH4 Standard Penetration test (SPT) N varies from 5 to 14.
<u>Layer - IA</u>	<u>GRAVELLY SILTY SAND</u> This layer was encountered from ground surface existing at the time of investigation from 1.0 (BH6) to 1.50m (BH5) depth.
<u>Layer - II</u>	<u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer I/ IA up to depth varying from 4.0m (BH6) to 6.0m (BH5) that is the maximum depth reach in BH4 & BH5. Recovery (Rec.) varies from 0% to 53% and Rock Quality Designation (RQD) varies from 0% to 17%. Based on RQD quality of rock can be considered as very poor. Water loss was noticed while drilling in this stratum.
<u>Layer - III</u>	<u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer II up to depth 6.0m that is the maximum depth reach. This layer is encountered only in BH6. Recovery (Rec.) varies from 53% to 58% and Rock Quality Designation (RQD) varies from 38% to 58%. Based on RQD quality of rock can be considered as good. Saturated unconfined compressive strength varies from 0Kg/cm ² to 268Kg/cm ² . Based on strength rock can be classified as average. Water loss was noticed while drilling in this stratum.

MULTY LEVEL CAR PARKING (BH7)

<u>Layer - I</u>	<u>GRAVELLY SILTY SAND</u> This layer was encountered from ground surface existing at the time of investigation up to 0.60m depth.
<u>Layer - II</u>	<u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer I up to 3.0m depth. Recovery (Rec.) is 0% and Rock Quality Designation (RQD) is 0%. Based on RQD quality of rock can be considered as very poor.
<u>Layer - III</u>	<u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer II up to depth 6.0m that is the maximum depth reach. Recovery (Rec.) varies from 70% to 95% and Rock Quality Designation (RQD) varies from 66% to 86%. Based on RQD quality of rock can be considered as good. Saturated unconfined compressive strength was 81Kg/cm ² . Based on strength rock can be classified as moderately weak.

FACULTY HOUSING (BH8, BH9, BH10)

<u>Layer - I</u>	<u>GRAVELLY SILTY SAND</u> This layer was encountered from ground surface existing at the time of investigation up to 1m depth.
<u>Layer - II</u>	<u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer I up to depth varying from 5.0m (BH8) to 8m (BH10). Recovery (Rec.) varies from 0% to 67% and Rock Quality Designation (RQD) varies from 0% to 23%. Based on RQD quality of rock can be considered as very poor. Water loss was noticed while drilling in this stratum.
<u>Layer - III</u>	<u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer II up to depth 11m that is the maximum depth reach. Recovery (Rec.) varies from 54% to 98% and Rock Quality Designation (RQD) varies from 33% to 98%. Based on RQD quality of rock can be considered as poor to excellent. Saturated unconfined compressive strength varies from 84Kg/cm ² to 113Kg/cm ² . Based on strength rock can be classified as moderately weak. Water loss was noticed while drilling in this stratum.

FACULTY HOUSING (BH11, BH12, BH13)

<u>Layer – I</u>	<u>GRAVELLY SILTY SAND (MURUM)</u> This layer was encountered from ground surface existing at the time of investigation up to depth varying from 1.10m (BH11). This layer was not encountered in BH12.
<u>Layer – I</u>	<u>YELLOWISH SILTY CLAY</u> This layer was encountered from ground surface existing at the time of investigation up to 3.0m depth in BH13. Standard Penetration test (SPT) N is 12.
<u>Layer - II</u>	<u>HIGHLY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer I up to depth varying from 2.50m (BH11) to 8m (BH13). Recovery (Rec.) varies from 0% to 58% and Rock Quality Designation (RQD) was 0 to 24%. Based on RQD quality of rock can be considered as very poor. Water loss was noticed while drilling in this stratum in BH12 and BH13.
<u>Layer - III</u>	<u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer II up to depth 11.0m that is the maximum depth reach. Recovery (Rec.) varies from 45% to 77% and Rock Quality Designation (RQD) varies from 26% to 70%. Based on RQD quality of rock can be considered as poor to fair. This layer was not encountered in BH13. Water loss was noticed while drilling in this stratum in BH12 and BH13. Saturated unconfined compressive strength is 64Kg/cm ² to 395Kg/cm ² . Based on strength rock can be classified as moderately weak to moderately strong.

HOSTEL BLOCK (BOYS) (BH- 15)

<u>Layer - I</u>	<u>BLACK / YELLOWISH SILTY CLAY</u> This layer was encountered from ground surface existing at the time of investigation up to 5.50m depth. Standard Penetration test (SPT) N varies from 6 to 13.
<u>Layer - II</u>	<u>HIGHLY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer I up to 7.0m depth. Recovery (Rec.) was 19% and Rock Quality Designation (RQD) was nil. Based on RQD quality of rock can be considered as very poor.
<u>Layer - III</u>	<u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer II up to 9.0m that is the maximum depth reached. Recovery (Rec.) varies from 71% to 74% and Rock Quality Designation (RQD) varies from 48% to 57%. Based on RQD quality of rock can be considered as fair. Saturated unconfined compressive strength is 273 Kg/cm ² . Based on strength rock can be classified as moderately strong.

POST DOC HOSTEL (BH- 16)

<u>Layer - I</u>	<u>BLACK COTTON SOIL</u> This layer was encountered from ground surface existing at the time of investigation up to 2.10m depth. Standard Penetration test (SPT) N was 7.
<u>Layer - II</u>	<u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer I up to depth 5.0m. Recovery (Rec.) varies from 0% to 68% and Rock Quality Designation (RQD) varies from 0% to 15%. Based on RQD quality of rock can be considered as very poor.
<u>Layer - III</u>	<u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered below layer II up to depth 9.0m that is the maximum depth reach. Recovery (Rec.) varies from 72% to 84% and Rock Quality Designation (RQD) varies from 32% to 69%. Based on RQD quality of rock can be considered as poor to fair. Saturated unconfined compressive strength is 124.60/cm ² . Based on strength rock can be classified as moderately strong.

HOSTEL BLOCK (GIRLS) (BH- 17)

<u>Layer - I</u>	<u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u> This layer was encountered from ground surface existing at the time of investigation up to 5.50m depth. Recovery (Rec.) varies from 0% to 52% and Rock Quality Designation (RQD) was 0% to 23%. Based on RQD quality of rock can be considered as very poor. Water loss was noticed while drilling in this stratum.
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<u>Layer - II</u>	<p><u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer I up to depth 8.5m that is the maximum depth reached. Recovery (Rec.) varies from 73% to 88% and Rock Quality Designation (RQD) varies from 37% to 49%. Based on RQD quality of rock can be considered as poor. Water loss was noticed while drilling in this stratum. Saturated unconfined compressive strength is 179 Kg/cm². Based on strength rock can be classified as moderately strong.</p>
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COMPUTER CENTER (BH18)

<u>Layer - I</u>	<p><u>GRAVELLY SILTY SAND</u></p> <p>This layer was encountered from ground surface existing at the time of investigation up to 1.0m depth.</p>
<u>Layer - II</u>	<p><u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer I up to 3.0m & below layer III up to 6.0m depth. Recovery (Rec.) varies from 10% to 44% and Rock Quality Designation (RQD) was 0% to 15%. Based on RQD quality of rock can be considered as very poor.</p>
<u>Layer - III</u>	<p><u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer II up to depth 4.50m that is the maximum depth reach. Recovery (Rec.) was 79% and Rock Quality Designation (RQD) was 73%. Based on RQD quality of rock can be considered as good. Saturated unconfined compressive strength was 219.0Kg/cm². Based on strength rock can be classified as moderately strong.</p>

LECTURE THEATER BLCOK (BH19)

<u>Layer - I</u>	<p><u>GRAVELLY SILTY SAND</u></p> <p>This layer was encountered from ground surface existing at the time of investigation up to 0.50m depth.</p>
<u>Layer - II</u>	<p><u>HIGHLY TO COMPLETELY FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer I up to 3.0m depth. Recovery (Rec.) and Rock Quality Designation (RQD) was nil Based on RQD quality of rock can be considered as very poor.</p>
<u>Layer - III</u>	<p><u>FRACTURED, WEATHERED AMYGDALOIDAL BASALT</u></p> <p>This layer was encountered below layer II up to depth 6.0m that is the maximum depth reach. Recovery (Rec.) varies from 33% to 87% and Rock Quality Designation (RQD) varies from 27% to 87%. Based on RQD quality of rock can be considered as poor to excellent. Saturated unconfined compressive strength was 60Kg/cm². Based on strength rock can be classified as very weak.</p>

GROUND WATER LEVEL:

Ground water level was encountered only in the six boreholes. Correct method to determine ground water table is to install standpipe piezometer and monitor over long period of time. Since the area is yet to be developed possibility of flooding the area during rainy season and surrounding irrigation cannot be ruled out. Table shows the ground water level encountered below the ground surface existing at the time of investigation.

Borehole No.	Ground Water Level
BH -1	NE
BH - 2	4.00m
BH - 4	3.50m
BH - 5	Water loss
BH - 6	Water loss
BH – 7	NE
BH – 8	Water loss at 5.20m
BH – 9	Water loss at 5.0m
BH-10	6.50m
BH-11	7.60m
BH -12	Water loss
BH -13	Water loss
BH -15	4.50m
BH -16	3.0m
BH -17	Water loss at 4.50m
BH-18	NE
BH-19	NE

NE – Not Encounter

LABORATORY TESTING:

On completion of drilling samples were sent to the laboratory for further testing. Following tests are in progress.

Soil samples

- Mechanical analysis and moisture content
- Liquid and plastic limit Test

Rock samples

- Dry and Wet Density
- Soaked unconfined Compression Test
- Percentage absorption

ENGINEER IN CHARGEING ANALYSIS:

Engineer in charging analysis of the subsoil was performed to determine net safe bearing capacity. Parameters obtained are based on various field and laboratory tests.

Open Foundations - Bearing Capacity calculation Based on IS: 12070 “Design and construction of shallow foundation on rocks” and IS 13365 (part I) “Quantitative classification system of rock masses. RMR (rock mass rating) of the stratum at foundation depth is determined. Based on the RMR, IS12070 recommend safe bearing capacity value. According to IS 12070, allowable pressure will result (in raft up to 6m thickness) in settlement less than 12mm

CONCLUSIONS & RECOMMENDATIONS:

According to IS 12070, allowable pressure will result (in raft up to 6m thickness) in settlement less than 12mm.

Following table lists net safe bearing capacity to be adopted, for Isolated / pad foundations placed on weathered basalt at different depth below the ground surface existing at the time of investigation.

Bore hole no.	Depth of foundation	Net safe Bearing capacity
BH1	1.5m	40T/m ²
	3.0m	60T/m ²
BH2	1.5m	50T/m ²
	3.0m	75T/m ²
BH4	3.0m	8T/m ²
	5.0m	50T/m ²
BH5	1.5m	40T/m ²
	3.0m	60T/m ²
BH6	1.5m	50T/m ²
	3.0m	75T/m ²
BH7	1.5m	50T/m ²
	3.0m	150T/m ²
BH8	1.5m	40T/m ²
	3.0m	70T/m ²
	5.0m	100T/m ²
BH9	1.5m	50T/m ²
	3.0m	70T/m ²
	6.0m	125T/m ²
BH10	2.0m	50T/m ²
	3.0m	70T/m ²
	6.5m	125T/m ²

BH11	2.5m	125T/m ²
BH12	1.5m	50T/m ²
	3.0m	60T/m ²
	4.5m	100T/m ²
BH13	3.0m	60T/m ²
	4.5m	100T/m ²
BH15	3.0m	8T/m ²
	5.5m	50T/m ²
BH16	2.5m	40T/m ²
	3.5m	75T/m ²
	5.0m	125T/m ²
BH17	1.5m	40T/m ²
	3.0m	75T/m ²
	5.0m	125T/m ²
BH18	1.5m	50T/m ²
	3.0m	75T/m ²
BH19	1.5m	40T/m ²
	3.0m	100T/m ²

Whenever Isolated / pad foundations are placed on rock, it is essential to ensure that there are no loose pockets on rock surface. In case of loose pockets or over excavation, it shall be filled by plain cement concrete.

MODULUS OF SUBGRADE REACTION:

Modulus of sub grade reaction is determined from plate load test data. In the absence of such data empirical co-relation may be used. One such correlation is listed below:

Modulus of sub grade reaction $K_s = 40 F \times q_a \text{ KN/m}^3$ (Bowles)

F = Factor of safety

q_a = Allowable bearing capacity KN/m^2

ANNEXURE III

LIST OF APPROVED MAKES

CIVIL & STRUCTURAL

S.No.	Material		Make
1.	Ordinary Portland GREY Cement 53& 43 Grade		a Ultra tech b ACC c Birla Ambuja
2.	Plain Portland Pozzolona (PPC)		a. Ultra tech b. ACC c. Birla Ambuja
3.	Ready Mix concrete		a. ACC b. Ultra tech c. Lafarge
4.	Water proofing Compound & Concrete admixture		a. Fosroc b. Sika c. BASF
5.	HYSD (TMT) Bars		a TISCO b SAIL c RINL
6.	Structural Steel		a. TISCO b. SAIL c. JINDAL
7.	Aluminum Sections		a. Bhoruka b. Hindalco c. JINDAL
8.	Paints		a Asian Paints b ICI c Berger
9.	PVC Water Bars		a Fixopan b Syntex c BASF
10.	MS Pipe & Tubular sections		a. TISCO b. SAIL

S.No.	Material		Make
			c. JINDAL
11.	Precast Cement concrete tile		a Nitco b Ultra c Johnson d Dura Crete
12.	Glazed Ceramic tiles		a. Johnson b.Regency c. Somany
13.	Glazed Ceramic designer tiles		a.Kajaria b.Nitco c. Johnson d.Imola
14.	Vitrified tiles - full body		a RAK b Asian c Euro d Johnson
15.	Vitrified tiles		a. RAK b. Asian c. Johnson d. Nitco
16.	Water proof cements paint		a. Snowcem India Ltd. b. Asian (Apex) c. ICI
17.	Hardware		a Geze b Dorma c Lock wood
18.	Flush door		a. Jackson b. Green ply c. Kenwood d. Archid ply
19.	Texture finish (External)		a. Asian b. Spectrum

S.No.	Material		Make
			c. Heritage d. Renovo
20.	Texture finish (Internal)		a. Asian b. ICI c. Heritage
21.	Laminates		a. Century ply b. Archidply c. Merinolam d. Green ply
22.	Veneer		a. Jacson b. Archidply c. Century ply
23.	Ply boards		a. Century ply b. Green ply c. Archid fly
24.	Fasteners		a. Hilti b. Fischner
25.	Fire Doors/Steel Doors		a. ShaktiMet b. System Schroders c. HORMANN
26.	XPS Boards		a. BASF b. Supreme c. Owns corning
27.	Lifts		a. Kone b. OTIS c. Schindler
28.	Polycarbonate sheets		a. GE b. Poly Clad
29.	Roof insulation		a BASF b Henkel system (Green tech engineers) c Lloyds
30.	Façade Clay tile		a. Wiener Berger (Argetone) b. Euro panels c. Faveton
31.	Concrete Pavers		a Basant Beton or equivalent

S.No.	Material		Make
32	BWR Plywood		Greenply Centuryply Archidply
33	Laminates		Merino Century greenlam Archidlam

APPROVED MAKE OF MATERIALS

PLUMBING & SANITARY

S.No.	Material	Make
1	SANITARYWARE	a.HINDWARE b. Johnson c. KOHLER d. PARRYWARE
2	STAINLESS STEEL SINK	a.PARRYWARE b.DIAMOND c.NIRALI
3	SENSOR	a.AOS SYSTEM b.JAQUAR c.KOHLER
4	CP FITTINGS	d. JAQUAR e. ESS ESS
5	CONCEALED FLUSH VALVE	d JAQUAR e ESS ESS
6	U PVC SWR PIPE/FITTINGS	a. SUPREME b. FINOLEX c. PRINCE
7	CPVC PIPES AND FITTINGS	d. ASTRAL e. ASHIRVAD
8	BALL VALVE	d RB e LEADER
9	BUTTER FLY VALVE/CHECKVALE	d LEADER e NORMEX
10	Y' STRAINER	d. LEADER e. NORMEX
11	AIR RELEASE VALVES	e VB f OR
12	NON RETURN VALVE	a LEADER b NORMEX

S.No.	Material	Make
13	WATER SUPPLY PUMPS	a. GRUNDFOS b.KIRLOSKAR c.TEXMO d. ITT
14	SFRC COVER	b. GPI c. NECO
15	CI GRATING	a. NECO
16	STONE WARE PIPES & GULLY TRAPS	a. PERFECT b. ANAND c. PARRY
17	BEVELLED EDGE MIRROR	a. ATUL b. MODI GUARD
18	SOLAR WATER HEATER	a..TATA-BP b.VENUS

Electrical

S.No.	Material	Make
1	Instrument Transformers Indicating Meters	a) Kappa b) Kalpa c) Voltamp
2	Analog	a) Meco b) Rishab c) AE
3	Digital	b) Meco c) AE d) Socomec e) Konzerv f) SECURE
4	Indicating Lamps	a) GE b) SCHNEIDER c) TEKNIC d) L&T e) ALTOS, (MULTIPLE LEDs)
5	PLC / Digital Load Monitor / Power monitor	a) Electrex b) Allen Bradley c) GE d) Schneider e) Konzerv
6	Panel Accessories / Terminal block	a) Dirak b) Elmax c) Phoenix d) Wago
7	Timers	a) L & T b) Minilec c) Siemens d) GE e) Schneider
8	TVSS	a) ASCO OR EQUIVALENT
9	Cable Terminating Kits	a) Raychem Heat Shrinkable
10	Earthing	a) Erico b) Nimbus c) Ashlok
11	MV Switch Boards (LT panels)	a) Accusonic /

S.No.	Material	Make
		b) Load Controls / c) Elins / d) Lotus Switchgear / e) Pace Switch gears / f) Suvarna Electricals g) Switch Brake Pune
12	Moulded Case Circuit Breaker	a) GE (Spectra / Record) b) Schneider (COMPACT) c) L & T (D SINE) d) ABB e) MDS Legrand
13	MCB Distribution Board	a) Legrand b) Schneider c) Seimens
14	Miniature Circuit Breaker	a) MK b) Legrand
15	ELCB / RCBO	a) Legrand b) L & T
16	Earth Leakage Relay	a) L & T b) Legrand
17	LT Cables (XLPE)	a) Polycab b) Finolex
18	PVC Insulated copper wire FRLS	a) Finolex b) Polycab
18	Cable Glands	a) Dowells b) SMI
19	PVC Rigid conduits	a) Precision b) DIAMOND
19	M S Conduits	a) BEC b) BI
20	Switches, Sockets, Plug etc	a) Legrand Mosaic b) MK
21	Ceiling rose / HOLDERS	a) Anchor b) MK
22	Light fitting, Flourscent CFL/GLs	a) Philips b) Wipro c) Durlum d) Schreder

S.No.	Material	Make
23	LED Light fitting	a)Wipro b)Philps
24	Ceiling Fan	a) Crompton greaves (high breeze) b) Bajaj Super Model
25	Exhaust Fans	a) Alsthom b) Almonard
26	Telephone Cables	a) Delton b) Finolex c) Polycab
27	Telephone Sockets	a)Anchor / b)MK (Suitable to mount on Legrand DLP trunking) /
28	Terminal Junction boxes	a)Elmex
29	Power Socket Industrial type	a) Legrand b) MK
30	TV Outlet	a)Anchor b) Legrand c) MK
31	Cable trays	a)Storrax b) Skaber c)Profab
32	Metallic raceways	a) Storrax b) Skaber c) Profab
33	PVC raceways	a) LEGRAND b) MK
34	Aluminium raceways	a) LEGRAND b) MK
32.	Surface / Recess mounted FTL fixtures	a) Philips b) Wipro
33.	Recess mounted down lighter	a) Philips b) Wipro
34.	Wall mounted luminaire	a) Philips b) Wipro c) Schreder
35.	Data Cable - CAT-6	a) D-Link b) Legrand. c) Polycab
36.	External light fittings/ Garden Light fittings /Achitect Light	a) Wipro b) Philips c) Schreder d) Durlum

FIRE HYDRANT SYSTEM / SPRINKLER SYSTEM

S.No.	Material	Make
1	Pumps	a. Kirloskar b. Beacon c. Mather & Platt
2	Motors	a. Kirloskar b. Crompton Greaves c. ABB
3	MS Pipes	a. Jindal b. TATA
4	Sluice Valves	a. Kalpana b. Upadhaya
5	Non-Return Valves	a. Normax
6	Hydrant Valve, Branch Pipe	a. NewAge b. Sukan c. Winco
7	RRL Hose	a. Newage b. Chataria
8	Hose Box	a. Fabricated
9	Hose Reel Drum	a. Fabricated
10	Coating & Wrapping	a. Integrated Water Proofing
11	Control Panel / Auto StartPanel	a. Bright Engg. b. Excel
12	Pressure Gauge	a. Waaree b. Wika c. Pricol
13	Pressure Switch	a. Infoss b. Danfoss c. Switzer
14	Cable	a. Polycab b. CCI c. Universal
15	Alarm Valve	a. HD

S.No.	Material	Make
		b. UL approved
16	Flow Switches	a. Switzer
17	Gunmetal Valve	a. Netu b. Hawa c. Leader d. zoloto
18	Batteries	a. Exide b. Amco
19	Pipe Fittings	a. VS b. BM
20	Supports	a. Hitech b. Sakthi
21	Nuts & Bolts	a. Precision b. Unbrako c. Equivalent
22	Butterfly valve	a. Audco b. Intervall c. Equivalent
23	Fire Extinguishers	a. Minimax b. Cease Fire
24	Fire brigade inlet	a. New age
25	Hydrant Valve & Branch Pipe	a. Newage b. Sukan c. Winco d. Shah Bhogilal

ADDITIONAL APPROVED MAKE OF MATERIALS

HVAC

S.No.	Material	Make
1.	Water cooled centrifugal chiller with VSD	a. Carrier b. York c. Mcquay d. Kirloskar
2	Cooling tower	a. Mihir

S.No.	Material	Make
		b. Paharpur
3	Air handling units	a.Bluestar b. Voltas
4	Fresh air AHU	a.HMX b.Unidyne
5	AHU Fans	a.Nicotra b. Kruger c.Comefri d.Green heck
6	Condenser pumps	a.ITT b. Grundfos c.Armstrong
7	Primary pumps with VFD	a.ITT b. Grundfos c.Armstrong
8	Automatic air vents	a.Flammco b..Anergy
9	Insulated flexible ducts	a.Caryaire b.Supaflex c. Atco
10	Combination valve (Balancing valve+ control)	a.Siemens b.Danfoss c.Honey well
11	Fire damper & volume control damper	a.George Rao b.Caryaire c.Airmaster

S.No.	Material	Make
		d.Cosmos / e.Ravistar
12	Grilles / Diffusers / Louvres	a.Airmaster b. Air products c.Caryaire d. Cosmos e. Dynacraft f.Ravistar
13	Duct insulation- Fibre glass Nitrile rubber	a.Kimmco b.UP Twiga c.Lloyds a. Armacell b.K FLex
14	Pipe insulation	a.Beardsell b.Modifoam
15	Butterfly valve	a. Advance b.Audco c.Intervalve
16	Non return valve	a. Advance b. Intervalve c. Audco
17	Ball valve	a.RB b.Leader c. Audco
18	Y strainer / Pot strainer with suction guide	a.Anergy b. Emerald / c.Trishul
19	MS Pipes	a. TATA b.Jindal c.SAIL

S.No.	Material	Make
20	GI sheets	a.Jindal b.TATA c.SAIL
21	Motors	a.ABB b. Crompton
22	Variable speed drives	a.Danfoss b.Honeywell
23	Temperature gauge & Pressure gauge	a.H Guru b.A N Instruments c.Fiebig
24	Ducting supports	Hi tech
25	Ventilation fans	a. Kruger b.Greenheck c.Systemsaire
26	Fire Stop material	a.Promat b.3M

ANNEXURE-IV

LIST OF PLANT & MACHINERY EQUIPMENT TO BE DEPLOYED ON THE WORK

PLANT, MACHINERY AND EQUIPMENT

The contractor shall provide the plant and machinery as per work requirements.

ANNEXURE - V

**HAND BOOK ON HEALTH AND SAFETY
AT WORK**

FOR

CONTRACTORS WORKING IN THE PROJECT

SECTION - 1**INTRODUCTION:**

This document defines the operations undertaken by Principal Contractors and their sub-vendors on Project premises, which can give rise to hazards to those engaged in the work and others who may be working, standing or passing in the vicinity.

Compliance with NBC norms on construction safety for ensuring safety during construction

It is the **IISER's** endeavour to secure a high standard of safety at site. Therefore, Contractors and sub-Contractors must know their duties under common law, both for establishments, and their own employees and to conduct their business and methods of work to conform to the best practices.

Before the **IISER**, allows any contracting or sub- contracting firm to carry out work on its premises, the **IISER** insists that Contractors and sub-Contractors understand their duties regarding safe practices for themselves, others and regulations covering the type of work they will be carrying out.

In furtherance to this policy, rules herein have been devised to bring to the notice of Contractors and sub-Contractors, some of the more common hazards, and appropriate preventive measures in connection with the erection, construction, cleaning, painting, alteration or demolition of plant, machinery and buildings.

The **IISER** is confident that the observance of these rules will be no hindrance to progress the work, but will assist in the avoidance of accidents.

IT IS IN A TERM OF ALL CONTRACTS BETWEEN THE **IISER** AND CONTRACTORS THAT THEY AND ANY SUB-CONTRACTORS, APPOINTED BY THEM COMPLY WITH THESE RULES AND THEIR CO-OPERATION IS THEREFORE OBLIGATORY IN CARRYING OUT THE PRECAUTIONS LAID DOWN.

Section - 2 : Details general rules which are applicable to most Contractors and sub-Contractors.

Section - 3 : Details specific rules which must be followed where applicable, where a particular type of work is to be undertaken.

All Contractors Supervisors will make sure that the Engineering Services / Safety Manager on Project site are notified as and when he and others (Sub-Contractors) are reporting for work on that site.

SECTION 2**RULES FOR GENERAL OPERATIONS:****2.1 ACCESS:**

Nothing shall be done or omitted to be done by Contractors or Sub-Contractors or their employees to render unsafe or obstruct:

- Any means of access to the places at which people are required to work.
- The passage of people and / or vehicles whether on a defined gangway or not, unless permission is obtained from the designated safety officer.
- Access for emergency apparatus, such as fire fighting equipment.
- Contractors and sub-Contractors shall nevertheless provide adequate fencing, lighting and warning signs to ensure safety at all times.

2.2 ACCIDENT AND INCIDENT REPORTING:

All notifiable accidents, dangerous occurrences and potential hazard situations shall be reported to the safety officer at site.

Injuries are to be treated by experienced medical staff available at site.

2.3 CONTRACTORS AND SUB-CONTRACTORS' TOOLS AND EQUIPMENTS:

All Contractors and sub-Contractors tools and equipments must comply with statutory regulations and approved codes of practices.

2.4 HAZARDOUS MATERIALS:

The Contractor must inform the safety officer, prior to commencement of work, procurement of materials connected with the contract work of a hazardous nature. The Contractor will have to secure storage for any such material.

2.5 DUST AND FUME CONTROL:

Contractors and sub-Contractors must inform the safety officer at the Project site of all processes producing dust or fumes, and under the conditions as laid down in the relevant Act of Government the safety precautions are to be fulfilled.

2.6 FIRE HAZARDS AND PRECAUTIONS:

When at site, all fire regulations, as well as regulations under relevant Sections of the relevant Act of Government of must be observed at all times.

2.7 MACHINERY SAFETY :

Contractors and sub-Contractors working at the Project site must not remove or displace any guard, fencing or other safety equipment which is designed to protect personnel or machinery or any place where safety equipment has been provided without the written permission of the safety officer or his designated representative.

On completion of any work, any guards that had to be removed must be replaced immediately and whilst work is being carried out, machinery must not be operated. The requirement of the relevant Act must be followed:

2.8. HOUSE-KEEPING:

The House-keeping standards employed by Contractors and sub- Contractors, must be as good as the **IISER**. Care must be taken by all responsible people to ensure that the standard of house-keeping for all establishments is known and understood.

2.8.1 House keeping and hygiene go hand in hand with safe working practices. Contractors and sub-Contractors must leave work areas in a clean, tidy and safe condition at the end of each working period.

2.8.2 Special attention must be paid to potential fire hazards, trip points and equipment left in a hazardous condition.

2.8.3 Contamination of any product (by drill swarf sawdust, oil, salient, paints and materials etc.) must be avoided at all costs, and the officers of the **IISER** are empowered to stop any activity which could result in contamination.

2.9. NOISE:

Contractors and sub-Contractors working at the Project site must obtain permission from the safety officer if the processes being employed to carry out that work significantly increase the ambient noise level in that area being worked.

2.10. OVERHEAD WORKING:

No work may be carried out above the heads of people or over gangways or roads, until all precautions have been taken to ensure the safety of the persons below, and until permission is given by the safety officer. Each specific site of overhead working will require consent from the safety officer. This will be given after satisfactory inspection.

Work may be carried out in the vicinity of power cables only when permission is obtained from the safety officer and/or **IISER** Project Engineer.

Work connected with overhead safety includes the movement of long metal objects, machinery, jibs, masts, arms or other elevated parts.

2.11 WORKING AT HEIGHT:

All temporary structure, erected by Contractors or sub-Contractors for the purpose of allowing their staff to work at heights of more than 2 M. above floor level, must be constructed in accordance with the Safety Regulations laid down.

Whenever possible, ladders are to be made of wood and in good condition. Metal ladders must not be used where there is any possibility of the ladder coming into contact with an electrical conductor.

Roof working must be properly supervised.

2.12 SAFETY CLOTHES AND EQUIPMENT:

This will be supplied by Contractors and sub-Contractors who are working on sites and must be adequate for the well being of their staff engaged in the type of work contracted for.

The equipment and its use must comply with the regulations and codes of practice as laid down that apply to the conditions of work being undertaken.

Contractors and sub-Contractors will be responsible for the use of any tools and equipment that is supplied by them, or their staff to the exclusion of all responsibility of the IISER. Tools will be maintained to the highest standard of safety. Whilst in the possession of such tools, the person so using said tools is responsible for the continued maintenance of safety standards.

It is the individual's responsibility to ensure that the tools he works with are suitable for the job and in a safe condition prior to work commencement. All necessary tools and equipment to complete a contract should be supplied by the Contractor. Due provision must be made during contract preparation.

2.13 PLANT SERVICES:

Before using plant services such as electricity, permission to do so must be obtained from the appropriate authority, IISER Project Engineer or Safety Officer.

2.14 SUPERVISION:

Contractors working at the Project site must ensure that their staffs are adequately supervised.

2.15 WARNING SIGNS AND NOTICES:

Suitable warning signs are to be displayed warning of potential hazards.

1.16 The ACMV Contractor shall at his own expense arrange for complying with all the occupational safety, health and welfare legislations of Government including the Electrical code and the Occupational Safety, Health and Welfare Act.

SECTION – 3**TOOLS****3.1 ELECTRICALLY DRIVEN PORTABLE TOOLS:**

Permission is to be obtained from the nominated person before any Contractor or sub-Contractor's electrical hand tools can be connected to the electricity supply.

Connection must be by 3-core and 3-pin plugs and sockets, except when tools are double insulated on a 2-wire supply. Where the supply is 3-phase, 4-core cable and 4-pin plugs and sockets with earth connections must be used.

Make-shift connections are prohibited.

The use of extension cables is discouraged, but sometimes necessary.

Portable electric lamps must be the 'Gripper' type with caged wire protection for the bulk and precautions as laid down under relevant section of the relevant Act of Government must be observed.

In all cases, with the exception of double insulated tools, the metal work of the tools must be effectively earthed; also any flexible metallic cable coverings must be earthed.

3.2 COMPRESSED AIR TOOLS

Contractors and sub-Contractors must obtain permission to use any compressed air supply at the Project site.

Contractors and sub-Contractors must also provide suitable noise suppression for pneumatic hammers, drills etc.

3.3 PERCUSSION CARTRIDGE TOOLS

Permission to use percussion tools must be obtained from the designated safety representative prior to the use of these tools.

Also when using percussion tools, it is the individual's duty to ensure that the charges used in said tools are correct. These tools are to be handled as dangerous weapons, never leave tools unattended, never leave tools charged or store charged, never point tools at personnel, always lock up when finished both tool and charges.

3.4 HOISTING AND LIFTING:

Permission must be obtained prior to the use of Plant and equipment, from the IISER Project Engineer or other nominated responsible person.

Equipment must be adequate for the purpose required and anchorage approved by the site safety officer.

All equipment so used must have been examined by a competent person, and where necessary a certificate obtained in accordance with relevant sections of the relevant Act of Government.

No object is to be left unattended whilst using lifting equipment.

3.5 MOVEMENT OF PLANT AND MACHINERY

Permission must be obtained prior to the movement of construction materials, plant or equipment in and around Project site.

3.6 POWERED INDUSTRIAL TRUCKS

Permission must be obtained prior to the use of lift-trucks by Contractors or sub-Contractors at the Project site.

Trucks must only be driven by competent licensed personnel, and must comply with statutory regulations.

SECTION – 4**CONTRACTORS AND SUB-CONTRACTORS GUIDELINES**

1. Safe working practices must be observed at all times.
2. It is the responsibility of the Contractors and sub-Contractors staff to use appropriate personal protection. It is the Contractors and sub-Contractors obligation to supply necessary protective equipment and clothing.
3. Certain areas are designated hazardous (eg. noisy areas) and warning signs must be obeyed.
4. Where the Contractors and sub-Contractors work presents a potential hazard, appropriate notices must be supplied and displayed, and the area made secure as far as is reasonably possible.
5. The **IISER** will not provide tools, materials, lifting or access equipment, fixings or raw materials, unless by previous arrangement.
6. Any equipment brought to site by Contractors and sub-Contractors must not be used by untrained persons, and attention is drawn to the indemnity clause of the **IISER** orders, which states that the Contractor is liable for any consequent damage or loss to people, equipment or buildings.
7. All welding, burning and grinding operations which could potentially cause fire must be reported to security.
8. No alcohol is permitted at site, and anyone deemed to be under the influence of alcohol will be required to leave the site.
9. Vehicle parking will be in designated areas only.
10. No smoking is allowed in work areas.
11. No food is to be consumed or left in work areas.
12. Warning signs and speed restrictions must be observed.
13. Place of work to be left in a tidy and safe condition at the end of each work period.
14. Care to be taken against contamination of any product of paint, oil, etc.
15. All injuries must be reported to the authorities as per law applicable.
16. A health and safety officer shall be employed on such conditions as circumstances require.

The above has been received and read by Contractor / Sub- Contractor, we agree to comply with these Rules (See foot-note)

Contractors

Company.....

Date

NOTE :

The Contractor will ensure that sub-Contractor receive and sign a copy of these Rules.

MODEL RULES FOR THE PROTECTION OF HEALTH AND SANITARY ARRANGEMENTS FOR WORKERS EMPLOYED BY CONTRACTORS

FIRST-AID-FACILITIES

At every work place there shall be provided and maintained, so as to be easily accessible during working hours, first-aid boxes at the rate of not less than one box for 150 labourers or part thereof ordinary employed.

The first-aid box shall be distinctly marked with a red cross on white back ground and shall contain the following equipment, :-

1.02.01 For work places in which the number of labour employed does not exceed 50, each first-aid box shall contain the following equipments:-

- 6 small sterilized dressings
- 3 medium size sterilised dressings
- 3 large size sterilised dressings
- 3 large size sterilised burn dressings
- 1 (30 ml.) bottle containing a two per cent alcoholic solution of iodine.
- 1 (30 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
- 1 snakebite lancet
- 1 (30 gms.) bottle of potassium permanganate crystals
- 1 pair scissors
- 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
- 1 bottle containing 100 tablets (each of 5 gms.) of aspirin.
- Ointment for burns
- A bottle of suitable surgical antiseptic solution

1.02.02 For work places in which the number of labour exceed 50. Each first-aid box shall contain the following equipments.

- 12 small sterilised dressings
- 6 medium size sterilised dressings
- 6 large size sterilised dressings
- 6 large size sterilised burn dressings
- 6 (15 gms.) packets sterilised cotton wool
- 1 (60 ml.) bottle containing a two per cent alcoholic solution of iodine.
- 1 (60 ml.) bottle containing salvolatile having the dose and mode of administration indicated on the label.
- 1 roll of adhesive plaster
- 1 snakebite lancet
- 1 (30 gms.) bottle of potassium permanganate crystals
- 1 pair scissors

- 1 copy of the first-aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes / Government of India.
- A bottle containing 100 tablets (each of 5 gms.) of aspirin. Ointment for burns
- A bottle of suitable surgical antiseptic solution

Adequate arrangements shall be made for immediate recoupment of the equipment when necessary.

Nothing except the prescribed contents shall be kept in the First-aid box.

The first-aid box shall be kept in charge of a responsible person who shall always be readily available during the working hours of the work place.

A person in charge of the First-aid box shall be a person trained in First-aid treatment, in the work places where the number of contract labour employed is 150 or more.

In work places where the number of contract labour employed is 750 or more and hospital facilities are not available within easy distance from the works. First-aid posts shall be established and run by a trained Compounder. The Compounder shall be on duty and shall be available at all hours when the workers are at work.

Where work places are situated in places which are not towns or cities, a suitable motor transport shall be kept readily available to carry injured person or person suddenly taken ill to the nearest hospital.

2.00 DRINKING WATER

Water quality shall conform to Indian standards. Drinking: IS 10500-1991, Irrigation: IS 11624-1986

- 2.01 In every work place, there shall be provided and maintained at suitable places, easily accessible to labour, a sufficient supply of water fit for drinking.
- 2.02 Where drinking water is obtained from an intermittent public water supply, each work place shall be provided with storage where such drinking water shall be stored.
- 2.03 Every water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of pollution. Where water has to be drawn from an existing well which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and waterproof.
- 2.04 A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

3.0 WASHING FACILITIES

- 3.01 In every work place adequate and suitable facilities for washing shall be provided and maintained for the use of labour employed and supervisory staff separately therein.

- 3.02 Separate and adequate cleaning facilities shall be provided for the use of male and female labourers and supervisory staff.
- 3.03 Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition.

4.0 LATRINE AND URINALS

This facility shall Compliance with NBC norms based on population of workers at site on construction safety for ensuring safety during

- 4.01.01 Latrines shall be provided in every work place on the following scale namely:-
- 4.01.02 Where females are employed there shall be at least one latrine for every 25 females.
- 4.01.03 Where males are employed, there shall be atleast one latrine for every 25 males.
- Provided that where the number of males or females exceeds 100, it shall be sufficient if there is one latrine for 25 males or females as the case may be upto the first 100, and one for every 50 thereafter.
- 4.02 Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
- 4.03 Construction of latrines: the inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside. Standard sanitary fixtures & fittings shall be provided.
- 4.04 Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men only" or "For Women only" as the case may be.
- 4.04.01 The notice shall also bear the figure of a man or of a woman, as the case may be.
- 4.05 There shall be atleast one urinal for male workers up to 50 and one for female workers upto fifty employed at a time, provided where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females upto the first 500 and one for every 100 or part thereafter.
- 4.06.a The latrine and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
- b Latrine and urinals other than those connected with a flush sewage system shall comply with the requirements of the Public Health Authorities.
- 4.07 Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrine and urinals.
- 4.08 Disposal of excreta shall be arranged either by connection to a municipal sewer with permission from the local sanitary authority, or by providing connection to a covered soak pit.

- 4.09 The contractor shall at his own expense, carry out all instructions issued to him by the **IISER** to effect proper disposal of night soil and other conservancy work in respect of the contractor's workmen or employees on the site. The contractor shall be responsible for payment of any charges which may be levied by Statutory Authority for execution of such on his behalf.

PROVISION OF SHELTER DURING REST

At every place there shall be provided, free of cost, four suitable sheds, two for males and the other two for rest separately for the use of men and women labour. The height of each shelter shall not be less than 3 metres from the floor level to the lowest part of the roof. These shall be kept clean and the space provided shall be on the basis of 0.6 sq.m per head.

Provided that the **IISER/** Architects may permit subject to his satisfaction, a portion of the building under construction or other alternative accommodation to be used for the purpose.

CRECHES

At every work place, at which 20 or more women worker are ordinarily employed; there shall be provided two rooms of reasonable dimensions for the use of their children under at the age of six years. One room shall be used as a play room for the children and the other as their bedroom. The rooms shall be constructed with painted masonry walls with light weight roofing.

The rooms shall be provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean.

The contractor shall supply adequate number of toys and games in the play room.

The contractor shall provide one ayah to look after the children in the crèche when the number of women workers does not exceed 50 and two when the number of women workers exceeds 50.

The use of the rooms earmarked as crèches shall be restricted to children, their attendants and mothers of the children.

CANTEENS

In every work place where the work regarding the employment of labour is likely to continue for six months and where in contract labour numbering one hundred or more is ordinarily employed, an adequate canteen shall be provided by the contractor for the use of such labour.

The canteen shall be maintained by the contractor in an efficient manner.

The canteen shall consist of at least a dining hall, kitchen, and pantry and washing places separately for workers and utensils.

The canteen shall be sufficiently lighted at all times when any person has access to it.

The floor shall be made of smooth and impervious materials and inside walls shall be lime-washed or colour washed.

The premises of the canteen shall be maintained in a clean and sanitary condition.

Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance.

Suitable arrangements shall be made for the collection and disposal of garbage.

The floor area of the dining hall shall be suitably provided with furniture.

Sufficient tables, stools, chair or benches shall be available for the number of diners to be accommodated.

There shall be provided and maintained sufficient utensils crockery, furniture and any other equipment's necessary for the efficient running of the canteen.

The furniture utensils and other equipment shall be maintained in a clean and hygienic condition.

Suitable clean clothes for the employees serving in the canteen shall be provided and maintained.

A service counter, if provided, shall have top of smooth and impervious material.

Suitable facilities including an adequate supply of hot water shall be provided for the cleaning of utensils and equipments.

The food stuffs and other items to be served in the canteen shall be in conformity with the normal habits of the contract labour.

The charges for food stuffs, beverages and any other items served in the canteen shall be based on 'No Profit, No Loss' and shall be conspicuously displayed in the canteen.

In arriving at the price of foodstuffs, and other article served in the canteen, the following items shall not be taken into consideration as expenditure namely:-

The depreciation and maintenance charges for the building and equipments provided for the canteen.

The cost of purchase, repairs and replacement of equipments including furniture, crockery, cutlery and utensils.

The water charges and other charges incurred for lighting and ventilation.

The interest and amounts spent on the provision and maintenance of equipments provided for the canteen.

8.0 Minimum Safety Requirements (To be made a part of Tender conditions and BOQ of works related package to address the inclusion of PPE, Scaffold, Electrical safety measures, House keeping as a minimum)

Prior to commencing work on Site, the Contractor must make himself aware of all the requirements for the Works and the Site relating to Environment, Health & Safety (EH&S) matters including all relevant legislation and standard codes of practice.

Contractor shall comply with all the EH&S Requirements listed below which shall be deemed a fundamental condition of this Contract.

Contractor must comply in full with all applicable Health & Safety (H&S) local and national legislation. (e.g. Labour Licence, Insurance Policy under Workmen Compensation Act, etc.)

In circumstances where there is a conflict between local or national legislation and these Minimum Safety Requirements (MSR), the higher (more protective) requirement shall prevail.

Guardrails are to be provided at all working places and other locations where persons or materials could fall more than 2.0m / 6'6". Where this can physically not be achieved, suitable and sufficient fall protection devices that do not rely on individuals should be provided and used to establish a safe place of work. (Examples include Safety Nets closely installed under height works, Stretched wire ropes installed to hook up safety harnesses while workers move from one location to another at height, Use of full body safety harnesses with double lanyards etc.)



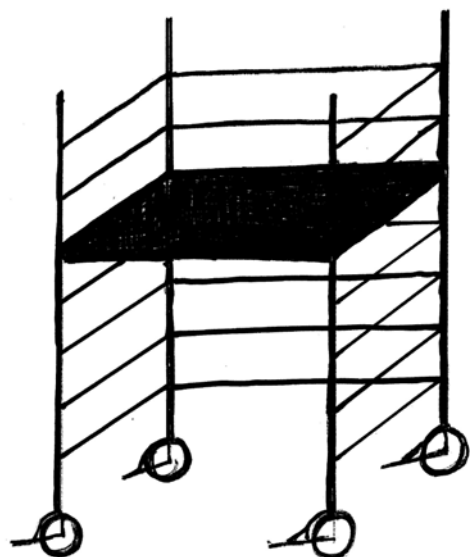
Full body harness with double lanyard



Proper Access to workplatform

All persons working on suspended scaffolds/cradles/gondolas must wear and use appropriate fall prevention equipment so as to protect them effectively at all times when they are at risk from any failure of any part of the scaffold/cradle/gondola, including its suspension system.

Free-standing scaffold towers used externally must not be higher to the top platform level than three times the minimum base dimension, unless secured to a permanent structure. For internal use only, the height to platform may rise to 3.5 times the minimum base dimension. Wheels must be locked when towers are in use. No person is permitted to remain on a tower platform while a tower is being moved.



Mobile Scaffolds

Holes, shafts and edges from or through which persons could fall a distance of more than 2 metre /6ft 6in must be clearly marked with signage or other means **and** be adequately protected by covers or barriers so as to prevent falls of persons and materials.



Holes, Shafts, Floor Penetrations

All temporary electrical circuits must include a Residual Current Device, Earth Leakage Circuit Breaker or Ground Fault Circuit Interrupter at source.



Temporary Electrical System

Powered Lifts and hoists, aerial platforms and scissors lifts must have a competent driver, certified by a qualified third party. Additionally, the above items must be certified as safe to use by a local government approved third party.

Adequate lighting must be provided to enable safe access to and egress from every place on a site where persons are liable to work, this is in addition to task lighting.

Induction/Orientation

All workers shall receive site-specific safety induction/orientation, before they are involved in any activity at site. They must be made aware of site safety rules, provisions of first aid and welfare facilities such as drinking water, washing place, toilets, rest rooms, etc.

Task related Safety Instruction

Contractor shall ensure all workers shall receive at least one specific task-related training/skilling session per week. This may be achieved by using Toolbox talks &/or induction to Safe Work Method Statement.

Incident/Injury Reporting & Investigation

Contractor shall report and record all incidents, which have potential to cause injuries and damages and also injuries including first aid cases.

Lost Time Injury (LTI) or serious injury must be intimated immediately as soon as possible by phone. (If an injured person doesn't likely to report to work in his next following shift, it is to be recorded as Lost Time Injury)

Job Safety Analysis & Safe Work Method Statement

Contractor must produce detailed Job Safety Analysis / Safe method of work for approval and use only approved work methods only. No work shall start without approved Job Safety Analysis / Safe Work Method Statement. All workers and supervisors must be inducted to Job Safety Analysis / Safe method of work.

(iii) Oxygen / Acetylene / Fuel Gases/ Compressed or Liquefied Gases

- (a) All gas cylinders shall be stored, transported and handled as per the requirements of Gas Cylinder Rules, 1981

**Indian Standard Safety Codes to be followed by the CONTRACTOR
during execution of work**

S.No	IS No	Part No./Year	Description
1.	IS 3696	1 - 1987	Safety code for scaffold and ladders
2.	IS 3996	2 - 1991	Safety code for ladders
3.	IS 4014	2 - 1967	Code of practice for steel tubular scaffolding
4.	IS 4081	1986	Safety code for blasting and related drilling operations
5.	IS 4082	1977	Recommendation on stacking and storage materials at site (1st Revision)
6.	IS 4130	1991	Safety code for demolition of buildings 2nd revision
7.	IS 4138	1977	Safety code for working in compressed air
8.	IS 4756	1978	Safety code for funneling work
9.	IS 4912	1978	Safety requirements for floor and wall openings, railing and toe boards
10.	IS 5121	1990	Safety code for piling and other deep foundations
11.	IS 5916	1990	Safety code for constructions involving use of hot bituminous material
12.	IS 7272	1974	Recommendation for labour output constants for building work
13.	IS 7293	1987	Safety code for working with construction machinery
14.	IS 7969	1975	Safety code for handling and storage of building materials with amendment No.1
15.	IS 8989	1978	Safety code for erection of concrete framed structures

S.No	IS No	Part No./Year	Description
16.	IS 10067	1982	Material constants in building works
17.	IS 1029	1990	Safety code for dress divers in civil engineering works
18.	IS 10302	1995	Unified nomenclature of workmen for civil engineering
19.	IS 13415	1992	Protective barriers in and around buildings - code of safety
20.	IS 13416	1 - 1992	Preventive measures against hazards at work places - recommendations falling materials hazards prevention
21.	IS 13416	2 - 1992	Preventive measures against hazards at work places - recommendations fall prevention
22.	IS 13416	3 - 1994	Preventive measures against hazards at work places - recommendations disposal of debris
23.	IS 13416	4 - 1994	Preventive measures against hazards at work places - recommendations timber structures
24.	IS 13416	5 - 1994	Preventive measures against hazards at work places - recommendations fire protection
25.	IS 13430	1992	Safety during additional construction and alteration to existing buildings - Code of practice.



INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH(IISER) PUNE

VOLUME II

TECHNICAL SPECIFICATIONS

NAME OF WORK: Construction of outreach chemistry lab including internal electrical and HVAC works at IISER Pune.

NIT NO : 25/IISER/PUNE/2017-18

Bids to be submitted online on : ([URL:https://eprocure.gov.in/eprocure/app](https://eprocure.gov.in/eprocure/app))

Note:

Latest CPWD standard specifications 2009 Volume I & II for Civil works and CPWD standard specification for internal Electrical works – 2013, external electrical services- 2007, DG set & Wet riser, sprinkler, specification-2006, Substation works Part IV-2013 with up to date correction slips are to be followed for the DSR items in the BOQ except for the Non DSR items covered under BOQ items /technical specifications given in this section and tender conditions/ as per relevant IS code.

(Technical specifications contain total 80 (eighty pages only)

TECHNICAL SPECIFICATION – CIVIL WORKS

1. GENERAL SPECIFICATION

1.1 GENERAL

These specifications are intended for general description of quality and workmanship of materials and finished work. They are not intended to cover minute details. The work shall be executed in accordance with best modern practices.

These specifications shall have precedence in case anything contrary to this is stated anywhere in this document. The IISER PUNE decision shall be final on any issues arising out of such discrepancies.

These specifications shall be read in conjunction with the particular specifications for various items of work the relevant drawings, construction logic, schedule of quantities and instructions to the Contractors to ascertain in detail the type and amount of work covered under this scope and time schedule. The Contractor shall carefully acquaint himself with the general specifications, coordinate the same with any other specifications forming a part of the contract document and determine his contractual obligations or the execution of various items of work in accordance with good engineering practice.

All standards, specifications, code of practice referred to are applicable and shall be considered to be a part of this specification. In case of variation and discrepancy in condition mentioned here, and in particular specifications, the IISER / Architect's interpretation and discretion shall govern.

1.2 SCOPE OF WORK

The work to be carried out under the Contract shall consist of the various items as generally described in the Tender Documents/Drawings as well as in the Bill of Quantities furnished in the Tender Documents.

The works to be performed shall also include all general works preparatory to the construction of civil, structural, architectural, water supply, sanitary works and Electro mechanical & all other related works. The work shall include work of any kind necessary for the due and satisfactory construction, completion and maintenance of the works to the intent and meaning of the drawings and these specifications and further drawings and orders that may be issued by the IISER PUNE from time to time. The scope of work shall include compliance by the Contractor with all general conditions of contract, whether specifically mentioned or not in the various clauses of these specifications, all materials, apparatus, plant, equipment, tools, fuel, water, strutting, timbering, transport, offices, stores, workshop, staff, labour and the provision of proper and sufficient protective works, diversions, temporary fencing lighting. It shall also include safety of workers, first-aid equipment, suitable accommodation for the staff and workmen, with adequate sanitary arrangements, as per rules, norms and regulations of statutory authorities,, the effecting on maintenance of all insurances, the payment of all wages, salaries, fees, royalties, duties or other charges arising out of the erection of works and the regular clearance of rubbish, reinstatement and clearing up of the site as may be required on completion of works safety of the public and protection of the works and adjoining land, structures properties etc.

The contractor shall ensure that all actions are taken to build in quality assurance in the planning and execution of works. The quality assurance shall cover all stages of work such as setting out, selection of materials, selection of construction methods, selection of equipment and plant, deployment of personnel and supervisory staff, quality control testing, etc. The Quality assurance plan shall be submitted well in advance for approval to the IISER PUNE. The work of building in quality assurance and documenting the same shall be deemed to be covered in the scope of the work.

The Contractor shall furnish, at least 15 days in advance, his programme of commencement of item of work, the method of working he intends to adopt for various items of work. He shall provide information regarding the details of the method of working, and equipment he proposes to employ and satisfy the IISER PUNE about the adequacy and safety of the same. Failing to submit the documentation and delay in approval shall not lead to extension of time and additional cost. A proactive approach should be adopted in achieving the project requirements. The sole responsibility for the safety and adequacy of the method adopted by the Contractor will, however, rest on the Contractor, irrespective of any approval given by the IISER PUNE.

1.3 CONTRACT DRAWINGS

The Contract Drawings provided for tendering purposes shall be as contained in the Tender Documents and shall be used as a reference and for guidance only. The Contractor should visualize the nature and type of work contemplated and to ensure that the rates and prices quoted by him in the Bill of Quantities have due consideration of the qualitative and quantitative variations, as may be found at the site and complexities of work involved during actual execution/construction.

The Contract drawings will also include any other drawings which the Architect may issue from time to time through IISER PUNE during the currency of the contract.

“Issued for Construction” drawings will be issued to the Contractor during the progress of the work and as further data becomes available to supplement the tender drawings.

“Issued for Construction” drawings will be revised and fresh revised copies issued to the Contractor from time to time by the Architect to adopt the work to the final designs and to suit the physical conditions encountered during the progress of the work. “Issued for Construction” drawings as issued by the Architect shall form part of this specification. Unless otherwise specified, the drawings and specifications are intended to include everything obviously requisite and necessary for the proper and entire completion of the work and accordingly the work shall be carried out completeness as required whether each item is mentioned herein or not.

It shall be understood that drawings furnished to the Contractor shall be interpreted by the use of given dimensions, and nomenclature only, and that the drawing shall not be scaled. Figured dimensions on drawings are in all cases to be accepted in preference to scaled sizes and drawings to a large scale shall take precedence over those to smaller scale drawings. In case of discrepancy/clarifications the Contractor is to ask for clarification well in advance of proceeding with the work. All dimensions shall be checked on site prior to execution.

In case of difference between drawings and specifications, the specifications shall govern. Anything mentioned in the specifications, and not shown on the drawings, or shown on the drawings and not mentioned in specifications, shall be of like effect as if shown or mentioned in both.

Shop drawings consisting of such detailed drawings as are not included in the contract drawings or larger scale details of certain parts of the work indicated on the contract drawings, shall be complete and shall contain all required detailed information as may be reasonably required for satisfactory prosecution of the work.

Prior to submittal for approval, the Contractor shall be responsible for thoroughly checking all drawings whether prepared by him or by his sub-contractors to ensure that they comply with the intent and the requirements of the contract specifications, norms and regulation of statutory authorities, and that they fit in with the overall building layout.

Examination and/or approval by the Architects of any drawing or other drawings or other documents submitted by the Contractor shall not relieve the Contractor of his responsibilities or liabilities under the contract. All drawings and documents shall be submitted to the Architect through IISER PUNE for approval.

The approval of the drawings by the Architect shall not be construed as a complete dimensional check, but will indicate only that the general method of construction and detailing is satisfactory. Approval of such drawings will not relieve the Contractor of the responsibility for any errors or compliance with requirements of the contract drawings and specifications nor will any discrepancy between shop drawings and contract plans, and specifications constitute a basis for deviation from the requirements of the contract plans, and specifications. The Contractor shall be responsible for the dimensions and design of adequate connections, supports details and satisfactory construction of the work, any fabrication, erection setting or other work done in advance of the receipt of approved drawings shall be done entirely at the Contractor's risk. Approval of the shop drawings shall not be construed as authorizing additional work or increased costs to the IISER PUNE. Adjustment in the bid price or any extension of time to cover required changes in the shop drawings to comply with the requirements of the contract specifications shall not be permitted.

The tendered rates/prices for the work shall be deemed to include the cost of preparation, supply and delivery of all necessary drawings, prints, The tendered rates/prices for the work shall be deemed to include the cost of preparation, supply and delivery of all necessary drawings, prints, hard copies and soft copies, tracings and negatives which the contractor is required to provide in accordance with the contract.

All drawings prepared for the above said project by the contractor under this specification and contract, contractor shall provided complete license to the owner of the project without any conditions attached to the same. Tracings and negatives which the contractor is required to provide in accordance with the contract.

All drawings prepared for the above said project by the contractor under this specification and contract, contractor shall provided complete license to the owner of the project without any conditions attached to the same.

1.4 SITE INFORMATION

The Contractor shall visit the construction site and examine himself thoroughly the site condition and satisfy himself as to the nature of the existing roads or other means of communications, the character of the soil and the excavations, the extent and magnitude of the work and facilities for obtaining materials and shall obtain generally his own information on all matters affecting the execution of the work. No extra for charges made in consequence of any misunderstanding or incorrect information on any of these points or on the grounds of insufficient description will be allowed. All expenses incurred by the Contractor in connection with obtaining information for submitting this tender including his visits to the site or efforts in compiling the tender shall be borne by the tenderer and no claims for reimbursement thereof shall be entertained.

1.5 SETTING OUT

Only one reference line and bench mark shall be given by the IISER Pune. Contractor is supposing carry out detailed layouts & Levels of the Building and gets the same checked from the employer (IISER Pune). The required instrument and labour for checking the layouts & Levels shall be provided by the contractor at no extra charge. Latest Electronic equipments shall be used for surveying, layout marking, column marking etc.

1.6 MATERIALS

The relevant standards for materials, as well as the testing procedures, have been indicated at appropriate places in the Specifications.

Materials shall be of approved quality and the best of their kind available and shall generally conform to I. S. Specifications. The Contractor shall order all the materials required for the execution of work as early as necessary and ensure that such materials are on site well ahead of requirement for use in the work. A material approval and procurement schedule and showing the date of approval required and date of material reaching the site, to meet the agreed schedule should be submitted well in advance.

All material brought on the site of work by Contractor meant to be used in the same, shall be as per the specification and to the approval of the IISER PUNE.

The Contractor shall obtain the IISER PUNE approval for samples of all materials to be used in the works and shall deposit these samples with him before placing an order for the materials with suppliers. The materials brought on the works, shall conform in every respect to their approved samples, fresh samples shall be deposited with IISER PUNE whenever type or source of any material changes. Any such changes in the source of materials /deviations to be brought to the notice well in advance and approval are sought.

The Contractor shall check each fresh consignment of materials as it is brought to the site of works to see that they conform in all respects to the specifications of the samples approved by the IISER PUNE.

The IISER PUNE will have the option to have all/any of the materials tested to find out whether they are in accordance with the specification and the Contractor shall bear all expenses for such testing.

Any materials that have not been found to be conforming to the specification will be rejected forthwith and shall be removed from the site by the Contractor at his own cost.

The IISER PUNE shall have power to cause the Contractor to purchase and use such materials from any particular source, as may in his opinion be necessary for the proper execution of the work.

1.7 STORAGE OF MATERIALS

The Contractor shall store cement on site in a weather proof and leak proof shed and the shed shall hold at least 2 two months requirement. Similarly reinforcement steel, structural steel and other steel related items to be stored over the wooden sleepers and should not touch the ground. The Contractor shall store all the other materials in a proper manner to avoid contamination and deterioration, at places at site approved by the IISER PUNE and protect from sun, wind, rain or other natural causes. Should the place where material is stored by the Contractor be required by the IISER PUNE for any other purpose, the Contractor shall forthwith remove the material from that place at his own cost and clear the place for the use of the IISER PUNE.

The Contractor shall make his own arrangement for storing water, if necessary, in drum or tanks or cisterns, to the approval of the IISER PUNE. Care shall be exercised to see that water is not contaminated in any way.

Contractor shall make his own arrangements for his scope

1.8 WORKMANSHIP

The work involved calls for high standard of workmanship combined with speed and to the entire satisfaction of the IISER PUNE.

All works shall be true to level, plumb and square and the corners, edges and arises in all cases shall be unbroken and neat.

Any work not to the satisfaction of the IISER PUNE or his representative will be rejected and the same shall be rectified, or removed and replaced with work of the required standard of workmanship at no extra cost.

1.9 PLANT

The Contractor will be required to provide and maintain in working order the power driven equipments required during the construction work.

In addition to the general conditions indicated in the Contract Documents, the following conditions regarding use of equipment in works shall be satisfied:

- a) The Contractor shall be required to give a trial run of the equipment for establishing their capability to achieve the laid down Specifications and tolerances to the satisfaction of the IISER PUNE before commencement of the work;
- b) All equipment provided shall be of proven efficiency and shall be operated and maintained at all times in a manner acceptable to the IISER PUNE;
- c) All the plant/equipment to be deployed on the works shall be got approved from a chartered engineer/IISER PUNE for ensuring their fitness and efficiency before commencement of work ;
- d) Any material or equipment not meeting the approval of the IISER PUNE shall be removed from the site forthwith ;
- e) No tools/plant/equipment shall be removed from site without permission of the IISER PUNE; and
- f) The Contractor shall also make available the equipment for site quality control work as directed by the IISER PUNE.

1.10 POLLUTION AND ENVIRONMENTAL PROTECTION

The Contractor shall take all precautions for safeguarding the environment during the course of the construction of the works. He shall abide by all laws, rules and regulations in force governing pollution and environmental protection that are applicable in the area where the works are situated.

The Contractor must take all reasonable steps to minimize dust nuisance during the construction of the works.

Since the campus is to be planned for Green building Pollution control and Environmental protection to be ensured very strictly.

1.11 METHODOLOGY AND SEQUENCE OF WORK

Prior to start of the construction activities at site, the Contractor shall submit to the IISER PUNE for approval, the detailed construction methodology including mechanical equipment proposed to be used, sequence of various activities and schedule from start to end of the project. Possession of site for road work shall be given as per program submitted by the bidder. Full possession of site will not be given in one go. The agency has to submit detailed program of taking up work in different locations and site shall be handed over in stages according to the resources deployed by the agency. Bidder to quote his rates accordingly.

1.12 TESTING OF WORK AND MATERIALS

The Contractor shall, if required by the IISER PUNE, arrange to test materials and / or portions of the works at his own cost in order to prove their soundness and efficiency. If after any such test the work or portion of works is found in the opinion of the IISER PUNE to be defective or unsound, the Contractor shall pull down and redo the same at his own cost. Defective materials shall immediately be removed from the site. Debris arising out of destructive tests shall also be removed for dumping at approved municipal dumping places to the satisfaction of and local authorities, within quoted rates.

1.13 FIELD LABORATORY

An adequately equipped field laboratory as required for site control on the quality of materials and the works shall be provided and maintained by the Contractor till the completion of works. The rates quoted for all the items of work shall include for the provision and maintenance of field laboratory.

Laboratory Equipment

The following items of laboratory equipment shall be provided in the field laboratory.

General

Curing tank of size **4m x 2m x 1m deep with an intermediate Partition**

Instruments in lab:

S/no	Description	Qty
(i)	Platform balance 300 Kg. capacity	1 No.
(ii)	Balance 20 Kg. capacity-self indicating type	1 No.
(iii)	Electronic Balance 5 Kg. capacity accuracy 0.5 gm	2 Nos.
(iv)	Glassware's, spatulas, wire gauzes, steel scales, measuring tape,	As required

casseroles, karahis, enameled trays of assorted sizes, pestle-mortar, porcelain dishes, gunny bags, plastic bags, chemicals, digging tools like pickaxes, shovels etc.

(v)	Set of IS sieves with lid and pan : 450 mm diameter :	1 Set
	63 mm, 53 mm, 37.5 mm, 26.5 mm, 13.2 mm, 9.5 mm 6.7 mm and 4.75 mm size	
	200 mm diameter : 2.36 mm, 2.0 mm, 1.18 mm, 600 micron, 425 micron, 300 micron, 150 micron and 75 micron	2 Sets
(vi)	Water testing kit	1 Set
(vii)	First aid box	1 Set
(viii)	Concrete cube testing machine	1 set
(ix)	Slump cone	2 sets

Note : The items and their numbers listed above in this Clause shall be decided by the IISER PUNE as per requirements of the Project and modified accordingly.

1.14 PROTECTION

The Contractor shall properly cover up and protect all work throughout the duration of work until completion, particularly slab surfaces, masonry, arises, mouldings, steps, terrazzo or special floor finishes, staircases and balustrades, doors and window frames, plaster angles / corners lighting and sanitary fittings, glass, paint work and all finishing.

1.15 CLEARING OF SITE

The Contractor shall after completion of the each work clear the site of all debris and left over materials at his own expense at designated disposal areas identified and allocated by municipal authorities and to the satisfaction of Municipal or other public authorities. The contractor shall take complete responsibility to approach local/municipal authorities for identifying/, allocating dumping places and obtaining permission to dump debris within quoted rates.

1.16. PREPARATION OF BUILDING FOR OCCUPATION

The whole of the work shall be thoroughly inspected by the Contractor and all deficiencies and defects are to be recorded and corrective measures documented, plan dates of corrective measures and seek approval before correcting the same and put them right. On completion of such inspection, the Contractor shall inform the IISER PUNE in writing that he has finished the work and it is ready for the IISER PUNE inspection. The clients inspection team would review the works and issue their own defects list, if found, a detailed corrective measures and schedule need to be submitted by the contractor and agreed with the client, before attempting the corrections

On completion, the Contractor shall clean all windows and doors and all glass panes, including cleaning of all floors, staircases and every part of the building including oiling of all hardware.

He will leave the entire building neat and clean and ready for immediate occupation and to the satisfaction of the IISER PUNE.

1.17. RATES

The quoted rate shall be for finished work covering all labour, materials, wastage, temporary work, plant, equipment, overhead charges and profit, all taxes, duties, levies as now existing or increased in future and any new taxes, imposed by the Central, State Governments or local authorities. As well as the general liabilities, obligations, insurance and risks arising out of General Conditions of Contract.

The items rates quoted by the Contractor shall, unless otherwise specified, also include compliance with / supply of the following, but not limited to:

- a) General works such as setting out, clearance of site before setting out and clearance of works after completion;
- b) A detailed programme for the construction and completion of the works (using CPM/PERT techniques) giving, in addition to construction activities, detailed network activities for the submission and approval of materials, procurement of critical materials and equipment, fabrication of special products / equipment and their installation and testing, and for all activities of the Owner that are likely to affect the progress of work, etc. including updating of all such activities on the basis of the decisions taken at the periodic site review meetings or as directed by the IISER PUNE;
- c) Samples of various materials proposed to be used on the work for conducting tests thereon as required as per the provisions of the contract;
- d) Design of mixes as per the relevant clauses of the specifications giving proportions of ingredients, sources of aggregates along with accompanying trial mixes as per the relevant clauses of these specifications to be submitted to the Architects for approval through the IISER PUNE before use on the works ;
- e) Detailed design calculations and drawings for all Temporary works (such as formwork, staging, centering, specialized constructional handling and launching equipment and the like) to be submitted to the Architect for approval through the IISER PUNE.
- f) Detailed drawings for templates, bar bending and cutting schedules for reinforcement, material lists for fabrication of structural steel etc;
- g) Mill test reports for all mild and high tensile steel and cast steel as per relevant provisions of the I.S. specifications
- h) Testing of various finished items and materials including bitumen, cement, concrete/reinforcement steel/structural steel , etc as required under these specifications and furnishing test reports / certificates ;
- i) Inspection Reports in respect of formwork, staging, reinforcement and other items of work as per the relevant Specifications;
- j) Any other data which may be required as per these specifications or the conditions of contract or any other annexure / schedules forming part of the contract;
- k) Any other item of work which is not specifically provided in the Bill of Quantities but which is necessary for complying with the provisions of the contract;

- l) All temporary works, formwork and false work;
- m) Establishing and running a laboratory **in the site/work area** with facilities for testing for various items of works as specified;
- n) Cost of in-built provisions for quality Assurance, quality control, documentation and client reporting;
- o) Cost of safeguarding the environment, health and safety of workers, safety equipments as per standards and norms;
- p) Cost of providing “as-built drawings” in original and minimum two sets of colour prints and 2 CDs ; cost of “marking up as built information” for architects for preparing their as built information and

Cost of other facilities and requirements connected the work;

Cost of setting up communication inside the project facility and outside the project facility, like phone, fax, emails etc need to be included

Cost of travels for any meetings arranged by IISER PUNE outside the site premises.

Providing relevant copies of codes to the contractor’s execution team.

All expenses incurred by the Contractor in connection with obtaining information for submitting this tender including his visits to the site or efforts in compiling the tender shall be borne by the tenderer and no claims for reimbursement thereof shall be entertained.

SH 2- NIL

SH 3 - Nil

4. SPECIFICATION FOR PLASTERING WORKS

4.1 SCOPE

This specification covers the general requirements for plastering and allied works for all types of masonry and concrete surfaces.

4.2 GENERAL REQUIREMENTS

The Contractor shall furnish all skilled and unskilled labour, plant, equipment, scaffolding, materials, etc. required for complete execution of the work in accordance with the drawings and as described herein and/or as directed by the IISER PUNE.

IS : 1661 shall be followed as a general guidance for plastering work. All plaster work and other wall finishes shall be executed by skilled workmen in a workmanlike manner and shall be of the best workmanship and in strict accordance with the dimensions on drawings subject to the approval of the IISER PUNE.

The primary requirement of plaster work shall be to provide absolutely water tight enclosure, dense, smooth and hard and devoid of any cracks on the interior and/or exterior. The contractor shall do all that is necessary to ensure that this objective is achieved. All plastering shall be finished to true plane, without any imperfections and shall be square with adjoining work and form proper foundation for finishing materials such as paint etc.

Masonry and concrete surfaces which call for applications of plaster shall be clean, free from efflorescence, damp and sufficiently rough and keyed to ensure proper bond, subject to the approval of the IISER PUNE.

Wherever directed by the IISER PUNE, all joints between concrete frames and masonry in filling shall be expressed by a groove cut in the plaster. The said groove shall coincide with the joints beneath as directed. Where grooves are not called for, the joints between concrete members and masonry in filling shall be covered by 24 gauges galvanized chicken mesh strips 400 mm wide or as called for on drawings / documents which shall be in position before plastering.

The Contractor shall strictly follow, at all stages of work, the stipulations contained in the Indian Standard Safety Code and the provisions of the Safety Rules as specified in the General Conditions of the Contract for ensuring safety of men and materials.

Any approval, instructions, permission, checking, review etc. whatsoever by the IISER PUNE shall not relieve the Contractor of his responsibility and obligation regarding adequacy, correctness, completeness, safety, strength, workmanship etc.

4.3. CODES AND STANDARDS

All applicable standards, acts and codes of practice referred to shall be the latest editions including all applicable official amendments and revisions. A complete set of all these documents shall generally be available at site with the Contractor.

In case of any conflict between this specification and those (IS Standards, Codes etc.) referred to in clause 3.3, the former shall prevail.

List of certain important Indian Standards, Acts and Codes applicable to this work is given below. However, the applicable standards and codes shall be as per but not limited to the list given below:

IS : 383	Coarse and fine aggregates from natural sources for concrete.
IS : 712	Building limes.
IS : 1542	Sand for plaster.
IS : 163	Code of practice for field slaking of building lime and preparation of putty.
IS : 1661	Code of practice for application of cement and cement-lime plaster finishes
IS : 2250	Code of practice for preparation and use of masonry mortars.
IS : 2547	Gypsum building plaster.
IS : 3150	Hexagonal wire netting for general purposes.

4.4 MATERIALS

Cement

The cement used shall be of Portland pozzolona Cement / Ordinary Portland cement conforming to IS: 269 or IS: 8112

The Contractor shall make his own arrangements for the storage of adequate quantity of cement.

Cement shall be stored in closed shed well in weather proof sheds with raised wooden plank flooring to prevent deterioration by damages or intrusion of foreign matter away from walls.

Sand

Sand shall conform to IS : 1542 and IS : 2116. It shall be from a natural source or crushed stone sand. The sand shall be hard, durable, clean and free from adherent coatings and organic matter, and shall not contain any appreciable amount of clay balls or pellets. The sand shall not contain any harmful impurities. The sand shall be properly graded and of medium size with a fineness modules of 2.0 to 2.2. Sand shall not contain any trace of salt and sand containing any trace of salt shall be rejected.

Water

Water used for mortar and curing shall be clean and free from injurious amounts of oils, acids, alkalis, sugar, organic materials etc. Potable water is generally considered satisfactory for mixing mortar.

4.5 MORTAR

Unless otherwise specified cement-sand mortar shall be used. Cement mortar shall be prepared by mixing cement and sand in specified proportions by volume. Sand shall be measured on the basis of its dry volume using gauge boxes. Suitable allowance in quantity shall be made to cater for the bulk age. Cement shall preferably be measured by weight. For the purpose of determining the corresponding volume, one cubic metre of cement shall be taken to weigh 1440 Kg.

The mixing of mortars shall be done in mechanical mixer. However. Depending on nature, magnitude and location of the work, the IISER PUNE may relax the condition of use of mechanical mixer and allow hand mixing.

Cement and sand in the specified proportions shall be fed into the mixer and mixed dry thoroughly in the mixer. Water shall then be added gradually and the wet mixing continued for at least 3 minutes. Hand mixing shall be carried out on a clean, water tight platform. Only that quantity of mortar, which can be used within 30 minutes of its mixing, shall generally be prepared at a time. Care shall be taken, not to add more water than that which shall bring the mortar to the consistency of a stiff paste. IS: 2250 and IS: 1661 shall be referred for ascertaining the quantity of water.

Cement mortar shall be used as soon as possible after mixing and before it begins to set, preferably within half an hour from the time water is added to cement during mixing. Any mortar for plaster for partially set shall be rejected and removed from the site.

Sweep mortar shall not be used.

4.6 SAMPLES

Samples of each type of plaster and other wall finish shall be prepared well in advance of undertaking the work for approval by the IISER PUNE.

4.7. CHASINGS AND CUTTINGS

All chasings, installations of conduits, inserts, boxes, etc. shall be completed before any plastering or other wall finish is commenced on a surface. No chasing or cutting of plaster or other finish on a surface shall be permitted. Broken corners shall be cut back not less than 150 mm on both sides and patched with plaster of Paris as directed. All corners shall be rounded to a radius of 8 mm or as directed by the IISER PUNE.

4.8 PREPARATION OF SURFACE

The surface shall be cleaned of all dust, loose mortar droppings, traces of algae, efflorescence and other foreign matter by water or by brushing. Smooth surfaces shall be roughened by wire brushing, if it is not hard and by hacking when it is hard. In case of concrete surface, if a chemical retarder has been applied to the framework, the surface shall be roughened by wire brushing and all the resulting dust and loose particles cleaned off and care shall be taken that none of the retarders is left on the surface.

Trimming of projections, wherever necessary shall be done to achieve an even Surface. Raking of joints in case of brickwork where necessary shall be done.

The masonry shall be allowed to dry out for sufficient period before plastering.

For ceiling plaster, the concrete surface shall be pock marked with a pointed tool to ensure a proper key for the plaster.

The wall shall be dampened evenly and not soaked before application of plaster. If the surface becomes dry in spots, such areas shall be moistened again.

4.9. SEQUENCE OF PLASTERING OPERATIONS

For external plaster, the plastering operations shall be started from the top and carried downwards. To ensure even thickness and a true surface, plaster about 15 x 15 cm shall be first applied horizontally and vertically, at not more than 2m intervals over the entire surface to serve as gauges. The surfaces of those gauged areas shall be truly in the plane of the finished

plastered surface. A approved waterproofing compound of reputed manufacturer shall be added in the backing coat of external plaster at no extra cost. For internal plaster, the plastering operations may be started wherever the building frame and cladding work are ready, the temporary supports of the ceiling resting on the wall have been removed. Water proofing compound shall be added for plasters of toilets and dado as recommended in drawings or Architect.

Where corners and edges have to be rounded off, such rounding off shall be completed along with the finishing coat to prevent any joint marks.

4.10 APPLICATION OF PLASTER

Plaster application shall be commenced only after the preparatory work is approved by the IISER PUNE. Mortar shall be firmly applied, spread evenly well pressed into the joints, rubbed, smoothened with straight edge, wooden float and trowel and finished as approved by the IISER PUNE to give a smooth, true and even surface.

a) **Wall/vertical surface plaster**

Plaster to internal faces of walls shall be 12 mm thick comprising of one part cement and four (1:4) part clean fine sand or as specified in the item specification.

The external surfaces of external wall shall have plaster of not less than 20 mm thickness comprising of one part of cement and five parts of clean fine sand mixed with approved water proofing material. or as specified in the item specification to form base for vapour barrier. The external plastering has to be done in two layers.

b) **Ceiling Plaster**

Stage scaffolding shall be provided for ceiling plaster. This shall be independent of the walls.

Projecting burrs of mortar formed due to gaps at the joints is shuttering shall be removed. The surface shall be scrubbed clean with wire brushes. In addition, the concrete surfaces shall be pock marked with a pointed tool at a spacing of not more than 50 mm centres, the pocks being made not less than 3 mm deep, to ensure a proper key for the plaster. The mortar shall be washed off and all surfaces cleaned of all oil, grease, etc. and well wetted before the plaster is applied.

Ceiling plaster shall not be commenced until the slab above has been furnished and centering has been removed. The average thickness of plaster shall not be less than 6 mm. The minimum thickness over any portion of the surface shall not be less than 5 mm. Any leakages found in the slabs/walls and any structural elements by the IISER PUNE shall be treated with grouting of approved material and shall be done to the satisfaction of the IISER PUNE at no extra cost

The Surface shall be cured for a minimum period of seven days

c) **Grooves in Plaster**

Where specified in drawings, rectangular grooves 12 to 20 mm wide and 8 to 10 mm deep shall be provided in external plaster by means of timber battens or metal strips, fixed on plaster when plaster is still green. Battens or strips shall be carefully removed after initial set of plaster and broken edges and corners made good. All grooves shall be uniform in width and depth and shall be truly plumb and correctly aligned.

d) **Drip Moulds**

Drip moulds shall be provided for chajjas and projections at the time of plastering to prevent traveling of water drops from the projections. Unless otherwise, specified, projected strip form drip course shall be provided. The quoted rates for plastering inclusive of drip moulds.

e) **Metal Lathing**

The lathing shall be tightly stretched with the long way of the mesh across the supports before nailing. This shall be secured with 25 mm galvanized steel staples or nails at 200 mm centres, if the studding is of wood and with 0.90 mm iron tying wire, if the studding is of steel. Edges of lathing shall be lapped not less than 25 mm at the sides and ends and wired together with galvanized wire of diameter not less than 1.25 mm, every 100 mm between supports.

Before plastering, the surface of metal lathing shall be brushed over with thin cement slurry or given a protective coat of bitumen oil paint.

f) **Plastering to lathing**

It shall be carried out in two coats. Mortars for the first coat shall be of stiff consistency and applied as evenly as possible to give a uniform good cover to the lathing. It shall be allowed to dry until all shrinkage movement has ceased before the second coat is applied. Too much pressure shall not be used in applying plaster to lathing to guard against its deflection.

g) **Rough Cast Finish**

The plaster base over which the rough cast finish is to be applied shall be done in general as per clause no. 10.00 under sub head "Application of Plaster".

It shall be ensured that the base surface which is to receive rough cast mixture is in plastic state. Coarse aggregate of size 6 to 12 mm shall be used in the finishing coat. The grading and size shall vary according to the texture required.

The rough cast mix shall be wetted and shall be dashed on the plaster base in plastic state by hand scoop so that the mix gets well pitched into the plaster base. The mix shall again be dashed over the vacant spaces, if any, so that the finished surface represents a homogeneous surface of sand mixed with gravel. The surface shall be cured for a minimum period of 7 days.

Plaster shall not in any place be thinner than specified. Any extra thickness of plaster required to be plastered in the case of brick masonry or extra thickness required due to raking of the joints or filling up depressions formed in concrete surface during the course of roughening or due to bad casting or centering shall not be paid separately,

The rate for plastering shall include the cost of scaffolding; platform, swing etc. needed for carrying out the plaster work and shall cover the extra labour for plastering the joints, sills and soffits of openings. No extra payment shall be made for roughening the surface to obtain key for plastering work.

4.11 Curing

Finished plaster shall be kept wet for at least 10 days after completion. In hot weather, walls exposed to such shall be screened with matting kept constantly wet or by any other approved means.

4.12 PUNNING WORK**Lime punning or Neeru finish****a) Materials**

Lime putty: It shall be obtained by slaking lime with fresh water and shifting it. The slaking shall be done in accordance with IS: 1635.

Neeru: It shall be obtained by mixing lime putty and sand in equal proportion and chopped jute @ 4 Kg. per cu.m. of mortar. The mixture shall be properly ground to a fine paste between two stones.

b) Application of punning

Lime punning consists in finishing the interior with a thin coat (3 mm) of fat lime putty mixed with an equal amount of sand. Before actual use, putty shall be matured for 2 to 3 days.

The mortar for punning shall be applied in 3 mm thick layer just after the undercoat has hardened. It shall be finished to a smooth surface by means of a plaster's trowel.

The curing shall be started as soon as the punning has hardened but in any case not earlier than 24 hours after the punning has been completed. The punning shall be kept wet for a period of seven days.

c) Plaster of Paris punning

The plaster of paris (gypsum Anhydrous) conforming to IS: 2547 shall be used for plaster of Paris punning. The plaster of Paris shall be mixed with water to a workable consistency and shall be applied on the plastered surface and finished to a smooth surface by steel float. The finished surface shall be smooth and true to plane, slopes or curves as required. The nominal thickness of the punning shall be 2 mm.

d) Neat Cement punning

The plastered surface over which neat cement punning is to be done, shall be uniformly treated over its entire area with a paste of neat cement and rubbed smooth, so that the whole surface is covered with neat cement coating. The quantity of cement applied shall be 1 kg. per sq. metre. Smooth finishing shall be completed with a float immediately and in no case later than half an hour of adding water to the cement.

4.13 TRUENESS OF PLASTERING SYSTEM

The finished plastered surface shall not show any deviation more than 4 mm when checked with a straight edge of 2 metre length placed against the surface.

Thickness of plaster

The thickness of the plaster shall be measured exclusive of the thickness of key i.e., grooves or open joints in brickwork. The average thickness of plaster shall not be less than the specified thickness. The minimum thickness over any portion of the surface shall not be less than the specified thickness by more than 3 mm for plaster thickness above 12 mm and 1 mm for ceiling plaster. Extra thickness required in dubbing behind rounding of the corners at junctions of wall or in plastering of masonry cornices etc. shall be ignored.

4.14 INSPECTION AND TESTING

- a) The plastered surface shall be checked for following defects and the remedial measures for the same shall be adopted as per IS: 1661.
- i) Blistering
 - ii) Bond failure or loss of adhesion
 - iii) Cracking
 - iv) Crazeing
 - v) Efflorescence
 - vi) Grinning
 - vii) Irregularity of surface texture
 - viii) Popping or blowing
 - ix) Recurrent surface dampness
 - x) Softness or chalkiness
- b) Trueness of the plaster shall be checked as per clause no. 12.01
- c) Thickness of the plaster shall be checked as per clause no.12.02

4.15 POINTING

The materials, preparation of mortar etc. shall be same as specified for cement plaster works. The mix proportion shall not be leaner than 1:3, unless otherwise specified. For all exposed brickwork or stone masonry work, self supporting double scaffolding, having two sets of vertical supports shall be provided so as to avoid openings in the wall.

Preparation of surface

The joints shall be raked out properly to such a depth that the minimum depth of the new mortar measured from either the sunk surfaces of the finished pointing or from the edge of the brick shall not be less than 10 mm. Dust and loose mortar shall be brushed out. Efflorescence, if any shall be removed by brushing and scraping. The surface shall then be thoroughly washed with water, cleaned and kept wet before commencement of pointing.

Application of mortar and Finishing

The mortar shall be pressed into the raked out joints, with a pointing trowel, either flush, sunk or raked, according to the type of pointing required. The mortar shall not spread over the corner, edges or surface of the masonry. The pointing shall then be finished with the proper tool according to the type of pointing required.

a) Ruled pointing

Unless otherwise specified ruled pointing shall be adopted for all exposed brick/block masonry work. However, for rubble masonry works, recessed pointing shall be adopted.

The mortar shall be pressed into the raked out joints and shall be finished off flush and then while the mortar is still green, a groove of shape and size as shown in drawings shall be formed by running a forming tool straight along the centre line of joints. This operation shall be continued till a smooth and hard surface is obtained. The vertical joints shall also be finished in a similar way. The vertical joints shall make true right angles at their junctions with the horizontal lines and shall not project beyond the same. For recessed pointing in rubble masonry recess shall be provided along the centre line of the joint profile.

b) Flush pointing

The mortar shall be pressed into the joints and shall be finished off flush and level with the edges of the brick, tiles or stones so as to give a smooth appearance. The edges shall be neatly trimmed with a trowel and straight edge. Unless otherwise specified, flush pointing shall be adopted for drains and brick on edge paving.

c) Raised and cut pointing

Raised and cut pointing shall project from the wall facing with its edges cut parallel so as to have a uniformly raised band about 6 mm raised and width 10 mm or more as directed. The superfluous mortar shall be cut off from the edges of the lines and the surface of the masonry shall also be cleaned off all mortar. Unless otherwise specified, raised and cut pointing shall be adopted for stone masonry pointing, and shall be provided along the Centre line of the joint profile.

4.16 Curing

The pointing shall be kept wet for 7 days.

4.17 MODE OF MEASUREMENT

The method of measurement for various items in the tender shall be generally be in accordance with the IS: 1200 subject to the following:

All plastering work shall be measured in square metres unless otherwise described. Net area of surface plastered shall be measured. No deductions will be made for ends of joists, beams, posts, etc. and openings not exceeding 0.5 sqm. Each and no addition shall be made for reveals, jambs, soffits, sills, etc. of these openings.

5. SPECIFICATION FOR PAINTING.

5.1 SCOPE

This specification covers painting, both interior and exterior surfaces of masonry, concrete, plastering, plaster of Paris, rain water down comers, floor and roof drains, waste and service water pipes and other items, as directed by the IISER PUNE.

Paints shall be of Zero or Low VOC as per the limits given below

Paint application	VOC Limits Gm of VOC per Litre
Interior works	Flat - < 50
	Non flat - < 150
Exterior Works	Flat - < 200
	Non flat - < 100
Anticorrosive	Glossy/ semi glossy < 250

Contractor has to submit the certificate for the above limits.

5.2 GENERAL REQUIREMENTS

If the surface to be finished cannot be put in a suitable condition for painting by customary preparatory method, the Contractor shall notify the IISER PUNE in writing and assume responsibility for any rectification and unsatisfactory finishing that might result.

Before commencing painting, the Contractor shall obtain the approval of the IISER PUNE in writing regarding the scheduling of work to minimise damage, disfiguration or staining by other trades. He shall also undertake necessary precautions to prevent damage, disfiguration or staining of other trades or other installations.

Contractor shall protect not only his own work at all times but also all the adjacent work and materials by suitable covering, protection or other methods acceptable to the IISER PUNE during progress of painting. It is the responsibility of the contractor upon completion of painting work to remove all paint and varnish spots from floors, walls, glass panes and other surfaces and restore them to the original conditions. The work generally to be touched up shall be attended to after all other workmen have left. All accumulated material, rubbish etc. have to be cleared and the premises left in clean, orderly and acceptable conditions.

Contractor shall provide scaffolding wherever necessary erected on double supports tied together by horizontals, no scaffolding pipes shall rest on or touch the surface which is being painted. Contractor is deemed to have considered the following while tendering and no extra claim on account of these will be entertained.

Supplying the paint and other materials required of approved colour

- Preparing the surface to be painted
- Providing and erecting scaffolding and removing the same after completion of the work.
- Lifting of materials to any height and painting at all levels.

- d) Application of paint as per the specification and to Manufacturer's instructions.
- e) Curing, protecting the painted surface, adjacent work and thoroughly cleaning of the premises.

The Contractor shall furnish all skilled and unskilled labour plant, equipment, scaffolding, all materials etc. required for complete execution of the work in accordance with the drawings and as described herein and / or as directed by the IISER PUNE.

The Contractor shall strictly follow, at all stages of work, the stipulations contained in the Indian Standard Safety Code and the provisions of the Safety Rules as specified in the General Conditions of the Contract for ensuring safety of men and materials.

Any approval, instructions, permission, checking, review etc. whatsoever by the IISER PUNE shall not relieve the Contractor of his responsibility and obligation regarding adequacy, correctness, completeness, safety, strength, workmanship etc.

5.3

CODES AND STANDARDS

All standards, specifications, acts, and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions.

In case of conflict between this specification and those (IS standards, codes etc.) referred to herein (in para 3.03) the former shall prevail.

List of certain important Indian Standards, Acts and Codes applicable to this work is given below. However, the applicable standards and codes shall be as per but not limited to the list given below:

IS : 104	:	Ready mixed Paint, brushing, Zinc chrome priming
IS : 157	:	Chemical resistant paint.
IS : 161	:	Oil resistant paint
IS : 162	:	Ready mixed paint, brushing, fire resisting, silicate type for use on wood, colour as required
IS : 423	:	Plastic wood for joiners filter
IS : 427	:	Distemper, dry, colour as required
IS : 428	:	Distemper, oil emulsion, colour as required
IS : 712	:	Building limes
IS : 1477	:	Code of practice for painting of ferrous metals and buildings.
IS : 2399	:	Aluminium paint for general purpose (Dual container)
IS : 2922	:	specification for wooden tent mallets

IS : 2932	:	Enamel, synthetic, exterior (a) undercoating, (b) finishing
IS : 2933	:	Enamel exterior (a) undercoating, (b) finishing
IS : 3536	:	Ready mixed Paint, brushing, wood
IS : 3537	:	Ready mixed paint, finishing, interior, for general purposes.
IS : 5410	:	Cement paint
IS : 5412-PtI	:	Plastic Emulsion paint for interior use.

5.4

MATERIALS

Paint shall be ready mixed and of first quality of the approved brand and manufacturer. Mixing of paint by the Contractor at site will not be allowed, except with preparation of ingredients and their quality shall be strictly maintained as per Manufacturer's instructions and all as directed by the IISER PUNE. All the materials shall be kept properly protected when not actually in use. Lids of containers shall be kept closed. Materials which have become stale or flat (in the opinion of the IISER PUNE) shall not be permitted to be used on the works and shall be removed from site forthwith. Wherever the word "approved" occurs in these specifications it shall mean that the competent authority for such approval is the IISER PUNE. Any materials found not conforming to the relevant specification shall have to be removed by the Contractor from the site at his own expenses. Colours shall be uniform and non-fading.

Materials shall be the highest grade products of well known approved manufacturers and shall be delivered to the site in original sealed containers, bearing brand name, manufacturer's name and colour shade, with labels intact and seals unbroken. All materials shall be subject to inspection and approval by the IISER PUNE. It is desired that materials of one manufacturer only shall be used as far as possible and paint of one shade be obtained from the same manufacturing batch. All paints shall be subjected to analysis from random samples taken at site from the painter's bucket, if so desired by the IISER PUNE.

All primer coats shall be compatible to the material of the surface to be finished as well as to the finishing coats to be applied.

All unspecified materials shall be of the highest quality available and shall conform to the latest IS standards. All such materials shall be made by reputable recognized manufacturers and shall be approved by the IISER PUNE.

All colours shall be as per the painting schedule and tinting and matching shall be done to the satisfaction of the IISER PUNE. In such cases, where samples are required, they shall be executed in advance with the specified materials for the approval of the IISER PUNE.

Before the commencement of the work the Contractor shall provide sample panels of painting at his own cost for the approval of the IISER PUNE/ARCHITECT to enable him to keep an accurate check on the materials supplied and final shade to be painted. It is however the express responsibility of the Contractor to provide any deviations and defects shall have to be rectified by the Contractor at his own cost.

5.5 Synthetic Enamel Paint

Shall be made from synthetic resins and drying oil with rutile titanium dioxide and other selected pigments to give a smooth, hard, durable and glossy finish to all exterior and interior surfaces. White and pastel shades shall resist yellowing and darkening with ageing, the paint shall conform to IS: 2932 and IS: 2933.

5.6 Waterproof Cement Paint

Shall be made from best quality white cement and lime resistant colours with accelerators, waterproofing agents and fungicides. The paint shall conform to IS:5410. It shall be of the approved make and shall be got approved well in advance before procurement

5.7 Dry Distemper

Dry distemper of required color conforming to IS:427 and of approved brand and manufacturer shall be used. The primer where used shall be cement primer or distemper primer. These shall be of same manufacturer as that of distemper.

5.8 White Washing

White washing shall be done from pure shell lime or fat lime, or a mixture of both as instructed by the IISER PUNE and shall conform to IS:712 (latest edition) Samples of lime shall be submitted to the IISER PUNE for approval and lime as per the approved samples shall be brought to site in an unslaked condition. After slaking, it shall be allowed to remain in a tank of water for two days and then stirred up with a pole, until it attains the consistency of thin cream. 100 grams of gum to 6 litres of white wash water and a little quantity of indigo or synthetic ultramarine blue shall be added to the lime.

5.9 Colour Wash

Shall be done with mineral colors not affected by lime added to white wash. No colour wash shall be done until a sample of the colour wash to the required tint or shade has been approved by the IISER PUNE. The colour shall be of even tint or shade over the whole surface. If it is blotchy or otherwise badly applied, it shall be redone by the Contractor at his own cost.

5.10 Acrylic Emulsion Paint

Shall be water based acrylic copolymer emulsion with rutile titanium dioxide and other selected pigment and fungicide. It shall exhibit excellent adhesion to plaster and cement surface and shall resist deterioration by alkali salts. The paint film shall allow the moisture in wall to escape without peeling or blistering the paint. After it is dried, the paint should be able to withstand washing with mild soap and water without any deterioration in colour or without showing flaking, blistering or peeling.

5.11 Oil Bound Distemper

Oil bound distemper (IS: 428-1969) of approved brand and manufacture shall be used. The primer where used be cement primer or distemper primer. These shall be of same manufacturer as that of distemper. The distemper shall be diluted with prescribed thinner in a manner recommended by the manufacturer. Only sufficient quality of distemper required for a day's work shall be prepared.

5.12 TEXTURE FINISH (EXTERNAL)

Texture paint shall be of approved shade and pattern as per approved vendor's specification.

Surface preparation to be done neatly over the plastered surface before the application of base coat. Base coat shall be of required thickness and not less than 2.0 mm thick as per manufacturer specifications, to be applied over the plastered surface by using trowel and putty blade / roller etc. Necessary patterns and grooves shall be formed within the base coat. Base coat shall be allowed for drying at least for 10-12 hrs before the application of final painting. Over this base surface approved shade painting to be applied in two coats.

Wall primer over the plastered surface is to be done based on the selection of texture pattern and finish.

The quoted rate shall include all the above operations including tools and tackles etc.

5.13 STORAGE

The Contractor shall arrange for safe and proper storage of all materials and tools. Paints shall be kept covered at all times and mixing shall be done in suitable containers. All necessary precautions shall be taken by the Contractor to prevent fire.

5.14 PREPARATION OF SURFACE

Before starting the work, the Contractor shall obtain the approval of the Engineer regarding the soundness and readiness of the surface to be painted on.

Masonry, Concrete and Plastered Surface

The surface shall be free from all oil, moisture, grease, efflorescence, mildew, loose paint or other foreign and loose materials. Masonry cracks shall be cleaned out and patch filled with mortar similar to the original surface and uniformly textured. Where this type of resurfacing may lead to the finishing paint being different in shade from the original surfaces, the resurfaced area shall be treated with a minimum of one coat of cement primer and should be continued to the surrounding area for a distance of at least 100mm.

Surfaces with mildew or efflorescence shall be treated as below:

(a) Mildew

All mildewed surfaces shall be treated with an approved fungicide such as ammoniacal wash consisting of 7 gm. of copper carbonate dissolved in 80 ml liquor and diluted to 1 liter with water or 2.5 percent magnesium silica fluoride solution and allowed to dry thoroughly before paint is applied.

(b) Efflorescence

All efflorescence shall be removed by scrubbing the affected surface with a solution of muriatic acid and in water (1:6 to 1:8) and then washed fully with clear water and allowed to dry thoroughly.

Metal

All metal surfaces shall be absolutely clean, dry and free from wax, grease and soap films. All steel and iron surfaces in addition shall be free from rust. All galvanized iron surfaces shall be pretreated with a compatible primer according to the manufacturer's direction. Any abrasion in shop coat shall be touched up with the same quality of paint as the original coat.

5.15

APPLICATION**a) General**

The method of application shall be as recommended by the manufacturer. In case of selection of a special shade and colour (not available in standard shades) the Contractor shall prepare test panels in different shades of minimum size 1 metre square as instructed by the ARCHITECT/ IISER PUNE and obtain his approval prior to applications of the finishing paints.

Proper tools and implements shall be used. Scaffolding if used shall be independent of the surface to be painted to avoid shade differences of the freshly repaired anchor holes. Painting shall be done by skilled labour in a workman like manner. All materials shall be evenly applied, so as to be free of sags, runs, crawls or other defects. All coats shall be of proper consistency. In case of application by brush, no brush marks shall be visible. The brushes shall be clean and in good condition before application of the paint.

All priming undercoats for painting shall be applied by brush only. Roller and spray equipment, etc., shall not be used.

The cleaned surface shall be dusted and a primer shall be applied.

No work shall be done under conditions that are unsuitable for the production of good results. No painting shall be done when plastering is in progress or is drying. Paint which seals the surfaces to moisture shall be applied only after the moisture on and below the surface has dried out.

All coats shall be thoroughly dry before being sand papered or before the succeeding coat is applied. Coats of painting as specified are intended to cover surfaces perfectly. In case the surface is not covered properly by applying the specified number of coats, further coats shall be applied by the Contractor when so directed by the IISER PUNE at no extra cost.

All primers and under coats shall be tinted to approximate the colour of the finishing coats. Finished coats shall be of exact colour and shade as approved samples and all finish shall be uniform in colour and texture. All parts of mouldings and ornaments shall be left clean and true to finish.

Stopping and filling carpentry work should be done when the primer is just dry. For deep scratches, holes etc. stopping shall be done with putty of plastic wood (IS 423). Putty can be white lead with linseed oil base or synthetic metal putty.

For all minor scratches and rough surfaces, like flush door's faces filling made out of one part of white lead, two parts of whiting (powdered chalk) mixed and kneaded in double boiled linseed oil shall be evenly applied and rubbed down with G/220 or G/240 sand paper after allowing it to dry overnight.

Painting shall be done by skilled labourers in a workmanlike manner. All materials shall be evenly applied so as to be free from sags, runs, crawls, or other defects. All coats shall be of proper consistency and shall be well brushed out, so that no brush marks are visible, except varnish and enamels which shall be uniformly flowed on. The brushes shall be clean and in good condition before application of paint. No work shall be done under conditions that are unsuitable for production of good results.

The undercoating should be nearest to the specified colour of the finishing coat. Ready mixed synthetic enamel paint or fill paint may be used for the undercoat. The undercoat shall be uniform and free of all brush marks.

Undercoats should be completely dry before finishing coat is taken up. For synthetic enamels overnight and for oil paints, a whole day shall be left between undercoat and finishing coat. The undercoat shall then be rubbed with G/240 sand paper and dusted clean. The finishing coat of approved paint shall then be applied. If the surface is not satisfactory additional finish coats shall be applied at no extra cost. The paints shall be applied with bristle brushes and not horse hair ones.

The manner of taking measurements will be in accordance with IS:1200.

b) Synthetic enamel Paint

Ready mixed oil paint, acrylic emulsion paint, ready mixed synthetic enamel paint, Aluminium paint, etc. Shall be brought in original containers and in sealed tins. If for any reason thinner is necessary the brand and quantity of thinner recommended by the manufacturer or as instructed by the IISER PUNE shall be used.

After allowing 24 hours for drying of primer coat specified quality paint shall be applied evenly and smoothly. If required filler putty coating may be given to give smooth finish. Each coat shall be allowed to dry out thoroughly and then lightly rubbed down with sand paper and cleaned of dust before the next coat is applied. Number of coats shall be as specified in the item and if however the finish of the surface is not uniform additional coats as required shall be applied to get good and uniform finish at no extra cost. After completion no hair marks from the brush or clogging of paint puddles in the corners of panel angles of mouldings shall be left on the work. The glass panes floor etc., shall be cleaned of stains.

When the final coat is applied, if directed, the surface shall be rolled with a roller or if directed it shall be stippled with a stippling brush.

c) Cement Paint

The number of coats shall be indicated in the bill of quantities. The surface to be cement painted shall be thoroughly cleaned of dust, dirt, grease, oil marks, cement marks, loose scales, etc. By the use of a stiff wire brush or by coir rope. The cleaned surface should be wetted with clean water either by spray gun or any other convenient method, to ensure complete absorption. Cement paint shall not be applied on dripping or wet surface. All holes, depressions, cavities, etc. shall be filled in with cement mortar 1:4 or as directed by the IISER PUNE, to render the entire surface smooth and even to receive the paint, at no extra cost. All fungus or organic matters, which may be present, shall be removed by scrapping and sand papering and the surface rendered smooth.

The cement paint shall be prepared in exact conformity and workable consistency as per specifications of the manufacturer. Approval of the IISER PUNE shall be obtained in regard to the exact shade and colour before applying the cement paint. Cement paint shall be applied with good quality flat brush horizontally or vertically to ensure perfect covering. The first coat should be well brushed into the surface to form a good film

appearance. The second or subsequent coats shall be applied carefully to give a good final satisfactory finish and may be applied by brushing or spraying. Each cement paint application should be wetted at the end of the day with a fine water spray. Twenty four hours after the first coat has been applied, saturate the surface with water and second or subsequent coats can be applied when the surface is damp to touch. Rewater the surface with ample water after 24 hours to ensure perfect setting of the paint film.

d) Dry Distemper

New plastered surface shall be allowed to dry for atleast two months. New lime or lime plastered surface shall be washed with a solution of 1 part of vinegar to 12 parts water or 1:50 sulphuric acid solution and left for 24 hours after which the wall shall be thoroughly washed with clean water. For cement plastered surface, the surface shall be washed with a solution of 100 gms of zinc sulphate to 1 litre of water and then allowed to dry.

Dry distempering shall be done as per manufacturer's instruction. In applying the distempers, the brush should first be applied horizontally and immediately crossed off perpendicularly. Brushing shall not be continued too long as otherwise brush marks may result.

e) White washing walls and ceilings

Lime used shall conform to IS: 712. The wash shall be prepared from lime of approved quality.

White wash shall be prepared from fat lime or shell lime slaked onsite mixed with just enough water to make a thick paste and allowed to remain for atleast 7 days before use. At the time of using, the paste shall be diluted with just sufficient water and stirred through clean and coarse cloth. Four kgs. of gum dissolved in hot water shall be added to each cu. metre of the lime used. Ultra marine blue shall be added to give required whiteness. The number of coats shall be specified in the bill of quantities and shall be applied by using flat brushes or spray pumps, on surface prepared. Before the wash is applied the surface shall be thoroughly cleaned of all dust dirt, scales, marks and mortar drops. All holes and depressions shall be filled in with cement mortar 1:4 or lime putty. The wash shall be applied with brush with alternate coats of horizontals and verticals. When a coat is being given it shall be ensured that the previous one has dried up completely. Two or more coats of wash (as specified in the schedule of quantities) shall be applied to give uniform finished surface without any patches or cracks and brush marks. It should not come off when rubbed hard with hand. One coat of white wash shall consist of one stroke from top downwards, another from bottom upwards over the first stroke, and another from left to right before the previous one dries up. The final coat shall be perfectly uniform in appearance and free from brush marks.

f) Colour Wash

Colour wash shall be prepared by adding mineral colours or approved pigments not affected by lime or light. Colour wash shall be applied as specified under "white wash". Approval of the IISER PUNE shall be obtained in regard to exact shade before applying colour wash.

g) Acrylic Emulsion Paint

Acrylic emulsion paint shall be brought in original containers and in sealed tins.

After allowing 24 hours for drying of primer coat specified quality paint shall be applied evenly and smoothly. If required filler putty coating may be given to give smooth finish. Each coat shall be allowed to dry out thoroughly and then lightly rubbed down with sand paper and cleaned of dust before the next coat is applied. Number of coats shall be as specified in the item and if however the finish of the surface is not uniform additional coats as required shall be applied to get good and uniform finish at no extra cost. After completion no hair marks from the brush or clogging of paint puddles in the corners of panel angles of mouldings shall be left on the work. The glass panes floor etc., shall be cleaned of stains.

When the final coat is applied, if directed, the surface shall be rolled with a roller or if directed it shall be stippled with a stippling brush.

Lime gauged cement plastered surfaces shall not be painted for at least one month after plastering. All sample patch shall be painted to check alkali reaction if so desired by the IISER PUNE. Painting shall be strictly as per manufacturer's specification.

h) Oil Bound Distemper

Any unevenness in surface shall be made good by applying putty. The patched surface shall be allowed to dry thoroughly before the coat of distemper is applied. One coat of distemper properly diluted with thinner as specified by the manufacturer shall be applied by brush in horizontal strokes followed immediately by vertical ones which together will constitute one coat. Two or more coats of distemper as found necessary shall be applied to obtain even shade.

5.16

PAINTING OF IRON WORK

Scope

This specification covers painting of grills, hand rails, steel doors / windows, ladders, steel cupboards, supplied / erected by the same or any other agency. One shop coat of red oxide or zinc chromate primer has already been completed by the concerned agency.

Paint to use for various items of work shall be of best quality and shall be obtained ready mixed in sealed containers from approved manufacturer. The Contractor shall obtain the Client /Architect / IISER PUNE's approval for the make and colour of the paint he proposes to use.

All surfaces shall be thoroughly cleaned of all dirt, loose particles and rust and approved prior to application of paint. Workmanship shall conform to IS: 1477 (Part I & II)

Specified number of coats shall be applied and at least 24 hours shall elapse between the applications of successive coats. No painting shall be carried out on exterior work in wet weather or on surfaces which are not entirely dry.

Painting rate shall include all necessary scaffolding, cradles and plant.

5.17 PROTECTION

Furniture and other movable objects, equipments, fittings and accessories shall be moved, protected and replaced upon completion of the painting work. All stationary items of equipments shall be well covered so that no paint can fall on them. Work finished by other agencies shall be well protected. All protection shall be as per instruction of the IISER PUNE.

5.18 CLEANING UP

The Contractor shall upon completion of painting etc. remove all marks and make good surfaces, where paint has spilled, splashed or splattered, including all equipments, fixtures, glass furniture, fittings, etc. to the satisfaction of the IISER PUNE.

5.19 ACCEPTANCE CRITERIA

All painted surfaces shall be uniform and pleasing the appearance.

The colour, texture etc. shall match exactly with approved samples.

All stains, splashes and splatters of paint shall be removed from surrounding surfaces.

5.20 PAINTING OF STEEL WORKS**Scope**

The specification covers painting of the structural / miscellaneous steel supplied and erected either by other agencies or by the Contractor for work under the scope of this contract. One shop coat of red oxide zinc chromate primer including necessary touching up has already been completed by the concerned agency. One coat of red oxide zinc chromate primer followed by a coat of undercoating and two or more finishing coats of synthetic enamel paint as described hereunder are only required to be provided under the item for painting structural / miscellaneous steel.

Type of Structures to be painted

Painting shall be done on all exposed surfaces (including undersides wherever exposed) of various structural steel members like columns, trusses, beams, roof girders, oil tanks, trestles, bracings, crane girders, chequered plates, gratings, brackets, base plates etc. in the plant as directed by the IISER PUNE. It should be clearly noted that all structures are already erected/placed in position or are under erection, hence the quoted rate by Contractor shall account for all aspects involved in painting keeping in view the heights, available access to members etc. It is advised that the Contractor should visit the site and get himself acquainted with the nature of work completely including the extent and type of scaffoldings etc, required, before quoting his rate.

Material

Paint shall be synthetic enamel paint conforming to IS: 2932 of approved colour and brand.

Painting

In general, painting work shall be in accordance with IS: 1477 (Part I & II).

Surface of steel work to be painted shall be thoroughly cleaned of all grease, oil dirt, rust, foreign matter like cement splashing, etc. by suitable solvent and mild rubbing with abrasive paper / hand scrapping to the full satisfaction of the IISER PUNE. Clearing with solvents / scraping shall be limited to the affected areas only.

In cases where the existing primer is removed while cleaning the surface as detailed in 12.4.2, damaged portions shall be provided with a coat of wash or etching primer on suitable chemical pretreatment solutions and another coat of red oxide Zinc chromate primer. The payment for red oxide primer will be made as per relevant item of Schedule of items.

After the surface is prepared in a manner described above, the primer coat shall be dry cut without scratching or in any way damaging the primer coats and clean the surfaces from dust.

Over this dry surface apply an optimum coat of undercoating (synthetic enamel paint) by brush or spray with minimum brush marks. Allow the film to dry hard, wet rub, cutting down to a smooth finish (ensuring that at no place the undercoat is completely removed) Allow the water to evaporate.

The total dry film thickness of each coat shall be not less than 25 microns.

The paint shall be applied by brushing / spraying. Spraying shall be adopted with prior approval of IISER PUNE generally on large surface areas. Paints shall be stirred frequently to keep the pigment in suspension. Paint shall be ready mixed in original sealed containers as packed by the paint manufacturers and no thinners shall be permitted. No painting shall be done in frosty / foggy / rainy weather or when humidity is high enough to cause condensation on the surface to be painted. Paint shall not be applied when the temperature of the surface to be painted is 5 deg or lower.

Contractor shall provide and use sufficient number of drop clothes, covers, tarpaulins and other screens to protect adjacent surfaces and shall remove all splatter and stains from such surfaces. The contractor shall also protect his own work.

Any and all damage to adjacent work or any part of the premises due to painting carelessness or accidental performance of the Contractor shall be repaired or made good at the Contractor's expense.

Painting shall be discontinued when exposed to rain and dust storm and shall not commence until the surfaces are perfectly dry and clean. Wherever practicable. Surfaces shall be painted when in shade or when temperature is falling.

Cleaning up

The Contractor upon completion of painting etc. shall remove all marks and make surfaces good, where paint has been spilled, splashed or splattered, including all equipment, fixtures, glass, furniture, fittings, etc. to the satisfaction of the IISER PUNE.

Acceptance Criteria

- (a) All painted surfaces shall be uniform and pleasing in appearance.
- (b) The colour, texture, etc. shall match exactly with the approved samples.
- (c) All stains, splashes and splatters of paints shall be removed from surrounding surfaces.

5.21

MODE OF MEASUREMENT

The method of measurement for various items in the tender shall be generally in accordance with the IS: 1200 subject to the following:

The following multiplying factors for obtaining equivalent areas shall be adopted.

S.No.	Description of Work (1)	How Measured Factor (2)	Multiplying (3)
1.	Paneled, or framed and braced or ledged and battened and braced joinery	Measured flat (not girthed), including CHOWKAT or frame. Edges, chocks, Cleats, etc., shall be deemed to be Included in the item.	1.30 (for each side)
2.	Flush joinery	Measured flat (not girthed) including CHOWKAT or Frame. Edges, chocks, cleats, etc., shall be deemed to be Included in the item.	1.20 (for each side)
3.	Fully glazed or gauzed joinery	Measured flat (not girthed), including CHOWKAT or frame. Edges, chocks, Cleats etc. Shall be deemed to be included in the item.	0.80 (for each side)
4.	Partly Panelled and partly glazed or gauzed joinery	Measured flat (not girthed), including CHOWKAT or frame. Edges, chocks, Cleats etc. Shall be deemed to be Included in the item.	1.00 (for each side)
5.	Fully venetioned or louvred joinery or gauzed joinery	Measured flat (not girthed), including CHOWKAT or frame. dges, chocks, Cleats etc. etc., shall be deemed to be included in the item	1.80 (for each side)

6.	Weather boarding	Measured flat (not girthed), supporting framework shall not be measured separately.	1.20 (for each side)
7.	Wood shingle roofing	Measured flat (not girthed)	1.10 (for each side)
8.	Boarding with cover fillets and match boarding.	Measured flat (not girthed)	1.05 (for each side)
9.	Tile and slate Battening.	Measured flat (not all) no deduction shall be made for open spaces.	0.80 (for painting all over)
10.	Trellis (or JAFRI work) one-way or two-way.	Measured flat over all; no deduction shall be made for open spaces; supporting members shall not be measured separately.	2.00 (for painting all over)
11.	Guard bars, balustrades, gates, gratings, grills shall be expanded metal and railings.	Measured flat over all; no deduction made for open spaces; supporting members shall not be measured separately.	1.00 (for painting all over)
12.	Gates, and open palisade fencing, including standards, braces, rails, stays, etc.	Measured flat over all; no deduction shall be made for open spaces; supporting members shall not be measured separately.	1.00 (for painting all over)
13.	Carved or enriched work.	Measured flat	2.00 (for each side)
14.	Steel roller shutters	Measured flat (size of opening) Overall Jamb guides, bottom rails and locking arrangement, etc. shall be included in the item (top cover shall be measured separately).	1.10 (for each side)

15.	Plain sheet steel doors and windows.	Measured flat (not girthed) including frame, edges, etc.	1.10 (for each side)
16.	Fully glazed or gauzed steel doors and windows.	Measured flat (not girthed) including frame, edges, etc.	0.50 (for each side)
17.	Partly Panelled and Partly glazed or gauzed steel doors.	Measured flat (not girthed) including frame, edges, etc.	0.80 (for each side)
18.	Collapsible gate.	Measured Flat (size of opening)	1.50 (for painting all over)

NOTE :

The height shall be taken from the bottom of the lowest rail, if the palisades do not go below it (or from the lower end of palisades, if they project below the lowest rail) upto the top of palisades, but not upto the top of the standards, if they are higher than the palisades. Similarly for gates depth of roller shall not be considered while measuring the height.

6. SPECIFICATION FOR FLOORING AND OTHER ALLIED WORKS

6.1 SCOPE

This specification covers the supplying, installation, finishing, curing, testing, protecting, maintaining until handing over of various types of floor finishes, dadoing and allied items of works.

6.2 GENERAL REQUIREMENTS

The Contractor shall furnish all skilled and unskilled labour, plant, equipment, scaffolding, materials etc., required for complete execution of the work in accordance with the drawings and as described herein and / or as directed by the IISER PUNE.

The Contractor shall follow all safety requirements / rules during execution of the work.

The Contractor should have adequate experience in execution of such works. Alternatively, he should engage specialized agency for executing the work after obtaining approval from the IISER PUNE.

All works shall be carried out as per relevant Indian Standard Specifications, as per the instructions of manufacturer and as directed by IISER PUNE. The Contractor shall carryout all works including preparation of base, chipping extra concrete, roughening of surface and skin removing, cleaning, screening, levelling, curing, protecting, etc.

The commencement, scheduling and sequence of the finishing works shall be planned in details and must be specifically approved by the IISER PUNE, keeping in view the activities of other agencies working in the area. However, the Contractor shall remain fully responsible for all normal precautions and vigilance to prevent and damage whatsoever till handing over to the Owner.

Only approved make, colour, size of tiles / slabs shall be used.

6.3 CODES AND STANDARDS

All applicable standards, acts and codes of practice referred to shall be the latest editions including all applicable official amendments and revisions. A complete set of all these documents shall generally be available at site, with the Contractor.

In case of conflict between this specification and those (IS Standards, Codes etc.) referred to in clause 3.03, the former shall prevail.

List of certain important Indian Standards, Acts and Codes applicable to this work is given below. However, the applicable standards and codes shall be as per but not limited to the list given below:

- IS: 777 - Glazed earthenware wall tiles
- IS: 1195 - Bitumen Mastic flooring
- IS: 1196 - Code of practice for Bitumastic flooring

- IS: 1237 - Cement concrete flooring tiles
- IS: 1443 - Code of practice for laying and finishing of cement concrete flooring tiles.
- IS: 2114 - Code of practice for laying in situ terrazzo floor finish .
- IS: 3462 - Unbaked flexible PVC flooring.
- IS: 5491 - Code of practice for laying of in situ granolithic concrete flooring topping
- IS: 13801 - Chequered Cement Concrete Tiles

6.4

MATERIALS

Generally, the materials shall be in accordance with their respective Indian Standard Codes and as specified in similar works, which shall be deemed to form a part of this specification.

- Cement : Ordinary Portland cement of 43 Grade conforming to IS : 8112 and as Specified under concrete work.
- Coarse Aggregate : As specified under concrete works and conforming to IS : 383.
- Fire Aggregates : As specified under concrete works and conforming to IS : 383. Sand for mortar shall conform to IS:2116.
- Water : As specified under concrete works and Conforming to IS: 456/2000

6.5

Special Materials

Materials required for individual finishing items are specified under respective items. In general, all such materials shall be in accordance with the relevant IS Codes (Latest edition) where applicable. In all cases these materials shall be of the best indigenous quality unless specified otherwise.

The materials for finishing items must be procured from well-reputed specialized manufactures and on the basis of approval of samples by architect/ IISER PUNE. The materials shall be ordered, procured and stored well in advance to avoid possible delays to the construction programme.

6.6

BASE CONCRETE

The base concrete may be deposited as per specification and as directed. Before placing the concrete the sub-base shall be properly wetted and well rammed. The concrete shall then be deposited between the forms where necessary, thoroughly tamped and the surface finished level with the top edges of the forms. The surface of base concrete shall be left rough to provide adequate bond for the topping. Two or three hours after the concrete has been laid in position, the surface shall be brushed with a hard brush to remove any scum or laitance and swept clean so that coarse aggregate is exposed.

6.7 WORKMANSHIP

Workers especially experienced in particular items of finishing work shall carry out the work. Where such workers are not readily available, experienced supervisors recommended by the manufacturer shall be engaged with the prior permission of the IISER PUNE. In particular cases, IISER PUNE may desire the installation of finishing items by the manufacturer. This arrangement shall be made by the Contractor.

6.8 PREPARATION OF THE BASE SURFACE

The surface to be treated shall be thoroughly examined by the contractor. Any rectification necessary shall be brought to the notice of the IISER PUNE and his approval shall be obtained regarding the method and extent of such rectification required. For all types of flooring, skirting, dado and similar locations, the base to receive the finish shall be adequately roughened by chipping, raking of joints and thoroughly cleaning of all dirt, grease, loose particles, caked mortar droppings, etc., using water, coir, hard brushes and detergent as required, unless otherwise directed by the manufacturer of any special finishing materials, or specifically indicated in this specification under the individual item. To prevent absorption of water from any wet finishing treatment, the base shall be thoroughly soaked with water and all excess water mopped up. However, the surface shall be dry where adhesive are used for fixing the finishes. The actual finishing work shall not commence until the IISER PUNE has approved the surface.

6.9 GRANOLITHIC FLOORING**General**

The work shall be carried out in accordance with Indian Standard Specification 5491 latest.

The flooring shall be of specified thickness and shall consist of CC 1:1.5:3 granolithic flooring. Floor finish shall be divided into panels of size not more than 20 Sqm so as to reduce and avoid the risk of cracking. The granolithic flooring shall be laid in alternate panels. The size of panels shall be as decided by the IISER PUNE. The screed strips shall be fixed on the base concrete dividing it into suitable panels. The intermediate panels shall be filled in after one or two days. If glass or aluminium or other metal strips are provided for effective separation of panels, the topping may be laid in all the panels simultaneously.

Laying

- a. Before the operation of laying the topping is started, the surface of base concrete shall be prepared as described earlier, screed strips shall be fixed over the base as divided.
- b. The flooring concrete shall be of PCC 1:1.5:3 mix (1 Part of cement, 1.5 parts of sand and 3 parts of coarse aggregate) using 6 to 10 mm graded crushed granite stone. The ingredients shall be thoroughly mixed with sufficient water to obtain the required plasticity. The free water on the surface of the base shall be removed and a coat of cement slurry of the consistency of thick cream shall be brushed on the surface.

- c. The prepared 1:1.5:3 concrete shall be laid immediately after mixing on the fresh grouted base. The concrete shall be spread evenly and levelled carefully and compacted. Then the surface shall be tested with the straight edge and mason's spirit level to detect any inequalities in the surface. Low places shall be filled, humps removed and the whole surface again levelled. The layer shall be thoroughly compacted to the finished thickness by ramming and power trowel led and allowed to set. Just sufficient trowel ling shall be made to give a level surface. The surface should not be over trowel led as excessive trowel ling will bring the cement to the surface which shall be strictly avoided. When the initial set takes place further compaction by power trowel ling shall be done and final trowel ling shall be done well before the topping becomes too hard.
- d. The surface shall be trowel led three times at intervals so as to produce a uniform, hard and smooth surface without any trowel marks or undulations. No mortar or cement will be allowed to be added in this process.

The screed strips should be removed the next day after the concrete has been deposited in the panels and the edges of panels shall be examined for any honeycombing or undulation which, if found, shall be repaired straight and smooth by cement mortar; if the intermediate panels are not to be filled the next day, the screed strips shall then be cleared and put back against the edge of panels till the concrete in the alternate panels is to be deposited. When the concrete is being deposited in the alternate panels the screed strips shall be removed. When the concrete is being compacted in new panels, care shall be taken to avoid damage to the panels already laid. When desired by the IISER PUNE, the surface while still 'green' shall be intended by pressing strings. The markings shall be of even depth, in straight lines and the panels shall be of uniform and symmetrical patterns.

- e. When ironite or equivalent hardonate is to be added the same shall be mixed and laid as per the manufacturer's instructions and specifications.

Curing

As soon as the surface is hard enough, it shall be covered with sacking or sand and kept continuously wet for a period of at least one week.

6.10

PRECAST CEMENT CONCRETE DESIGNER TILE

The designer precast tile of approved equivalent shall be of thickness not less than 22mm, Average wear < 2mm and wear on individual specimen < 2.5mm, Water Absorption < 10%, Wet transverse strength not less than 3 N/mm² when tested as per IS 1237-1980.

Base concrete or RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tiles shall be with cement mortar of specified proportion and shall be in conformity with the relevant provisions of CPWD specification.

Over this bedding, neat grey cement slurry of honey like consistency shall be spread at the rate of 4.4 kg of cement per square metre over such an area as would accommodate about twenty tiles. Tiles shall be washed clean and shall be fixed on this grout one after another, each tile being gently tapped with a wooden mallet till it is properly bedded, and in level with the adjoining tiles. The joints shall be kept as thin as possible but not exceeding 1.5 mm and in straight lines or to suit the required pattern. The surface of the flooring during laying shall be frequently checked with a straight edge atleast 2 metre long, so as to obtain a true surface with the required levels/

slopes. After the tiles have been laid, surplus cement grout that may have come out of the joints shall be mopped off.

The day after the tiles are laid, all joints shall be cleaned of the grey cement grout with a wire brush or trowel to a depth of 5 mm and all dust and loose mortar removed and cleaned. Joints shall then be grouted with grey cement mixed with pigment (in case of grey cement tiles / dark shade tiles) or white cement mixed with pigment (in case of light shade tiles) to match the shade of the topping of the wearing layer of the tiles. The floor shall then be kept wet for a minimum period of 7 days.

The finished floor shall not sound hollow when tapped with a wooden mallet.

Top of the finished flooring shall be in level or as per gradient provided in the approved drawings

Levelling concrete if required due to adjacent flooring level / under floor cable management system/ drainage system shall be measured and paid separately.

Measurements

Length and breadth of the finished surface shall be measured correct to cm before laying skirting dado or wall plaster and area shall be calculated in Sqm correct to two places of decimal. Nothing extra shall be paid for on account of flooring in circular/ spiral/ any other geometrical shaped areas. No deduction shall be made nor extra paid for making voids not exceeding 0.20 sqm. Further no deduction shall be made for the volume occupied by pipes, conduits, cable manager etc.

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the description of item.

6.11

GRANITE FLOORING

The granite stone slab shall be of the shade as specified in the item and it shall be got approved by the Engineer-in-Charge before using in the work. Stone shall be hard, sound, durable and free from weathering decay and defects like cavities, cracks, flaws, sand holes, injurious veins, patches of loose or soft materials and other similar defects that may adversely affect its strength and appearance. As far as possible stones shall be of uniform colour, quality or texture.

Base concrete or RCC slab on which the slabs are to be laid shall be cleaned, wetted and mopped. The bedding for the tiles of specified thickness shall be with cement mortar of specified proportion and shall be in conformity with the relevant provisions of CPWD specification.

Mortar of the specified mix shall be spread under the area of each slab, roughly to the average thickness specified in the item. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped with wooden mallet and brought to level with the adjoining slabs. It shall be lifted and laid aside. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows. The mortar shall be allowed to sufficiently harden and cement slurry of honey like consistency spread over the same at the rate of 4.4 kg of cement per sqm. The edges of the slab already paved shall be buttered with grey cement.

The slab to be laid shall then be lowered gently back in position and tapped with wooden mallet till it is properly bedded in level with and close to the adjoining slabs with as fine a joint as possible. Subsequent slabs shall be laid in the same manner. After each slab has been laid, surplus cement on the surface of the slabs shall be cleaned off. The flooring shall be cured by wetting for a minimum period of seven days. The surface of the flooring as laid shall be true to levels and slopes as instructed by the Engineer-in-Charge.

The day after the slabs are laid, all joints shall be cleaned of the grey cement grout with a wire brush or trowel to a depth of 5 mm and all dust and loose mortar removed and cleaned. Joints shall then be grouted with Laticrete or Araldite joint filler or approved equivalent joint filler of approved shade.

The floor shall then be kept wet for a minimum period of 7 days.

The finished floor shall not sound hollow when tapped with a wooden mallet.

Top of the finished flooring shall be in level or as per gradient provided in the approved drawings

The finished surface shall be protected with POP layer and the same shall be removed and disposed as per the direction of Engineer-in-Charge. After removal of protective layer, the surface shall be finally wax cleaned.

Levelling concrete if required due to adjacent flooring level / under floor cable management system/ drainage system shall be measured and paid separately.

Measurements

Granite stone flooring shall be measured separately as per the size and the type of stone used. Length and breadth of the finished surface shall be measured correct to cm before laying skirting, dado or wall plaster and area as calculated in Sqm correct to two places of decimal shall form the basis of payment. Platforms, vanity counters, facias, steps and treads of stairs paved with granite stone slab shall also be measured under this item. Nosing or moulding shall be paid separately.

Inlay flooring shall be paid separately. Flooring shall be treated as inlay only when it has been laid after cutting the already laid flooring. The measurement shall be taken before inlay work and deduction shall not be made for inlay work.

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the description of item.

6.12

GRANITE FLOORING (INLAY WORK)

Flooring shall be treated as inlay only when it has been laid after cutting the already laid flooring.

The granite stone slab shall be of the shade as specified in the item and it shall be got approved by the Engineer-in-Charge before using in the work. Stone shall be hard, sound, durable and free from weathering decay and defects like cavities, cracks, flaws, sand holes, injurious veins, patches of loose or soft materials and other similar defects that may adversely affect its strength and appearance. As far as possible stones shall be of uniform colour, quality or texture.

For laying of inlay work, the pattern as shown in the drawing shall be drawn to full scale on 3mm plywood and after approval of Engineer-in-Charge, necessary template shall be prepared for the work. With the help of this template existing flooring shall be

cut out and stone to be inlaid shall be suitably shaped. Care shall be taken to avoid damage to existing flooring. In the event of damage, the same shall be made good/replaced by the contractor as approved by the Engineer-in-Charge without extra cost.

After cutting the existing Granite flooring Base concrete or RCC slab on which the slabs are to be laid shall be cleaned, wetted and mopped. The bedding for the tiles of specified thickness shall be with cement mortar of specified proportion and shall be in conformity with the relevant provisions of CPWD specification.

Mortar of the specified mix shall be spread under the area of each slab, roughly to the average thickness specified in the item. The slab shall be washed clean before laying. It shall be laid on top, pressed, tapped with wooden mallet and brought to level with the adjoining slabs. It shall be lifted and laid aside. The top surface of the mortar shall then be corrected by adding fresh mortar at hollows. The mortar is allowed to harden a bit and cement slurry of honey like consistency shall be spread over the same at the rate of 4.4 kg of cement per sqm. The edges of the slab already paved shall be buttered with grey cement.

The slab to be inlaid shall then be lowered gently back in position and tapped with wooden mallet till it is properly bedded in level with and close to the adjoining slabs with as fine a joint as possible. Subsequent slab shall be laid in the same manner. After each slab has been laid, surplus cement on the surface of the slabs shall be cleaned off. The flooring shall be kept wet for a minimum period of seven days. The surface of the flooring as laid shall be true to levels and slopes as instructed by the Engineer-in-Charge.

The day after the slabs are laid all joints shall be cleaned of the grey cement grout with a wire brush or trowel to a depth of 5 mm and all dust and loose mortar removed and cleaned. Joints shall then be grouted with Laticrete or Araldite joint filler or approved equivalent joint filler of approved shade.

The floor shall then be kept wet for a minimum period of 7 days.

The finished floor shall not sound hollow when tapped with a wooden mallet.

Top of the finished flooring shall be in level or as per gradient provided in the approved drawings

Surface shall be protected with POP layer and the same shall be removed and disposed as per shall be the direction of Engineer-in-Charge. After removal of protective layer, the surface shall be finally wax cleaned.

Measurements - Granite stone flooring in inlay work with different kind and/or size shall be measured separately and in square metre correct to two places of decimal. Length and breadth of the finished surface shall be measured correct to cm. For shape other than rectangle the dimensions of circumscribing rectangle shall be measured.

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the description of item.

6.13

CERAMIC TILE FLOORING

Ceramic tile shall be of size and shade as specified in the item. The actual size of the tiles shall be as per manufacturer's specification.

Preparation of Surface and Laying: Base concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be with cement mortar 1: 4 (1 cement: 4 coarse sand) or as specified. The average thickness of the bedding shall be 20 mm and minimum thickness shall not be less than 10 mm.

Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it

Over this mortar bedding neat grey cement slurry of honey like consistency shall be spread at the rate of 3.3 kg of the cement per square metre over such an area as would accommodate about twenty tiles. Tiles shall be soaked in water washed clean and shall be fixed in this grout one after another, each tile gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long, so as to obtain a true surface with the required levels/ slope.

Where full size tiles cannot be fixed these shall be cut (sawn) to the required size, and their edge rubbed smooth to ensure straight and true joints. Tiles which are fixed in the floor adjoining the wall shall enter not less than 10 mm under the plaster, skirting or dado.

After tiles have been laid surplus cement slurry shall be cleaned off.

Pointing and finishing the joints shall be cleaned off the grey cement slurry with wire/coir brush or trowel to a depth of 5 mm and all dust and loose mortar removed. Joints shall then be flush pointed with Laticrete Unhanded Grout 600 Series mixed with Laticrete 1776 Grout Admix Plus (in the proportion as recommended by manufacturer) or approved equivalent joint filler of approved shade. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet.

Top of the finished flooring shall be in level or as per gradient provided in the approved drawings

Levelling concrete if required due to adjacent flooring level / under floor cable management system/ drainage system shall be measured and paid separately.

The finished surface shall be protected with POP layer and the same shall be removed and disposed as per the direction of Engineer-in-Charge and after removal of protective layer the surface shall be acid cleaned.

Measurements - Length and breadth shall be measured correct to a cm before laying skirting, dado or wall plaster and the area calculated in square metre correct to two places of decimal. Where coves are used at the junctions, the length and breadth shall be measured between the lower edges of the coves. No deduction shall be made nor extra paid for voids not exceeding 0.20 square metres. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square metres. Areas, where glazed tiles or different types of decorative tiles are used will be measured separately.

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the description of item.

6.14

VITRIFIED TILE / FULL BODY VITRIFIED FLOORING

Tiles shall be of size and shade as specified in the item. The actual size of the tiles shall be as per manufacturer's specification.

Base concrete or the RCC slab on which the tiles are to be laid shall be cleaned, wetted and mopped. The bedding for the tile shall be with cement mortar 1: 4 (1 cement: 4 coarse sand) or as specified. The average thickness of the bedding shall be 20 mm and minimum thickness shall not be less than 12 mm

Mortar shall be spread, tamped and corrected to proper levels and allowed to harden sufficiently to offer a fairly rigid cushion for the tiles to be set and to enable the mason to place wooden plank across and squat on it.

Over this mortar bedding neat grey cement slurry of honey like consistency shall be spread at the rate of 3.3 kg of the cement per square metre over such an area as would accommodate about twenty tiles. Tiles shall be soaked in water washed clean and shall be fixed in this grout one after another, each tile gently being tapped with a wooden mallet till it is properly bedded and in level with the adjoining tiles. The joints shall be kept as thin as possible and in straight lines or to suit the required pattern.

The surface of the flooring during laying shall be frequently checked with a straight edge about 2 m long, so as to obtain a true surface with the required levels/ slope.

Where full size tiles cannot be fixed these shall be cut (sawn) to the required size, and their edge rubbed smooth to ensure straight and true joints.

After tiles have been laid surplus cement slurry shall be cleaned off.

The joints shall be cleaned off the grey cement slurry with wire/coir brush or trowel to a depth of 5mm and all dust and loose mortar removed. Joints shall then be flush pointed with Laticrete Unsanded Grout 600 Series mixed with Laticrete 1776 Grout Admix Plus (in the proportion as recommended by manufacturer) or approved equivalent joint filler of approved shade. The floor shall then be kept wet for 7 days. After curing, the surface shall be washed and finished clean. The finished floor shall not sound hollow when tapped with a wooden mallet.

Top of the finished flooring shall be in level or as per gradient provided in the approved drawings

Levelling concrete if required due to adjacent flooring level / under floor cable management system/ drainage system shall be measured and paid separately.

The finished surface shall be protected with POP layer and the same shall be removed and disposed as per the direction of Engineer-in-Charge. . After removal of protective layer, the surface shall be finally acid cleaned

Measurements

Length and breadth shall be measured correct to a cm before laying skirting, dado or wall plaster and the area calculated in square meter correct to two places of decimal. No deduction shall be made nor extra paid for voids not exceeding 0.20 square metro. Deductions for ends of dissimilar materials or other articles embedded shall not be made for areas not exceeding 0.10 square meters.

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the description of item.

6.15

TILE IN SKIRTING AND DADO

Vitrified / ceramic tiles shall be of size and shade as specified in the item. The actual size of the tiles shall be as per manufacturer's specification.

The masonry and concrete walls shall be roughened and cleaned with wire brushes. The surface shall be cleaned thoroughly, washed with water and kept wet before skirting is commenced

12 mm thick plaster of cement mortar 1: 3 (1 cement: 3 coarse sand) mix or as specified shall be applied and allowed to harden. The plaster shall be roughened with wire brushes or by scratching diagonal at closed intervals

The tiles shall be soaked in water, washed clean, and a coat of cement slurry applied @ 3.3 Kg. per sqm. at the back of tiles and set in the bedding mortar. The tiles shall be tamped and corrected to proper plane and lines. The tiles shall be set in the required pattern and jointed. The joints shall be as fine as possible. Top of skirting or dado shall be truly horizontal and joints truly vertical except where otherwise indicated. Skirting and dado shall rest on the top of the flooring. Where full size tiles cannot be fixed these shall be cut (sawn) to the required size and their edges rubbed smooth.

The joints shall be cleaned off the grey cement with wire/ coir brush or trowel to a depth of 5 mm and all dust and loose mortar removed. Joints shall then be flush pointed with Laticrete Unsanded Grout 600 Series mixed with Laticrete 1776 Grout Admix Plus (in the proportion as recommended by manufacturer) or approved equivalent joint filler of approved shade. The work shall then be kept wet for 7 days.

After curing, the surface shall be washed and finished clean. The finished work shall not sound hollow when tapped with a wooden mallet.

Measurements - Length shall be measured correct to a cm. Height shall be measured correct to a cm in the case of dado and 5 mm in the case of riser and skirting. The area shall be calculated in square metre, correct to two places of decimal. Length and height shall be measured along the finished face of the skirting or dado including curves where specials such as coves, internal and external angles and beads are used. Where cornices are used the area of dado shall be measured excluding the cornices. Nothing extra will be paid for cutting (sawn) the tiles to sizes. Areas, where glazed tiles or different types of decorative tiles/ borders are used will be measured and paid separately.

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the description of item. Areas where different types of decorative tiles are used will be measured and paid separately.

6.16

GRANITE IN WALL LINING WORK

The granite stone slab shall be of the shade as specified in the item and it shall be got approved by the Engineer-in-Charge before using in the work. Stone shall be hard, sound, durable and free from weathering decay and defects like cavities, cracks, flaws, sand holes, injurious veins, patches of loose or soft materials and other similar defects that may adversely affect its strength and appearance. As far as possible stones shall be of uniform colour, quality or texture.

Granite slab shall be of size and shade as specified in the approved drawing.

The stones shall be secured in position by means of cramps. The material for cramps shall be stainless steel of 304 grades.

Cramps shall be attached to edges as approved by Engineer-in-Charge. The actual number of cramps shall be as per the approved drawing. The cramps shall be fixed to the granite by making holes/ grooves in the granite and shall be filled with Araldite. Necessary grooves/ cutting shall be made in the granite slab for ensuring proper joints

Sample wall lining shall be prepared based on the approved cramps and fixing arrangements and got approved by the Engineer-in-Charge before starting of lining work.

The walls lining shall be carried out true to plumb. All courses shall be laid truly horizontal and all vertical joints truly vertical.

The joints shall be cleaned and be flush pointed with Laticrete Unsanded Grout 600 Series mixed with Laticrete 1776 Grout Admix Plus (in the proportion as recommended by manufacturer) or approved equivalent joint filler of approved shade.

Measurements - The length and breadth of the finished work shall be measured in metre correct to cm. The area shall be calculated in sq. metre correct to two places of decimal. The lining work curved on plan for any radius shall be measured on external face and nothing extra shall be paid on account of lining in curved in plan.

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the description of item. Areas where different types of granites are used will be measured and paid separately. The chamfering and cramps shall be measured and paid separately.

6.17

GRANITE IN RISERS OF STEP, SKIRTING, DADOS

The granite stone slab shall be of the shade as specified in the item and it shall be got approved by the Engineer-in-Charge before using in the work. Stone shall be hard, sound, durable and free from weathering decay and defects like cavities, cracks, flaws, sand holes, injurious veins, patches of loose or soft materials and other similar defects that may adversely affect its strength and appearance. As far as possible stones shall be of uniform colour, quality or texture

The masonry and concrete walls shall be roughened and cleaned with wire brushes. The surface shall be cleaned thoroughly, washed with water and kept wet before skirting is commenced.

12 mm thick plaster of cement mortar 1: 3 (1 cement: 3 coarse sand) mix or as specified shall be applied and allowed to harden. The plaster shall be roughened with wire brushes or by scratching diagonal at closed intervals.

The granite stone slab shall be cut to the size, washed clean, and a coat of cement slurry applied @ 3.3 Kg. per sqm. at the back of granite stone slab and set in the bedding mortar. The granite stone slab shall be tamped and corrected to proper plane and lines. The granite stone slab shall be set in the required pattern and jointed. The joints shall be as fine as possible. Top of skirting or dado shall be truly horizontal and joints truly vertical except where otherwise indicated. Skirting and dado shall rest on the top of the flooring.

The joints shall be cleaned off the grey cement with wire/ coir brush or trowel to a depth of 5 mm and all dust and loose mortar removed. Joints shall then be flush pointed with Laticrete Unsanded Grout 600 Series mixed with Laticrete 1776 Grout Admix Plus (in the proportion as recommended by manufacturer) or approved equivalent joint filler of approved shade. The work shall then be kept wet for 7 days.

After curing, the surface shall be washed and finished clean. The finished work shall not sound hollow when tapped with a wooden mallet

Measurements

Length shall be measured correct to a cm. Height shall be measured correct to a cm in the case of dado and 5 mm in the case of riser and skirting. The area shall be calculated in square metre, correct to two places of decimal. Length and height shall be measured along the finished face of the skirting or dado including curves where specials such as coves, internal and external angles and beads are used. Where cornices are used the area of dado shall be measured excluding the cornices. Areas, where granite stone slab of different types are used will be measured and paid separately. Nosing or moulding shall be paid separately.

Rates

The rate includes the cost of all materials, labours and other inputs involved in all the operations described above and in the areas where different types of granite stone slab are used will be measured and paid separately.

6.18 Cement tile flooring

Cement tiles shall conform to IS 1237 and the size shall be 250 mm x 250 mm or 300 x 300 mm and shall be not less than 20 mm thick and not more than 25 mm thick. They shall be of the colour approved and conform to IS 1237. A bed of cement mortar, 1:4 shall be laid and properly levelled to an average thickness of 20 mm and the surface shall be kept slightly rough to form a satisfactory key for the tiles. In other aspects the tiles will be set and polished as per IS 1443.

6.20 MODE OF MEASUREMENT

The method of measurement for various items in the tender shall be generally in accordance with the IS : 1200 subject to the following :

Flooring shall be measured from skirting to skirting and where the wall surfaces are plastered or provided with dado it shall be measured from plaster to plaster or dado to dado. The measurements shall be in square metre.

The measurement for skirting shall be in running metre. The height of skirting shall be specified in bill of quantities

PLUMBING & SANITARY

SECTION – I : MATERIAL AND GENERAL SPECIFICATIONS**1.00 SCOPE:**

This specification covers the general requirements for sanitary and water supply installation work with all fittings and fixtures including ancillary works such as connections , manholes, inspection chambers, etc.

The scope of work covers supplying and installing sanitary, water supply and drainage items of works in accordance with drawings and specifications.

2.00 GENERAL REQUIREMENTS:

- 2.01 The contractor shall furnish all skilled and unskilled labour, plant and equipment, scaffolding all materials, etc, required for complete executions of the work in accordance with the drawings and as described herein and / or as directed by the Engineer.
- 2.02 All pipe lines, location of fittings and fixtures etc, shall be as per approved drawings or as directed by the Engineer. Correctness of lines, plumb, orientation. Symmetry and levels shall be strictly ensured. All items shall be fully secured against movement in any direction and so located as to allow easy maintenance where desired by the Engineer.
- 2.03 All pipe lines and fittings shall be installed leak proof , when the works under scope of this specifications connect with the others the connection shall be such as to prevent any splashing or emission of foul odour and gases
- 2.04 The installation shall also be in conformity with the bye-laws and requirements of the local authority in so far as these become applicable to the installation. Wherever this specification calls for a higher standard of materials and / or workmanship than those required by any of the above regulations and standards, then this specifications shall take precedence over the said regulations and standards, Wherever drawings and specifications require something which will violate the regulations the regulations shall govern.
- 2.05 Contractor shall set out the drainage, soil, waste and water pipes lines and other fittings and fixtures in accordance with the plans and instructions of the Engineer, The contractor shall be responsible for the correctness of the above and inaccuracies are to be rectified at his own expenses. He will be responsible for taking levels of the site before setting out and putting them on record without extra charge.
- 2.06 All works should conform to the description given for each item and in specification in addition to the bye – laws / requirements of the Municipal / Corporation / Local Authorities within whose jurisdiction the work is required to be done.
- 2.07 The drawings , specifications and schedule of quantities forming the part of the contract are explanatory and are complementary to one another , representing together the works / Installation to be carried out . If neither the specifications nor the schedule of quantities include any provision specifically. But if such provision is necessary to complete the work as per drawing the contractor shall provide the same without extra cost, in case of any discrepancy in-between the bill of quantities and drawings , the former will take precedence subject to the approval of the Engineer.

2.08 Works to comply with local regulations and rates to include all cost

- a) All sanitary installations, water supply and drainage works shall conform to the local bodies and the works shall be inspected and passed by the various authorities having jurisdiction.
- b) The work shall be carried out through a licensed plumber.
- c) The contractor shall arrange with the local Municipal and / or Public Authorities to obtaining water and drainage connections and the owner will reimburse the permanent connection charges on production of receipts.
- d) The contractor shall obtain all necessary permission forms from the various authorities having jurisdiction and shall make application and file all plans require for obtaining permission and satisfactory completion of the work.
- e) The rates quoted shall be for complete items as fixed in position and cover all costs of materials , labors, tools, supervision , cutting of holes , chases etc.
(Expect core cutting of concrete by machine) and also for providing fixing arrangements, Viz, clamps, brackets, wooden blocks etc, The rate shall also include restoration to original condition of all damages to walls, floors etc, During the process of fixing of sanitary installations , water supply, and drainage to the entire satisfaction of the Engineer. All debris of plumbers, excavation etc, shall be removed without any extra charges, the plumbing work or the other building work affected by the plumber's work shall be left thoroughly cleaned to the satisfaction of the Engineer.
- f) All CI pipes, brackets, cisterns, GI pipes and fixtures, MS fixtures shall be painted with one coat of approved primer and two coats of enamel paint/oil paint. All painting work shall be carried out entire satisfaction of The Engineer. If directed additional coats of paint shall be applied to get uniform and matching finish without any extra cost.
- g) In the interior of the building all pipes shall be embedded in an approved manner in chases made in brick walls or floors if required by the Engineer. The plumber shall make necessary holes in the walls etc and restore them to the original condition. (Expect core cutting of concrete by machine)
- h) All water supply and sanitary fixtures, pipes and pipe fittings, traps, etc., which are to be embedded in to the concrete or masonry work or other building work shall be placed in position and embedded or concealed at the time of casting concrete or erecting brickwork. In case where chasing or cutting of concrete, masonry, or other structural or construction work is unavoidable, the locations of such fittings, pipe lines and traps etc., shall be marked suitably and the cutting, chasing or disturbing of the construction work shall proceed only after due approval of the Engineer.
- i) All cutting, chasing and fixing work shall be completed before commencement of any plastering, tiling or finishing work.
- j) Unless otherwise specified, galvanized iron pipes and pipe fittings shall be of medium quality conforming to IS: 1239 and shall be tested if required by the Engineer.
- k) The contractor shall be responsible for the adequacy and efficiency of the entire plumbing system and if, in his opinion, he finds any serious objection to the system shown on the drawings, he shall set forth his objection or his suggestions to ensure adequacy and efficiency of the said system and notify the Engineer before proceeding with the work.

- l) The work in every respect during its progress and till final acceptance by the Engineer, including raw materials delivered at site to be incorporated for use in construction of the work by the Contractor shall be under the charge and in the care of and under the responsibility of the Contractor and at his risk. Any loss or damage to such materials or work prior to final acceptance of the work by the Engineer shall immediately be replaced by the Contractor at his expense.
- 2.09 The contractor shall strictly follow, at all stages of work, the stipulations contained in the Indian Standard Safety Code and the provisions of the safety rules as specified in the General Conditions of the Contract for ensuring safety of men and materials.
- 2.10 Any approval, instructions, permission, checking, review, etc. whatsoever by the engineer shall not relieve the Contractor of his responsibility and obligation regarding adequacy, correctness, completeness, safety, strength, workmanship etc.

3.0 CODES AND PRACTICES:

- 3.01 All standards, specifications, acts, and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions.
- 3.02 List of certain important Indian Standards, Acts and Codes applicable to this work is given below. However, the applicable standards and codes shall be as per but not limited to the list given below:

Latest editions shall always be consulted.

IS:458	Precast concrete pipes (with and without reinforcement).
IS:771	Glazed fire clay sanitary appliances.
IS:774	Flushing cistern of water closets/urinals (Valve less Siphonic type).
IS:778	Copper alloy gate, globe and check valves for water works purposes.
IS:783	Code of practice for laying of concrete pipes.
IS:781	Cast copper alloy screw down bib taps & stop valves for water services.
IS:784	Pre-stressed concrete pipes.
IS:1172	Code of basic requirements for water supply drainage and sanitation.
IS:1200	Methods of measurement of building and civil engineering works.
IS:1703	Copper alloy float valves for water supply fittings.
IS:1726	CI manhole covers and frames intended for use in drainage works.
IS:1742	Code of practice for building drainage.
IS:2064	Code of Practice for selection, installation and maintenance of sanitary appliances.
IS:2065	Code of practice for water supply in building.
IS:2470	Code of practice for installation for septic tank.
IS:2527	Code of practice for fixing rain water gutters and down pipes for roof drainage.
IS:2548	Plastic seats and covers for water-closet.
IS:3076	Low density polyethylene pipes for potable water supplies.
IS:4111	Code of practice for ancillary structures in sewerage system.
IS:4984	Specification for high density polyethylene pipes for potable water supplies, Sewage and industrial effluents.
IS:5329	Code of practice for sanitary pipe work above ground for buildings.
IS:1795-1982	Pillar taps for water supply purposes (second revision).
IS:2548-1980	Plastic water-closet seats and covers (third revision).
IS:2556	Vitreous sanitary appliance (vitreous china)
Part XI-1979	Specific requirements for shower rose (first revision).
Part XII-1973	Specific requirements for floor traps.
Part XV-1974	Specific requirements of universal water – closets.
IS:3311-1979	Waste plug and its accessories for sinks and wash basins (first revision).

IS:5961-1970	Cast iron gratings for drainage purposes.
IS:7231-1974	Plastic flushing cisterns (valve less Siphonic type) for water-closets and urinals.
IS:4985-1981	In-plasticized PVC Pipes for potable water supplies (first revision).
IS:1742-1983	Code of practice for Building drainage.
IS:4111 (Part 1)-1986	Code of practice for Manholes.
IS:4985-1987	Specification for PVC Pipe lines.
IS:7834-1987	Specification for PVC Fittings.
Part 3,4,6	
IS:2379-1990	Pipe lines-identification colour code.
SP 27-1987	Mode of measurement for water supply, plumbing, drains water and sewer lines.

4. **MATERIALS:**

4.1 Materials shall be of the best approved quality obtainable and unless otherwise specified they shall conform to the respective Indian Standard Specification.

Sample of all materials shall be got approved before placing order and the approved samples shall be deposited with the Engineer.

In case of non-availability of materials in metric sizes, the nearest size in FPS units shall not be provided with prior approval of the Engineer for which neither extra will be paid nor shall any rebate be recovered.

If directed, materials shall be tested in any approved Testing Laboratory and the Contractor shall produce the test certificate in original to the Engineer and entire charges for original as well as repeated tests shall be borne by the Contractor. If required by the Engineer, the Contractor shall arrange to test portions of the work at his own cost in order to prove their soundness and efficiency. If after any such test the work or portion of works is found, in the opinion of the Engineer, to be defective or unsound, the Contractor shall pull down and redo the same at his own cost. Defective materials shall be removed from the site.

It shall be obligatory for the Contractor to furnish certificate, if demanded by Engineer, from manufacturer or the material supplier that the work has been carried out by using their material and installed/fixed as per their recommendations.

4.2 **Cement**

Cement shall comply in every respect with the requirements of the latest publication of IS: 8112-1989 and unless otherwise specified, Ordinary Portland cement Grade 43 shall be used.

Cement shall be stored in weatherproof shed with raised wooden plank flooring to prevent deterioration by dampness or intrusion by foreign matter.

4.3 **Sand**

Sand shall be clean, free from salt, clay, loam, shells, vegetable matter and fit for use in the opinion of Engineer and shall conform to IS : 383 and IS : 2116.
if directed, the sand shall be washed.

4.4 Coarse aggregate

Coarse aggregate shall conform to IS: 383.

It shall be angular, tough, and sharp and well graded stone metal from approved source. It shall be clean and free from any foreign material. If directed, the metal shall be washed.

4.5 Bricks

Brick shall conform to IS: 1077.

Bricks shall be with a minimum compressive strength of 50 Kg/sqcm.

Bricks shall be of chamber burnt best quality locally obtainable and shall be well burnt, but not over burnt and shall be free from cracks, chips, flaws and stones. It shall not absorb water more than 20% of its own weight when dry.

4.6 Cement mortar

Cement mortar shall be in proportion specified in the particular item in the Schedule of Quantities. Sand shall be measured in suitable measuring boxes and correct quantity of cement shall be added. The materials are mixed dry on a clean platform. Clean water is then added and mixed thoroughly. It shall be prepared in such quantity as can be readily used up. Mortar which has partially set shall under no circumstances be re-tempered by mixing with additional material or water.

5.0 Piping And Fitting Materials

5.1 Work Included

Supply and install piping, fittings and joint materials for Plumbing Systems.

5.2 Related Works as under specified elsewhere

- (i) Pipe hangers
- (ii) Valves
- (iii) Soil, Waste, Vent and Storm Water System.
- (iv) Pipe Insulation.

5.3 Quality Assurance

- a. Each Pipe length shall have the manufactures name cast/stamped/rolled on
- b. Each fitting shall have the manufacturer symbol and pressure rating stamped, rolled on.

5.4 Polyvinyl Chloride (PVC) Pipes

Pipe	Virgin PVC	Schedule 40 & Schedule 80
Fittings	Virgin PVC	Schedule – 40
Joints		Washer jointed / Solvent Welded

Cutting

In order to make a proper and neat joint, measure the pipe length accurately and make a visible marking using a felt tip pen. Ensure that the pipe & fittings are size compatible. You can easily cut with plywood cutting saw/ratchet cutter or a wheel cutter. Cutting the pipe as squarely as possible (at 90°) provides optimal bonding area with in a joint. Inspect pipe ends thoroughly prior to making a joint. If a crack or splintering is noticed, cut-off min. 25mm beyond the visible crack before proceeding.

Deburring / Beveling

Burrs in & on pipe end can obstruct flow/proper contact between the pipe & socket of the fitting during assembly & should be removed from both in & outside of the pipe. A 15 mm dia half round file/a pen knife or deburring tools are suitable for this purpose. A slight bevel on the end of the pipe will ease entry of the pipe into the socket of the fitting socket.

Fitting Preparation

Using a clean dry rag, wipe the dirt and moisture from the fitting sockets and pipe end. Dry fit the pipe to ensure total entry into the bottom of the fittings socket & make a visible marking using a felt tip pen.

Solvent cement application

Use only Flowguard CPVC Cement conforming to ASTM F-493 to ensure a perfect solvent weld joint. When making a joint, apply an even coat of cement on the pipe end and also inside the fitting socket. Do not use thickened or lumpy solvent cement. It should have a flow consistency like that of syrup or honey.

Assembly

Immediately insert the pipe into the fitting socket, rotate the pipe $\frac{1}{4}$ to $\frac{1}{2}$ turn while inserting. This motion ensures an even distribution of cement within the joint. Hold the assembly for approx. 10 seconds to allow the joint to set-up.

Cure time for operating/test pressure up to 12 kg/cm²

Ambient Temp	Up to 1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ " to 2"
17° to 48° C	1 hr	2 hr
5° to 17° C	3 hr	4 hr
-20° to 5° C	8 hr	16 hr

Cure time for operating/test pressure above 12 kg/cm²

Ambient Temp	Up to 1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ " to 2"
17° to 48° C	6 hr	6 hr
5° to 17° C	12 hr	24 hr
-20° to 5° C	48 hr	96 hr

5.5 Galvanised Iron Pipe

Pipe

Standard weight Galvanised iron “B” Class Conforming IS: 1239 of TATA make.

Application

- Cold Water and Flush Water Supply lines.
- Unless otherwise specified, the pipe below ground level or shaft pipes shall be ‘B’ Class (TATA).
- All screwed tubes and sockets shall have pipe threads conforming to the requirements of IS: 54-1975 (or revised). Screwed tubes shall have taper threads while the sockets shall have parallel threads.
- The weights of GI Pipes for various classes and dia. Are as per IS Code.

Fittings

- The fittings shall be “R” Brand or approved equal.
- The fittings shall have screw threads at the ends and conforming to the requirement of IS: 544-1975 (or revised). Female threads or fittings shall be parallel and male threads (except on running nipples and collars of unions) shall be tapered.
- Unions shall be provided at regular intervals in the pipe lines for easy maintenance/ Repair/ Replacement of pipes.
- The fitting shall be designated by the respective nominal bores of the pipes for which they are intended.

5.6 Cutting, Threading, Laying and Joining

The pipes and fitting shall be inspected at site before use to ascertain that they conform to the specification given in Para 2.0 above. The defective pipes shall be rejected and removed from site. Where the pipes have to be cut or rethreads, the ends shall be carefully filed out so that no obstruction to bore is offered. The ends of the pipes shall then be threaded conforming to the requirements of IS: 544-1975 with pipe dies and taps carefully in such a pieces are screwed together. The taps and dies shall be used only for the straightening screw threads which have become bent or damaged and shall not be used for turning of the threads so as to make them slack, as the later procedure may not result in a water tight joint, the screw threads of pipes and fittings shall be protected from damage until they are fitted.

5.7 Joining & Laying

A. Screwed Joints

Do not damage the fitting surface, remove burrs and ream smooth. Apply red lead oil to nail threads only. Clean joints thoroughly of excess joining materials.

B. Flanged Joints

Use matched flange faces and 2 mm thick compressed asbestos gaskets / rubber gaskets.

- C. Exposed Threads on exposed finished piping at plumbing fixtures and equipment will not be accepted.

5.8 Internal Work:

5.8.1 In Generally the Galvanized iron pipes and fittings shall run in the wall chase inside the toilets and kitchen but on the surface in the service ducts. For exposed pipes, the Clamps fixing shall be done by means of mild steel angle brackets and clamps, as shown in the drawings, keeping the pipes not more than 200 mm clear of the wall. When it is concealed, the pipe chasing may be adopted. For pipes fixed in the ducts or recesses etc., provide sufficient space to work on the pipes with the usual tools. The pipes shall not ordinarily be buried in solid floors. Where unavoidable pipes may be buried for short distances provided adequate protection is given against damage and shall be fixed at a place a pipe is passing through a wall or floor to allow freedom for expansion and contraction and other movements. In the case, the pipes is embedded in walls or floors it should be painted with anti-corrosive bitumastic of approved quality and pipe shall be wrapped in burlap or Hessian cloth impregnated with bitumen. The wrapping shall be made to fit tightly over the pipe and where wrapping with a new piece overlap the old pipe and where wrapping one joint it shall be tied with M.S wire or nylon thread. Where pipes are encased within chases made in the wall, they shall be fixed to the wall with M.S clamps so as to prevent movement before filling in and making good the chase.

5.8.2 PVC Pipes and fittings

If internal cold water piping inside the toilets is carried out with PVC Pipes the same shall be threaded PVC Pipes of 'FINOLEX' or equivalent make manufactured as per ASTM-D-1785 and threads as per IS:1239 (Part 1). The pipes shall be of following duty conditions.

- | | | | |
|----|---------------------------|---|-------------|
| a. | 15mm dia upto 40 mm dia | - | Schedule 40 |
| b. | 50 mm dia upto 150 mm dia | - | Schedule 80 |

5.8.3 Tightening by hand only.

Support: All horizontal pipes should be supported at a distance of approximately 0.8 M and all vertical pipes shall be supported at a distance of 1.2 Mts. With appropriate clips which allow for movement of pipes during temperature change.

5.8.4 Threading

While threading at site, square cut of pipe ends shall be ensured. The ends shall be chamfered with a file. Proper sized wooden plugs shall be inserted in the pipe end and then threading shall be carried out. The sharp edges of gripping vice and other handling tools should be muffed with a suitable packing to prevent damage of pipe surface. No metallic tools should be used preferably for joining.

When pipes are concealed in walls, the pipes should be pressure tested and shall be kept full water while other accessories are being installed. In case of accidental puncture, this will ensure immediate detection.

Special care should be taken while connecting PVC Pipes and fittings with G.I. System. Either araldite joint or standard threaded injection Moulded fittings should be used.

5.9 External Works:

The galvanized iron pipes and fittings shall be laid in trenches. The widths and depths of the trenches for different diameters of the pipes shall be given as in the table below, and shall be enough to have a clear cover of at least 400 mm above the top of pipes.

Dia of pipe	Width of trench	Depth of Trench
15 mm to 50 mm	300 mm	600 mm
65 mm to 100 mm	450 mm	750 mm

At joints and multi pipe routes the trench width shall be widened where necessary. To work of excavation and refilling shall be done true to line and gradient. The pipes shall be painted with two coats of anti-corrosive bitumastic paint of approved quality and wrapped with Hessian cloth impregnated with bitumen. The pipes shall be laid on a sand cushion layer of 75 mm. river sand and filled with excavated earth. The surplus earth shall be disposed off as directed. The filling shall be done after testing & rectifying leakages and after final passing of work by Engineer In charge / Owners Representative at site.

When the excavation is done in rocks the bottom shall be cut deep enough to permit the pipes to be laid on a sand cushion of minimum 75 mm. in case of bigger diameter pipes where the pressure is very high thrust blocks of cement concrete 1:2:4 (1 Cement: 2 coarse sand: 4 graded stone aggregate of 20 nominal size) shall be constructed on all bends to transmit the hydraulic thrust without impairing the ground and spreading it over a sufficient area, as directed by the Engineer-in-charge / Owners Representative at Site.

5.9 Inspection & Testing :

5.10.1 General

- After installation and prior to testing, insulating or painting, inspect each run of each system for completion of joints, supports and accessory items.
- During the progress of work, pressure test the various piping system including mains, risers, branches and fixtures as directed or as required to permit insulation, general construction and built in rough work to proceed.
- Provide all apparatus and temporary work for tests. Take all due precautions to prevent damage to the building or its contents as a result of such tests. Pay for all such damage to the building or work of other trades caused by such tests. After testing remove all water.
- The test for domestic water piping is tested to 1.5 times the system working pressure but not less than 200 PSIG with no loss in pressure for a period 2 hours. Test includes all valve and vessels.

5.10.2 Testing the Joints

After laying and jointing, the pipes and fittings shall be inspected under working conditions of pressure and flow. Any joint found leaking shall be redone and all leaking pipes removed and replaced without extra cost. The pipes and fittings after they are laid shall be tested to hydraulic pressure of 6 kg/cm². (Double the designed working pressure whichever is more). The pipes shall be slowly and carefully charged with water allowing all air to escape and avoiding all shock or water hammer. The draw off takes and stop cocks shall be then closed and specified hydraulic pressure shall be applied gradually. Pressure gauges at least 2 hrs. The pipes and fittings should be tested in section as the work of laying proceeds, keeping the joints exposed for inspection during the testing.

5.11 Measurements

The length shall be measured in running metre correct to a cm. for the finished work, which shall include PVC Pipes, G.I Pipes, G.I Fittings such as bends, tees, elbows, reducers, crosses, plugs, sockets, nipples and nuts, but exclude brass or gunmetal taps (cocks), valves, lead connection pipes and shower rose. The length shall be taken along the central line of the pipe fittings. All pipes and fittings shall be classified according to their diameter of the internal bore. The pipe shall be described as including all cuttings and wastage. In case of fittings of unequal bore, the largest bore shall be measured. Digging and refilling of trenches shall be measured separately or clubbed with main item as indicated in the BOQ.

For concealed piping the rates shall be inclusive of chasing of walls, fixing of pipes & fittings, making good the chases, etc., as indicated in the BOQ.

SECTION II – WATER SUPPLY AND WASTE FITTINGS

1. General

The brass or gun metal fitting shall be of heavy quality and approved manufacture and pattern with screwed ends as specified. The fittings shall in all respects comply with the Indian Standard Specifications I.S: 778-1957 and I.S:781-1959.

The Standard size of brass or gun metal fittings shall be designated by the nominal bore of the pipe outlet to which the fittings are attached. A sample of each kind of fittings shall be got approved from the Engineer-in-charge / Owners representative at site and all supplies made according to the approved samples. All cast fittings shall be sound and free from laps, blow holes and fillings. Both internal and external surfaces shall be clean, smooth and free from sand etc., burning, plugging, stopping or patching of the casting shall not be permissible. The bodies, bonnets, spindles and other parts shall be truly machined so that when assembled the parts shall be axial, parallel and cylindrical with surfaces smoothly finished. The area of the water-way of the fittings shall be less than the area of the nominal bore.

The fittings shall be fully examined and cleared of all foreign matters before being fixed. The fittings shall be fitted in the line in a workman-like manner. The joints and fittings shall be leak-proof when tested to a pressure of 6 kg/sqcm as described in Para above and the defective fittings and joints shall be replaced or redone, without any extra cost.

2. Water Supply Fittings

All water supply fittings (including mixing fittings accessories shall be brass / copper, heavy chromium plated, of the make and design specified. The fittings shall be cast fittings of screw type, machine and threaded properly for fixing to the supply pipes. The plating shall conform to Indian Standard Specification IS:4759-1996 electroplated coating of nickel and chromium on copper and copper alloys.

The fittings shall be supplied complete with chromium plated matching flanges, nuts and extension pieces of required lengths. Metallic washers where required shall also be of chromium plated brass. All bib cocks and stop cocks shall conform to Indian Standard Specification IS: 781 – 1967 – Bib taps and stop valves for water services, sand cast brass screw-down (revised) pillar cocks to IS: 1795 – 1961.

Pillar taps, mixing fitting to IS: 1701 – 1960 mixing valves for abolitionary and domestic purpose. Bath filler, shower arm, raised spout and other fittings shall match the supply fittings in construction, performance and appearance.

All fixing accessories and screws shall be similar to fittings with all exposed parts chromium plated. All washers shall conform to Indian Standard Specification IS: 4326 – 1967 washers for water taps for cold water services.

2.1 Waste Fitting

All waste fittings (waste, chain, pop-up, over-flow) shall be brass / copper, heavy chromium plated of the make and design specified and match the supply fittings. They shall conform to Indian Standard Specification IS: 2963 – 1964 waste fittings for wash basins and sinks non-ferrous.

2.1.1 Bottle Traps

Bottle traps (for wash basins, sinks, urinals etc.,) shall be deep seal (minimum 6cm seal) cast brass bottle traps, heavy chromium plated. All bottle traps shall be provided with suitable cleaning eye, extension piece, and flare nuts-all chromium plated. Bottle traps shall be of approved make and design. Traps for wash basins shall be 32mm, for sinks 40 mm.

2.1.2 Wall Flange

Wall caps shall be provided on all walls, floors, columns, etc., wherever supply and disposal of pipes pierce through them. These wall caps shall be chromium plated brass snugly fitting. The receiving pipes shall be large enough to cover the punctures properly.

2.1.3 Floor Traps

Floor traps shall be of PVC / prefabricated of the size required, of approved design incorporating a deep seal (6 cm. minimum) and venting device unless otherwise indicated. The traps shall be supplied with atleast iron cap with collar capable of receiving a screwed grating.

2.2 Valves & Appurtenances**2.2.1 Ball Float Valve**

The ball valve shall be of high pressure type shall be of sizes as specified. The normal size of a ball valve shall be that corresponding to the size of the pipe to which it is fixed. The ball valve shall be of brass or gun metal as specified, and the float of copper sheet. The minimum thickness of copper sheet used for making the float shall be of 0.45 mm for float exceeding 115 mm dia. Plastic floats may also be used if specified. The body of the high pressure ball valves when assembled in working conditions with the float immersed to not more than half of its volume shall remain closed against a test pressure of 3.5 kg/sqcm.

The ball valve shall generally conform to I.S. specification No. 1703:1862. The weight of ball cock and the size of the ball cock shall be as per I.S. Specification.

2.2.2 Brass full way Valve

Full way valve is a valve with suitable means of connection for insertion in a pipe line for controlling or stopping the flow. The valve shall be of brass fitted with a cast iron wheel and shall be of gun metal gate valve type opening full way of the size as specified. The valve shall be of best quality or approved by the Engineer-in-charge.

2.2.3 Gun-metal full way valve with wheel

These shall be of the gun metal fitting with wheel and shall be of gate valve type opening full way and of the size as per specification. These shall generally conform to I.S 7780 - 1957.

2.2.4 Butterfly Valves

All valves shown in the drawings for water piping for sizes 50 mm and above shall be wafer type butterfly valves. The valves should be suitable for mounting between flanges drilled to IS 6392 Table 10 to 20. The valve body shall be cast iron. Body liner shall be integrally molded and bonded to the body. The material shall be Buna-N Rubber. This body liner shall provide seating to the valve disk and "Gasket Joint" with mating pipe flanges. The valve disk material shall be Stainless steel or Ductile (SG) Iron with Electro less Nickel Coating. The valve stem shall be high tensile stainless steel (AISI 410). The Valve Stem shall be sealed properly using

'O' rings. All valves upto 200 mm NB shall be provided with flow control levers. Valves of 250 mm NB and above shall be provided with gear operated levers. The valve should have a pressure rating of ANSI 150.

2.2.5 Ball Valves

All valves for shut-off purposes for sizes of 50 mm and below shall be ball valves. The valve body and body connector shall be carbon steel as per ASTM A216-WCB, the ball and stem shall be stainless steel SS 304/316. The seats and stem packing shall be PTFE. All Valves shall have socket weld able ends, in 2/3 piece construction and the central portion could be bolted out for maintenance. All valves should be supplied in full bore construction. The valves should have a pressure rating of ANSI 150.

2.2.6 Foot Valves

Provide cast iron body with brass disc and strainer of approved quality, Hherever Shown.

2.2.7 Pressure Reducing Valves

Pressure reducing valves shall be "Leader" make bronze pilot operated spring loaded valves for reducing pressure from 2.5 kg/cm² to 0.5 kg/cm² suitable for specified dia of pipe.

2.2.8 Sluice Valve

The sluice valves are used in a pipe line for controlling or stopping flow of water. They shall be of specified size and class and shall be of inside non-raising screw type spindle with either double flange or double sockets ends and cap or hand-wheel.

These shall in all respects comply with IS: 780-1963 for valves upto and including 300 mm, size and Ni. BDC (429) p2 for valves above 300 mm. Size. Class-I sluice valves are used for maximum working pressure of 10 kg/cm² (100meter head) and Class-II sluice valves for 15 kg/cm² (150 meter head).

The body, domes, covers, wedge gate and stuffing box shall be of good quality cast iron, the spindle of bronze the nut and valves seats of leaded tin bronze. The bodies, spindles and other parts shall be truly machined with surfaces smoothly finished. The area of the water way of the fitting shall be not less than the area equal to the nominal bore of the pipe. The valve wheel shall be marked with an arrow to show the direction to turn for closing the valves. The valve shall be fully examined and cleared of all foreign matter before being fixed. The fixing of the valve shall be done by means of bolts, nuts and 3 mm rubber insertions or chemically treated compressed fiber board of 1.5 mm thick minimum thickness and of weight not less than 0.183 gm per sqcm with the flanges of spigot and the socketed tail pieces drilled, to the same specification in the case of S & S pipe and with flanges in case of flanged pipes. The tail pieces shall conform to I.S 1938 – 1960. These shall be jointed to the pipe line by means of lead caulked joints.

2.2.9 Valve Schedules

Service	Type	Size	Rating	Ends	Materials
Cold Water	Butterfly	50 mm NB & above	150	Wafer type slip on	Cast iron body
Cold Water	Ball with through bore 3 piece construction	40 mm NB & below	150	Screwed	Cast steel body and SS Ball.
Cold Water	Dual Plate Check Valve	100 mm NB	150	Wafer type slip-on	Cast Steel & SS flap

2.2.10 Appurtenances

The other appurtenances of pipe line are mentioned below:

a) Purge Valves

These are placed at every summit in the pipe line to permit the escape of air when the main is filled and afterwards, if any air carried out into the mains. These are also placed on long stretches of nearly level main. Purging assembly shall comprise of 25 mm x 150 mm G.I Pipe nipple and 25 mm NB CS Ball Valve, fitted with hose nipples at the outlet.

b) Scout Valves

These are placed at the bottom of all depressions for emptying the main or letting out the sediment.

c) Reflux Valves

These are fixed so as to open in the direction of flow but automatically close if the water flows back. They are used to diminish the damage done by the escape of water due to a burst or prevent damage to impellers of pumps.

d) Safety or Relief Valves

These are fixed at the down stream ends of long lengths of main or where water hammer may take place so as to reduce from any excessive pressure to the normal if it occurs, like in water pipes of high rise buildings. They are also called pressure reducing valves.

2.2.11 Fixing Water meter and stop cock in G.I. pipe line Material –Pipe fittings as described in material section.

Cutting G.I Pipe Line

The G.I line shall be cut to the required length at the position where the meter and stop cock is required to be fixed. The ends of the pipe shall then be threaded. Unions shall be provided in the pipe assembly for fixing water meter.

Fixing Meter and Stop Cock

The meter and stop cock shall be fixed in position by means of connecting pipes, G.I. jam nut and socket etc., The stop cock shall be fixed near the inlet of the water. The paper disc inserted in the ripples of the meter shall be removed and the meter installed exactly horizontal or vertical in the flow line in the direction shown by the arrow cast on the body of the meter.

Care shall be taken that the factory seal of the meter is not disturbed. Wherever the meter shall be fixed to a newly fitted pipe line, the pipe line shall have to be completely washed before fitting the meter. For this purpose a piece of pipe equal to the length of the meter shall be fitted in the proposed position of the meter in the new pipe line. The water shall be allowed to flow completely to wash the pipe line and then the meter installed as described above by replacing the connecting piece.

3.0 MASONRY CHAMBERS

3.1 General

All masonry chambers for stop cocks, sluice valves, etc., shall be built as per supplied drawings.

3.2 Excavation

The excavation for chambers shall be done true to dimension and levels as indicated on plans or as directed by the Engineer-in-charge.

3.3 Bed Concrete

This shall be cement concrete 1:3:6 (1cement: 3fine sand: 6graded stone aggregate 40 mm nominal size).

3.4 Brick Work

This shall be in Class B bricks (Table Molded) with crushing strength not less than 35kg / sqcm in cement mortar 1:5 (1cement : 5fine sand).

3.5 Plastering

Plastering not less than 12 mm thick shall be done in cement mortar 1:3 (1cement: 3coarse sand) finished with a floating coat of neat cement.

3.6 Surface Box

This shall be of cast iron, well made and free from casting and other defects. All sharp edges shall be removed and finished smooth. The shape and dimensions for surface boxes for stop cocks, sluice valves, etc., shall be as per approved samples.

3.7 Measurements

Masonry chambers shall be measured as No. of units and the item may or may not include, excavation and back-filling as detailed in the BOQ.

3.8 Rating

The rate shall include the cost of materials and labor involvement in all the operations described above, except the excavation in soft or decomposed and hard rock.

The difference in cost, between ordinary soil and soft or decomposed or hard rock as the case may be, shall be paid for separately if the rock is met with.

SECTION III – INTERNAL DRAINAGE WORKS

1. Soils, Waste, Vent Pipes and Fittings

All soil, waste, vent pipes and fittings used within sunken floor areas in service floors or within plumbing shafts vertical run shall be PVC Pipes with washer jointed. The internal and external surfaces of pipes shall be smooth and clean, free from grooving and other defects. The end shall be designated by external diameter.

2. Installation Methods

2.1 Above Ground Installation

The PVC Pipes shall be laid and clamped to MS frames fixed above the surface of walls. Use of fittings with door and cleaning pipe may be made at suitable points to provide access for inspection and cleaning. Provisions shall be made for the effect of thermal movement by not gripping or restricting the pipe at supports between the anchors for suspended pipes. Generally the pipes shall be clamped at a spacing of 900 mm for horizontal run and 1200 mm for vertical run. It is essential that PVC pipes shall be aligned the clamps are not fixed keeping the pipe plumb. The pipe aligned properly before fixing them.

2.2 Concealed Installation

For concealing the drain lines in sunken floors, pipes shall be laid to proper slope and shall be aligned first proper P.C.C / brick masonry supports shall be provided near the joints and at regular intervals. Sharp edged objects shall be avoided while filling the sunken portions. All concealed lines shall be tested for leakage before concealing the system.

2.3 Underground Installation

For laying PVC Pipes in trenches, trench width should not be less than pipe diameter plus 300 mm, while trench depth should be about 600 to 1000 mm depending upon the size of the pipe and slope as required. Care should be taken to avoid dirt entering the joints. The trench bottom shall be carefully examined for the presence of hard objects such as flints, rock projection or tree roots, etc., Pipes shall be bedded in sand or soft soil free from rock and gravel. Back filling shall be with fine river sand or soft soil and should be carried out to a height of 150 mm above the pipe. Pipes shall not be painted. Testing of the lines shall be done before filling back the trench.

3. Jointing – PVC Pipes

3.1 Rubber Ring

Cut the PVC pipes with a fine toothed saw to required length and square to the axis. Chamfer the edge of the pipe to be inserted at angle of about 15 degree to about 1/3rd the wall thickness using 3 coarse file. Make sure the spigot and socket are thoroughly clean and dry. Apply the jointing lubricant to the chamfer end of the pipe right up to the mark made on spigot or to the socket end of the fitting. Push the pipe firmly into the socket leaving a gap between mark on the spigot and socket of about 10 mm to allow for thermal expansion.

4. Storage of PVC Pipes

To avoid any possibility of damage to PVC Pipes and fittings, a few points should be observed.

- ❖ Pipes and fittings should not be kept on sharp objects.
- ❖ Pipes and fittings shall be lifted and not dragged.
- ❖ Fittings should be stored in cartons or bags
- ❖ Pipes should be stacked on even surface, the stacking height not exceeding 1.5 mts. If they have to be stored for a long period.
- ❖ Rubber rings should be kept tension free
- ❖ Lubricants and solvent cement should be stored in a cool place away from direct sunlight.

5. Miscellaneous Items

Supports, Pedestals and base for inspection chambers, gully traps and pipes shall be in 1:2:4 cement concrete mix.

Pipe sleeves and inserts, etc., through RCC walls either external or internal shall be of C.I. or M.S provided with water bar flange.

During installation open ends of pipes shall be plugged with wood cut into required shape or gunny bags and to be maintained free from dirt.

Space between pipe and sleeve packed with hemp and chalk water tight with lead.

Space between pipe or pipe covering and sleeve with a non combustible, permanently plastic, water proof, non-staining compound, leaving a finish smooth appearance or pack with mineral wool or fibre glass within 15 mm of both wall faces and provide caulking compound as per above, on floors provide caulking compound on inside faces only.

The size of branch waste pipes for different fittings shall be generally as follows:

Wash Basin	-	40 mm dia PVC
Sink	-	40 dia PVC waste pipes.

W.C pan connectors shall be to suit the requirements as per drawing, with 75 dia. Vent horn for connection to the anti-syphonage pipe with pan connector.

The Pipe Connection to the sewage or storm water collection chambers shall be perfectly water tight.

The floor traps for toilet blocks shall be specially made to suit the toilet configuration. The trap shall be of PVC with one inlet and one outlet, SS grating with suitable flashing shall be provided. The trap shall be generally of size 100x75.

SECTION IV – EXTERNAL DRAINAGE WORKS

1.0 Unplasticised PVC Pipes

UPVC Pipes for soil, Waste shall conform to IS:4985 – 1981 with Pressure rating of 10 kg/cm² or as stated in the schedule of quantities, with rubber ring joints or solvent cemented socket and spigot joints as specified. Rubber rings shall conform to IS: 5382 and all the fittings like tee, bends, and couplers cross etc., shall conform to IS: 7834-75 Soil, Waste and rain water pipes fitted within pipe shafts shall be with 'O' ring joints. For external drainage – pipes buried underground solvent cement joints shall be used.

1.1 Storage and Handling

UPVC Pipes: The pipes should be given adequate support at all times. Pipes should be stored in a reasonably flat surface free from stones and sharp projections so that the pipe is supported throughout its length. In storage, pipe racks should provide continuous support and sharp corners of Metal racks should be avoided. Socket and spigot pipes should be stacked in layers with sockets placed at alternate ends of the stacks to avoid top sided stacks. It is recommended not to store pipe inside another pipe.

On no account pipes shall be stored in a stressed or bend condition or near the source of heat.

Pipes should not be stacked more than 1.5 M high and pipes of different size and classes should be stacked separately.

The ends of pipes should be protected from abrasion particularly those specially prepared for joints or soldered for use with couplings.

If due to unsatisfactory storage or handling a pipe become 'kinked' the damaged portion should be cut out completely. 'Kinking' is likely to occur in very thin walled pipes.

1.2 Joining of Unplasticised PVC Pipes

Method of jointing:

- a) Solvent Welded Joints: For SWR Pipes laid underground.
- b) White cement & linseed oil mixture
(Connection of UPVC to Cast Iron pipes and stoneware pipes).
- c) Screwed or threaded joints – for Water Supply piping.
- d) Rubber Ring joints – for SWG Pipes fitted in shafts.

1.3 Solvent Welded Joints – for UG SWR Piping

This technique is used with spigot and socket type joints, in which the socket is made specially to form a close fit on the pipe end and with injection mould / fabricated fittings.

Solvent cement of Supreme Industries Ltd. Or Equivalent make shall be used as per the recommendation of the manufacturers. The dust, oil, water grease, etc., should be wiped out with dry cloth from the surface to be coated with solvent cement. Before applying solvent cement, the pipes and fittings should set and laid as per the layout and the length of insertion of pipe end into the sockets should be marked. The pipes and fittings are then dismantled and joints effected progressively. The coating of solvent cement shall be applied evenly on the inside of the fitting for full length of insertion and then on the outside of the pipe and up to the marked line and the pipe twisted to a quarter of a turn to spread the cement evenly at the same time ensuring the pipe, pushed home fully into the socket. The pipe should be pushed into the fitting socket and held for one to two minutes as otherwise the pipes come out of the

fitting due to slippery quality of cement and the tapered inside bore of the fitting. The surplus cement on the pipe surfaces shall be wiped out. In most of the cases the pipe inserted should be up to the marked line and in no case shall be less than 2/5 of the diameter of the pipe and up to marked line.

When the joints is made, the remaining cement on the pipe surfaces shall be wiped off immediately without fail as the continued action of solvent cement will weaken the wall on the pipe and cause failure under pressure. In summer months joints shall be made preferably early in the morning or in the evening, when it is Cooler.

Since solvent cements are inflammable they should not be used near naked flames. In certain cases fumes given off from cement may be a source of danger if not carried in a well ventilated area.

When not in use containers of cement should be kept closed tightly to avoid loss of solvent or entry of dirty cement which has settled or hardened should be discarded and removed from the site.

1.4 Rubber Ring Joints or 'O' Ring shrink joints (Shaft Piping)

Un-plasticized PVC Pipe may be jointed by employing approved rubber ring to provide the water tight seal. The ring may be housed in groove formed in a plastic or metallic housing. The rubber is compressed and makes a seal between the pipes and the housing.

2. Salt Glazed Stoneware Pipes

- 2.1 All pipes with spigot and socket ends shall conform to IS 651 – 1965 and shall be of grade 'A' as specified. These shall be sound, free from visible defects such as fine cracks or hair cracks. The glaze of the pipes shall be free from cracks. The pipes shall give a sharp clear sound when struck with a light hammer. There shall be no broken blisters or chipping on the spigot or socket. The approximate thickness and weight of 600 mm long pipes shall be given in the table below.

Internal Diameter of the Pipe mm	Thickness of the Barrel & of socket mm	Weight of each pipe per Mtr. Kg.
100	12	14
150	16	22
200	17	33
230	19	44
250	20	52
300	25	79

The length of pipes shall be 600 mm exclusive of the internal depth of the socket. The pipes shall be handled with sufficient care to avoid damage to them.

2.2 Trenches for SW Stoneware Pipes Drain:

Unless otherwise mentioned the widths of trenches for various dia of stoneware pipes shall be as given in the table given below for depth upto 3 m.

Size of Pipes	Width of Trench
150	0.8 m
230	0.9 m
300	0.9 m

2.3 Laying Stoneware Pipes

All pipes shall be laid on a bed of 150 mm cement concrete of 1:4:8 using 20 mm graded granite aggregates projecting on each side of the pipe to the width of the trench specified. The pipes with their crown level at 1200 mm depth and less from ground shall be covered with 150 mm thick concrete above the crown of the pipe ends sloped off to meet the outer edges of the concrete to give a minimum thickness of 150 mm. all round the pipe. Pipes laid at a depth greater than 1200 mm at crown shall be concreted at the sides up to the level of the centre of the pipe and sloped off from the edge to meet the pipe tangentially.

The pipes shall be carefully laid to the alignment, levels and gradients shown on the plans and sections. Great care shall be taken to prevent sand etc., from entering the pipes. The pipes between two manholes shall be laid truly in a straight line without vertical or horizontal undulation. The pipes shall be laid with socket up the gradient.

If the excavation has been carried too low, the desired levels shall be made up with concretes 1:5:10 (1cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) for which no extra payment shall be made.

If the floor of the trench consists of rock or very hard ground that cannot easily be excavated to a smooth surface the pipe shall be laid on a leveling course of concrete as desired.

2.4 Jointing

Tarred gasket of hemp yarn soaked in thick cement slurry shall first be placed round the spigot of each pipe and the spigot shall then be slipped home well into the socket of the pipe previously laid. The pipe shall then be adjusted and fixed in the correct position and the gasket caulked tightly home so as to fill not more than $\frac{1}{4}$ of the total depth of the socket.

The remainder of the socket shall then be filled with stiff mixture of cement mortar in the proportion of 1:1 (1cement: 1 fine sand). When the socket is filled, a fillet shall be formed round the joint with trowel forming an angle of 45 degree with the barrel of the pipe. The joints shall be tested hydraulically and no. concreting for encasement shall be done unless pipes are jointed and tested after a day's work any extraneous material shall be removed from the inside of the pipe. The newly made joints shall be cured.

2.5 Testing of Joints

Hydraulic Test: Stoneware pipe used for sewers shall be subjected to a test pressure of 1500 mm or required head of water at the highest point of the section under test. The test shall be carried out by suitable plugging the low end of the drain and the ends of the connection, if any and filling the system with top and a sufficient length of vertical pipe jointed to it so to join with a connection to a hose ending in a funnel which could be raised or lowered till the required head is obtained and fixed suitably for observation.

During the test the required head is maintained for 30 minutes by adding water from a measuring vessel at 10 minutes interval and the average quantity added shall not exceed 1 liter per hour per 100 m. length per 10 mm dia of pipe. Where leakage will be visible the defective part of the work shall be removed and made good, at no extra cost.

2.6 Refilling of Trenches

As described under water supply section.

In case where pipes are not bedded on concrete, special care shall be taken in refilling trenches to cement the displacement and subsequent settlement at the surface resulting in uneven surfaces and dangers to foundations etc., the back-filling materials shall be packed by hand under and around the pipe and rammed with a shovel and light tamper. This method of filling will be continued up to the top of pipe. The refilling shall rise evenly on both sides of the pipe continued up to 60 mm above the top of pipe so as not to disturb the pipe. No tapping should be done within 150 mm, of the top of pipe. The remainder of the backfill shall not be done until 7 days have elapsed for brick sewers and 14 days for concrete sewers, unless local conditions or materials are suitable for the earlier placing of a load on the pipes. The tapping shall become progressively heavier as the depth of the backfill increases.

3 S.W. Gully Trap

Gully traps shall conform to IS: 651-1965. These shall be sound, free from visible defects such as fire cracks or hair cracks. The glaze of the traps shall be free from crazing. They shall give a sharp clear note when struck with a light hammer. There shall be no broken blisters.

The size of the gully trap shall be as specified and all dimensions will be as per drawing / Bill of Quantities.

Each gully trap shall have one C.I. grating of square size corresponding to the dimensions of inlet of gully trap. It will also have a water tight C.I cover with frame inside dimensions 300 x 300 mm, the cover weighing not less than 4 kg. the grating cover and frame shall be of sound and good casting and shall have truly square machined seating faces.

3.1 Excavation

The excavation for gully traps shall be done true to dimensions and levels as indicated on plans or as directed by the Engineering-in-charge/Owners Representative at Site.

3.2 Fixing

The gully trap shall be fixed on cement concrete foundation 600 x 600 mm square and not less than 100 mm. thick. The mix for the concrete will be 1:5:10 (1cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size). The jointing of gully outlet to the branch drain shall be done similar to jointing of S.W. Pipe.

3.3 Brick Masonry Chamber for gully trap

After fixing and testing gully and branch drain, a brick masonry chamber 300 x 300 (inside) in Class B bricks in cement mortar 1:5 (1 cement :5 fine sand) shall be built with a 230 mm thick brick work round the gully trap from the top of the bed concrete up to ground level. The space between the chamber walls and the trap shall be filled in with cement concrete 1:5:10 (1cement: 5 fine sand: 10 graded stones aggregate 40 mm nominal size). The upper portion of the chamber i.e above the top level of the trap shall be plastered inside with water proof cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement. The corners and bottom of the chamber shall be rounded off as to slope towards the grating and form a hopper. C.I. cover with framed 300 x 300 mm, (inside) shall then be fixed on the top of the brick masonry with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and rendered smooth. The finished top to cover shall be left about the adjoining ground level so as to exclude the surface water from entering the gully trap.

4. Manholes, Inspection Chambers, Gullies, Etc:

4.1 Inspection Chambers

Where depth of sewer is less than 1500 mm. below outside rectangular made up / finished level of paving, chambers shall be used having size as specified. Usual sizes are 600 x 600 or 600 x 900. These shall be constructed in the sewer lines at such places and levels and dimensions as indicated on the drawing. Sizes specified shall be clear internal dimensions of the chamber.

4.2 Manholes

Various types and sizes of manholes and inspection chambers are specified for different invert levels. The details of manholes and inspection chambers along with invert levels are furnished in external drainage drawings enclosed with this tender. All manholes / inspection chamber construction shall be as per IS: 4111 Part 1.

For manholes and inspection chambers, which are provided in roads or where heavy vehicular traffic is expected, heavy duty CI air type frame and cover as per IS: 1726 should be provided.

For manholes / inspection chambers built on foot paths, carriage drivers and cycle tracks medium duty covers and frames should be provided.

For location within domestic premises or areas not subjected to traffic loads, light duty covers and frames should be provided.

4.3 Construction of Manholes, Inspection Chambers and Gullies

(i) Excavation

This shall be done to dimensions and levels on the drawing.

(ii) Bed Concrete

Base of the manhole shall be constructed in R.C.C 1:2:4, using 20 mm graded stones. Thickness shall be 200 mm up to 4250 mm depth and 300 mm for depths more than 4250 mm depth or as specified by the Engineer-in-charge / Owners Representative at Site.

(iii) Brickwork

Brickwork shall be in C.M. 1:4 constructed with Class B wire cut bricks. Brick masonry in arches and arching over the pipe shall be in C.M. 1:3. walls shall be generally built in 230 mm thickness for inspection chambers and manholes up to a depth of 2100 mm and 350 mm for depth over 2:2.

(iv) Plastering

Walls of manholes shall be plastered inside with 15 mm thick cement plaster 1:3 using W.P. Compound and finished smooth. Where ground water table is high, external surfaces of manholes shall also be plastered in C.M. 1:3.

(v) Filleting

75 mm fillet shall be made with C.M 1:3 all round the external joint between the bed concrete and brick masonry wall of manhole.

(vi) Benching

Channels and benching inside the manhole or inspection chambers shall be done in C.C 1:2:4 and rendered smooth with cement.

The following size of channels for the bench shall be adopted.

Size of drain		Depth at centre		Depth at sides at walls	
In cms	In inches	In cms	In inches	In cms	In inches
10	4	15	6	25	10
15	6	20	8	30	12
23	9	28	11	38	15
30	12	35	14	45	18
38	15	43	17	53	21
45	18	50	20	61	24

(vii). R.C.C. Cap

RCC M. 150 cap of 1:2:4 150 mm thickness shall be provided on top of manholes for fixing the manhole frame.

(viii) Foot rest

Manhole rungs shall be plastic encapsulated manhole steps conforming to BS:1247 Part 2 : 1990. The overall dimensions of the footrest shall be 263 mm long x 165 mm wide x 25 mm thick. Out of 263 mm length, 138 mm shall be embedded in the manhole side walls. This embedded length shall have necessary ribs to provide adequate grids. The plastics used shall be polyolefin conforming to IS: 10910 – 1984. The steel used in steps shall be 12 mm dia conforming to IS: 1786 – 1985. Footrests shall be placed 300 mm apart vertically and 375 mm horizontally in a staggered fashion. First footrest shall be 450 mm below top of manhole. Footrests shall preferably be painted with luminous paints for easy identifications.

(ix) Manhole frames and covers

Approximate weights for various dimensions of frames and covers of various duties shall be as follows: All (M.H. Covers of heavy duty and medium duty shall be of Double seal type and light duty single seal type).

Size	Heavy duty kg.	Maximum Duty kg.	Light Duty kg.
Square 600 x 600	200	100	60
Rect. 910 x 455	230	200	50
Rec. 910 x 6120	275	251	70
Circular 530 dia.	238	125	-

The covers and frames shall be cleanly cast and shall be free from air and sand holes and from cold shuts. They shall be neatly dressed and carefully trimmed. All castings shall be free from voids either due to shrinkages gas inclusion or other causes.

Covers shall have raised checkered design on the top surface to provide adequate non-slip grip. The cover shall be capable of easy opening and closing and it shall be fitted in the frame in a workman-like manner. Covers shall be gas and water tight. Size of the cover shall be the clear internal dimensions of frame $\pm 12\%$ variations in weights shall be permissible.

Covers and frames shall be coated with a black anti-corrosive paint of bituminous composition. The coating shall be smooth and tenacious. It shall not flow at 63 deg. C and shall not drip off at 0 deg. C. the covers shall be so fixed as to be flushed with ground surface. After completion the manhole covers shall be sealed by means of grease.

4.4 Testing

Manhole, after it is raised above highest expected sub soil water level in monsoon, shall be tested for water tightness. The mouths of all pipes entering the manhole shall be suitably plugged with brick masonry or wooden or any other type of plug. Manhole under test shall then be filled with water up to general subsoil water level and the level observed for one hour. If the level does not drop to more than 50 mm in one hour, it shall be deemed as water tight. During testing the pit around shall be kept free of water contractor shall observe the places where leakage takes place and takes steps to correct the same. Filling earth around manholes shall be done after testing.

4.5 Drop Connection

In cases where branch pipe-sewer enters the manhole of main pipe sewer at level higher than the main sewer by more than 600 mm a drop connection should be provided as per typical drawing for drop connection.

For 150 and 250 mm main line, the difference in level between the water line (Peak-flow-level) and the invert level of branch line is less than 600 mm, a drop connection may be provided within the manhole by giving ramp. If the difference in level is more than 600 mm, the drop should be provided externally.

4.5.1 Excavation

The excavation shall be done for the drop connections at the place where the branch line meets the manhole. The excavation shall be carried up to the bed concrete of the manhole and to the full width of the branch line.

4.5.2 Laying

At the end of branch sewer line stoneware shall be fixed to the line which shall be extended through the wall of the manhole by a horizontal piece of S.W. pipe to form an inspection or cleaning eye. The stoneware drop shall be connected to the tee at the top and the S.W bend at the bottom. The end shall be extended through the wall of the manhole by a piece of C.I. pipe which shall discharge into the channel. Necessary channel shall be made with cement concrete 1:2:4 (1cement: 2 coarse sand: 4 graded stone aggregate 20 mm. nominal size) and finished smooth to connect the main channel. The joint between S.W pipe and tee and S.W branch line shall be made with cement mortar 1:1 (1 cement: 1 fine sand) for S.W. Pipes. The exposed portion of the drop connection shall be encased all round with a single brickwork in C.M. 1:4 (1 cement: 4 fine sand) and plastered with cement mortar 1:3 (1cement: 3 coarse sand) on the inside of the manhole wall. The excavated earth shall be back filled in the trench in level with the original ground level.

5 RAIN WATER DRAINAGE WORKS

5.1 Rigid P.V.C Pipes for Rain Water

5.1.1 General

P.V.C. pipes shall conform to the relevant specification of I.S 4985 of SWR quality. They shall be made of Polyvinyl Chloride (PVC) and shall be sound with good surface finish, mechanical strength and capacity. During manufacture only those additives may be added to produce the above characteristics. No additives shall be added separately or together in quantities sufficient to constitute toxic hazard, or impair the fabrication or welding properties of the pipe or impair its physical or chemical properties. All pipes shall be spigot and socket type (bell end type).

5.1.2 Pipe Sizes and Wall Thickness – 6 kg class

Pipe Dia (mm)	Wall Thickness (mm)
100 mm	3.7 to 4.3 mm
160 mm	5.4 to 6.2 mm
200 mm	6.8 to 7.9 mm

5.1.3 **Tolerances:** Tolerances on diameters, wall shall be as per I.S. 4985.

5.1.4 Fittings

All fittings shall be injection Moulded socket fittings with or without inspection doors as specified and shall be in accordance with the requirements of the relevant I.S. 7834. Pressure ratings and Tolerances shall be as per I.S. 4985.

5.1.5 Laying and Jointing

Pipes shall be cut to length required including the portion to be inserted in the socket with a hacksaw. The pipe shall be cut square. Pipes and Sockets shall be clean and dry and burrs removed both inside and outside with a file. The surface to surfaces to be in contacted shall be roughened with emery paper, and dry fit checked.

After cutting and chamfering the pipe as described above, insert the pipe into the socket without seal ring and mark along the pipe, when it is fully inserted. Fix the rubber ring into the groove without twisting it. Apply superior quality jointing lubricant to the chamfer end of the pipe right up to the mark made on the spigot or to the socket end of fitting. Push the pipe firmly into the socket till the gap between the mark on the spigot and socket is about 10 mm to allow for thermal expansion.

5.2 Rain Water and basement Collection Gratings

5.2.1 The rain water collection grating at the Terrace level shall be of C.I. Grating with C.I frame embedded on to the water proof surface. Water proofing shall be done around the pipe, frame and grating to ensure the water tightness around the collection point. Adequate slope on the terrace level shall be provided for collecting all rain water at the collection gratings.

5.2.2 The rain water collection at the balconies shall be done using PVC Nahani trap of 75 mm dia installed concealed in to concrete slab and connected to the vertical main PVC rain water stack, at the collection point heavy brass C.P frame with C.P grating shall be provided. The C.P frame shall be laid in the slab above the pipe with water seal joint all-round the frame.

SECTION V – SANITARY INSTALLATION AND FIXTURES

- 1 All fixtures and fittings shall be of approved quality and type manufactured by well known manufacturers. All items brought to the site must bear identification mark of the type and manufacturer. Procurements shall be made well in advance and got inspected and approved immediately by the Engineer. All fixtures shall be adequately protected covering and plugging till handed over.

All fittings, gratings, fasteners, unless specified otherwise, shall be chromium plated.

All fixtures shall be fixed in a neat workman like manner true to line and as recommended by the manufacturer or shown on the drawings. Care shall be taken to fix all fixtures, brackets and accessories by proper wooden cleats, rawl plugs, bolts and nuts as each fixture will warrant with the correct site of screws, nuts or bolts.

Care shall be taken in fixing all approved chromium plated fixtures and accessories so as not to leave any tool marks or damages. All such fixtures shall be tightened with fixed spanners. Use of pipe wrenches with toothed jaws shall not be allowed.

All fixtures shall be thoroughly tested after connecting up the drainage and water supply system. All fixtures shall be thoroughly finished and any leakage in piping, valves and waste fittings corrected to the entire satisfaction of the Engineer.

Upon completion of the work, remove all labels, stickers, plasters etc. from the fixtures and clean all fixtures with soap and water so as to present a neat and clean toilet.

2 Water closet

i) Indian type W.C pans

The W.C pan shall be of white vitreous china, of specified size and pattern. Pan shall be of approved quality and shall bear the mark of the firm manufacturing it. It shall have 10 cm. (4") porcelain trap ('P' or 'S' type with effective seal) and 5 cm. (2") vent arm.

The foot rests shall be of white glazed stoneware with chequered surface.

ii) Orissa type pans

Shall be from an approved manufacturer and trapped as specified above.

Fixing

Pan shall be fixed securely with a cushioning bed in an approved manner taking care that the cushion is uniform and even, without having any hollows between pan and the concrete. The joint between the pan and the trap shall be made with cement mortar 1: 1 and shall be leak proof.

Each closet shall be provided with the following accessories and the rate shall be all inclusive

- a. Necessary length of 10 cm. H.C.I pipe or lead pipe connecting the pan and plug bend. (The plug bend/tee connection to vertical stack shall be paid under appropriate item).

- b. Wherever anti-syphonage pipe connections are required necessary length of lead pipe 62.5 mm. dia. shall be provided.
- c. Necessary length of porcelain or lead or C.I connecting pipe 10 cm. dia. (plug bend/tee connection to vertical stack shall be paid under appropriate item.)

Painting

All fittings and fixtures shall be painted with two coats of enamel paint over a coat of primer.

(iii) European Type/American Standard W.C.

The closet shall be of white Vitreous China readily flushed, of "Wash down type" and shall be of best quality manufactured by an approved firm, and fixed to the floor by approved means. It shall have 100 mm dia. Porcelain 'P' or 'S' trap with effective seal.

Each closet shall be provided with the following accessories and the rate shall be all inclusive

Seat: Heavy black plastic seat of approved quality and seat cover with rubber buffers fixed to the pan with C.P. brass bar hinge.

3 Cistern

Low level flushing tank 15 litres capacity (3 gal.) of white vitreous china cistern of best quality manufactured by an approved firm with C.P. flush handle and C.P. overflow pipe of length as per Municipal requirement or as per Engineer's drawing with mosquito-proof bronze cap etc. complete unit including enameled or C.P. flush pipe and bend.

Necessary length of lead water inlet pipe and 12 mm dia. C.P. brass stop cock.

Necessary length of porcelain or lead or C.I. connecting pipe 10 cm dia. (Plug bend / tee connection to vertical stack shall be paid under appropriate item).

Wherever anti-syphonage pipe connections are required, necessary length of lead pipe 6.25 cm. dia. shall be provided.

Painting: All fittings and fixtures shall be painted with two coats of enamel paint over a coat of primer.

4 Urinals

i) Lipped Urinals

Shall be flat back or angle urinal of specified dimensions and shall be of white Vitreous china from an approved manufacturer. They shall be screwed to the wall with coach screws of chromium plated brass on dowel shaped wooden plugs built in to the walls or fixed as per manufacturer's specification. Each basin should have an outlet with C.P brass hinged grating connected to 40 mm diameter waste pipe through a C.P. bottle trap. When a range of urinals are provided only a straight length of 40 mm diameter waste pipe and white glazed half round channel with tread platform finished with white glazed tiles complete as per Engineer's drawings shall be provided. All joints shall be in plumber's wiped solder joint with necessary C.P. brass sockets and thimble etc.

ii) Stall wall type urinals

These shall be white vitreous china of approved design and manufacturer.

They shall be fixed to the wall as per manufacturer's specification each urinal should have an outlet with C.P. brass hinged grating connected to 40 mm diameter waste pipe through a C.P. brass bottle trap. All joints shall be in plumber's wiped solder joint with necessary C.P. brass sockets and thimble etc.

5 Flushing Cistern

These shall be automatic flushing cisterns of vitreous china or as specified in the Schedule of Quantities complete with valve less siphon fittings. Cistern shall be supported on brackets of standard pattern and fixed to wooden dowel plugs embedded in the wall with C.P. brass screws.

6 Angle valve

The cistern shall be fed with 15 mm. (1/2") C.P. brass inlet tube angle valve of approved make with necessary length of lead inlet pipe complete with C.P. brass unions unless otherwise specified in the Schedule of Quantities.

The capacity of flushing cistern and size of the flush pipe for the number of urinal shall be as follows:

Number of Urinals	Capacity of flushing		Mains		Size of distribution	
	in litrs.	In galns.	In mm	in inch	in mm	in inches
1	5	1	-	-	15	½
2	10	2	20	¾	15	½
3	10	2	25	1	15	½
4	15	3	32	1-1/4	15	½

The main and distribution pipe fittings and clamps shall be of C.P. brass unless otherwise specified in the Schedule of Quantities. Distribution pipes shall feed the urinals with C.P. brass spreaders of approved make.

Painting: All brackets etc. shall be painted with two coats of enamel paint over a coat of primer.

7 Lavatory Basin

Wash basin

They shall be of white vitreous china of best quality manufactured by an approved firm and size as specified in the schedule of quantities. They shall be supported on a pair of CI brackets of approved design.

Fittings

Each lavatory basin shall be provided with a single cold water C.P. brass pillar tap of approved design and make, C.P. brass waste, C.P. brass chain and rubber plug, C.P. brass bottle trap of approved quality and design, with C.P. brass stop cock and water inlet pipe of standard length complete.

Waste pipe: Waste pipe beyond bottle trap shall be measured and paid separately under appropriate item.

Painting: All brackets, pipes etc. shall be painted with two coats of enamel paint over a coat of primer.

8 **Sinks**

They shall be of White Vitreous China of best quality and sizes as per the schedule of quantities. They shall be supported on necessary brackets.

Fittings

Each sink shall be provided with 40 mm. (1.5") C.P. brass waste of approved pattern with C.P. brass chain and 40 mm. rubber plug and 40 mm. dia. C.P. brass trap and union which shall be connected to 40 mm. diameter waste pipe.

Waste pipe beyond the trap shall be measured separately and paid under appropriate item.

Where specified, sinks shall be provided with puff pipe with a brass perforated screw cap.

Painting: All fittings, brackets and pipes shall be painted with two coats of enamel paint over a coat of primer.

9 **Drain board**

Drain board of type and size as specified in the Schedule of Quantities shall be provided. These shall be fixed on strong brackets of approved design and where necessary provided with hinges. Brackets shall be painted with two coats of enamel paint over a coat of primer.

10 **TOILET REQUISITES**

10.1 **Mirrors**

Mirrors shall be of the best quality, specified size, approved design and make. It shall be mounted on asbestos sheet backing and shall be fixed in position by means of four C.P. brass screws and cup washers over rubber washers on wooden plugs firmly embedded in the wall. Alternative method for fixing could be by using brass clamps with C.P. brass screws. A suitable T.W. cover of approved design shall be fixed all rounds as directed.

10.2 **Glass shelf:**

The shelf shall be of glass of approved quality and thickness with edges rounded off. The size of the shelf shall be as specified and shall rest on C.P. brass brackets which shall be fixed with C.P. brass screws to wooden plugs, firmly embedded in the wall. The shelf shall have C.P. brass guard rail all round.

10.3 **Towel rail**

Towel rail shall be of C.P. brass with two C.P. brass brackets. The size of the rail shall be as specified. The bracket shall be fixed by means of C.P. brass screws to wooden cleats firmly embedded in the wall. Where specified, anodized aluminum towel rails may be used of approved quality and design.

10.4 **Toilet paper holder**

Toilet paper holder shall be of white vitreous china or as specified. It shall be recessed in wall.

10.5 Floor Traps

Toilet trap shall be of CI or as per the relevant item in the BOQ and self cleaning and deep water seal type with a 50 mm water seal. It shall have a 100 mm dia. Grating. These shall be fixed in concrete to the required level and position.

10.6 Shower: These shall be of CP finish swivel type as specified.**10.7 Towel Ring, Soap Tray, Cloth Stand etc.**

These shall be of CP/anodized aluminium as described in the schedule and as per the displayed sample. These shall be fixed by means of CP brass screws to wooden cleats, firmly embedded in the wall.

10.8 Liquid Soap Dispenser

It shall be round and easily revolving with removable threaded nozzle. The body, bracket for wall mounting and screws shall be chromium plated.

10.9 WATER HEATERS

These shall be as of Venus / Racold make. The type and capacity will be as per schedule of quantities. They shall be mounted on the wall with necessary bolts of approved make. They shall have 8 mm PVC inlet pipe, 12 mm lead pipe outlet, 15 mm non-return valve.

SECTION VI – MISCELLANEOUS WORKS**1. SUPPORTS****1.1 General**

Provide proper Hi-tech, supports for all pipe runs in the vertical ducts. For attachment in concrete, use 'Dash' Fasteners or Anchor plug type inserts or equivalent. Support angles to be fixed at 1500 mm C/C maximum.

2.0 Cutting, Patching, Repairing & Making Good

Cutting, Patching and repairing required for the proper installation and completion of the work specified in each division, including chasing, plastering, masonry work, concrete work, etc., and making good shall be carried out by the Contractor wherever required. Any damages to water-proofed location should not be patched up, without rectification by the water proofing agency (specialist contractor) to ensure his guarantee. Repair of water proofing shall be born by the Sanitary Contractor.

3.0 Equipment Protection:

3.1 Keep all pipe and conduit openings closed by means of plugs or caps to prevent the entrance of foreign matter. Protect all piping, conduit, fixtures, equipment or apparatus. Any such items damaged prior to final completion or work shall be restored to its original condition or replaced at no expense to the Owner.

3.2 Accessibility

The installation of valves, thermometers, clean out fittings and other indicating equipment or specialties requiring frequent reading, adjustment, inspections, repairs, removal or replacement, shall be conveniently and accessibly located with reference to the finished buildings. Thermometers and gauges shall be installed so as to be easily read from the floor. For floor clean outs minimum distance of 600 mm shall be available from any wall.

4. Cleaning, Operation & Tests

4.1 Plumbing equipment fixtures, piping, etc., shall be free of stamping, marking (except those required by codes) iron cutting and other foreign materials.

4.2 Flush, Cold and drinking water systems shall be cleaned thoroughly, filled and flushed with water.

4.3 Test all plumbing systems in the presence of the Engineer in charge / Owners Representative at Site / Consultants and the Architect as herein specified. Provide all equipment, materials and labor necessary for inspection and tests and repair all work, not passing the tests. After repairs are made, repeat test until units / systems is found satisfactory, to the above authorities. Carry out tests prior to concealing, insulating or back filling over any piping. No exceptions will be made.

5. Water Test

Test entire system or sections of system by closing all openings except the highest opening and filling system with water to the point of overflow. If the system is tested in sections, plug each opening except the highest opening of the section filled with water. Keep the water in system or in portion under test for at least 45 minutes before inspection starts with test pressure / head lasting for two hours. The system must be tight at all joints.

- 5.1 Test all down spouts or rain headers and their branches within the building by water as described for the above soil, waste and vent system.

- 6 **Final Test:** After fixtures are set, test the system with smoke test as follows:

6.1 **Smoke Test**

Fill traps with water, then introduce into system a pungent thick smoke produced by one or more smoke machines. When smoke appears at stacks on the roof, plug stacks and allow pressure of 1-inch water column to build up in systems. The system shall be tight at all joints.

- 6.2 Test all down spouts or rain headers and their branches within the building by water as described for the above soil, waste and vent system.

7 **All Water Piping**

- 7.1 Hydro-static test 7.5 kg / cm² or twice the working pressure whichever is higher, without drop in pressure as required.

- 7.2 All tests on below ground lines shall be continued until back fill on such lines is completed to disclose any damages caused by back-filling.

- 7.3 All systems shall be tested in sections as required to expedite the work of other trades and meet construction schedules and final test on completion.

- 7.4 On completion of the works, the following tests shall be performed to the satisfaction of the consultants / clients representative before issue of virtual completion certificate, if so required.

- a. Smoke Test
- b. Hydraulic Test
- c. Performance Test for fixtures.
- d. Tests for anti-syphonage system
- e. Pump rating and output
- f. Inspection of all units and fixtures.

- 7.5 The contractor shall arrange for similar tests during the progress of works to ensure that there are no defects in material / workmanship in portions of work to be concealed or embedded under the floor or walls or in ceiling and get this approved by the Consultants. The under floor pipe works shall not be closed without the approval of Consultants.

8 **Disinfection of Piping System and Tanks**

Before commissioning the water supply system, the Contractor shall arrange to disinfect the entire system as described in the succeeding paragraph. The filtered water storage tanks and pipe shall first be filled with water and thoroughly flushed out. The storage tanks shall be then filled with water again and disinfecting chemical containing chlorine added gradually, while tanks are being filled to ensure thorough mixing. Sufficient chemicals shall be used to give the water a dose of 50 parts of chlorine to one million parts of water. If ordinary bleaching, the powder is mixed with water to a creamy consistency before being added to the water in the storage tank. If a proprietary brand of chemical is used, the proportions shall be as specified by the manufacturer. When the storage tank is full, the supply shall be stopped and all the taps on the distributing pipes opened successively, working progressively from storage tank. Each tap shall be closed when the water discharge begins to smell of chlorine. The storage tank shall then be filled up with water from supply pipe and added with more disinfecting chemical in the recommended proportion. The storage tank and pipe shall then remain charged at least for

three hours. Finally, the tank and pipes shall be thoroughly flushed out before any water is used for domestic purpose.

9 Clean Outs

9.1 Provide clean outs at the base of all soil, waste and leader stacks and all changes in direction of horizontal piping, wherever no manholes are present. Distance between clean outs on horizontal runs shall be minimum 15 M on centers.

9.2 Clean out fittings in vertical stacks shall consist of tapped tees capable for receiving a rough brass raised head clean out plug.

9.3 When clean outs occur in floors, furnish and install fittings with clamping collar device where required. Clean out shall be of following type – cast iron, with aerated cut-off sections.

Brass internal plugs shall be, floor deck plate and rim shall be polished bronze and vandal proofed.

9.4 All clean out plugs shall be brass and lubricated with graphite before installation.

9.5 Clean out fittings to exterior grade shall consist of clean out plug, cast iron double flanged housing and cast iron vandal-proof cover.

9.6 Clean outs occurring in cast iron soil pipe above floor at change in direction of pipe run and at end of horizontal runs shall have cast iron ferrule for caulk connection and fitted with a straight threaded, tapered bronze plug with raised head.

10 Installation

10.1 All materials shall be new and installed in a first class manner.

10.2 All drainage piping, unless otherwise indicated, shall be pitched at a minimum rate of 10 MM / 1 M in direction flow. Branch connections to stacks or main drains shall not be made in a manner which will permit back-flow.

10.3 Any main vent line, regard less of size off-setting horizontally shall be made of galvanized steel pipe and black steel pattern fittings unless otherwise noted from point of offset and up through roof.

10.4 **Nipples:** Any piece of pipe 200 MM in length and less shall be considered a nipple. All nipples shall be used unless otherwise directed.

10.5 Plugged outlets shall be left in drainage piping for future fixtures, where indicated on the drawings.

SECTION VII – MODE OF MEASUREMENTS

1. Unless otherwise stated, all pipes shall be measured net, length as laid or fixed and measured linear over all fittings, such as bends, junctions, etc. and given in running metres. The length shall be taken along the centre line of the pipes and fittings.
2. Length of fittings viz., taps, valves, traps, etc. which is paid under appropriate items shall not be re-measured under linear measurements as enumerated above.
3. Soil, waste and vent pipes shall be measured along the centre line of the stack including the connecting bends/tees to W.C. Pan, Nahani trap, etc. and shall be paid as enumerated above.
4. W.C. pans, Lavatory basins, Sinks, Drain boards, Urinals, Mirrors, Glass shelf, Toilet paper holder shall be measured by number and shall include all accessories as enumerated in detailed specifications under each item.
5. Unless otherwise specified, all types of taps, valves, etc. shall be measured by number and paid separately.
6. Manholes, inspection Chambers, Gulley traps, etc. shall be constructed according to detailed specifications, and measured by number and paid separately. The depth of manhole shall mean the vertical distance from the top of the manhole cover to the outgoing invert of the main drain channel.
7. Water meter shall include 'Y' strainer and other appurtenances required by the Local bodies and shall include Brick Masonry Chamber etc. as per detailed specification and item shall be measured by number and paid for accordingly.

NAME OF WORK: CONSTRUCTION OF OUTREACH CHEMISTRY LAB INCLUDING INTERNAL ELECTRICAL, FIREFIGHTING, HVAC AT IISER PUNE, PASHAN, PUNE.					
Schedule of quantity (BOQ)					
SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
I	SH 1 EARTH WORK				
1	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30cm in depth. 1.5m in width as well as 10 sum on plan) including disposal of excavated earth, lead up to 50m and lift up to 1.5m, disposed earth to be levelled and neatly dressed.				
1.1	All kinds of soil	1200	125.95	cum	1,51,140.00
2	Earth work in excavation by mechanical means (Hydraulic excavator)/ manual means over areas (exceeding 30cm in depth. 1.5m in width as well as 10 sum on plan) including disposal of excavated earth, lead up to 50m and lift up to 1.5m, disposed earth to be levelled and neatly dressed.				
2.1	Ordinary rock	500	221.05	cum	1,10,525.00
2.2	Hard rock (blasting prohibited)	300	619.80	cum	1,85,940.00
3	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth up to 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
3.1	All kinds of soil				
3.1.1	Pipes, cables etc. not exceeding 80 mm dia.	50	138.05	Metre	6,902.50
3.1.2	Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	30	225.45	Metre	6,763.50
4	Filling available excavated earth (including available ordinary rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift up to 1.5 m.	1000	150.00	cum	1,50,000.00
5	Extra for every additional lift of 1.50 m or part thereof in (for taking out excavated earth/Rock beyond the depth of 1.50 m from Ground level)				
5.1	All kinds of soil	1000	51.75	cum	51,750.00
5.2	Ordinary or Hard rock	1000	92.80	cum	92,800.00
6	Carriage of material by mechanical transport including loading, unloading and stacking / spreading / leveling lead up to 1 km beyond the initial lead of 50m.				
6.1	Excavated Earth	100	98.34	cum	9,834.00
6.2	Excavated rock	500	157.35	cum	78,675.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
7	Supplying and filling disintegrated rock of size not more than 100mm brought from out side in trenches, plinth, under floors and basement etc. in layers not exceeding 20cm in depth consolidating each deposited layer by ramming, mechanical earth compactors and watering including all leads and lifts etc. as directed by the Engineer in charge. The rate shall includes the cost of the materials, labour and all the operations and nothing extra shall be payable.(The payment shall be made for the compacted thickness of filling based on the levels or actual depth of compacted filling at site.)	750	400.00	cum	3,00,000.00
8	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge.				
8.1	M-30 grade concrete in road pavement etc.	50	997.05	Cum	49,852.50
II	CEMENT CONCRETE & REINFORCED CEMENT CONCRETE WORKS				
9	Providing and laying in position ready mixed concrete manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10kms having continuous agitated mixer, manufactured as per mix design of specified grade for cement concrete work including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge. M-10 grade Reinforced cement concrete by using minimum 220 kg of OPC cement (43 Grade) per cum of concrete as per IS standard plus fly ash up to 20 % confirming to Grade I of IS 3812 (Part-I) with uniform blending with cement in accordance with clauses 5.2 and 5.2.1 of IS 456:2000 .				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
9.1	Note : Contractor shall submit the necessary design mix reports from the approved Lab for the above grade of concrete with 28 days test results to the Engineer in charge for the approval of design mix prior to start of any type of concreting works at site. The contractor should quote his rate considering minimum 180 kg of 43 grade OPC cement plus required fly ash as per IS code. In case additional qty of cement is required to achieve the desired target strength as per design mix ,the same shall be used but shall not be paid separately. (for concrete under floors at plinth)	120	6,051.70	Cum	7,26,204.00
10	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - All work up to plinth level for 1:4:8 (1 Cement : 4 fine sand : 8 graded stone aggregate 40 mm nominal size)	75	4,478.15	Cum	3,35,861.25
11	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - for sunken floors of toilets etc. at all levels for 1:4:8 (1 Cement : 4 fine sand : 8 graded brick aggregate 40 mm nominal size)	30	4,478.15	Cum	1,34,344.50

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
12	Providing and laying in position ready mixed concrete manufactured in fully automatic batching plant and transported to site of work in transit mixer for a lead up to 10kms having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge. M-30 grade Reinforced cement concrete by using minimum 345 kg of OPC cement (43 Grade) per cum of concrete as per IS standard plus fly ash 20 % or more confirming to Grade I of IS 3812 (Part-I) with uniform blending with cement in accordance with clauses 5.2 and 5.2.1 of IS 456:2000 .				
	Note : Contractor shall submit the necessary design mix reports from the approved Lab for the above grade of concrete with 28 days test results to the Engineer in charge for the approval of design mix prior to start of any type of concreting works at site. The contractor should quote his rate considering minimum 345 kg of 43 grade OPC cement plus required fly ash as per IS code. In case additional qty of cement is required to achieve the desired target strength as per design mix ,the same shall be used but shall not be paid separately.				
12.1	All work up to Plinth Level.	400	6,515.95	Cum	26,06,380.00
12.2	All work above plinth level.	1000	7,319.55	Cum	73,19,550.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
13	Providing and applying of acrylic based curing compounds of approved make for the exposed surfaces of the concrete. Curing compound shall be applied immediately after the removal of form work for the columns and side of beams at the rate of 4 sqm per litre as per direction of Engineer In Charge. Only Exposed surface of the column/ beam shall be measured and to be paid for all leads and lifts. Area where curing compound is required to be applied shall be identified by the Engineer in charge and intimated to the contractor.	1000	32.20	Sqm	32,200.00
14	Centering and shuttering including strutting, propping etc. and removal of form for removal of form for:				
14.1	Foundations, footings, bases of columns etc. for mass concrete.	500	193.95	Sqm	96,975.00
14.2	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	470	378.60	Sqm	1,77,942.00
14.3	Suspended floors, roofs, landings, balconies and access platform.	3300	422.30	Sqm	13,93,590.00
14.4	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	4900	342.90	Sqm	16,80,210.00
14.5	Columns, Pillars, Piers, Abutments, Posts and Struts	2200	467.85	Sqm	10,29,270.00
14.6	Stairs, (excluding landings) except spiral-staircases.	650	419.35	Sqm	2,72,577.50

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
14.7	Vertical and horizontal fins individually or forming box louvers band, facias and eaves boards.	150	627.85	Sqm	94,177.50
14.8	Small lintels not exceeding 1.5m clear span, moulding as in cornices, window sills, string courses, bands, copings, bed plates, anchor blocks and the like.	10	193.95	Sqm	1,939.50
14.9	Weather shade, Chajjas, corbels etc., including edges	100	521.75	Sqm	52,175.00
14.10	Extra for additional height in centering, shuttering where ever required with adequate bracing, propping etc. including cost of de-shuttering and decentering at all levels, over a height of 3.5 m, for every additional height of 1 metre or part thereof (Plan area to be measured)				
14.10.1	Suspended floors, roofs, landing, beams and balconies (Plan area to be measured).	3400	171.50	Sqm	5,83,100.00
15	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete. Upto plinth level.				
15.1	Thermo-Mechanically Treated bars. Fe 500 D	50000	56.60	kg	28,30,000.00
16	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete. Above plinth level.				
16.1	Thermo-Mechanically Treated bars.	150000	56.60	kg	84,90,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
17	Extra for laying reinforced cement concrete in or under water and/ or liquid mud, including cost of pumping or bailing out water and removing slush etc., complete.	10	474.50	cum	4,745.00
III	MASONRY WORKS				
18	Brick work with non modular fly ash bricks conforming to IS:12894, class designation 6 average compressive strength 60kg/sqcm in below plinth level	30	6,167.20	Cum	1,85,016.00
19	Brick work with non modular fly ash bricks conforming to IS:12894, class designation 6 average compressive strength 60kg/sqcm in super structure above plinth level up to floor V level in :				
19.1	Cement mortar 1:6 (1 cement : 6 coarse sand) with PPC 43 grade cement having Fly ash content not less than 30%.	750	6,167.20	Cum	46,25,400.00
20	Half brick masonry with F.P.S. bricks of class designation 35 in superstructure above plinth level up to floor V level. Cement mortar 1:4 (1 cement :4 coarse sand). with PPC cement having Fly ash content not less than 30%.	200	684.20	Sqm	1,36,840.00
21	Extra for providing and placing in position 2 each 6mm dia. M.S. bars at every third course of half brick masonry (with F.P.S. bricks).	200	56.85	Sqm	11,370.00
IV	WOOD WORK				
22	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position Second class teak wood. (Frame size to be vary from 2" to 4".)	1	92,743.05	cum	92,743.05

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
23	Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embeddings in cement concrete block 30x10x15cm 1:3:6 mix (1 cement : 3 coarse sand :6 graded stone aggregate 20mm nominal size)	90	550.00	each	49,500.00
	FLUSH DOORS				
24	Providing and fixing factory made 38/35/30 mm thick laminated flush door shutter made of ISI marked flush door shutters of required thick ness excluding thickness of laminate, non–decorative type, core of block board /souerland core filling construction with frame of 1st class hard wood and well matched commercial 3 ply veneering with vertical grains or cross bands and face veneers on both faces of shutters having 1.5 mm thick decorative type laminates in mat finish, colour, shade, print approved by Engineer in charge on both faces of shutter fixed with phenol formaldehyde synthetic resin type adhesive conforming to IS 848 including providing external lipping with 2nd class teak wood battens 32 mm x 6 mm on all edges of shutters and polishing all the exposed faces of lipping with melamine polish in approved shade including fixing shutters with stainless steel screw etc complete as per direction of Engineer in charge.				
24.1	The quoted rate shall includes the supplying and fixing of hard wares as listed below for each category of door, glazing or vision panel of mentioned sizes etc. The cut portion of glazing shall be finished smoothly by lipping.				
24.1.1	35 mm thick of size 1000 x 2400 (Toilet Entry) - List of hardwares per door				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	i) Door closure EN 2-4 (Dorma TS68 Rack & pinion or equivalent) power adjustable and back check & surface mounted . ii) Handle SS304 make Shall be tested for corrosion resistance in accordance with AS 2331.3.1Neutral salt spray test (Dorma SH 812,Lockwood HO 2 or equivalent) iii) Floor stop SS 304 finish -1 No iv) Hinges SS 304 Button tipped 102 x 76 x 3mm - 3 Nos v) Mortice lock with Euro profile cylinder,shall be tested to 500000 operation cycles,options like cylinder &turn,double cylinder, single cylinder,privacy cylinder shall be made available	6	11,250.00	each	67,500.00
24.1.2	35 mm thick of size 1000 x 2400 mm (Handi cap toilet) - List of hardware per door i) Mortice lock with Euro profile cylinder,shall be tested to 500000 operation cycles, with double throw deadbolt,to comply with PrEN12209 -1and BS 5872:1980 standards. Options like cylinder &turn,double cylinder, single cylinder,privacy cylinder shall be made available ii) Handle with SS Flush pull handle of satin finish iii) Sliding track 2m length with door stopper	1	20,000.00	each	20,000.00
24.1.3	30 mm thick of size 800 x 2100 mm i) Handle SS304 make Shall be tested for corrosion resistance in accordance with AS 2331.3.1Neutral salt spray test (Dorma SH 812,Lockwood HO 2 or equivalent) ii) Baby latch (inside) - 1 No iii) WC Indicator with knob lock	20	6,000.00	each	1,20,000.00
V	General Steel Door - Painted & Fire Dorrs				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
25	Providing and fixing of Hollow metal door at all levels from ISO 9001-2000 certified Manufacturer. The metal doors should be made from high grade galvanised steel stretched level sheet flush, with vision panel, louvers etc. Single /Double leaf to required sizes from approved make which consists of frame, shutter, infill and finish as detailed below and conforming to IS 277.				
	a)Door frame shall be single rebate profile of size 100 x 57 mm made out of 1.20mm thick galvanized steel sheet (18 gauge). Frames should be MITERED and field assembled with self tabs. Door frames should be prepared for suitable hardware as scheduled and should have necessary reinforcement to withstand regular wear and tear. All provision should be mortised, drilled and tapped for receiving the hardware. Rubber door silencers should be provided on the striking jamb. All door frames should be provided with SOFIT bracket and anchor fasteners for installation on a finished plastered masonry wall opening. Once the frame is installed it should be grouted with cement & sand slurry.				
	b)Door leaf should be 46mm thick fully flush double skin door with or without vision lite. Door leaf shall be manufactured from 0.8mm (22 gauge) thick galvanised steel sheet. The internal construction of the door should be rigid with steel stiffeners/ pads for receiving appropriate hardware. The infill material shall be resin bonded honeycomb core. All doors should be factory prepped for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	<p>c)The edges should be interlocked with a bending radius of 1.4mm. For pair of doors astragals has to be provided on the meeting stile for both active and inactive leaf. Vision lite wherever applicable with a clip on arrangement. The glass should be 12mm clear toughened glass All doors and frames shall be finished with etched primer coating (35 microns), stove zinc phosphate primer and thermosetting polyurethane aliphatic grade paint (35 micron DFT) of approved colour. Steel surface should be blast cleaned to near to clean surface. Once the surface is cleaned the doors should be checked for finish before it is taken for painting.</p> <p>d)Rate should include for supply and installation of door and hardware set as mentioned in the door and hardware schedule.</p>				
25.1	<p>Steel door double leaf of size: 2.40 x 2.40m with the following hardwares , fittings vision panel of size 800x1100 mm - 2 no</p> <p>List of hard wares as given below</p> <p>Ball bearing butt hinges SS- 304 of 100 x 89 x 3mm as Per EN 1935 with CE mark -8 nos</p> <p>Door closure EN 5 - 7 (Dorma TS 93 / Geze) with back check and delayed action in silver finish as per EN 1154 with CE mark - 1 No (mounting feature & speed)</p> <p>-speed control / overload protection / regular, parallel & over mounting features to be made available.</p> <p>Half dome door stopper in SS304 - 2nos</p> <p>Handle SS304 make Shall be tested for corrosion resistance in accordance with AS 2331.3.1Neutral salt spray test (Dorma SH 812,Lockwood HO 2 or equivalent)</p> <p>Lock shall be of dead lock type with Euro profile cylinder and to be tested for 500000 operation cycles ,cylinder and turn with escintheions as per EN 12209 with CE mark.- 1no</p> <p>Flush bolt L=300mm at the bottom and 600mm at the top - 2 nos (Each one)</p>	10	45,000.00	each	4,50,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
25.2	Steel doors of size 1000 x 1500 for shafts with the following hardware & fittings- Ball bearing butt hinges SS- 304 of 100 x 89 x 3mm as Per EN 1935 with CE mark - 2 nos Shaft lock with Allenkey Flush full rectangular with screws in Stainless steel	3	15,000.00	each	45,000.00
25.3	Steel doors of size 600 x 1500 for shafts -with the following hardwares and fittings Ball bearing butt hinges SS- 304 of 100 x 89 x 3mm as Per EN 1935 with CE mark - 2 nos Shaft lock with Allenkey Flush full rectangular with screws in Stainless steel	4	9,000.00	each	36,000.00
26	FIRE DOORS				
26.1	Fire Door 2hr rated - Painted				
	a)Providing and fixing of Hollow metal fire door at all levels from approved Manufacturer. Fire door should be as per IS 3614 part 1 and part 2 and BS 476 part 2 or EN 1634. All fire doors should be tested at CBRI/ARAI for maximum rating of 2hrs both with vision panel and without vision panel. Pressed Galvanized steel Single /Double leaf to required sizes for 2 Hour rating of approved make which consists of frame, shutter, infill and finish as detailed below and conforming to IS 277.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	<p>b)Door frame shall be double rebate profile of size 143 x 57 mm made out of 1.60mm thick galvanized steel sheet (16 gauge). Frames should be MITERED and field assembled with self tabs. Door frames should be prepared for suitable hardware as scheduled and should have necessary reinforcement to withstand regular wear and tear. All provision should be mortised, drilled and tapped for receiving the hardware. Rubber door silencers should be provided on the striking jamb. All door frames should be provided with SOFIT bracket and anchor fasteners for installation on a finished plastered masonry wall opening. Once frame installed should be grouted with cement & sand slurry necessary for fire doors on the clear masonry opening.</p> <p>c)Door leaf should be 46mm thick fully flush double skin door with or without vision panel. Door leaf shall be manufactured from 1.2mm (18guage) thick galvanised steel sheet. The internal construction of the door should be rigid with steel stiffeners/ pads for receiving appropriate hardware. The infill material shall be resin bonded honeycomb core. All doors should be factory prepped for receiving appropriate hardware and provided with necessary reinforcement for hinges, locks, and door closers.</p>				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	<p>d)The edges should be interlocked with a bending radius of 1.4mm. For pair of doors astragals has to be provided on the meeting stile for both active and inactive leaf. Vision panel shall be of fire rated glass wherever applicable of size 300mm x 300mm with a clip on arrangement. The glass should be 6mm clear borosilicate glass of relevant rating of the door. All doors and frames shall be finished with etched primer coating (35 microns), stove zinc phosphate primer and thermosetting polyurethane aliphatic grade paint (35 micron DFT) of approved colour. Steel surface should be blast cleaned to near to clean surface. Once the surface is cleaned the doors should be checked for finish before it is taken for painting.</p> <p>e)Rate should include for supply and installation of door and hardware set as mentioned in the door and hardware schedule.</p>				
26.1.1	Two hour rated door single leaf of size 1200 x 2400 with Panic bar- with the following hardwares and fittings				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	i) vision panel of size 300x300 mm - 1 no List of hardwares Ball bearing butt hinges (fire rated) SS- 304 of 100 x 89 x 3mm as per EN 1935 with CE mark - 8 nos Door closure EN 5- 7 (Dorma TS 93 or equivalent) with back check and delayed action in silver finish as per EN 1154 with CE mark - 1 No (mounting feature & speed) -speed control / overload protection / regular, parallel & over mounting features to be made available. Half dome door stopper in SS - 1no Exit device / panic bar shall be single point locking system ,external trim &cylinder, key entry with key/ lever mechanism safety over ride features to be adopted, and shall comply with EN 1125with CE mark -1No Dorma 3000 series, Lockwood PE-RM-01 or equivalent	2	45,000.00	each	90,000.00
26.1.2	Two hour rated door single leaf of size 1200 x 2400 with out panic bar with following hardware and fittings-				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	<p>vision panel of size 300x300 mm - 1 no</p> <p>List of hard wares</p> <p>Ball bearing butt hinges (fire rated) SS- 304 of 100 x 89 x 3mm as Per EN 1935 with CE mark -8 nos</p> <p>Door closure EN 5 - 7 (Dorma TS 93 or equivalent) with back check and delayed action in silver finish as per EN 1154 with CE mark-1 No (mounting feature & speed)</p> <p>-speed control / overload protection / regular, parallel & over mounting features to be made available.</p> <p>Half dome door stopper in SS304 - 1 no</p> <p>Handle SS304 make Shall be tested for corrosion resistance in accordance with AS 2331.3.1Neutral salt spray test (Dorma SH 812,Lockwood HO 2 or equivalent)</p> <p>Lock shall be of dead lock type with Euro profile cylinder and to be tested for 500000 operation cycles ,cylinder and turn with escintions as per EN 12209 with CE mark.- 1no</p>	2	44,000.00	each	88,000.00
VI	STEEL WORKS				
27	<p>Providing and fixing in position structural steel members at all levels and to any shape & profile consisting of channels, angles, insert plates, flats and with necessary sleeves, bolts and nuts, gratings, pipes including cutting, straightening, welding as per standards for connections including consumables etc. Complete. Rate shall include preparation of surface, applying two coats of Zinc chromate/Phosphate primer before and after erection and two coats of first quality synthetic enamel paint of approved make after erection, etc. complete, as directed.</p>	1000	130.00	Kg	1,30,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
28	Supplying and fixing of stainless steel railing and completed as per architectural drawing for staircases, over the masonry parapets etc. at all levels & heights, fabricated with Stainless steel pipes, square tubes, flats, square bars etc, round plates, bent to the shape and profile as per architectural drawings, fixed to the required height as specified in the drawing complete, as directed.				
28.1	Rate shall include for making pockets in existing RC / Masonry surfaces, fixing verticals with 100 x 100mm x 6mm thick M.S. plate with 12mm dia Lugs so as to fix into the steps and grouting the pockets with CC 1:2:4 and make the surface to the original position, and necessary tools & Plants, S.S. shall be brushed finish and AISI 306 grade steel etc complete, as directed. Rate shall include necessary tools & Plants, Welding with consumables & buffing charges etc. complete as directed as per drawing.	1000	500.00	Kg	5,00,000.00
VII	FLOORING WORKS				
29	Providing Dadoing the walls with best quality glazed tiles / vitrified tiles (colour to be approved by CRN/ IISER) / 300 x 600mm of thickness not less than 12mm of approved make of premium double charged tiles with water absorption less than 0.08% and conforming to IS : 15622 , fixing the tiles after applying a coat of cement mortar 1:3 , 9mm thick with a neat flushing coat / MYK latricate with cement grout and fixing the tiles to correct lines and plumb with paper tight joint and pointing with white cement / matching pigment etc. with cost and conveyance of all materials to site, labour charges etc. complete for all floors as per the direction of engineer in charge.	200	1,100.00	Sqm	2,20,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
30	Providing and laying Ceramic glazed floor tiles 300x300 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in all colours, shades, laid on 20mm thick bed of Cement Mortar 1:4 (1 Cement : 4 Coarse sand) including pointing the joints with white cement and matching pigments etc., complete. Rate shall include for preparation of base surface & finished the surface, protection with gypsum/POP layer over plastic sheet and removing the same before handing over,work at all levels, as directed.	150	550.00	Sqm	82,500.00
31	Providing and laying Vitrified tiles of double charge / premium quality tiles of required thickness for the given size, with water absorption 0.50% as per IS 4457 of approved make in all colours & shades with cement slurry spread at the rate of 4.4 kg of cement per sqm over 20mm average thickness of cement mortar 1:4 (1cement : 4 coarse sand) and pointing the joints with white cement and matching pigments etc. all complete as per Particular Specification and as directed by Employer / Architect. Rate shall include for preparation of base surface & finished the surface, protection with gypsum/POP layer over plastic sheet and removing the same before handing over,work at all levels, as directed.				-
31.1	600 X 600MM - plain design as per approved makes catalogue	2800	1,350.00	Sqm	37,80,000.00
31.2	600 X 600MM - Dark shades design as per approved makes catalogue	600	1,450.00	Sqm	8,70,000.00
32	Providing & Laying of Vitrified tile skirting double charge / premium quality of required thickness for the given size, (up to 100mm height) with cement mortar 1:4 (1 cement : 4 coarse sand)	1500	175.00	Rm	2,62,500.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
33	Providing and laying mirror polished granite stone flooring / skirting in single size or in combination of different sizes as per approved drawings with 18 mm thick mirror polished granite of approved colour, shade and texture with cement slurry spread at the rate of 4.4 kg of cement per sqm over an average thickness of 20mm cement mortar 1:4 (1cement : 4 coarse sand) including finishing the joint with white cement and matching pigments with approved shade all complete as per direction of Engineer in charge. Rate shall include for preparation of base surface & finished the surface, protection with gypsum/POP layer over plastic sheet and removing the same before handing over, work at all levels, as directed.				
33.1	With 18mm thick Granite stone slab area not less than 2.5 Sqm of single slab				
33.1.1	Red Royal / Multi Red, sindoori red, chikku brown , tan brown or equivalent shades	250	3,500.00	Sqm	8,75,000.00
33.1.2	Extra rate over and above item for providing antique finished granite stone flooring / step treads, skirting etc.	50	250.00	Sqm	12,500.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
34	Providing and fixing mirror polished granite stone in risers of steps, skirting, in single size or in combination of different sizes with polished granite of thickness not less than 18 mm thick approved colour, shade and texture, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) as per approved pattern / design and jointing with grey cement slurry @ 3.3 Kg. per sqm. including pointing with filler compound or approved equivalent, to matching shade as per Manufacturer's Specification, including edge moulding (half Round) and polishing the moulded edge to give highly smooth surface, & groove to the specified size of 2nos - 3mm @ 25mm c/c from the edges, rubbing and polishing complete. curing, protection, scaffolding and preparation of base surface etc. complete as per direction of Engineer in charge. Rate shall include for protection with gypsum/POP layer over plastic sheet and removing the same before handing over,work at all levels, as directed.				
34.1	With 18 mm thick Granite stone slab area not less than 0.6Sqm				
34.1.1	Red Royal, Multi Red, sindoori red, Jet black,Kashmiri gold,Jaisalmeer or equivalent shades	100	3,500.00	Sqm	3,50,000.00
35	Providing wall dadoing with best quality approved colour mirror polished granite slab of any shade not less than 18 mm thick machine cut and machine high pre-polished, set in C.M 1:4, 20 mm thick topped with white cement slurry (for surface contact of the bottom of the granite slab) as per approved pattern/design including finishing the joints with white cement slurry, cutting, edge chamfering and polishing and as directed.Rate shall include for preparation of base surface , finished the surface, & protection with gypsum/POP layer over plastic sheet and removing the same before handing over,work at all levels, as directed.work at all levels and as directed.	30	4,000.00	Sqm	1,20,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
36	Providing and fixing 18mm thick gang saw cut mirror polished premoulded and prepolished) machine cut for kitchen platforms, vanity counters, window sills , facias and similar locations of required size of approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) with joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edge to give high gloss finish etc. complete at all levels.				
36.1	Granite of any colour and shade - Area of slab up to 0.50 sqm	40	3,800.00	Sqm	1,52,000.00
36.2	Extra for providing edge moulding to 18mm thick Granite stone counters, Vanities etc. including machine polishing to edge to give high gloss finish etc. complete as per design approved by Engineer-in-Charge.	120	150.00	Rm	18,000.00
VIII	FINISHING WORKS				
37	12mm cement plaster of mix 1:4 (1 cement : 4 fine sand) with PPC 43 grade cement having Fly ash content not less than 30%.	6000	172.95	Sqm	10,37,700.00
38	15 mm cement plaster on the rough side of single or half brick wall of mix cement plaster 1:4 (1 cement: 3 fine sand) with PPC 43 grade cement having Fly ash content not less than 30%.	250	200.25	Sqm	50,062.50
39	18mm cement plaster in two coats under layer 12mm thick cement plaster 1:5 (1 cement : 5 coarse sand) finished with a top layer 6mm thick cement plaster 1:3 (1 cement : 3 coarse sand) finished rough with sponge, with PPC 43 grade cement having Fly ash content not less than 30%.	2600	272.05	Sqm	7,07,330.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
40	Extra for providing and fixing of GI Chicken mesh at junction of RCC and masonry works. The mesh should be in double folded of 15cm width fixed in to the Masonry / RCC by using rawl plugs at the location as directed by the engineer in charge. The quoted rate inclusive of all materials, tools, tackles at all levels and height etc.	100	45.00	Rm	4,500.00
	Note : As per GRIHA norms all the paints shall be low VOC the tenderers are requested to quote the rate by considering the same				
41	Providing and applying 2 coats of Wall Care Putty Birla / Altek or equivalent having water absorption less than 0.5%, making it smooth over plastered surface (should be in line & level) including cleaning & removing loose particles over the surface & proper pre wetting the surface before applying putty.(total average thickness of putty not less than 2 mm)	6000	120.00	Sqm	7,20,000.00
42	Distempering with oil bound washable distemper of approved brand and manufacture to give an even shade (AHU & Electrical Internal walls & ceiling for Lab)				
42.1	New work (two or more coats) over and including priming coat with cement primer	500	50.00	Sqm	25,000.00
43	Providing and applying texture paint for the internal wall surface of approved make as per approved design and pattern and as per manufacture specification, over a base coat of thickness not less than 2 mm. The quoted rate shall inclusive of all the above and including wall putty ,labour,tools & tackles at all heights and levels etc complete.	500	350.00	Sqm	1,75,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
44	Providing two coats of Acrylic emulsion paint to Internal walls of approved colour over a coat of water based primer including preparation of surface by thorough cleaning and wetting and applying Wall Care Putty Birla / Altek or equivalent as per manufacturer's specification fully to give an even shade before and subsequent application and making good all small holes of nails, open joints and minor defects of every kind after application of priming coat painting and curing as per manufacturers specifications of approved makes and as directed.	6000	73.90	Sqm	4,43,400.00
45	Dismantling of existing Dry wall cladding with Clay tile including aluminium members etc complete and refixing the same on new wall with required missing members, fasteners, nuts and bolts and fixing plates etc complete as required: Existing Dry wall cladding is Designed, supplied and installed by the approved agency for fixing of Clay tile of NBK of Hunter Douglas or Tonality of Euro panel or Argeton Wienerberger make with suitable size and thickness not less than 28 mm as per manufacturer and size as per drawing with approved color and pattern with composition of finest powdered clay and colour mixtures. The Clay tile shall be fixed on the suitable farming system by using continuous aluminium anodized profiled section as per manufacturer with suitable size and spacing to withstand the Structural design criteria specified in the technical specification by using necessary Alum / HDG brackets, SS 316 grade anchor bolts etc as per manufacturer specification. Cladding joints shall be sealed with Gasket / open groove system. The size of clay tile shall be as per architectural requirement and the suitable fixing system shall be designed in accordance with the size of clay tile proposed in the drawing and to be designed to withstand design wind pressure of 125 Kg/Sqm conforming to IS 875 - Part 3.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Cladding the external surface to any surface, any profile and shape, horizontally, vertically, sloped, curved, circular etc by using Clay tile as given above. Jambs for glazing / windows & ventilators / doors and parapet copings are shall be considered with 2 mm thick aluminium PVDF finished sheet (exposed) fixed with SS 316 grade screws / rivet. The aluminium sheets shall have overlap of 100 to 125 mm in plan with sealant at joints to make sure that no water leakage through jambs / coping joints. Rate shall include the cost of all materials 2 mm thick aluminium PVDF finish SS screws / rivets, weather sealant and necessary accessories etc as per the manufacturer profile. Rate shall include the cost of all materials like Clay tile with necessary framing system by using profiled aluminium sections, HDG brackets, SS anchors, weather sealant, 1.2 mm thick aluminium anodized flashing (un-exposed) sheet at terrace & and all required levels and necessary accessories etc.				
	Dismantling and re-fixing of dry wall Clay tile cladding and providing and fixing of Metal Jambs of glazing / windows & ventilators / doors and parapet copings with 2 mm thick aluminium PVDF finished sheet as per the manufacturer profile for Jambs of glazing / windows & ventilators / doors and parapet copings other than Clay tile cladding by using aluminium box frame work with brackets & fasteners etc complete. (Only Aluminium sections for fixing, clay tiles shall be dismantled from the existing dry cladded walls and other required materials for completing the job shall be arranged by the contractor. Rate shall include the cost of new materials required for completing the job as per architectural design. Net are of refixed clay tiles shall be measured for payment.	350	2,500.00	Sqm	8,75,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
46	Providing and applying External Texture finish from the approved agencies as per approved design and pattern, Texture finish shall be applied over the plastered surface with required thickness shall not be less than 2 to 2.5 mm thickness to form the necessary patterns of designs by using trowel / roller / putty blade and it should be allowed for drying minimum 12 hrs before the application of top painting, 2 coats of external weather proof water based emulsion shall be applied over this and a coat of primer may be applied based on the approved texture pattern. Including surface preparation like through cleaning, prewetting & removal of loose mortars etc. .The quoted rate shall includes the cost for all the above items including labours, tools & tackles for at all heights etc.	1200	440.00	sqm	5,28,000.00
IX	WATER PROOFING WORKS				
47	Lift pit water proofing - Horizontal Surface lift pit				
47.1	Providing and laying integral cement based treatment for water proofing on horizontal surface at all depth below ground level for under ground structures as directed by Engineer-in-Charge and consisting of : i) 1st layer of 22mm to 25mm thick approved and specified rough stone slab over a 25mm thick base of cement mortar 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound conforming to IS:2645 in the recommended proportion over the leveling course (leveling course to be paid separately). Joints sealed and grouted with cement slurry mixed with water proofing compound. ii) 2nd layer of 25mm thick cement mortar 1:3 (1 cement: 3 coarse sand) mixed with water proofing compound in recommended proportions. iii) Finishing top with stone aggregate of 10mm to 12mm nominal size spreading @ 8 cudm/sqm thoroughly embedded in the 2nd layer. Using rough kota stone.	25	1,017.55	Sqm	25,438.75
48	Lift pit water proofing - Vertical Surface of lift wall				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
48.1	Providing and laying integral cement based treatment for water proofing on the vertical surface by fixing specified stone slab 22 mm to 25mm thick with cement slurry mixed with water proofing compound conforming to IS:2645 in recommended proportions with a gap of 20mm (minimum) between stone slabs and the receiving surfaces and filling the gaps with neat cement slurry mixed with water proofing compound and finishing the exterior of stone slab with cement mortar 1:3 (1 cement : 3 coarse sand) 20mm thick with neat cement punning mixed with water proofing compound in recommended proportion complete at all levels and as directed by Engineer-in-charge. Using rough Kota stone	30	1,253.30	Sqm	37,599.00
49	Toilet water proofing				
49.1	Providing and laying water proofing treatment to vertical and horizontal surfaces of depressed portions of W.C., kitchen and the like consisting of: i) Ist course of applying cement slurry @ 4.4 Kg/sqm mixed with water proofing compound conforming to IS 2645 in recommended proportions including rounding off junction of vertical and horizontal surface. ii) IInd course of 20mm cement plaster 1:3 (1 cement : 3 coarse sand) mixed with water proofing compound in recommended proportion including rounding off junction of vertical and horizontal surface. iii) IIIrd course of applying blown or residual bitumen applied hot at 1.7 Kg. per sqm of area. iv) IVth course of 400 micron thick PVC sheet. (Overlaps at joints of PVC sheet should be 100 mm wide and pasted to each other with bitumen @ 1.7 Kg/sqm.)	100	505.90	Sqm	50,590.00
50	Terrace Water proofing				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
50.1	<p>Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations:</p> <p>a) Applying a slurry coat of neat cement using 2.75 kg/sqm. of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls up to 300mm height including cleaning the surface before treatment.</p> <p>b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls up to 300 mm height including rounding of junctions of walls and slabs</p>				
	<p>c) After two days of proper curing applying a second coat of cement slurry using 2.75kg/ sqm of cement admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge.</p> <p>d) Finishing the surface with 20 mm thick jointless cement mortar of mix 1:4 (1 cement :4 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge including laying glass fibre cloth of approved quality in top layer of plaster and finally finishing the surface with trowel with neat cement slurry and making pattern of 300x300 mm square 3mm deep.</p>				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	e) The whole terrace so finished shall be flooded with water for a minimum period of two weeks for curing and for final test. All above operations to be done in order and as directed and specified by the Engineer-in-Charge. With average thickness of 120mm and minimum thickness at khurra as 65 mm.	1400	1,034.95	Sqm	14,48,930.00
X	MISCELLANEOUS WORKS				
51	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer - in- charge.	10	1,454.55	Cum	14,545.50
52	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge.				
52.1	In cement mortar	50	842.75	Cum	42,137.50
53	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge.				
53.1	1:3:6 or richer mix	20	997.05	Cum	19,941.00
53.2	1:4:8 or leaner mix	100	615.15	Cum	61,515.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
54	Making hole for rebar in concrete / masonry surface to any dia and depth as required @ site by using HILTI make driller with HY150 chemical compound for inserting the reinforcement after drilling and air jet. Cleaning etc complete, at any level, etc complete. Rate shall include for all charges and preparation of surface, cutting of reinforcement cleaning the surface, staging, scaffolding and working platform, application of necessary chemical / foil as per manufactures specification with necessary tools and equipment, water and power, removal of debris from the site, tax component etc complete, as directed.				
54.1	8 / 10 / 12 MM Dia - Rebar for the depth vary from 100 mm to 120 mm	20	300.00	Each	6,000.00
54.2	16/ 20/ 25 MM Dia Rebar for the depth vary from 150 to 200 mm	20	400.00	Each	8,000.00
55	Providing drilling and driving of various Dia & Shape Anchor rods / Anchor fastener of HILTI make or approved equivalent including all other consumables like chemicals, foils, Grouting materials using HILTI make machinery, tools & plants, all accessories etc complete and as directed.				
55.1	HST M 8/10 - 75 mm long.	20	250.00	Each	5,000.00
55.2	HST M 10/30 - 110 mm long.	20	350.00	Each	7,000.00
55.3	HST M 16/25 - 140 mm long.	20	500.00	Each	10,000.00
55.4	HVU M 12x110 with HAS-E M 12/110/28 - 160mm long.	20	750.00	Each	15,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
55.5	HVU M 16x125 with HAS-E M 16/125/38 - 190mm long.	20	1,200.00	Each	24,000.00
55.6	HVU M 20x170 with HAS-E M 20/170/48 - 240mm long.	20	1,450.00	Each	29,000.00
55.7	HVU M 24x210 with HAS-E M 24/210/54 - 290mm long.	20	1,800.00	Each	36,000.00
56	Making Core Cutting in slabs / beams / retaining walls and any other R.C members to any dia & depth by using 'HILTI' make diamond drilling machine with tolerance for any type of inserts, anchor fasteners etc. Rate shall include for all charge, preparation of surface, cutting of reinforcement, cleaning the surface, staging, scaffolding application of necessary chemical / foil (HAV) as per manufactures specification with necessary tools and equipment water and power, removal of debris from the site, staging scaffolding etc complete, as directed.				
56.1	75 to 110 mm dia pipe to the following depth:				
56.1.1	150 mm to 200 Depth	10	1,000.00	Each	10,000.00
56.2	110 to 160 mm dia pipe to the following depth:				
56.2.1	150 mm to 200mm Depth	3	1,200.00	Each	3,600.00
57	Supplying, fixing and testing of PVC SWR - A class pipe confirming to IS 13592-1992 and 6 kg pvc pipe confirming to IS4985 for rain water from terrace level, with necessary specials like bends,shoes etc., complete.Rubber ring joints and solvent cement joints are used for jointing pvc pipes with fittings.Wall brackets rates not included.				
57.1	160mm outer diameter	120	2,100.00	m	2,52,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
58	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.(i) Single socketed pipes. - 110 mm diameter	30	1,500.00	m	45,000.00
59	Providing and fixing on wall face unplasticised - PVC moulded fittings / accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.				
59.1	Coupler - 110 mm dia	10	95.00	Each	950.00
59.2	Bend 87.5° - 110 mm dia	5	120.00	Each	600.00
59.3	Shoe (Plain) - 110 mm dia	5	110.00	Each	550.00
60	Providing and fixing CI grating of specified size for rain water pipes in terrace,including cutting and making good the walls with water proofing compound, wherever required etc .,all complete as directed by the Engineer-in-Charge.				
60.1	200X200	10	250.00	Each	2,500.00
61	Providing and laying 60mm thick factory made cement concrete designer tiles of approved size and design / shape laid in required colour and pattern over the bed mortar of CM 1:4, 20mm thick and filling the joints with matching colour pigments etc. all complete as per the direction of Engineer-in-charge.	200	1,100.00	Sqm	2,20,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
62	Providing and fixing 4mm thick rounded edge mirror of superior glass (of approved quality) complete with SS holding clamps and fixed in the walls over the tile face with necessary Screws etc with 4mm thick ACP backing of the size of the glass. Net area of glass fixed at site shall be measured for payment.	10	2,000.00	sqm	20,000.00
63	Providing and fixing false ceiling at all height including providing and fixing of frame work made of special sections, power pressed from M.S. sheets and galvanized with zinc coating of 120 gms/sqm (both side inclusive) as per IS : 277 and consisting of angle cleats of size 25 mm wide x 1.6 mm thick with flanges of 27 mm and 37mm, at 1200 mm centre to centre, one flange fixed to the ceiling with dash fastener 12.5 mm dia x 50mm long with 6mm dia bolts, other flange of cleat fixed to the angle hangers of 25x10x0.50 mm of required length with nuts & bolts of required size and other end of angle hanger fixed with intermediate G.I. channels 45x15x0.9 mm running at the spacing of 1200 mm centre to centre, to which the ceiling section 0.5 mm thick bottom wedge of 80 mm with tapered flanges of 26 mm each having lips of 10.5 mm, at 450 mm centre to centre, shall be fixed in a direction perpendicular to G.I. intermediate channel with connecting clips made out of 2.64 mm dia x 230 mm long G.I. wire at every junction, including fixing perimeter channels 0.5 mm thick 27 mm high having flanges of 20 mm and 30 mm long, the perimeter of ceiling fixed to wall/partition with the help of rawl plugs at 450 mm centre, with 25mm long dry wall screws @ 230 mm interval,				-

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	including fixing of gypsum board to ceiling section and perimeter channel with the help of dry wall screws of size 3.5 x 25 mm at 230 mm c/c, including jointing and finishing to a flush finish of tapered and square edges of the board with recommended jointing compound , jointing tapes , finishing with jointing compound in 3 layers covering up to 150 mm on both sides of joint and two coats of primer suitable for board, all as per manufacturer's specification and also including the cost of making openings for light fittings, grills, diffusers, cutouts made with frame of perimeter channels suitably fixed, all complete as per drawings, specification and direction of the Engineer in Charge but excluding the cost of painting with :				
63.1	12.5 mm thick tapered edge gypsum fire resistant board conforming to IS: 2095-Part I	800	922.05	sqm	7,37,640.00
64	Providing & fixing of approved make aluminum plank system with extra micro perforation of 0.7 mm dia & open area of 1% and acoustical fleece glued to the back of the tile finish consisting of 300 mm wide planks of lengths up to 3000 mm planks made out of pre coated aluminum of 0.7 mm thickness with bevelled edge in white colour (global white) with light reflectance > 86%. The panel ends will be raised up to 29 mm to create a smart hairline end joint. The panels abut each other with a narrow V groove to facilitate the removal of the individual panel without damaging the edge of the pane Installation: To comprise of 3000 mm long 'carrier bars' manufactured and supplied by approved manufacturer to be spaced at 1200 mm maximum centres securely anchored to the structural soffit by 6 mm/ 8 mm threaded rods. The last hanger at the end of each carrier bar should not be greater than 600mm from the adjacent wall. Tiles should be clipped on to the special locking arrangement provided in the carrier bar from below.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
64.1	Perimeter trims to be of Armstrong wall angles of white colour secured to walls at 450mm maximum centres. The rate shall be inclusive of cost of all the materials, operations, labour, all taxes, wastages etc. finished area of the false ceiling shall be measured in sqm for payment.	500	2,800.00	sqm	14,00,000.00
65	Providing and fixing AMF Thermatex Antaris complete Mineral Fibre Ceiling tile of approved make or equivalent suspension system to consist of 2mm or 3mm GI suspension rod/wire with adjustable Butterfly Clips of 4mm dia securely affixed to structural ceiling using 10mm dia hook type anchor fastener . Ceiling Suspension System to be fixed at interval (Main Runner) of 1200mm spacing. Proprietary supplied ceiling suspension system to consist of Main Runners @ 1200mm and joined by C Channel @ 300mm to form overall grid opening of 1200mm * 300mm centre to centre. Additional cross tees are to be placed where appropriate for light fixtures, AC diffusers etc. exposed surfaces chemically cleaned and capped prefinished in high-gloss polyester enamel with two coat system on cold rolled steel. False ceiling will be measured only for the laid area, inclusive of all vertical drops, edge moldings, facias, etc. Rate quoted to include all cut - outs required for light fixtures, smoke detectors and other services cut - outs complete as directed by Engineer in charge.				
65.1	Product : AMF Thermatex Antaris Complete VT S 15 / Equivalent Ultima of Armstrong. Tile Type : Lay-in ceiling type System C (Exposed Grid Ceiling) Dimensions : 600 x 600 x 15 mm thick . Edge Detail : Bevelled Edge - VT S 15, Light Reflectance : up to 88%, Humidity Resistance : 95%, Colour : White Similar to RAL 9010, Surface Burning Characteristics : Class1, BS 476:Part 7:1987, Building Material Class A2-s1,d0 as per EN 13501-1, Thermal Conductivity : 0.052 - .057 W/mK, Sound Absorption : NRC = 0.70 as per ASTM C 423, Sound Attenuation : Dnfw = 31 dB as per EN 10848, Thickness / Weight : 3.6 Kg/m2	2000	1,650.00	sqm	33,00,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
66	<p>Providing & Fixing of Aluminium Perforated metal ceiling System consisting of 600x600mm Lay in tiles of pre coated Aluminium in 0.7 mm thickness in white colour with standard perforation of 2.5mm dia & open area of 16% and acoustical fleece glued to the back of the tile to be laid on 15mm wide T - section flanges colour white having rotary stitching on the Main Runner, 1200 mm & 600 mm Cross Tees.</p> <p>The tiles should have Humidity Resistance (RH) of 100%, NRC of 0.70, Fire Performance A2-s1.d0 in module size of 600 X 600 mm, suitable for Green Building application, with Recycled content of 50%.</p> <p>The grid should be of 15mm wide T - section flanges colour white having rotary stitching on all T sections i.e. the Main Runner, 1200 mm & 600 mm Cross Tees with a web height of 38mm and a load carrying capacity of 15.80 Kgs/M2. The T Sections have a Galvanizing of 120 grams per M2 & passed through 72 hrs of Salt test.</p>	150	2,500.00	sqm	3,75,000.00
67	<p>Straight Glazed Partition-Slim line partition of JEB ASIA make: Supply and installation of 2.4m ht from FFL and as per drg.full height straight glass partition 12mm thick toughened glass in partitions and glass doors and proprietary anodized aluminium sections of the SLIM LINE series of approved make 45x25mm thick. providing widline section (105x25mm) at around the door two vertical up to false ceiling and horizontal at door top The sections shall be matt natural anodized and shall be a combination of SAP 004 and 005 on all four sides as per the manufacturers specification and shall be inclusive of all accessories like stake1, stake3 and wedge 3G/B from FFL to the bottom of false ceiling height. The glass joints shall be filled with silicon sealant on both side and the vendor has to prepare the shop drawing for client / Architects approval.</p>				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
67.1	Rate shall include for providing transport charges, handling, loading and unloading, Installation, protecting the module and glass till handing over, testing, commissioning all necessary hardware's for partitions and pivots, extending the vertical members up to ceiling for fixing rigidity, scaffolding,wastage, Structural supports if any, etc. complete and all as per manufacturers specifications as directed except floor spring and patch fittings for 12 mm thick toughen glass door. One side partition area including glass door shall be measured for payment.	100	12000	Sqm	12,00,000.00
67.2	P/F Dorma patch fitting for glass door and Dorma make floor spring heavy duty for glass door complete as per direction of Engineer in charge.	20	16000	Nos	3,20,000.00
	II - PLUMBING AND SANITATION WORKS				
A	SANITARYWARE AND CP FITTINGS				
68	Supplying,installing, testing and commissioning of White Color European Water Closet - wall mounted with integral low level flushing cistern(Dual flushing type)- 'P' trap including following accessories: solid seat and cover with rubber buffers and flap, brackets, brass screws with washer, 15mm CP Angle valve with connection tube,CP wall flange, pan connector, CI chair bracket,all hardware items like wall brackets bolts washers & screws & brackets to be painted with two coats of enamel paint of approved shade over a coat of primer and necessary screws,etc.complete. Works including cutting and making good the walls /floor wherever required, etc., complete.	18.00	14622.26	Each	263200.59
	Hind ware wall mounting water closet studio model no: 20050				
	15mm CP Angle valve with connection tube Model no: CON-053-KN				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
69	Providing and fixing water closet (Indian type W.C. Orissa pan) with 100 mm sand cast iron P or S trap, Dual flushing type with internal fittings, fixed at medium level, with 32mm dia flush pipe connecting the cistern up to the closet 15mm dia cp angle valve with PVC inlet connection pipe, cp wall flange, cp extension nipple, etc complete. the rate includes for embedding the closet in 1:3:6 plain cement concrete using 20mm and downgrade aggregates and finishing flush with floor level.	1.00	4911.48	Each	4911.48
	Hind ware Indian type water closet model no: 20004				
70	Providing and fixing white vitreous china battery <u>based infrared sensor operated urinal</u> of approx. size 610 x 390 x 370 mm having pre & post flushing with water (250 ml & 500 ml consumption), having water inlet from back side, including fixing to wall with suitable brackets all as per manufacturers specification and direction of Engineer-in-charge.	12.00	24211.36	Each	290536.27
	Hind ware -OLYMPUS urinal - model no:60006 including tax				
	Jaquar- flush valve for Urinal-model no-SNR 51083				
71	Providing and fixing stone slab with table rubbed, edges rounded and polished, of size 75x50 cm deep and 1.8 cm thick, fixed in urinal partitions by cutting a chase of appropriate width with chase cutter and embedding the stone in the chase with epoxy grout or with cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 6 mm nominal size) as per direction of Engineer-in-Charge and finished smooth.	9.00	4724.30	Each	42518.74
	Granite stone approved shade				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
72	Supplying,installing, testing and commissioning of White color Oval Wash basin size 550x410mm(below counter) type with CP Pillar tap, 32mm dia CP waste coupling, 32mm dia CP bottle trap with extension pipe, pair of stainless steel bolts,with bracket (MS /CI) to support to the basin, 15mm CP angle valve with CP inlet connection tube , CP wall flange, including necessary brakets etc complete.	18.00	5608.65	Each	100955.72
	Hindware wash basin -560x410 model no: 10049				
	CP Pillar tap ,Prismatic type-Jaquar-model no: PRS-031				
	15mm CP Angle valve with connection tube model no: CON-053-KN				
	Jaquar Waste Coupling - Model - ALD 709				
	CP bottle trap-Jaquar-model no:ALD 769				
73	Providing and fixing 600x450mm bevelled edge Mirror of superior glass (of approved quality) complete with 6mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	0.00	2310.17	Each	0.00
74	Supplying and fixing cp Double Coat hook fixing with necessary screws etc., complete.	19.00	654.51	Each	12435.60
	Jaquar cp Double Coat hook - Model - 1161N				
75	Supplying , fixing in position and testing C.P. health faucet wall hook one metre long flexible tube, angle cock with wall flange all complete including cutting and making good the walls wherever required.	19.00	2264.34	Each	43022.54
	Jaquar C.P. health faucet- Model -ALD CHR 583				
	15mm CP Angle valve with connection tube model no: CON-053-KN				
76	Providing and fixing C.P. brass long body bibcock of approved quality conforming to IS standard and weighing not less than 690 gms.	3.00	1325.98	Each	3977.93
	15mm nominal bore				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
77	Providing and fixing liquid soap container of approved make near wash basins with necessary fixing screws and clamps etc., complete.	6.00	1192.86	Each	7157.16
	Jaquar Continental liquid soap container - Model -CAN 1135N				
78	Providing and fixing 600mm long CP towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fitting arrangement of approved quality colour and make .	6.00	783.89	Each	4703.31
	Jaquar Continental towel Rail 600 mm long - Model -1111N				
79	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required:	1.00	10208.83	Each	10208.83
	Kitchen sink with drain board				
	510x1040 mm bowl depth 250 mm				
80	Supplying,installing, testing and commissioning of CP sink cock with swivel spout wall mounted etc, including cutting and making good the walls wherever required etc., all complete as directed by Engineer	1.00	2088.38	Each	2088.38
	Jaquar CP sink cock with swivel spout - Model - SOL 6347				
81	Supplying, Installing, testing and commissioning of White color Floor Mounted European water closet with inbuilt low level PVC flushing cistern and Wash Basin for Physically Challenged Persons (Matrix) with necessary Grab Rails, hinged rails for support , pan connector bend,checknut, stopcock etc., colour solid seat and cover with polythene buffer and flap, CP flanges, CP bolts and nuts, bracket with nuts and bolts wall flanges etc., complete, Wash Basin shall include 15mm dia CP liver operated pillar Cock with waste coupling, 32mm dia CP bottle trap with extension pipe, supporting bracket with necessary steel to support basin 1 No.15mm CP angle valve with 450mm long CP connection pipe and CP wall flanges all of approved make etc., complete.	1.00	83045.04	Each	83045.04

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Hind ware - Matrix -70003				
82	Supplying,installing, testing and commissioning of Electric hand drier twin blower integrated with timer (0-3min) and infrared arrangement. The timer shall be fully automatic	6.00	9146.81	Each	54880.88
B	INTERNAL WATER SUPPLY				
83	Providing and fixing chlorinated Polyvinyl chloride (CPVC) pipes having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fitting including fixing the pipe with clamps at 1.00m spacing. this includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in charge.				
	Internal work –Exposed on wall				
83.1	25 mm nominal outer dia .pipes	100	334.83	meter	33483.43
83.2	32 mm nominal outer dia .pipes	100	429.51	meter	42950.86
83.3	40 mm nominal outer dia .pipes	100	590.48	meter	59048.38
83.4	50 mm nominal outer dia .pipes	100	841.86	meter	84186.29
83.5	80 mm nominal outer dia pipes	60	1722.52	meter	103350.97
84	Providing and fixing chlorinated Polyvinyl chloride (CPVC) pipes having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fitting i/c fixing the pipe with clamps at 1.00m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and cost of cutting chases and making good the same include testing of joints complete as per direction of Engineer in charge.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Concealed work including cutting chases and making good the wall etc.				
84.1	15 mm nominal outer dia .pipes	50	586.29	meter	29314.29
84.2	20 mm nominal outer dia .pipes	170	643.61	meter	109413.94
84.3	25 mm nominal outer dia .pipes	125	762.82	meter	95352.86
84.4	32 mm nominal outer dia .pipes	100	917.21	meter	91721.14
85	Providing and fixing ball valve (brass) of approved quality etc. Complete				
85.1	25 mm nominal bore	2	1356.43	Each	2712.87
85.2	32 mm nominal bore	2	2234.55	Each	4469.10
85.3	40 mm nominal bore	2	2337.26	Each	4674.53
85.4	50 mm nominal bore	2	2639.24	Each	5278.48
86	Supplying and fixing of 25mm dia Air release valve etc. complete	1	1103.13	Each	1103.13
C	INTERNAL DRAINAGE				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
87	Providing, fixing and testing UPVC SWR- B Class pipe of Supreme/Finolex/Prince Make confirming to IS 13592-1992. and fittings confirming to IS 14735-1999, such as such as coupler, elbow, bends, Tee, Y, vent cowl etc for Soil, Waste and rain water pipe works in shaft and suspended in ceiling., laid in ground(from shaft to Inspection chamber and Gully chamber), etc., using rubber ring joints(rubber ring confirming to IS 15382) for shafts lines and solvent cement joints for suspended lines and work in below ground. Woks includes necessary scaffolding, cutting and making good the walls wherever required all complete as directed by the Engineer in-Charge.				
87.1	40mm dia	20	117.79	RM	2355.7543
87.2	50mm dia	150	144.11	RM	21616.09575
87.3	75mm dia	190	299.11	RM	56830.8012
87.4	110mm dia	275	419.94	RM	115483.5894
88	Supplying, fixing and testing of PVC floor trap with cockroach trap and CP grating 150 mm nominal size square 100mm diameter of the inner hinged round grating various inlet from 40 dia to 110 dia and various outlet from 75 dia to 100 dia with the extension boss tee connections, fixed in sunken floors /Suspended support with ceiling level etc., complete.	30	1042.45	Each	31273.3875
89	Supplying, fixing and testing of UPVC floor clean out used in sunken floors,75or110mm dia extension boss tee arrangements with female thread fix with the up clean out plug in male thread with gascet and three s.s screws for sunken floors etc. complete	10	1162.08	Each	11620.8075

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
90	Supplying, fixing and testing of Urinal trap(Sealed Trap) used in sunken floors 110mm dia extension boss tee arrangements with female thread fix with the Stainless steel /Upvc clean out plug in male thread with gascet and three ss screws for urinals, etc., complete	6	1134.79	Each	6808.713
D	External Water Supply				
91	Excavating trenches of required width for pipes, cables, etc, including excavation for sockets and dressing of sides ramming of bottoms, depth up to 1.5 m including getting out the excavated soil and then, returning the soil as required in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming watering etc.and disposing of surplus excavated soil as directed, with in a lead of 50m.				
	All kinds of soil				
91.1	Pipes, cables etc. not exceeding 80 mm dia.				
91.2	Pipes, cables etc. exceeding 80 mm dia but not exceeding 300 mm dia	150.00	452.31	metre	67846.29
93	Providing and fixing chlorinated Polyvinyl chloride (CPVC) pipes having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings this includes jointing of pipes & fittings with one step CPVC solvent cement,trenching, refilling &testing of joints complete as per direction of Engineer in Charge.				
	External work				
93.1	100 mm nominal outer dia pipes	150.00	6155.57	metre	923334.86
94	Providing and fixing gun metal non return valve with C.I. wheel of approved quality(screwed end)				
94.1	65mm nominal bore				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Horizontal				
94.2	80mm nominal bore				
	Horizontal	2.00	5437.91	Each	10875.82
95	Supplying, installing, testing & commissioning approved make Butterfly valve with standard lever conforming to IS 13039 with necessary flange,nuts and boltsetc.,complete.				
95.1	65mm nominal bore	2.00	2818.69	Each	5637.39
95.2	80mm nominal bore	2.00	3019.68	Each	6039.36
96	Constructing masonry Chamber 120x120x100 cm, inside with 75 class designation brick work in cement mortar 1:4 (1 cement :4 coarse sand) for sluice valve, with C.I. surface box 100 mm. top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) necessary excavation foundation concrete 1:5:10 (1 cement :5 fine sand:10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement :3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design.				
	With F.P.S. bricks class	2.00	34949.43	Each	69898.86
97	Providing and fixing enclosed type water meter (bulk type) conforming to IS: 2373 and tested by municipal board complete with bolts, nuts, and rubber insertions etc. (the tail pieces if required will be paid separately):				
	80 mm dia nominal bore	2.00	7895.10	Each	15790.19

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
98	Providing and fixing C.I dirt box strainer for bulk type water meter with nuts, bolts, rubber insertions etc complete conforming to IS: 2373				
	80 mm dia	2.00	7895.10	Each	15790.19
99	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete:	4.00	651.36	Each	2605.42
	25 mm nominal bore				
E	External Drainage				
100	Excavating trenches of required width for pipes, cables, etc, including excavation for sockets and dressing of sides ramming of bottoms, depth up to 1.5 m including getting out the excavated soil and then, returning the soil as required in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming watering etc.and disposing of surplus excavated soil as directed, with in a lead of 50mt.				
	All kinds of soil				
	Pipes , cables etc. exceeding 80 mm dia but not exceeding 300 mm dia	150.00	452.31	metre	67846.29
101	Providing, fixing and testing UPVC Class-3 pressure rating 6 kg /sqcm pipe of approved Make for underground drainage and sewerage systems - Confirming to IS 4985:2000 - pipe in trenches to required gradients and provide sand cushion for pipes to the full width of trench above and below the pipe to required minimum thickness etc., complete. rates including for laying pipes, forming bottom surface to required level, etc., complete				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	160mm diameter	150.00	887.04	metre	133055.63
102	Constructing brick masonry manhole in cement mortar 1:4 (1cement:4 graded stone aggregated 20mm nominal size), foundation concrete 1:4:8 mix (1cement:4coarse sand: 8graded stone aggregated 40mmsize nominal size) in side plastering 12mmthick with cement mortar 1:3(1cement:3coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1cement :2coarse sand :4graded stone aggregate 20mm nominal size) finished with floating coat of neat cement complete as per standard design:				
102.1	Inside size 90x80 cm and 45cm deep including C.I cover with frame (light duty)455x610mm internal dimensions total weight of cover and frame to be not less than 38kg(weight of cover 23kg and weight of frame 15 kg):				
	With Sewer bricks conforming to IS:4885	6.00	18872.46	metre	113234.79
102.3	Extra depth for manholes				
102.3.1	Size 90x80cm				
102.3.1.1	With Sewer bricks conforming to IS:4885	6.00	13407.82	metre	80446.91

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
103	Providing orange colour safety foot rest of minimum 6mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263mm and width as 165mm with minimum 112mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement :3 coarse sand :6 graded stone aggregate 20 mm nominal size) complete as per design.	20.00	676.62	Each	13532.34
104	Making connection of drain or sewer line with existing manhole including breaking in to and making good the walls, floors with cement concrete 1:2:4 mix (1 cement: 2coarse sand: 4 graded stone aggregate 20 mm nominal size) cement plaster on both side with cement plaster 1:3 (1cement:3 coarse sand) finished with a floating coat of neat cement and making necessary channels for drain etc. Complete				
104.1	for pipes 100 to 230 mm diameter	1.00	791.70	Each	791.70
105	Providing and fixing square-mouth S.W.gully trap grade 'A' complete with C.I grating brick masonry chamber with water tight C.I cover with frame of 300x300mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70kg as per standard design :				
105.1	100x100 mm size P type				
	With F.P.S.bricks				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
105.2	With Sewer bricks conforming to IS:4885	10.00	3564.83	Each	35648.34
106	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10sqm on plan) including dressing of sides and ramming of bottoms, lift up to 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m				
106.1	All kinds of soil (for manhole)	25.00	342.00	Cum	8550.00
	III - ELECTRICALWORKS				
	WIRING				
107	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, with modular switch , modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FR PVC insulated copper conductor single core cable etc as required.				
107.1	Group C	598.00	1,037.00	Point	6,20,126.00
108	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable in surface/ recessed PVC conduit, and earthing the point with 1.5 sq. mm FRLS PVC insulated copper conductor single core cable etc. as required.	30.00	317.00	Point	9,510.00
109	Wiring for twin control light point with 1.5 sq.mm FR PVC insulated copper conductor single core cable in surface / recessed medium class PVC conduit, 2 way modular switch, modular plate , suitable GI box and earthing the point with 1.5 sq.mm. FR PVC insulated copper conductor single core cable etc as required.	6.00	809.00	Point	4,854.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
110	Supply, loading ,transportation, unloading at site, storages at site of following type light fittings including required integral control gears,Drivers , lamps,& other accessories etc to complete the work as per Engineer -In -charge.				
110.1	Supply and fixing, Testing & Commissioning of recess mounted 600x600 mm - 38W LED light fitting of based luminaire for recess mounting in False ceiling with 600 x 600 mm module, square luminaire complete with lamp and all accessories. like drivers etc Including the cost of all materials, labour, HOM of equivalent and machineries all lead lift, loading and unloading, transportation, if any other incidental charges at all level complete all as per specification & as directed by Engineer in charge. equivalent to PHILIPS LIGHTING CAT REF :RC 380B G2 LED35S-6500PSU OD WH, Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	315.00	4575	each	14,41,125.00
110.2	Supply and fixing, Testing & Commissioning of surface mounted integral type 20 W LED light fitting for surface mounted type battern luminaire complete with lamp and all accessories. like drivers etc Including the cost of all materials, labour, HOM of equivalent and machineries all lead lift, loading and unloading, transportation, if any other incidental charges at all level complete all as per specification & as directed by Engineer in charge. equivalent to PHILIPS LIGHTING CAT REF BN108 C LED 20S PSU CDL WH Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	10.00	1462.5	each	14,625.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
110.3	Supply and fixing, Testing & Commissioning of surface mounted integral type 12 W LED light fitting for surface mounted type Down Lighter complete with lamp and all accessories. like drivers etc Including the cost of all materials, labour, HOM of equivalent and machineries all lead lift, loading and unloading, transportation, if any other incidental charges at all level complete all as per specification & as directed by Engineer in charge. equivalent to PHILIPS LIGHTING CAT REF :SM200C LED11S 6500 PSU OD WH Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	21.00	1837.5	each	38,587.50
110.4	Supply and fixing, Testing & Commissioning of surface mounted integral type 15 W LED light fitting for Recess mounted type Down Lighter complete with lamp and all accessories. like drivers etc Including the cost of all materials, labour, HOM of equivalent and machineries all lead lift, loading and unloading, transportation, if any other incidental charges at all level complete all as per specification & as directed by Engineer in charge. equivalent to PHILIPS LIGHTING CAT REF : DN194B LED15S-6500 PSU WH S1 WH Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	20.00	2062.5	each	41,250.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
110.5	Supply and fixing, Testing & Commissioning of surface mounted integral type 22 W LED light fitting for Recess mounted type Down Lighter complete with lamp and all accessories. like drivers etc Including the cost of all materials, labour, HOM of equivalent and machineries all lead lift, loading and unloading, transportation, if any other incidental charges at all level complete all as per specification & as directed by Engineer in charge. equivalent to PHILIPS LIGHTING CAT REF : DN395B LED20S WH Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	70.00	2662.5	each	1,86,375.00
110.6	Supply and fixing, Testing & Commissioning of surface mounted integral type 20 W LED light fitting for surface Mounted type Down Lighter complete with lamp and all accessories. like drivers etc Including the cost of all materials, labour, HOM of equivalent and machineries all lead lift, loading and unloading, transportation, if any other incidental charges at all level complete all as per specification & as directed by Engineer in charge. equivalent to PHILIPS LIGHTING CAT REF : SM200C LED16S 6500 PSU OD WH Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	28.00	2325	each	65,100.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
110.7	Supply and fixing, Testing & Commissioning of surface mounted integral type 9 W LED light fitting for wall mounted type luminaries complete with lamp and all accessories. like drivers etc Including the cost of all materials, labour, HOM of equivalent and machineries all lead lift, loading and unloading, transportation, if any other incidental charges at all level complete all as per specification & as directed by Engineer in charge. equivalent to PHILIPS LIGHTING CAT REF : BWS400 LED05 V CW Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	4.00	2025	each	8,100.00
	Note: Before procurement ,contractor to get sample approval from IISER Engineer In Charge & Qty shall be procured as per final Approved Lighting Layout				
111	Wiring for circuit/ sub main wiring along with earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required				
111.1	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	3,000.00	137.00	M	4,11,000.00
111.2	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	900.00	168.00	M	1,51,200.00
111.3	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	227.00	125.00	M	28,375.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
112	Supply & installation of surface mounted DLP U- PVC adaptable trunking raceways, made out of U-PVC to Off-White or approved shade as per IS 733 of thickness 2.0mm for the base and sides with removable covers, complete with necessary bends, suitable sized junction boxes and tees etc, Complete. (For every 1m distance cable tag has to be provided for each circuit in the raceways - as more that 1C FRLS copper wire is required for 1 Circuit) PVC RACEWAYS (Along the wall), DLP U- PVC adaptable trunking . Size: 105x 50mm PVC Raceways for Power & Data with above specifications . Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	380.00	1,138.50	M	4,32,630.00
113	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	50.00	24.00	Each	1,200.00
114	Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess etc. as required.				
114.1	1 or 2 Module (75 mmX75 mm)	25.00	175.00	Each	4,375.00
114.2	3 Module (100 mmX75 mm)	15.00	185.00	Each	2,775.00
114.3	4 Module (125 mmX75 mm)	176.00	205.00	Each	36,080.00
114.4	6 Module (200 mmX75 mm)	10.00	258.00	Each	2,580.00
114.5	8 Module (125 mmX125 mm)	281.00	297.00	Each	83,457.00
114.6	12 Module (200 mmX150 mm)	6.00	344.00	Each	2,064.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
115	Supplying and fixing following modules, modular base and cover plate with required accessories like PVC box & PVC trunking plates etc for modular switches in recess / on UPVC trunking etc, as required. for modular IO point (DATA Point) in recess / on UPVC trunking etc, as required. (The job includes cutting & chasing existing wall, fixing the box in position as required including rough plastering.) (In all the rooms, vertical drops of conduits and switch boxes shall be concealed in the wall). Boxes should be of same make as that of modular accessories.				
115.1	up to 2 Modules	15.00	83.00	Each	1,245.00
115.2	4Modules	176.00	101.00	Each	17,776.00
115.3	6Modules	10.00	126.00	Each	1,260.00
115.4	8Modules	281.00	151.00	Each	42,431.00
115.5	12Modules	6.00	166.00	Each	996.00
116	Supplying and fixing following Modular switch / socket on the existing raceways including connections and accessories, as required. (All switches and Sockets shall be spark proof type)				
116.1	5/6 amp switch	50.00	84.00	Each	4,200.00
116.2	15/16amp switch	706.00	114.00	Each	80,484.00
116.3	6 Pin 15/16 amp socket outlet (POWER SWITCHES / SOCKETS on Raceways/Modular Plate)	770.00	153.00	Each	1,17,810.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
116.4	6/13 AMP UPS INTEL SOCKET : 3 Pin 6/13 amp Intel type socket outlet with safety shutters (POWER SWITCHES / SOCKETS on Raceways). Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	45.00	250.00	Each	11,250.00
117	Supplying and fixing following on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
117.1	Bell push	12.00	114.00	Each	1,368.00
117.2	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	60.00	24.00	Each	1,440.00
117.3	Supplying and fixing call bell/ buzzer suitable for single phase, 230 volts, complete as required.	12.00	61.00	Each	732.00
	MCCB, MCB & DB'S				
118	Supplying ,Installation ,Testing & commission ing of following way prewired Double door type TP&N MCB distribution board of steel sheet of 1.6 mm thick for 415/240 Volts volts on surface/ recess complete with loose wire box, terminal connectors for all incoming and outgoing circuits, duly prewired with suitable size FR PVC insulated copper conductor up to terminal blocks, tinned copper bus bar, neutral link, earth bar, din bar, detachable gland plate, interconnections, powder painted including earthing etc. as required. Including supply and fixing of MCB/ RCCB/RCBO s Isolator etc) The IP Degree of All DBs shall be IP42				
118.1	Typical D.B. for Lighting of following configuration.	6.00	38,000.00	Each	2,28,000.00
	Incomer : 4 Pole 63 Amp MCB -C-Class -10 KA				
	RCCB(ELCB) Per Phase : 60 Amp 2 Pole 300 m.A.(Total 3 Nos)				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Outgoing MCBs : SP MCB up to 20 Amp -C-CL-10 KA 36 Nos (12Nos Per Phase)				
118.2	20 KVA UPS OUTPUT DB : of following configuration.	1.00	30,000.00	Each	30,000.00
	Incomer : MCCB 63 Amp 4 Pole ,25 KA With operating Knob/Handle and RYB Indication				
	Outgoing MCBs : 4Pole MCB 25 Amp -D-CL-10 KA 6 Nos				
118.3	Work Station -DB- (UPS fed Supply) of following configuration.	3.00	28,000.00	Each	84,000.00
	Incomer : 4 Pole 25 Amp MCB -D-Class -10 KA				
	elcb (ELCB) Per Phase :25 Amp 2 Pole 100 m.A.(Total 3 Nos)				
	Outgoing MCBs : SP MCB up to 16 Amp -D-CL-10 KA 12 Nos (4 Nos Per Phase)				
118.4	1 Phase Output DB of following configuration.(SPN DB) for Emergency lighting system for various areas of New Building	3.00	8,500.00	Each	25,500.00
	Incomer : 2 Pole 20 Amp MCB -D-Class -10 KA				
	Outgoing MCBs : SP MCB up to 10 Amp -D-CL-10 KA 6 Nos				
118.5	Supplying and fixing 20 amps, 240 volts, SPN industrial type, socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 amps "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	35.00	980.00	Each	34,300.00
118.6	Supplying and fixing 20 amps, 240 volts, TPN industrial type, socket outlet, with 2 pole and earth, metal enclosed plug top along with 20 amps "C" curve, TP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	2.00	1,455.00	Each	2,910.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
118.7	Supplying and fixing 32 amps, 415 volts, 5-pin (3P+N+PE) industrial type, socket outlet, with 4 pole and earth, metal enclosed plug top along with 32 amps "C" curve, TPMCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	6.00	2,488.00	Each	14,928.00
118.8	Providing and fixing M.V. danger notice plate of 200 mm X 150 mm, made of mild steel, at least 2 mm thick, and vitreous enamelled white on both sides, and with inscription in single red colour on front side as required.	6.00	149.00	Each	894.00
119	EARTHINGS				
119.1	Earthing with G.I. earth pipe 4.5 M long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke and salt as required.	15.00	3,672.00	Each	55,080.00
119.2	supply and laying 6 SWG G.I wire at 0.50 M below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required.	250.00	28.00	M	7,000.00
119.3	supply and laying 25 mm X 5 mm G.I strip at 0.50 M below ground as strip earth electrode, including connection/ terminating with nut, bolt, spring, washer etc. as required. (Jointing shall be done by overlapping and with 2 sets of G.I nut bolt & spring washer spaced at 50mm)	600.00	85.00	M	51,000.00
120	LOW TENSION SWITCHGEAR CUBICAL PANELS				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	<p>Supply, loading ,transportation unloading at site, storages at site, shifting from storage place to site, Installation, Testing & Commissioning following 3 Phase, 4 wire, 415 V, 50 Hz panels. The fabrication shall be made with cold rolled cold annealed sheet with Machine pressing. The surface shall be rigorously treated for derusting in 7 tank process with dephosphating and with powder coating on both sides of the panel. The panel shall be totally enclosed metal clad type with double gasketting with rubber / resin lining. The panel shall be having control directory pasted inside the panel. The panel shall be mounted on existing trench and shall have cable entry provision from the top and bottom with suitable alley as the case may be. All components shall be from ISO-9001companies and shall have relevant IS/IEC approvals & shall comply CPRI Latest general specification of Substation works which is must.</p> <p>The panel builder shall must have approved CPRI type test certificate for assembly of panel up to 50k.A. Breaking capacity for 1 sec (Fabrication, drawing and list of components and panel detail shall be got approved by consultants before fabrication). The panel shall be free standing & should include base frame channel support. (The Single Line Diagram shall be closely followed).</p> <p>Note: 1. 1. The Panel shall be fully as per the requirement of Engineer-in-charge. 2. Auxiliary contactor to be provided along with auto-manual switch where ever required. 3. All Breakers both Incoming & Outgoing shall have LED 'ON / OFF / TRIP' indications without fail.</p>				
	<p>4. CTs shall be with dual ratio and cast resin type only. 5. For Capacitors earthing shall be provided.</p>				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	6. Ventilators shall be provided for Panels with 2500A & above rated bus bars. 7. Cu bus earthing of 25x5mm shall be provided for all panels. 8. Circuit Breakers shall confirm IS 13947-2/IEC 947-2 9. All doors to have double rubber gasket with shutter assembly & door seating frame. 10. All AC feeders will have time delays of 0-60 Seconds with timers. 11. All breakers release shall be as mentioned in BOQ of each feeder and as per Tender electrical single line diagrams. 12. Any panel if more than 1.5m width should be made in parts each part not exceeding 1.5m 13. The current density for ALU bus bars shall be 0.8 only. 14. The current density for CU bus bars shall be 1.0 only. 15. All UPS outgoing panels shall have neutral bus bars double size of phase. 16. TP means three pole 17. TP&N means 3 pole breaker with neutral link 18. 4P & TPN means Four Pole breaker with 100% neutral 19. Unless specified as 4 pole breaker, 4 pole means 4 pole ONLY. 20. All breakers to have breaker manufacturer's factory made Separators and Spreaders.. 21. In any case Aluminium bus bars should not be connected directly to the breaker without spreaders. 22. The control wiring has to be in Troughs of appropriate size. 23. Irrespective of the Ampacity all breakers shall be connected to the breakers using Bus bars only. Cables of any make will never be accepted.				
	24. All vertical bus bars in bus bar alley shall have bottom supports. (Rating of vertical busbar shall be more than sum of total switchgear rating connected to vertical section of busbar) 25. Panel earthing strip should come out vertically on top of the panel. 26. Earthing bus shall be coated to give a look of tin. 27. Door earthing shall be provided for all doors. 28. Base frame shall be with each panel. The size will be equal to each section. 29. Bi-metallic tape/washers to be used where ever Cu. & Al are joined. 30. All test certificates must be provided immediately after commissioning. 31. SAFETY CERTIFICATE FOR THE PANELS SHALL BE PRODUCED FROM CEIG.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
120.1	<p>32. Panel General Arrangement drawing must be provided for approval before fabrication.</p> <p>33. Makes of material must be provided for approval before procurement</p> <p>34. Cubicle Details : Material of construction - CRCA - 16/14 SWG, IP Protection - IP - 52, Indoor cubicle type free standing & floor mounting, Front/Rear panels - Hinged doors/ Removable type, Gland plates - Undrilled, dust & vermin proof</p> <p>35. Cable entry details : Incoming - All cables are from top / bottom, Outgoings - All outgoings by cables from top</p> <p>Supply, Installation, Testing & Commissioning of PDB For Chemical Lab- as per standard fabrication details mentioned above & as per enclosed electrical Single line diagram ref IISER/CRN/EMEA/CL/EL-01. The Details of feeders as under</p>	1.00	6,15,000.00	Each	6,15,000.00
	<p>a.1 INCOMER: As under</p> <p>MOULDED CASE CIRCUIT BREAKER:</p> <p>Quantity - 1No</p> <p>Rating - 630 Amps - 35 KA</p> <p>Operation - Manual Fixed type with extendable Rotary Handle with Pad Lock arrangement.</p> <p>No. of poles - 4 Poles</p> <p>Releases - In Built Microprocessor Adjustable Over current, Short circuit ,Instantaneous,& Earth Fault. (LSIG)</p> <p>Indication - RYB / ON/OFF/TRIP-LED Type</p> <p>Other features - All standard with Shunt , & Closing coil 240 Voltas operated</p> <p>Auxiliary Contactors as under</p> <p>Quantity - As required (DI (Voltage free Auxiliary Contacts for Breaker ON , Breaker Off , & Breaker Trip on Fault status for remote monitoring with BMS with necessary wiring up to terminals)</p> <p>Rating of contacts - 6 Amps.</p> <p>CT's - Measurement - 1 set of 3 Nos for Load Manager as under</p>				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Class I - 15VA burden. Type - Cast resin. Ratio - 630 / 5.A METERS As under : Voltmeter 3 Phase 4 wire,440Volts, Analogue AC Voltmeter (96x96) mm with 7 Positions selector switch Range - 0-500V, . 3 CT Operated Digital Microprocessor Load Manager for Line Current,Phase current, KW, KVA, KWH, KVAH,KVARH, Hz, TDH, with RS 485 Serial communication Port. BUS BAR :630A, TPN, 415V, 3Phase, 35Hz, Aluminium Bus Bar. Bus Bar Supports - FRLSP.				
	Bus bar sleeves - Heat shrinkable - colour coded. Internal & control wiring - To be with ferrules Heat resistant type, 1100V grade single core copper flexible. a.2 :OUTGOINGS: As under MCCB: 35 KA Rated as under Rating & Quantity :- ,250 Amp : 3 Nos, 125 Amps :2 Nos , 100 Amps :3 Nos, 63 Amps :4 Nos No. of poles - TP&N Operation - Manual Fixed type with extendable Rotary Handle with Pad Lock arrangement. Releases - Adjustable Thermal Magnetic type Over current ,Short circuit Release Indications - OFF/ON/TRIP. -LED Type Other features - All standard. Auxiliary Contactors: Quantity - As required. Rating - 6 Amps. METERS: 3 Nos CT Operated Digital meter for KWH and Ampere parameter with RS 485 Serial communication port duly wired for ready to use for each outgoing MCCB feeder.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	CTs for Metering : CT Material type & VA Burden shall be as per CT details mentioned in Incomer Breaker section .The Primary Current shall be per Switchgear rating of respective feeders & Secondary shall rated for 5 Amp.				
120.2	Supply, Installation, Testing & Commissioning of PDB For Lighting & Raw Power as per standard fabrication details mentioned above & as per enclosed electrical Single line diagram ref IISER/CRN/EMEA/CL/EL-01. The Details of feeder as under	1.00	2,25,000.00	Each	2,25,000.00
	<p>a.1 INCOMER: As under MOULDED CASE CIRCUIT BREAKER: Quantity - 1No Rating - 250 Amps - 35 KA Operation - Manual Fixed type with extendable Rotary Handle with Pad Lock arrangement. No. of poles - 3 Poles with Neutral Link Releases - In Built Adjustable Thermal Magnetic Over current, Short circuit.</p> <p>Indication - RYB / ON/OFF/TRIP-LED Type Other features - All standard with Shunt , coil 240 Voltas operated BUS BAR :250A, 35 KA TPN, 415V, 3Phase, 35Hz, Aluminium Bus Bar. Bus Bar Supports - FRLSP. Bus bar sleeves - Heat shrinkable - colour coded. Internal & control wiring - To be with ferrules Heat resistant type, 1100V grade single core copper flexible.</p> <p>a.2 :OUTGOINGS: As under MCB: 10 KA -C-CL , No. of poles - TP&N Qty : 12Nos</p>				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
120.3	Supply, Installation, Testing & Commissioning of Lift Power panel as per standard fabrication details mentioned above & as per enclosed electrical Single line diagram ref IISER/CRN/EMEA/CL/EL-01. The Details of feeder as under	2.00	65,000.00	Each	1,30,000.00
	<p>a.1 INCOMER: As under</p> <p>MOULDED CASE CIRCUIT BREAKER: Quantity - 1No Rating - 63 Amps - 16KA Operation - Manual Fixed type with extendable Rotary Handle with Pad Lock arrangement. No. of poles - 3 Poles with Neutral Link Releases - In Built Adjustable Thermal Magnetic Over current, Short circuit.</p> <p>Indication - RYB / ON/OFF/TRIP-LED Type Other features - All standard with Shunt , coil 240 Voltas operated BUS BAR :63A, 16KA TPN, 415V, 3Phase, 35Hz, Aluminium Bus Bar. Bus Bar Supports - FRLSP. Bus bar sleeves - Heat shrinkable - colour coded. Internal & control wiring - To be with ferrules Heat resistant type, 1100V grade single core copper flexible.</p> <p>a.2 :OUTGOINGS: As under</p> <p>a2.1 MCB:as under Rating :16 Amp 10 KA -C-CL , No. of poles - TP&N Qty : 3Nos</p> <p>a2.2 MCB:as under Rating :63 Amp 16 KA Thermal Magnetic with Rotary Handle & with ON/OFF/TRIP Indication No. of poles - TP&N Qty : 1Nos</p> <p>MV CABLE LAYING</p>				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
121	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
121.1	Above 185sq. mm and up to 400 sq. mm	150.00	223.00	M	33,450.00
121.2	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				
	Above 185sq. mm and up to 400 sq. mm	30.00	139.00	M	4,170.00
122	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
122.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	550.00	25.00	M	13,750.00
123	SUPPLY of one number XLP insulated and PVC sheathed / XLPE 1.1 KV grade of following size Aluminium/Copper power cable with all necessary test certificates. Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.				
123.1	3x 4 sq. mm 2XFY- (Cu)	200.00	263.56	M	52,712.21
123.2	3x 6 sq. mm 2XFY- (Cu)	200.00	362.49	M	72,497.33
123.3	4x 4 sq. mm 2XFY- (Cu)	250.00	334.33	M	83,581.34

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
123.4	4x 6 sq. mm 2XFY- (Cu)	300.00	467.19	M	1,40,156.70
123.5	4x 10 sq. mm 2XFY- (Cu)	250.00	727.86	M	1,81,965.42
123.6	4x 25 sq. mm A2 XFY (AL)	300.00	168.10	M	50,430.42
123.7	3.5x240 sq. mm A2 XFY (AL)	426.00	1,193.17	M	5,08,291.81
124	supply and making end terminations with brass compression gland and aluminium lugs and other jointing materials for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required. Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.				
124.1	4x 25 sq. mm	20.00	252.00	Each	5,040.00
124.2	3.5x240sq. mm	4.00	1,128.00	Each	4,512.00
125	supply and making end terminations with brass compression gland and Copper lugs and other jointing materials for following size of XLPE insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required. Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.				
125.1	3x 4 sq. mm 2XFY- (Cu)	20.00	150.00	Each	3,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
125.2	3x 6 sq. mm 2XFY- (Cu)	30.00	175.00	Each	5,250.00
125.3	4x 4 sq. mm 2XFY- (Cu)	20.00	200.00	Each	4,000.00
125.4	4x 6 sq. mm 2XFY- (Cu)	16.00	250.00	Each	4,000.00
125.5	4x 10 sq. mm 2XFY- (Cu)	18.00	350.00	Each	6,300.00
126	Data /Voice Passive Components				
126.1	Supply and Laying and fixing of one number PVC insulated and PVC sheathed UTP 4 pair CAT 6 LAN cable on wall surface / open tray / existing open duct with required clamps & accessories as required.	5,000	34.00	M	1,70,000.00
126.2	Supply and making end termination for UTP 4 pair CAT 6 LAN cable with required IO modules which is suitable for modular type base , cover plates and accessories (At field side) as required.Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	120.00	550.00	Each	66,000.00
126.3	Supply and making end termination for UTP 4 pair CAT 6 LAN cable on existing fully loaded patch panel with IO modules which is suitable for network rack mounting as required. Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	120.00	155.00	Each	18,600.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
126.4	Supply and installation of 24 port fully loaded patch panel with IO modules suitable for UTP CAT 6 cable and required mounting accessories for existing network rack. Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	2.00	5,500.00	Each	11,000.00
126.5	Supply of Patch cords of UTP CAT 6 with RJ 45 port at both ends, having 1 M length. Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls , filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	35.00	90.00	Each	3,150.00
126.6	Supply and Laying of 12 core OFC cable with 50mm dia, 3.5mm wall thickness DWG pipes on wall surface/ open try/ ground etc with required clamps etc with direction of engineer in charge. Quoted rate shall be including material, labour, taxes, duties, lead, lift, loading, transportation, unloading, storing , scaffolding etc, making holes in walls, filling holes with mortar etc complete as per direction of Engineer In-charge. Nothing extra shall be paid separately.	150.00	188.00	M	28,200.00
126.7	Supply, Installation, testing and commissioning 24 U Network Rack 800x1000 - Dlink complete as per direction of Engineer in charge.	1.00	35,000.00	each	35,000.00
126.8	Supply, installation testing and commissioning 24 Port Jack Panel Loaded - Dlink	6.00	3,500.00	each	21,000.00
126.9	6 Core LIU SM – Loaded – Dlink	4.00	5,835.00	each	23,340.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
126.1	Supply, installation testing and commissioning OFC Patch Cord 3 Mtr. Length SM	4.00	2,600.00	each	10,400.00
126.11	Supply, installation testing and commissioning CAT 6 Patch Cord 1 Mtr Length – Dlink	60.00	165.00	each	9,900.00
126.12	Supply, installation testing and commissioning CAT 6 Patch Cord 2 Mtr Length - Dlink	60.00	210.00	each	12,600.00
126.13	Supply, installation testing and commissioning CAT I/O - Dlink	150.00	250.00	each	37,500.00
126.14	Termination of OFC Splicing	24.00	350.00	each	8,400.00
126.15	Supply, installation testing and Termination of IO	400.00	65.00	each	26,000.00
	IV - HVAC WORKS				
127	AIR HANDLING UNITS				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Supplying, installing, testing and commissioning of factory built floor mounted - horizontal or vertical/ ceiling suspended as mentioned, chilled water double skin type air handing units made of 25 mm thick panels consisting of G.I.casing of thickness 0.6 mm outside layer and 0.6 mm inside layer with polyurethane foam (PUF) insulation factory injected between them by injection moulding machine, complete with blower section with DIDW forward curved blower suitable for static pressure as detailed below, minimum 2 bend GSS/PVC eliminators, cooling coil section with aluminium finned copper tubes (tube thickness not less than 0.5mm) cooling, filter sections with 50 mm thick metal viscous/washable synthetic type air pre-filters EU-4 class -90% efficiency down to 10 micron, wherever specified belt drive package with TEFC energy efficient motor as per IE2 , drive motor suitable for 415 + 10% volts, 50 HZ, 3 phase, A.C. supply,				
	Variable speed application, drain connections, stainless steel drain pan thermometers and pressure gauges at the inlet and outlet of coil, necessary vibration isolation arrangement complete as per specifications and of following capacities. All AHUs to have UV emitter as per specifications for bacterial germicide installed in fan section facing cooling coil.				
127.1	5000 cfm / 12.5 TR / 50 mm SP / 4 R - Floor mounted	1	3,26,625	No	3,26,625
127.2	5000 cfm / 12.5 TR / 40 mm SP / 4 R - Ceiling suspended	1	2,98,500	No	2,98,500
127.3	4000 cfm / 10 TR / 40 mm SP / 4 R - ceiling suspended	1	2,53,500	each	2,53,500
127.4	3000 cfm / 10 TR / 40 mm SP / 4 R - ceiling suspended	1	2,14,125	each	2,14,125

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	TWO STAGE EVAPORATIVE COOLING UNIT				
128	Supply, installation, testing and commissioning of Single stage evaporative cooling unit complete with below mentioned details and enclosed technical specifications				
i	Blow through construction air washer				
ii	Construction - Double skin sandwich panel construction 50 mm thick suitable for outdoor application-weather proof with inner skin 0.8mm thick plain GI and outer skin 0.63 mm thick plasticized GI.				
iii	Blower - Backward curved plug fan . Blower to be sized along with scavenging air quantity.				
iv	Vibration isolation for blower- cushy foots				
v	Motor - VFD suitable , TEFC IP 54 / 1500 RPM / 415 Volts/ 50 Hz / IE 2 standards for energy efficiency				
vi	Inlet louver section with louvers				
vii	Filter section with filters HDPE washable 90% efficiency down to 10 microns				
vii	Celdek media 300 mm depth with min 90% saturation efficiency				
viii	Monoblock pump of suitable rating. Pump impeller shall be bronze / SS.				
ix	UV Treatment unit for water -in water circulation pipe.				
x	UV lamps -air side				
xi	Marine lamps with door limit switches				
128.1	Air delivery at outlet of machine 9000 CFM / 55 MM Total S.P	3	4,34,000	each	13,02,000

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
129	Supply installation testing and commissioning of Single stage evaporative cooling unit Starter panel suitable for Outdoor Duty IP 65 with starters for fan, VFD for fan, with safety protection for overload, low and high voltage, short circuit, earth fault. Indicating lamps, ON/OFF / TRIP Indication for blower, pump, fan. Provision to interlock with FAS panel. Each control panel to have outgoing feeder for one blower motor 7.5 kW, 2 Nos pump motor 3phase 0.75 kW both working, Single phase supply for UV treatment unit, water level sensor, marine lamp.	3	95,875	each	2,87,625
130	Supply, installation, commissioning & testing of chilled water Fan coil units / Cassettes with drain pump / Hi walls as specified and shown in the drawing consisting of: unit pipe connection from main pipe headers to the unit , 19 mm Nitrile Rubber pipe insulation., Power wiring from the 5A switch socket within 2m along with a 5A plug top, Control wiring between the unit and thermostat, Supporting frame and suspenders, Earthing of motor and unit., Earthing of motor & unit. Valve assembly with two way control valve, isolation valves, inlet valve with strainer to be factory supplied.				
130.1	1.5 TR Capacity	16	37,775	each	6,04,400
130.2	2.0 TR Capacity	2	41,150	each	82,300
131	SHEET METAL DUCTING, (AIR-CONDITIONING & VENTILATION)				
	Supply, installation, testing of G.I. Sheet Metal Duct Work As Per IS 655 stds of 120 GSM. Rectangular factory fabricated ducting with all ancillary material like anchor fastners on slab, GI threaded rod, nut bolts, neoprene gasket, support angle, MS angle with painted duct frames, sealing of all joints with silicone sealant.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
131.1	0-750 -----0.63 MM (24G) with flanges	700	848	sqm	5,93,250
131.2	751-1500-----0.80 MM (22G) with flanges	450	1,018	sqm	4,57,875
131.3	1501-2250-----1.00 MM (20G) (Plenum)	10	1,358	sqm	13,575
133	Dampers				
133.1	Supply and fixing of GI Manual Volume control dampers for ducts as specified.	10	9,050	Sqm.	90,500
133.2	Supplying, fixing, testing and commissioning of GI fire dampers in supply air duct/main branch and return air path as & where required of required sizes. The damper shall be fusible link type for 120 minutes fire rating as per specifications as required.	6	15,800	Sqm.	94,800
133.3	Supply and installation of supply air grilles extruded aluminum, powder coated as specified				
	150 mm wide linear grilles	180	1,468	Mtr	2,64,150
134	Grilles / diffusers				
134.1	Supply and installation of Exhaust air grilles without VCD extruded aluminum, powder coated as specified	3	7,925	SQM	23,775
134.2	Supply and installation of supply air grilles with VCD extruded aluminum, powder coated as specified	20	11,300	SQM	2,26,000

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
134.3	Supply and installation of Aluminium Powder coated louvers with bird screen as shown in drawings	5	10,738	Sqm	53,688
134.4	Supply and installation of Supply air diffusers of extruded aluminum with VCD, powder coated as specified and complete with Flush or stepdown, 20mm flanges with PVC gasket, removable core type,square, rectangular or as shown on drawings.. 1-way. 2-way. 3-way as specified	1	13,000	SQM	13,000
134.5	Supply and installation of Return air diffusers of extruded aluminum, powder coated as specified and complete with Flush or stepdown, 20mm flanges with PVC gasket, without damper,square, rectangular or as shown on drawings., 1-way, 2-way, 3-way as specified	1	11,875	SQM	11,875
134.6	Supply and installation of Supply air diffusers with factory fabricated plenum and spigot connection. Diffuser shall be extruded aluminum with VCD, powder coated as specified and complete with Flush or stepdown, 20mm flanges with PVC gasket, removable core type,square, rectangular or as shown on drawings., 1-way, 2-way, 3-way as specified. Size - 600x 600	40	4513	Nos	1,80,500
135	Supply installation of 25 mm thick insulated flexible ducts. Make : UPTWIGA / ATCO / Equivalent. Size 250 mm dia	60	1355	Mtr	81,300
136	INSULATION				
	Supply and fixing of Nitrile rubber / cross linked polyethylene with factory backed aluminium foil insulation on duct after applying two coats of adhesive sealing all joints (Indoor applications)				
136.1	13 mm thick (duct in return air path)	500	848	SQM	4,23,750
136.2	18 mm thick (duct in Non AC air path)	300	1,016	SQM	3,04,875

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
136.3	18 mm thick (Air washer exposed to atmosphere) with additional 26 G aluminium cladding	150	1,304	SQM	1,95,563
136.4	Supply and fixing of 15 mm thick nitrile rubber / cross linked polyethylene insulation for Underdeck with manufacturer recommended adhesive, wire netting. as per specifications.	750	904	SQM	6,77,813
136.5	Supply and fixing of acoustic lining of ducts with 25 mm thick, density 48 kg/cu.m resin bonded glass fibre insulation rigid board fixed in frame work as per specifications covered with reinforced fibre glass tissue and finished with 0.50 mm perforated aluminium sheet.	100	681	SQM	68,125
136.6	Supply and fixing of acoustic lining on wall and ceiling of AHU rooms with 50 mm thick, density 32 kg/cu.m resin bonded glass fibre insulation friction fixed in 610 mm X 610mm frame work made of 25x50x50x50x25 made out of 0.6 mm thick G.I.Sheet 'U' shaped channel and covered with reinforced factory backed black glass cloth as per specifications.				
136.6.1	50 mm thick for AHU Rooms	30	1,413	SQM	42,375
137	VENTILATION & EXHAUST SYSTEMS				
	Supply, installation, commissioning & testing of ventilation systems in accordance with and meeting the intents of the specifications complete with AHU Fan section, or inline centrifugal fan or SISW fan or Axial flow fan or Propeller fan as specified with M S Mounting frame,Vibration mounts,Canvas connection, Filter with necessary frame wherever necessary, Drive assembly and motor.				
	Inline centrifugal fans				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
137.1	750 mm / 20 mm SP	3	27,050	No.	81,150
137.2	Propeller Fan with gravity louvres suitable for wall mounting and of low noise				
	300-500 cfm- utility rooms	3	6,200	Nos	18,600
	CHILLED WATER PIPING				
138	Supply, laying, testing and commissioning of nominal sizes of chilled water plumbing inside the building (with necessary clamps, vibration isolators and fittings but excluding valves, strainers, gauges etc.) duly insulated with nitrile rubber covered with factory backed treated woven glass fibre for mechanical protection.				
	The pipes of sizes 150 mm and below shall be of M.S. heavy class as per IS : 1239 and pipe of sizes above 150mm shall be of welded black steel pipe medium class as per IS:3589. and thickness of 200-350 mm dia shall be minimum 6 mm.				
138.1	80 mm dia. x 19 mm thk	80	1,838	Mtr	1,47,050
138.2	65 mm dia.-----do-----	70	1,486	Mtr	1,04,030
138.3	50 mm dia.-----do-----	220	1,156	Mtr	2,54,332
138.4	40 mm dia.-----do-----	100	964	Mtr	96,375
138.5	32 mm dia.-----do-----	100	850	Mtr	85,000
138.6	25 mm dia.-----do-----	50	736	Mtr	36,813

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
138.7	20 mm dia.-----do-----	50	680	Mtr	34,000
139	Supply, fixing, testing and commissioning of Drain piping with insulation of G.I. class B with 6 mm thick nitrile rubber insulation with mechanical protection as per above Water pipes of following size along with necessary clamps, fittings such as bends, tees etc. Adequately supported as per specifications and as required.				
139.1	40 mm dia.	50	254	RM	12,688
139.2	32 mm dia.	100	177	RM	17,709
139.3	25 mm dia.	50	155	RM	7,760
140	Supply, fixing, testing and commissioning of following valves, strainers, gauges in the chilled water piping duly insulated to the same specifications as the connected piping and adequately supported as per specification.				
	Butterfly valves				
140.1	80 mm dia.	2	4,973	each	9,945
140.2	65 mm dia.	2	4,295	each	8,590
140.3	50 mm dia.	8	3,675	each	29,400
	Strainers and Non return valves				
140.4	50 mm dia. Y strainer	2	5,363	each	10,725
140.5	40 mm dia. Y strainer	2	4,800	each	9,600

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Ball valves				
140.6	40 mm dia.	4	2,825	each	11,300
	Pressure independent balancing cum flow control valve with actuator and necessary wirings				
140.7	40 mm dia.	2	37,200	each	74,400
140.8	50 mm dia.	2	49,025	each	98,050
	Instruments				
140.9	Thermowells	8	1,008	each	8,062
140.10	Thermometers	8	1,665	each	13,318
140.11	Pressure gauge	8	1,774	each	14,195
140.12	25mm automatic air vents with valves	6	2,650	each	15,903
141	Electrical Panels				
	Supplying, installation, testing and commissioning of MV panel board of cubical type, compartmentalised design fabricated from 2.0 mm thick CRCA sheet having necessary cable alleys, powder coated trough seven-tank process facility for pricking and degreasing, including connections and inter connections as per specification complete with following accessories as required (Supply panels in each AHU room).				
141.1	AHU STARTER PANELS WITH VFD				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	a. 32 A TPN MCCB motor duty & current limiting type with all settings shall be suitable as per specification for 2.2 KW AHU motors,with LED type ON- OFF indication, auto manual switch & ON-OFF Push Button(1-sets). Energy meter - DIGITAL ADDED	4	73,250	each	2,93,000
142	POWER & CONTROL CABLING				
	Supply and laying of Power and control cabling work with glands and terminations, using XLPE insulated PVC sheathed steel tape/wire armoured aluminium conductor cables of following sizes for electric supply from HVAC panel to various loads including interconnections from starters to motors on suitable cable trays/supports as required including double compression gland connections on both sides as per specifications as required.				
142.1	3CX6 YWY (Blower motor)	100	458	mtr	45,825
142.2	3CX4 YWY (Blower motor)	100	402	mtr	40,200
142.3	4CX 2.5 YWY (pump motor)	60	346	mtr	20,745
142.4	4C X 1.5 YWY (temperature / RH sensor)	100	300	mtr	30,038
142.5	3C X 1.5 YWY (Push button)	100	272	mtr	27,225
142.6	3CX1.0 YWY (Marine lamp)	30	239	mtr	7,155
142.7	2CX1.0 YWY (UV treatment unit & water level sensor)	30	216	mtr	6,480
143	Supply and installation of GI Cable tray perforated type, supports of following sizes as per specifications				
143.1	50 mm wide x 20 mm x 1.6 mm thk	100	294	mtr	29,400

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
143.2	150 mm wide x 50 mm x 1.6 mm thk	500	565	mtr	2,82,500
144	MAKE UP WATER				
144.1	Supply and installation of HDPE water Storage tank 5000 litres	1	39,500	each	39,500
144.2	Supply and installation of 25 mm dia GI ERW class C pipe for make up water	20	368	Mtr	7,350
	BMS				
145	Supply installation testing and commissioning of Individual Automation stations / DDC Controller with I/O module etc., as per IO summary for corresponding AHU as per air flow diagram other equipment considering 10% spare counts with necessary enclosure. The controllers shall be 32 bit microprocessor based standalone and networkable type with real time clock, with inbuilt port for POT (Portable Operating Terminal), Peer-Peer communication and battery backup in an enclosure with necessary accessories, transformers, SMPS, wiring and relays etc., complete in all respect as per IO schedule of following systems. Light arrangement shall be provided inside each DDC panel.				
145.1	DDC Controller - AHU -01 , 02- GROUND FLOOR- common DDC	1	50,750	each	50,750
145.2	DDC Controller - AHU - 03 , 04	2	39500	each	79,000
145.3	DDC Controller - Air washer	3	39,500	each	1,18,500
	Supply installation testing and commissioning of field instruments				
145.4	Return air temperature / RH sensor	4	12,400	each	49,600
145.5	Outside air temperature / RH sensor	1	12,400	each	12,400

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
145.6	Differential pressure switch	14	6,775	each	94,850
145.7	Room pressure sensor - Labs - fume hood	3	29,275	each	87,825
145.8	Supply and installation of all necessary accessories like tubings, junction boxes, connectors, MS angle stands with painting, frames etc glanding, lugs, etc for mounting of all the above sensors to make the system complete.	1	67,750	Lot	67,750
145.9	Supply, installation, testing and commissioning of following armoured cables. All control cables shall have BLUE colored XLPE sheath FRLS.				
	PVC Sheathed ATC (Annealed Tinned Copper) shielded cable				
145.9.1	2 Core , screened min 1.0 sq.mm	350	255	Mtr	89,250
145.9.2	4 Core , screened min 1.0 sq.mm	100	311	Mtr	31,125
145.9.3	2 core, screened, min 1.5 sqmm, copper cable (BAS signal).	500	255	Mtr	1,27,500
	V - FIRE PROTECTION SYSTEM				
146	Removing ,Re-using (usable) and disposing (un-usable) of existing underground pipes as per site conditions.				
146.1	200 NB	50	750	Mtr	37,500
146.2	150NB	50	500	Mtr	25,000
146.3	80NB	15	300	Mtr	4,500

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
147	Removing ,Re-using (usable) and disposing (un-usable) of existing above ground pipes as per site conditions.				
147.1	150NB	50	400	Mtr	20,000
147.2	80NB	15	250	Mtr	3,750
	Removing and Re-using existing Sluice valves as per site conditions.				
147.3	200NB	1	750	each	750
147.4	150NB	1	500	each	500
148	Under Ground piping - Supply, erection, testing and installation of MS pipes conforming to IS 3589 for 200NB & above and IS 1239 for 150NB & below with welded joints including cutting the pipes to correct length, providing and welding flanges to pipe, fixing with clamps to MS brackets/ hangers, making flanged joints with necessary nuts, bolts, gaskets,. blank flanges, etc. Rates including 10% radiograph all complete as per specifications of the following diameters.				
148.1	200 NB - Heavy	115	3,600	Mtr	4,14,000
148.2	150 NB - Heavy	166	2,454	Mtr	4,07,364
148.3	80 NB - Heavy	33	1,168	Mtr	38,544

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
149	For above Ground pipe: Supply, fabrication & installation of Class 'B' MS black pipe confirming to IS 1239 including cutting, welding MS flanges fixing in pump room and yard and wherever necessary nuts, bolts, gaskets. Rates inclusive of heavy class fittings, steel supports with painting, anchor bolts, hitec supports, clamping etc as per specification. Rate shall be inclusive of Zinc chromate primer over that 2 coats red enamel paint as per Fire authorities requirement and providing pedestal for above ground pipes as per the drawing.				
149.1	150 NB - Heavy	45	2,531	Mtr	1,13,895
149.2	80 NB - Heavy	10	1,211	Mtr	12,110
149.3	25 NB - Heavy	15	406	Mtr	6,090
150	Supply & Installation of Cast iron sluice valve including making necessary flanged joints by providing necessary nuts, bolts, gaskets, etc. all complete as per specification				
150.1	200 NB, PN 1.6 rating	1	26,750	each	26,750
150.2	150 NB, PN 1.6 rating	1	16,323	each	16,323
150.3	80 NB, PN 1.6 rating	1	8,157	each	8,157
151	Supply & installation of Cast Iron Butterfly Valves including matching flanged joints by providing necessary nuts, bolts, gaskets (1.5 mm CAF) etc. All complete as per specifications.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
151.1	100 NB	3	8,251	each	24,753
152	Providing & installation of gunmetal gate valve having screwed ends				
152.1	50 NB.	3	3,537	each	10,611
153	Supply & installation of 20 mm dia CI Automatic Air Release Valve to all wet risers all complete as per specifications.	2	2,383	each	4,766
154	Removing and Re-using existing hydrant valves as per site conditions	2	1,500	each	3,000
155	Removing and Re-using existing hose box as per site conditions	2	750	each	1,500
156	Supply, installation, testing and commissioning of courtyard Gun metal Single headed hydrant as per IS: 5290 consisting of 63NB single outlet flanged oblique type hydrants valve with instantaneous female plunger type coupling, chained blank cap including making flanged joints by providing necessary nuts, bolts, gaskets all complete as per specifications.	3	8,045	each	24,135
157	Supply & installation of RRL type-A hose cabinet of 63mm dia. x 15 meters long with heavy quality gun metal male coupling of IS: 903. combined with 2 Nos of Canvass hoses and 1 No. of nozzle.	3	14,401	each	43,203

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
158	Supply installation of fabricated 18SWG MS sheet of size 750x600x250 with glass fronted door, with synthetic enamel / with a coat of primer painted in red out side and white in inside, hose boxes along with GI support angles for courtyard hydrants. Each box shall be capable to accommodate 2 hose each of 63 mm dia x 15 m long hose pipe, nozzle, branch pipe etc.	3	3,907	each	11,721
159	Supply & installation of 63mm dia. approved make GM single headed fire hydrant landing valves (with instantaneous female plunger type couplings, chained blank caps) including making flanged joints by providing necessary nuts, bolts, gaskets, etc. painting complete as per specifications.	3	8,045	each	24,135
160	Supply & installation of RRL type-A hose cabinet of 63mm dia. x 15 meters long with heavy quality gun metal male coupling of IS: 903. combined with 2 Nos of Canvass hoses with painted MS hose tray of size 600 x 250 x 200 and 1 No. of nozzle.	3	18,245	each	54,735
161	Supply & Installation of drum type wall mounting hose reels, swivelling 180° consisting of 25 mm dia. x 30 meters long armoured rubber hose pipe with 15 mm dia. bronze shut of type jet nozzle & cut-off valve on the inlet including making connection to the wet riser, by drilling welding, fixing the hose reel to the wall by providing necessary anchor fasteners/ expansion bolts, grouting the same with cement mortar, painting all complete as per drawings, specifications.	3	13,666	each	40,998

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
162	Supply and fixing of fire shutter fabricated out of anodised aluminium sheet and frame,door shall be 900mmx1500mm & fixed with 4mm thick class,suitable rubber beeding and locking arrangement.Quoted rate shall be includes all fateners etc, and complete shutter shall be powder coated of approved colour both inside and outside.	3	8,479	each	25,437
163	Supply & installation of Siamese inlet (Fire Brigade inlet) connection with provision for Four male instantaneous coupling fabricated out of 150 mm dia. approved make heavy class MS pipe with non-return valve, for fire fighting system including making connection by providing necessary piping & fittings to the fire storage tank, fire fighting wet riser, sprinkler system painting the same with 3 coats of enamel paint over a coat of Zinc Chromate primer all complete as per drawings, specifications.Connection to Fire Tanks / Yard Hydrants.Fire brigade body and NRV will be made of gun metal.	1	34,414	each	34,414
164	Supply and wrapping of Coating & Wrapping Materials manufactured as per IS 10221 (make:Pypkote) 4mm thick for underground Pipes as per specification Steel pipelines to be laid underground buried in the soil shall be protected against corrosion by means of coating & wrapping as per IS:10221. The above coating and wrapping shall be carried out in systematic manner such that uniform thickness of coating is obtained as per IS specification. Buried pipelines shall be laid in general with top of pipe 1(one) meter below the ground level. Where soil conditions are not satisfactory, masonry or equivalent supports shall be provided at regular intervals. The rate shall be inclusive of holiday test of undergorund pipes.	150	419	Sqm.	62,850

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
165	Supply and installation of Orifice plate made out of stainless steel 5mm thick 100 NB dia	4	3,843	each	15,372
166	Construction of valve chambers with 345mm thick brick wall in CM 1:5, 200mm thick PCC base of 1:4:8 and internal size of 1m x 1m x 1.3m depth with heavy duty CI cover as per specification. Internal walls to be plastered in CM 1:4.	3	31,013	each	93,039
167	Supply and erection of Hume pipes (NP3 class) of approved make				
167.1	300mm dia Hume Pipe NP3 class	30	1,500	m	45,000
III	SPRINKLER SYSTEM				
168	Supply, erection, testing and installation of heavy class black steel pipes conforming to IS 1239 with welded joints including cutting the pipes to correct lengths, fixing with clamps to MS brackets / hangers, steel supports, hitec supports as per drawing. The hydro testing shall be done at 18 kgs/cm ² pressure. Rate shall be inclusive of Zinc chromate primer over that 2 coats red enamel paint as per Fire authorities requirement over all above ground pipes. Rates to inclusive of all complete as per specifications (including heavy class forged fittings of IS standards) of the following diameters.				
168.1	150 NB.	45	2,701	Mtr	1,21,545
168.2	100 NB.	38	2,857	Mtr	1,08,566
168.3	80NB.	63	1,991	Mtr	1,25,433

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
168.4	65 NB.	34	1,092	Mtr	37,128
168.5	50 NB.	13	891	Mtr	11,583
168.6	40 NB.	7	663	Mtr	4,641
168.7	32 NB.	14	571	Mtr	7,994
168.8	25 NB.	604	451	Mtr	2,72,404
169	Supply and installation of Pendant type Sprinkler head with the following temperature rating & respond, universal deflector, chromium finish as per specifications. Size: 15-mm dia. The rate shall be inclusive of Stainless steel Rossette plate in office area and other false ceiling areas. Temperature Rating: 68°C Standard respond	300	399	each	1,19,700
170	Supply, erection, testing and commissioning of Temperature Rating: 68°C standard response Upright sprinklers for office area.	300	312	each	93,600
171	Supplying & installing of approved make flow switches (flow sensors) suitable to be fixed directly on line of the following diameters, with 1 NO & 1 NC potential free contacts				
171.1	100 NB	3	6,311	each	18,933
172	Supply & installation of Instrument cables for flow switches to annunciator panel The cable should be 2 core x 1.5 Sq.mm copper armoured cable. Complete as per specification.	1000	123	Mtr	1,23,000

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
173	Supply, installation, testing and commissioning of water flow will activate a hydraulic powered water motor alarm by way of integral valve alarm line trim piping. Water motor gong shall be connected to a water pressure retarding chamber to limit the propensity of unnecessary alarms. Water motor alarm shall be equipped with a rear closure plate to limit the access of foreign materials of accumulation of debris. Size of alarm valve shall be 150NB.	1	62,738	each	62,738
174	Steel supports for piping like clamps, tierods, brackets, nuts and bolts as per details given in the drawings.	500	110	kg	55,000
IV	PORTABLE FIRE EXTINGUISHERS				
175	Supply & installation of following Portable Fire Extinguisher :				
	Pressure in tank must sustain up to DLP .and if pressure drop found with in DLP, same need to refilled free of cost. Vendor must take inspection camps of PORTABLE FIRE EXTINGUISHERS with in DLP period.				
175.1	ABC Type Extinguisher				
	Capacity - 5 Kg	30	2,657	each	79,710
	Type - Upright				
	IS - 15683				
	Supply, installation, testing and Commissioning of the following system as per the technical specification.				
A - I	FIRE ALARM SYSTEM.				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
176	Analogue addressable micro Process - controlled Fire Alarm Control Panels, capable of being IP networked to the central monitoring System, to monitor and integrated the following quantity of accessories like detectors, MCP's/hooters/control modules, Fault Isolation Modules, hooters, response indicators, fire/fault indicators, audio-visual signals, central processing units, complete with LCD display, zone indicating LEDs as per the detailed specification: complete with 24V DC Battery backup with charger for each panel. Each loop should provided with minimum 125 detectors /devices (Proposed System Shall be integrated with existing system)				
176.1	4 LOOP PANEL	1	2,85,000	each	2,85,000
	RATE OF RISE HEAT DETECTORS :				-
177	Supply, Installation, Testing and Commissioning of Rate of Rise Heat Detectors (Thermal Detectors):GRADE-I Addressable analogue type Heat Detectors with solid state design with sensing element combination of fixed type and rate of rise of temperature indicating LED, mounting base etc. as per detailed specifications.	70	2,900	each	2,03,000
178	SMOKE DETECTORS				-
178.1	Addressable analogue MUTISENSOR type smoke detectors with dual chamber, solid state design, indicating LED, mounting base etc. as per detailed specification. The rate shall inclusive of necessary base box, connecting glad for above detectors	150	2,782	each	4,17,300
178.2	Duct detector suitable for providing the return air path with suitable fixing accessories	6	10,503	each	63,018
	ELECTRONIC HOOTERS :				-

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
179	Hooter with relay module and storb light with minimum 85 db audible and control relay module,24V DC power supply units etc	60	6,406	each	3,84,360
	MANUAL CALL POINTS :				-
180	Manual call points pull stations of approved make with NO/NC contacts slim type and projecting out from the surface of enclosure with glass suitable for addressable function	30	3,443	each	1,03,290
	FAULT ISOLATION MODULE :				-
181	Fault isolation module to electrically isolate different sections of detector loops.	15	2,582	each	38,730
	CONTROL MODULE				-
182	Addressable control module to trip the AHU,s, Access door, triggering the DVR etc	25	2,982	each	74,550
183	Addressable monitor module for door contact for Fire doors and Flow switch	25	2,782	each	69,550
	RESPONSE INDICATOR				-
184	Response indicator for mounting on false ceiling at the entries of the cabin for indicating the operation for detectors in the above areas.	130	127	each	16,510
	MIMIC PANEL				-

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
185	Supply, fixing, testing and commissioning of 10 zone mimic panel as per the specification. The mimic panel shall have respective floor layout printed in the Acrylic sheet with suitable colour & LED indication as required by engineers in charge. The size of the mimic panel shall be A3 with suitable Powder coated base box. Also, the rate shall be inclusive of all power supply units, driver card, control MCB etc. The panel should be connected from Main fire alarm panel through bus cables.	3	31,500	each	94,500
	CABLES / WIRES				-
186	Supply and fixing of 2C 1.5 armoured copper FRLS cable in ceiling with suitable clamps and screws (RED colour)	3000	135	Mtrs	4,05,000
187	25mm dia MS conduit for laying of fire cable including necessary accessories like bend, junction box fixing of clamps etc., complete. The conduit shall be recessed in wall including chipping, roun plastering etc. (only for the Drops - MCPs)	500	80	Mtr	40,000
	Proposed system shall be integrated with existing Fire Alarm system				
A - II	PUBLIC ADDRESS SYSTEM AND EVC SYSTEM				
188	Supply, Installation, Testing and Commissioning of 6 W Ceiling Mounted Speakers with line matching transformers & selectedable tap setting as specified in the Tender Specifications for false ceiling areas.	70	1,090	set	76,300
189	Supply, Installation, Testing and Commissioning of Supply & Laying of 2 core twin twisted 48/0.2 ATC, Multi strand, over all armored speaker cable as specified in the Tender Specifications	2000	113	Mtr	2,26,000
A - III	ACCESS CONTROL SYSTEM				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Access control system complete with necessary hardware, Software etc., as specified for centralized security monitoring. Supply, installation, testing and Commissioning of the following system as per the technical specification.				
190	Access Controllers, each with capacity of 10000 events buffer memory connecting the item listed below such as card readers, , Magnetic locks, boom barriers etc				
190.1	1 door - 2 reader controller	22	27,000	Nos	5,94,000
190.2	Smart Card readers with stainless steel base plate	41	7,750	Nos	3,17,750
190.3	Release push button	41	301	Nos	12,341
190.4	Electromagnetic Locks - Double Door	34	5,607	nos	1,90,638
190.5	Electromagnetic Locks - Single Door	7	11,054	nos	77,378
190.6	Magnetic Contact	75	241	Nos	18,075
	FRLS sheilded Cables:				-
191	Cable from electromagnetic lock/Sensor to Controller - 1 Sqmm 4 C sqmm multistand armoured shielded cable	1800	160	Mtrs	2,88,000
191.1	Cable from Reader to Controller - 1 Sqmm 6 C sqmm multistand shielded armoured cable	1800	192	Mtrs	3,45,600
191.2	Network cable for controller to controller - Armoured cable	500	92	Mtrs	46,000

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
191.3	25 mm dia MS conduit for the laying of cable with suitable clamp in ceiling with junction box, bend etc (only for the drops)	250	141	Mtrs	35,250
191.4	Smart Card with holder, Lanyard, Adhesive labels for printing the ID card	250	514	Nos	1,28,500
192	Emergency break Glass	41	1,182	Nos	48,462
A - V	Miscellaneous items				
	Supply, Installation, testing and Commissioning of the following system				
193	Wiring to the IBMS equipment using 2 R uns of 1.5 Sqmm insulated copper cable and 1R-1.5 Sqmm of earthing inside the suitable size MS conduits with clamp and fixing accessories - The supply should be taken from existing UPS DB.	750	145	Mtrs	1,08,750
194	Supply of 6 A 3-Pin Socket mounted on PVC Box which has to be fixed in wall as required. The Socket should be of modular type	75	528	Nos	39,600
	VII - EXTERNAL FACADE WORKS				
A	Glazing works				

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
195	Semi unitized Glazing with Punched / Strip window System (with Glass): Quote rate for complete system designing, providing and fixing Semi Unitized structurally glazed punched / strip window system with structurally held in position by Structural sealant and factory fabricated with Aluminium adaptor of suitable size in order to satisfy the structural design criteria specified in the Technical specification. In general, the system comprising Aluminium anodized extruded frames & Adapters, aluminium sub frame & L - Angle around the windows , Toggle cleats, HDG brackets & SS anchors and bolts (spanning 3.20 M as max), flashing & smoke seal around the window etc with Insulated Glass of 24 mm thick having Reflective coated glass - ST 167 of Saint Gobain make or Spring (SC60/52) clear of Asahi make as outer pane and 12 mm airgap and 6 mm thick uncoated clear glass as inner pane of same make. Both panes are heat strengthened.				-
	Rate shall exclude the cost of top hung window hardwares and insulation, which will be measured and paid separately under the respective item below. Rate shall include the cost of supplying and fixing of glass, Top hung window hardwares, aluminium sub frame & L - angle, visual mock up and field water test. System to be designed to with stand design wind pressure of 150Kg/Sqm confirming to IS 875 part 3 and other load parameters specified in Technical specification. Refer Particular Specification	50.00	9,500.00	Sqm	4,75,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
226	<p>Designing, providing and fixing colour anodized aluminium Swing Door as part of Glazing system and fabricated as per drawing and fixed at all levels, elevations and heights by using aluminium box frame of size 100 x 40 mm and thickness not less than 2.0mm as outer frame and suitable aluminium frames with rebated profile shall be used for Doors with thickness not less than 2.0mm. Aluminium box frame shall be fixed into wall/RC by using SS anchor fasteners of Hilti make or approved equivalent. All glass panels shall be fixed by using snap fit aluminium colour anodized beading with special water proof cascades, Neoprene, hardware etc. complete, as directed.</p> <p>All aluminium sections shall be 63400 (H9) grade conforming to IS 8147. All aluminium sections shall be finished with exterior grade powder coat of thickness not less than 70 microns and weight ratio joints mitered adjoined with heavy duty aluminium pressure die cast cleats with fins to match the sections of frames.</p>				-
	<p>Door shall be provided with necessary hardware such as Door closer - ITS 96 EN 2 - 4 or TS 91 EN 3 (Opening restrict to 85 deg), Mortise dead lock - Model No. 278 (both side key operation) SS forend and SS strike plate (Suitable for both single / double leaf shutter) of Satin finish - Grade SS 316, SS satin finish handle - TG9377-25 (Angled Spacer) - 600 mm long with back to back handle SS 316 grade, SS hinges (Minimum 4 Nos / Shutter) SS Door stoppers floor mounted, Door buffers etc. complete and as directed. All Hardware shall be Dorma / Kinlong / Geze Make.</p>				-

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Rate shall include the cost of supplying & fixing 12.52 mm thick laminated glass having 6 mm thick as outer panel and 5 mm thick as inner panel with interlayer of 1.52 mm thick sentry Glass (R) of Dupont make. Outer pane glass shall be reflective coated glass - Inner pane and Outer pane glass shall be uncoated clear glass of Saint Gobain make or Asahi make. Both panes shall be heat treated and heat soak tested. System to be designed to with stand design wind pressure of 150Kg/Sqm confirming to IS 875 part 3 and other load parameters specified in Technical specification. Refer Particular Specification				-
195.1	Single Leaf door (1.00 x 2.40M)	2.50	21,000.00	Sqm	52,500.00
195.2	Double Leaf door (2.0 x 2.70M)	6.00	21,500.00	Sqm	1,29,000.00
196	Designing, providing and fixing Aluminium fixed cum sliding windows using 2 track or 3 track system finished with exterior grade powder coated of thickness not less than 70 microns and having Monolithic - 6mm thick Reflective coated glass - ST 167 of Saint Gobain make or Spring (SC60/52) clear of Asahi make. Rate shall include the cost for supplying and fixing of glass, non staining weather silicon sealant of Dowcorning or approved equivalent make shall be provided at the junctions between wall, main frames and wherever required, stainless steel safety clips at each corner of glass as an additional safety to avoid breakage of corner of the glass, aluminium powder coated 'L' angle 50 x 25 - 2.30 mm thick around the window including subframe of size 14 x 62mm weight not less than 0.855 kg/m of sec.no 1698 of Bhoruka make and also to be provided with EPDM gasket as weather strip to ensure water and air tightness and shall include				

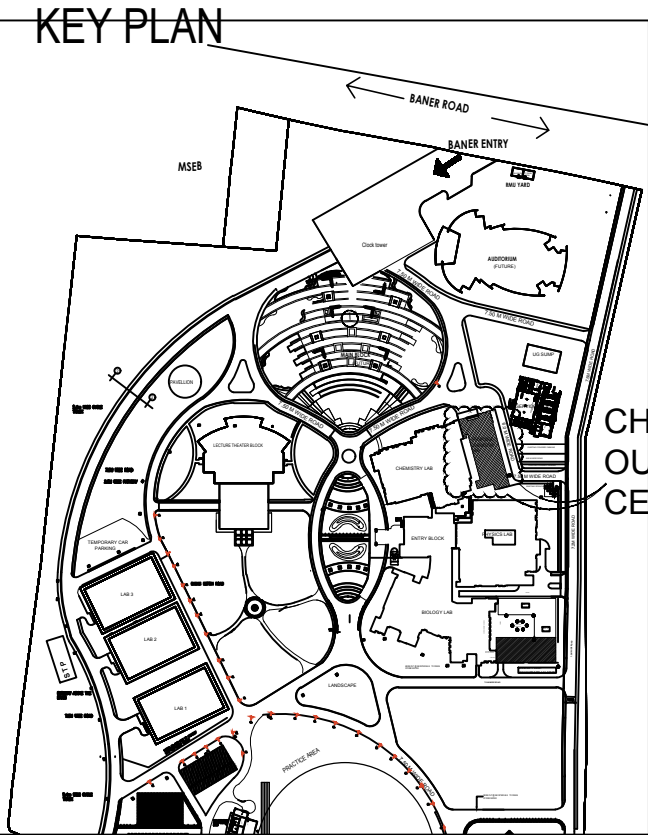
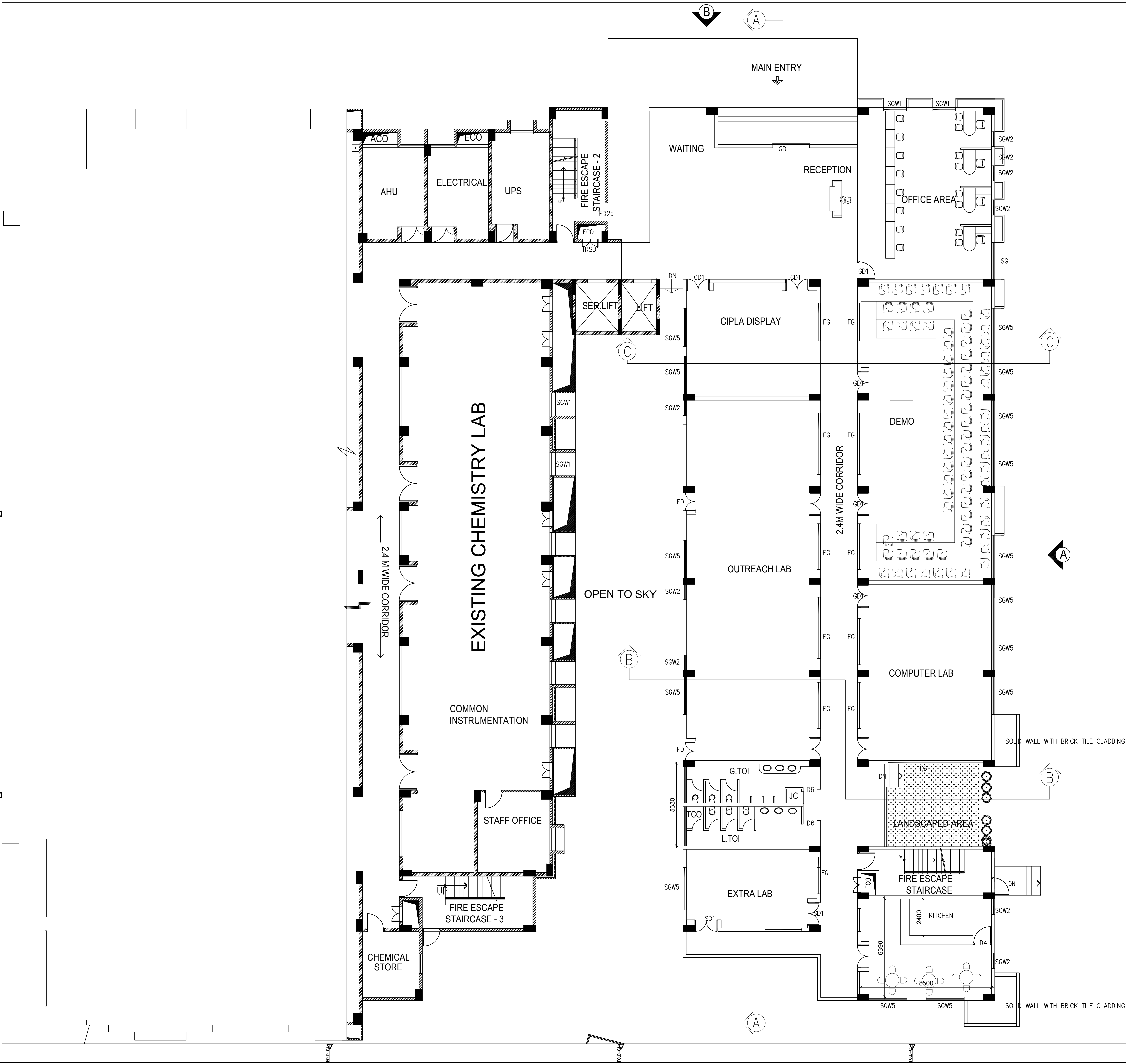
SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	providing necessary hardwares like, rollers, concealed locks cum Handle and scaffolding etc. complete all as directed. Thickness of aluminium frames shall be not less than 1.80 mm thick. (Provisional Item). Refer Particular Specification Item. No. 22.06. which shall form part of BOQ	10.00	7,500.00	Sqm	75,000.00
197	Designing, providing and fixing Fixed cum Top Hung Window with Aluminium Extruded sections of approved Extruder and fabricate the windows as per drawing and fixed at all levels, elevations and heights. All aluminium sections shall be 63400 (H9) grade conforming to IS 8147 and thickness of aluminium sections shall not be less than 2.0mm. All aluminium sections shall be finished with exterior grade powder coat of thickness not less than 70 microns. Main / outer frames shall be fixed into masonry wall / RC concrete surface with necessary clamps, fasteners with Hilti make and other fastening materials shall be in stainless steel SS 316 grade.				
	Rate shall also include for providing and fixing aluminium extruded Alu. Sub frame of the section size size 14 x 62mm weight not less than 0.855 kg/m of sec.no 1698 of Bhoruka make matching with window finished with exterior grade powder coat of thickness not less than 70 microns with suitable size as per site, cost for scaffolding, non staining weather silicon sealant of Dowcorning or approved equivalent make shall be provided at the junctions between wall, main frames and wherever required. Rate shall also include the cost of hardwares like SS 316 grade friction hinges, handle with multi point locking of approved make etc and safety clips at each corner of glass as an additional safety to avoid breakage of corner of the glass and also to be provided with EPDM gasket as weather strip to ensure water and air tightness. System to be designed to with stand design wind pressure of 150 Kg/Sqm and other load as per IS code or relevant international code.	250.00	6,750.00	Sqm	16,87,500.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
198	Designing, providing and fixing aluminium Fixed window with Storm proof louver and fabricate the windows as per drawing and fixed at all levels, elevations and heights having a main frame work of vertical and horizontals, made out of locally extruded sections with thickness not less than 1.80mm to satisfied the structural design criteria specified in the technical specification. All aluminium sections shall be 63400 (H9) grade conforming to IS 8147, finished with exterior grade powder coating of thickness not less than 70 microns of approved colour. Rate shall include fixing the main frames into masonry wall / RC concrete surface with necessary clamps, fastening straps, nuts, bolts, rivets, washers and other fastening materials shall be in stainless steel or aluminium.				
	<p>Window shall be provided with monolithic glass of approved make and tint as given below and as per design for all panels and with snap fit aluminium colour anodized beading with special water proof cascades, Neoprene etc. complete, as directed. Necessary weather silicon sealant of Dow corning or approved equivalent make shall be provided at the junctions between wall and main frames.</p> <p>Rate shall include stainless steel safety clips to be provided on each corner of glass as an additional safety to avoid breakage of corner of the glass and also to be provided with EPDM / Neoprene triple barrier, extruded Reddiprone weather strip to ensure water and air tightness and shall include providing necessary accessories etc. complete all as directed. Rate shall also include for providing and fixing aluminium extruded aluminium 'L' angle - 2.0mm thick with suitable size as per site or Alu. Sub frame of the section size of 14 mm height and width matching to the outer profile at around the window. System to be designed to with stand design wind pressure of 150 Kg/Sqm and other load parameters specified in the Technical specification</p>				

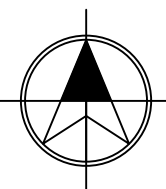
SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
	Designing, providing and fixing aluminium extruded louver "Z" type finished with exterior grade powder coat of thickness not less than 70 microns of approved colour and as described below and System to be designed to with stand design wind pressure of 150Kg/Sqm confirming to IS 875 part 3 and other load parameters specified in Technical specification. Refer Particular Specification				-
198.1	Support system to fix the Louver: Providing and fixing complete louver system having aluminium box frame, aluminium flat to receive the louvers and aluminium angles around the louvered window to protect the water ingress through the outer frame etc and to be designed to with stand design wind pressure specified. Note : Weight will be considered only for the assembled frame part and hence necessary wastage shall form part of the rate quoted.	1,000.00	400.00	Kg	4,00,000.00
198.2	Fixed Louver: Providing and fixing Storm proof Louver - Louver - 75 x 28 x 1.5 mm thick section no 2089 - weight not less than 0.464 Kg/Rmt "Z" type made out of specially extruded aluminium with powder coated finish and as specified in Particular specifications and to be fixed with pitch not less than 50 mm and overlapping shall be 25 mm as minimum as shown in the drawing. Rate shall include supply and fixing of Louver, but excluding cost frames, plates, L - angle and other accessories, which shall part of Item above.	200.00	3,800.00	Sqm	7,60,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
199	<p>Canopy cladding: Designing, Providing and fixing the system to clad the Laminated sandwiched composite panel of Alucobond or Knauf of Fameline make or Eurobond with approved colour and shade (4 mm (0.5 + 3.0 + 0.5) ACP with 3000 series coil and 100% virgin LDPE core) as per the specification described in Technical specifications for Canopy and Pergola as per profile and shape shown in the Drawing with necessary Hot dip Galvanized Structural steel support to clad the ACP and all support to be designed to withstand the Design wind pressure and the specification specified in specifications etc complete. Main structural steel support will consider under respective item separately. Also drip mould on the canopy shall be considered at suitable location by using aluminium powder coated channel matching to ACP.</p> <p>Rate shall include the cost of supplying and fixing of Laminated sandwiched composite panel (ACP), Drip mould, Non staining weather for Vertical & horizontal joints in general the frame work for ACP cladding consists of aluminium box frame with thickness of not less than 2.0mm with suitable size of box frame to satisfying the design criteria with require nos of cleat (spacing not more than 300 mm) having thickness not less than 2.0mm to hold the ACP and HDG bracket with maximum 600mm c/c spacing etc, complete. All anchors, bolts and screws shall be SS 316 grade of Hilti / Fischer make. Refer Particular Specification item - 22.05</p> <p>NOTE :- Main structural steel frame work for Canopy and Pergola to clad the canopy with ACP shall consider under respective Items, but the aluminium frame work and supporting bracket required for cladding shall be part of the rate quoted under this item.</p>	50.00	4,500.00	Sqm	2,25,000.00

SL.No	Description	Qty	Rate (Rs.)	Unit	Amount (Rs.)
200	Providing and fixing aluminum work for doors, windows, ventilators and partitions with extruded built up standard tubular sections / appropriate Z sections and other sections of approved make conforming to IS: 733 and IS : 1285, fixed with raw plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC / neoprene felt etc. Aluminium sections shall be smooth,rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / panelling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge.				
200.1	For fixed portion -Powder coated aluminum (minimum thickness of powder coating 50 micron)	750	Kg	384.50	2,88,375
200.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of PVC / neoprene gasket required (Fittings shall be paid for separately). A) Powder coated aluminum (minimum thickness of powder coating 50 micron)	200	Kg	444.90	88,980
201	Providing and fixing glazing in aluminum door, window, ventilator shutters and partitions etc. with PVC/ neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in charge . (Cost of aluminum snap beading shall be paid in basic item):				
201.1	With heat strengthened glass panes of 5 mm thickness	100	sqm	1303.95	1,30,395
201.2	With toughened glass panes of 8 mm thickness	180	sqm	1453.90	2,61,702
201.3	With frosted toughened glass panes of 4 mm thickness at louvers / panels above door.	10	sqm	1041.50	10,415
	TOTAL AMOUNT IN Rs				8,94,22,648



- LEGEND :-
- 230MM THK FLY ASH BRICK WALL
 - 100MM THK FLY ASH BRICK WALL
 - COLUMN & R.C WORKS



GENERAL NOTES :-

ALL DIMENSIONS ARE IN MILLIMETRES AND ARE UNFINISHED DIMENSIONS UNLESS OTHERWISE SPECIFIED.

ALL LEVELS ARE IN METRES AND ARE UNFINISHED LEVELS UNLESS OTHERWISE SPECIFIED.

DO NOT SCALE DRAWINGS. ONLY WRITTEN DIMENSIONS SHALL BE FOLLOWED. ANY DISCREPANCIES NOTED SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT PRIOR TO EXECUTION.

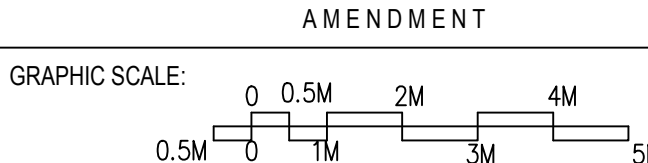
FOR DETAILS SUCH AS DOORS, WINDOWS, GRILLS, GATES, SKYLIGHT, TOILETS, STAIRCASES, HANDRAIL, RAILING, ETC REFER RESPECTIVE ARCHITECTURAL DRAWINGS.

THESE DRAWINGS SHALL BE CORRELATED AND READ IN CONJUNCTION WITH RESPECTIVE CONSULTANTS' APPROVED DRAWINGS FOR STRUCTURAL, MECHANICAL, SERVICES SUCH AS PLUMBING, SANITARY, ELECTRICAL, AIR-CONDITIONING, VENTILATION, RAINWATER DRAINAGE & WATERPROOFING AND LANDSCAPING. ANY DISCREPANCIES NOTED SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT PRIOR TO EXECUTION.

ALL TOILETS WILL HAVE SINK FLOORS (UNLESS OTHERWISE SPECIFIED) AS PER RESPECTIVE STRUCTURAL DRAWINGS, AND WATERPROOFING AS PER SPECIFICATION.

ALL ROOF SLABS TO HAVE WATERPROOFING AND INSULATION TREATMENT AS PER SPECIFICATIONS.

T1	ISSUED FOR TENDER	27.05.17	MRA	ANU/R
REV.	DESCRIPTION	DATE	BY	CHKD.



CLIENT:

 **INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH(IISER), PUNE.**

PROJECT:

PROPOSED CAMPUS FOR IISER,PUNE

ELECTRICAL CONSULTANT: **EMEA**
Designers and Consultants
Kundan Classic?, Office No. 4,
Ground Floor,S. No. 46/D/1/A/1,
Aundh-Spicer Road,
BopodiPune -411003,
Maharashtra,India
Telefax: 020-25813060
Email: emea@emea.co.in

HVAC CONSULTANT: **EMEA**
Designers and Consultants
Kundan Classic?, Office No. 4,
Ground Floor,S. No. 46/D/1/A/1,
Aundh-Spicer Road,
BopodiPune -411003,
Maharashtra,India
Telefax: 020-25813060
Email: emea@emea.co.in

DRAWING TITLE:

**PROPOSED CHEMISTRY OUTREACH CENTER
GROUND FLOOR PLAN**

SCALE : 1:125 (A1)	DRAWN : R.SAILAKSHMIL	T1
DATE : 18.05.17	DESD : R.ANURADHA	
	CHKD : CSR	


CLIENT SIGNATURE :

DRAWING NO:

IISER-LAB-Ar1-1236-T1-122697

Design | Interiors | Engineering | Construction management

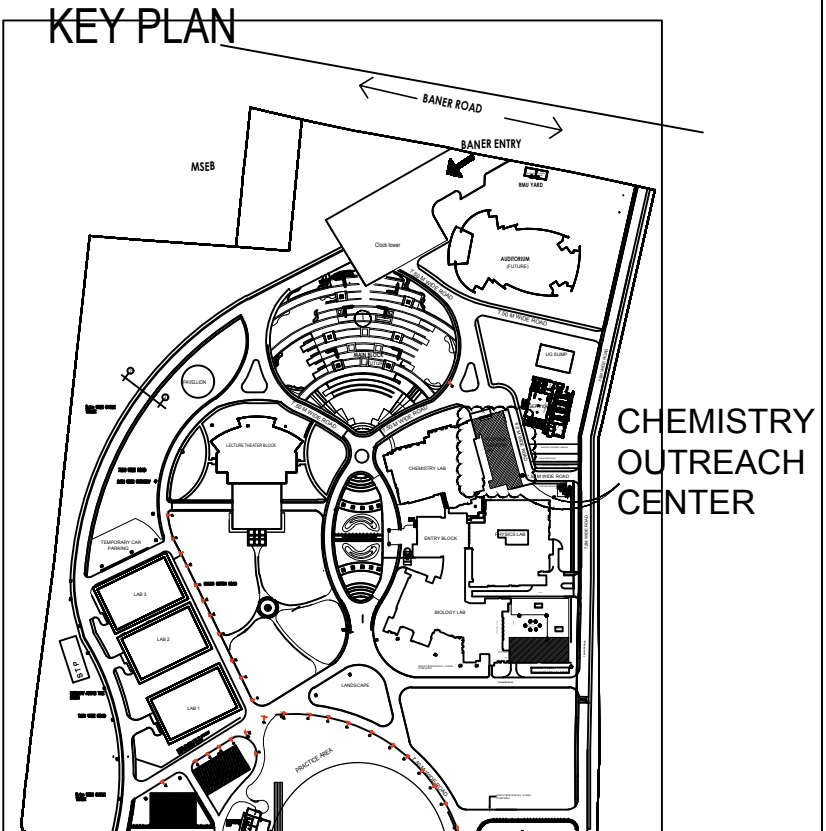
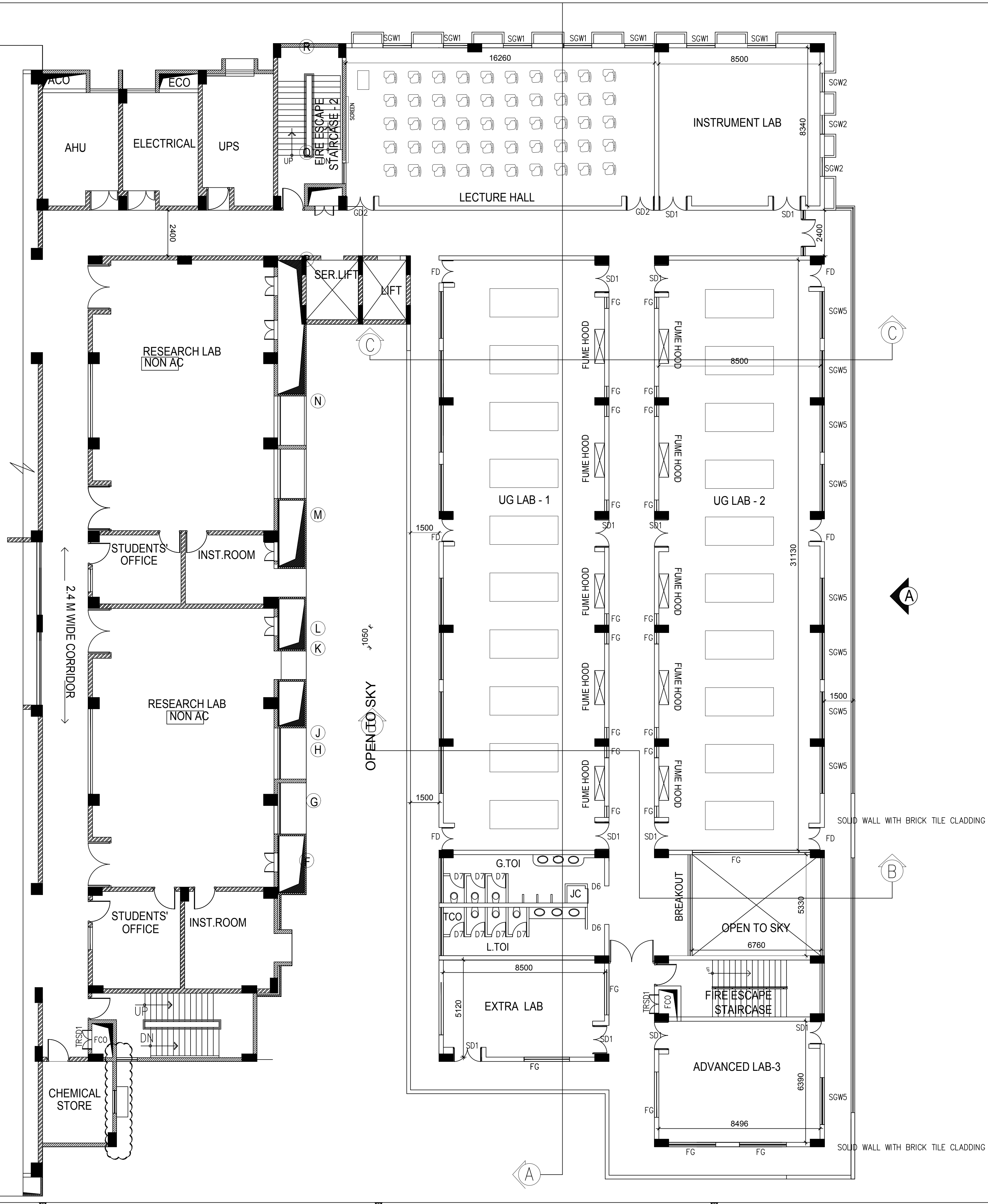
C.R.Narayana Rao (Consultants) Private Limited

 **C R NARAYANA RAO**

No. 10, Karpagambal Nagar,
Mylapore, Chennai-600 004,
India.
www.crn.co.in

SECOND FLOOR PLAN

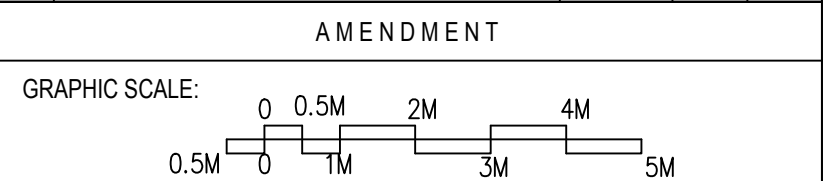
EXISTING CHEMISTRY LAB



LEGEND :-	
230MM THK FLY ASH BRICK WALL	
100MM THK FLY ASH BRICK WALL	
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FOR DETAILS SUCH AS DOORS, WINDOWS, GRILLS, GATES, SKYLIGHT, TOILETS, STAIRCASES, HANDRAIL, RAILING, ETC REFER RESPECTIVE ARCHITECTURAL DRAWINGS.
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ALL TOILETS WILL HAVE SINK FLOORS (UNLESS OTHERWISE SPECIFIED) AS PER RESPECTIVE STRUCTURAL DRAWINGS, AND WATERPROOFING AS PER SPECIFICATION.
ALL ROOF SLABS TO HAVE WATERPROOFING AND INSULATION TREATMENT AS PER SPECIFICATIONS.

T1	ISSUED FOR TENDER	27.05.17	MRA	ANU/R
REV.	DESCRIPTION	DATE	BY	CHKD.



CLIENT:

**INDIAN INSTITUTE OF SCIENCE
EDUCATION AND RESEARCH(IISER),
PUNE.**

PROJECT:
PROPOSED CAMPUS FOR IISER,PUNE

ELECTRICAL CONSULTANT: EMEA
Designers and Consultants
Kundan Classic?, Office No. 4,
Ground Floor,S. No. 46/D/1/A/1,
Aundh-Spicer Road,
BhopalPune -411003.
Maharashtra,India
Telefax: 020-25813060
Email: emea@emea.co.in

HVAC CONSULTANT: EMEA
Designers and Consultants
Kundan Classic?, Office No. 4,
Ground Floor,S. No. 46/D/1/A/1,
Aundh-Spicer Road,
BhopalPune -411003.
Maharashtra,India
Telefax: 020-25813060
Email: emea@emea.co.in

DRAWING TITLE:
**PROPOSED CHEMISTRY OUTREACH CENTER
SECOND FLOOR PLAN**

SCALE : 1:125 (A1)	DRAWN : R.SAILAKSHMIL	T1
DATE : 18.05.17	DESD : RANURADHA	
	CHKD : CSR	

CLIENT SIGNATURE :

DRAWING NO:
IISER-LAB-Ar1-1236-T1-122697

Design | Interiors | Engineering | Construction management
C.R.Narayana Rao (Consultants) Private Limited

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No. 10, Karpagamal Nagar,
Mylapore, Chennai-600 004,
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SECOND FLOOR PLAN